

A SUPPLY CHAIN PROFILE OF A SCHOOL-BASED FEEDING PROGRAM USING THE CENTRALIZED KITCHEN MODEL

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ABSTRACT

There has recently been renewed interest and a growing demand for school feeding programs. In the Philippines, the government, through the Department of Education (DepEd), Department of Social Welfare and Development (DSWD), and non-government organizations such as the Ateneo Center for Educational Development (ACED), has initiated such programs to address the prevalence of malnutrition among Filipino school-age children. In 2011, ACED introduced the *ACED Blueplate Centralized Kitchen* (ABCK) model for large-scale school feeding. This study aims to provide a supply chain profile of the first and largest city-wide implementation of the ABCK model in the Philippines to date, which is fully funded by a local government unit, DepEd, and DSWD. The research considers the crucial internal and external factors that influence the attainment of the program objectives, affect its performance, and promote its overall sustainability using the school feeding supply chain framework.

Keywords: Humanitarian supply chain; Malnutrition; School feeding program; Social protection; Sustainability

1. INTRODUCTION

The relationship between nutrition and education (Pollitt, 1990; Birdsall et al., 2005), along with the need to address severe malnutrition as early as possible, has made school-based feeding programs a natural and popular solution for NGOs and governments in developing countries (World Bank, 2005). The ubiquity of these programs has emphasized the need to document and implement best practices to ensure proper cost containment and maximum efficacy. However, due to unclear (or even competing) performance indicators, the intricacies of public-private interactions, and the presence of operating and social costs, determining the effectiveness of these programs can be difficult. Furthermore, there has been a dearth of literature with respect to effective program monitoring and evaluation (Gelli & Espejo, 2012).

Absenteeism due to hunger is one of the associated factors in the poor performance of children in the Philippines (Tabunda et al., 2016). In response to this, several school feeding programs have been initiated in the Philippines by the Department of Education (DepEd) through its

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School-based Feeding Program (SBFP), by the Department of Social Work and Development (DSWD) through its Supplemental Feeding Program (SFP), and by non-governmental organizations such as the Ateneo Center for Educational Development (ACED) through its the Blueplate for Better Learning feeding program. These programs primarily aim to improve the nutritional status of children classified from wasted to severely wasted, improve their classroom attendance, and alleviate short-term hunger in public schools in the Philippines. The ACED Blueplate is also a template-building initiative which seeks to develop a sustainable, replicable, and cost-effective large-scale school feeding model. To this end, they developed and introduced what we refer to as the ACED Blueplate Centralized Kitchen (ABCK) model, which is a template for large-scale school feeding.

The largest implementation of the ABCK model to date has been the City-wide School Feeding Program (CSFP) in a city in Metro Manila, Philippines (henceforth referred to as the City). Launched in 2012, it was the first city-wide school feeding program in the whole country, and now feeds more than 17,000 schoolchildren daily through a single centralized kitchen. It is also the first implementation of the ABCK model which is fully funded by a city LGU and DepEd through SBFP, and DSWD through SFP.

This study aims to provide a supply chain profile of the CSFP using the school feeding supply chain framework developed by Kretschmer et al. (2014). The supply chain framework gives us a template from which we can begin to provide a more holistic assessment of the feeding program performance. The study examines the crucial internal and external factors that influence the attainment of program objectives and which affect its performance. It contributes to the growing body of humanitarian logistics, which focuses on the complexities of managing supply chains in humanitarian settings (Van Wassenhove, 2006). Moreover, the research contributes to the building of the evidence base to inform policymakers and implementers in designing and identifying SBFP implementations that are effective, efficient and sustainable. The study is part of an on-going comprehensive impact and process evaluation of ACED Blueplate and its implementations all over the Philippines.

2. THE CASE STUDY

In response to the urgent need for hunger alleviation, health and education in the Philippines, DepEd has been implementing food for education (FFE) programs since 1997. These programs have undergone modifications over the years in terms of target beneficiaries, coverage, modality, and strategic objectives. In 2012, DepEd's FFE was renamed SBFP. As the name suggests, its modality is in-school feeding for a duration of 120 days, targeting undernourished children in Kindergarten to Grade 6 (K-6). It primarily aims to rehabilitate at least 70 percent of the severely wasted and wasted to normal nutritional status by the end of 120 feeding days. Its secondary aims are to increase classroom attendance to 85-100 percent, and to improve the beneficiaries' health and nutritional values and behavior.

At the legislative level of the Philippine government, members of the congress, both in the lower and the upper houses, are apparently cognizant of the need to have a more expansive school feeding program, as evidenced by the parallel bills they recently passed proposing the creation of a national school feeding program. This is also becoming true for almost every government in the world (Bundy et al., 2013). Hence, the key question now is not whether to implement school feeding, but *how to improve the effectiveness and efficiency of program implementation*.

2.1. SBFP Implementation and Operating Models

The SBFP has traditionally been implemented by a School Feeding Core Group (SFCG), created by the School Head (SH) of an SBFP-implementing school. The SFCG is composed of

one to two teaching personnel and one to two parents; one of the teaching personnel is often designated as the school feeding coordinator. The core group is in charge of project management (PM): it identifies the target beneficiaries following the nutritional assessment made by the school; finalizes the cycle menu for the 120 feeding days; identifies, trains and manages the parents and volunteers (P&V) who will help in the food preparation and cooking (FP&C) and the feeding proper (FP); prepares the feeding area; and supervises the daily feeding. It also conducts the main administrative activities of an SBFP implementation, namely procurement (P), accounting and liquidation (A&L), and monitoring and evaluation (M&E).

In this traditional operating model of SBFP, the bulk of the work is done by the SFCG. For the teacher members of the group, their involvement is an extra workload on top of their regular teaching duties. Thus, the inconsistent attendance of parents and volunteers is problematic, as the teachers will also have to conduct the main daily feeding operations (FP&C). In 2015, DepEd presented other SBFP operating models with the aim of lessening the burden on the teachers. These models were developed through a series of consultations with DepEd school administrators, feeding coordinators and health personnel, as well as with partner LGUs and NGOs.

The various SBFP operating models presented in DepEd Order (DO) No. 39, s. 2017 are summarized in Table 1. They are characterized in terms of the centralization or decentralization of the main SBFP administrative activities and main daily feeding operations. The traditional operating model of the SBFP described above is denoted as School-led Model A in Table 1. It is a decentralized model, because all main SBFP activities are undertaken at school level. In other decentralized operating models, the school may outsource the FP&C, using hired cooks to do the daily cooking or contracting a catering service provider.

Table 1 Various operating models for SBFP (DO No. 39, s. 2017)

	Model	FP&C	FP	P	A&L	PM	M&E
Decentralized	School-led Model A	P&V	P&V	SFCG	SFCG, SH	SFCG, SH	SFCG, SH
	School-led Model B	FP by P&V C by HC	P&V	SFCG	SFCG, SH	SFCG, SH	SFCG, SH
	School-led Model C	Catering Service	P&V	SFCG	SFCG, SH	SFCG, SH	SFCG, SH
Semi-centralized	Schools Cluster Model	P&V from CMS in CLS	P&V in CMS	SFCG of CLS	SFCG, SH of CLS/CMS	SFCG, SH of LS	SFCG, SH of LS
	SDO Cluster Model	P&V	P&V	SDO	SDO	SDO	SDO
Centralized	LGU-led Model	P&V LGU Staff	P&V LGU Staff	LGU	LGU	LGU	LGU

In a centralized operating model, all the main SBFP activities are done at LGU level; an LGU may be a provincial, city or municipal government unit. In an LGU-led model, the LGU manages centralized kitchens to cater to all public elementary schools in the whole province, city or municipality. The CSFP, using the ABCK model, falls under this category. It is important to note that the LGU-led model was included in the SBFP operating models in 2015, with the CSFP as proof of the concept, as by then it had been successfully operating for three years. The ABCK model is being used in various SBFP LGU-led implementations all over the country, but CSFP remains the largest and the most mature, entering its seventh year of operations.

2.2. City-wide Feeding Program

In school year 2011-12, the nutritional status results of the K-6 schools in the City showed that out of 68,890 students in the public elementary schools, around 12,000 were undernourished.

This is the external environment that prompted the local government to launch CSFP in June 2012. From its inception, the CSFP employed the ABCK model in its implementation, with the program management under ACED. In the second year of the CSFP operations, the City decided to include its 78 daycare centers in the CSFP coverage.

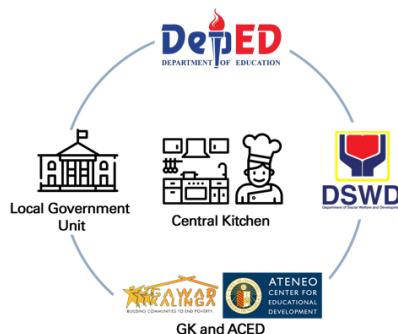


Figure 1 The inter-sectoral partnership in the implementation of CSFP

Initially, the CSFP was funded wholly by the City, but by the second year they were able to access funds from DepEd SBFP for the food budget of the undernourished K-6 students. Meanwhile, the food for the feeding program for the daycare students is funded by the DSWD. The City takes care of the other aspects of the feeding program, such as the salaries and honoraria of central kitchen personnel and the incentives for the kitchen volunteers. As a result, inter-sector collaboration was established in the implementation of CSFP between an NGO (ACED), a local government unit (the City LGU) and government agencies (DepEd and DSWD) (see Figure 1).

3. THEORETICAL FRAMEWORK

In this section, we discuss the Supply Chain Framework as a means of evaluating the efficacy and efficiency of the ABCK model. In doing so, we discuss several widely accepted measures of success and use these to determine the appropriate framework to use.

Despite the seeming universality of school feeding programs, the keys to effective and sustainable implementations remain under dispute. The World Bank and WFP highlight five standards for good practices: strong policy frameworks; strong institutional structure and coordination; stable funding and planning; strong community involvement; and sound program design and implementation (Bundy et al., 2009). However, studies have shown that disparities between school feeding programs across the globe in terms of costing (Gelli & Daryanani, 2013) and outcomes (Kristjansson et al., 2016) continue to exist, implying that more needs to be done in terms of identifying and promoting best practices for different situations. In general, the development of common templates and systems for humanitarian settings continues to be an area of interest in the humanitarian logistics literature (Kovács & Spens, 2011).

Beyond costing and cost-outcomes, another key measurement of the success of feeding programs is sustainability. Feeding programs are ideally viewed as a temporary intervention mechanism, specifically with respect to external funding and administration. Sustainability in this context refers to program continuity, in which programs are transitioned to and run effectively by local entities and have little to no reliance on external (typically international) funding and expertise (Gruen et al., 2008; Kretschmer et al., 2014). This echoes previously mentioned good practices that highlight programs that utilize local resources and encourage community participation.

From an operations management perspective, feeding programs can be viewed as supply chains that involve a complicated network of stakeholders and their objectives. However, unlike profit-driven commercial supply chains, feeding programs are primarily a social welfare mechanism. Program sustainability thus relies on the ability of the program to continuously coordinate the various stakeholders throughout the supply chain and to keep their objectives aligned.

There have been several proposed frameworks for the study of school feeding programs. One example is the SABER approach, which characterizes programs using four stages of development across five policy goals, with a focus on driving policy and big-picture implementation (World Bank, 2012). In this approach, operational aspects of the program, such as volunteer formation and day-to-day operations, may be mentioned but are not clearly identified (especially with respect to their influence on program success), so the approach is thus inadequate for the purposes of this study. Furthermore, an appropriate framework for studying feeding programs should not only identify the interaction between stakeholders and their objectives, but also determine key drivers for program sustainability. Another approach to studying school feeding programs is the value chain framework, which views stakeholders as actors in the supply chain (Gelli et al., 2015). This more granular approach emphasizes the interactions between actors and the corresponding interventions that can be formulated. This alternative framework is suitable for complex supply chains, such as those that integrate local procurement from smallholder farmers, where incentives may be grossly misaligned and where incentive alignment is crucial at every step of the value chain. However, despite the number of actors involved in the ABCK model, their identified roles and hierarchies are relatively straightforward, and our study wishes to focus on the effect of key operational practices on the success of the program. Therefore, this framework is not suitable for our purposes either.

To study the ABCK model as implemented in the City through its CSFP, we utilize the Supply Chain Framework (SCF) of Kretschmer et al. (2014) to characterize the different factors that comprise the supply chain and how their dynamics satisfy or impair the objectives of the feeding program. The flexibility of the framework allows us to focus on the granular operational aspects of the program without sacrificing the holistic assessment of the overall process, as a supply chain with multiple stakeholders and objectives. In the following section we give an overview of the SCF.

From the outset, the SCF has stressed the importance of taking into account the context of the region of implementation, as the contextual fit of the program design impacts program performance. As illustrated in Figure 2, the SCF integrates the various aspects of the school feeding supply chain (left-hand box) and the program performance (right-hand box). The features of the school feeding supply chain are classified into external and internal factors.

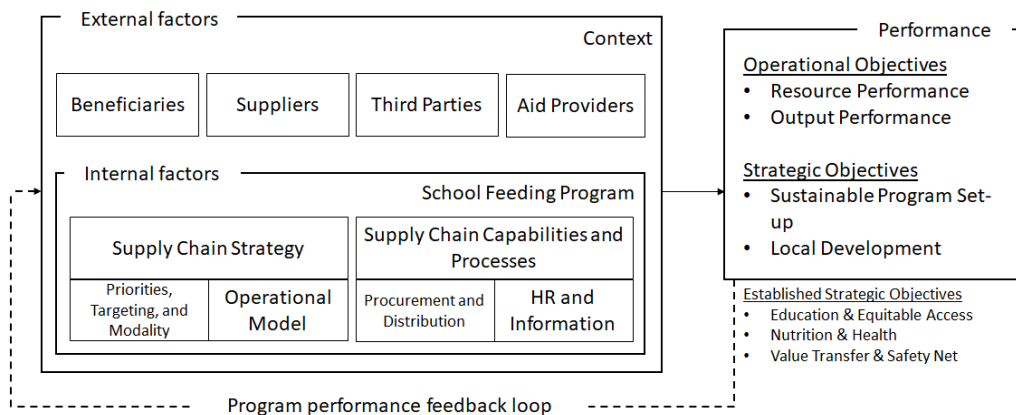


Figure 2 Diagram of the school feeding supply chain framework (Kretschmer et al., 2014).

All the entities involved in the feeding program, namely suppliers, aid providers, beneficiaries, and third parties, along with the operating conditions of the program (i.e. political climate, accessibility, etc.), are classified as *external factors*. Meanwhile, the factors that directly influence the supply chain choices, such as the supply chain strategies, capabilities and processes, are referred to as *internal factors*. The *supply chain strategies* consist of identifying the priorities of the feeding program by analysing the needs of the beneficiaries, followed by targeting and choosing an appropriate modality. On the other hand, the components of the *supply chain capabilities and processes* include procurement and distribution, and HR and information. Procurement capabilities include sourcing processes, supplier management, and supplier development, while distribution includes transportation, storage, processing of supplies, food preparation, and distribution of meals to the school feeding beneficiaries. The other components of the supply chain capabilities and processes are HR and information, which refer to the people and tools used to facilitate the supply chain processes.

The external and internal factors of the school feeding supply chain directly affect program performance, which is evaluated with respect to the various operational and strategic objectives. Operational objectives are more concerned with day-to-day operations and encompass direct measurements of program performance, such as inventory and costing. Strategic objectives are more long-term and involve both established objectives, such as improved education and nutrition, along with others such as sustainable program setup and local development. The interaction between factors and performance over time can then be characterized as a dynamic feedback loop that allows for program improvement in an iterative process.

4. SUPPLY CHAIN PROFILE OF THE ACED BLUEPLATE CENTRALIZED KITCHEN

In this section, we provide a supply chain profile of the first and largest city-wide implementation of the ABCK model to date using the school feeding supply chain framework.

4.1. External Factors

Context. The City is a highly-urbanized and first-class city in the Philippines. Since 2004, the local chief executives of the City have come from the same family, allowing them to build substantial political capital there. This fact has also played a significant role in the creation of the grassroots organizations that play a crucial role in the operations of CSFP as the source of committed and reliable volunteers for the daily operations in the central kitchen. Furthermore, the continuous and uninterrupted support by the local chief executive for the feeding program has paved the way for the institutionalization of the feeding program in the city governance processes, as indicated by the succession of local ordinances passed by the City Council through the years in support of the feeding program.

Beneficiaries. The targeting of beneficiaries for the 78 daycare centers in the City is universal. Individual targeting is employed for the K-6 students, as stipulated in the operational guidelines for SBFP issued by DepEd. During the first three weeks of the school year, all 42 public elementary schools conduct nutritional assessment of their pupils, which include measurement of their weight and height. The Body Mass Index (BMI) of the students is computed and the nutritional status - from obese to severely wasted - is determined using the World Health Organization Child Growth Standards. The students who are classified as wasted or severely wasted are considered as CSFP beneficiaries. The families of the student beneficiaries are also considered CSFP beneficiaries in anticipation of some level of value transfer. In the CSFP setting, the schools are also considered as beneficiaries, since they are now freed from some of their traditional SBFP functions, such as procurement, accounting, liquidation, and daily food preparation.

Suppliers. As a highly urbanized city, the availability of logistics and suppliers for basic food commodities is not problematic. However, bureaucratic requirements and delays in payment discourage smallholders, small players and even some big players from engaging in the supply chain. For this reason, the three suppliers for CSFP meat, vegetables and grocery items over the last six years have remained the same. A separate supplier provides the food containers used for distribution.

Third Parties. ACED is one of the third parties involved in the CSFP, as the technology (ABCK model) provider. An ACED staff member is designated as the Project Coordinator of the CSFP and is tasked to ensure proper implementation of the ABCK model. Grassroots organizations and the Barangay Health Workers, who include the Barangay Nutrition Workers and Barangay Population Management Workers, are also considered third parties, and comprise the volunteer pool for the daily operations in the central kitchen. The other parties involved in CSFP are the informal group of volunteer parents who help the teachers in the actual daily feeding, and the barangay (village) councils that sometimes provide logistical support.

Aid Providers. The aid providers are the national government through DepEd's SBFP, DSWD's SFP, and the City LGU. DepEd allocates 16.00 PHP (0.31 USD) per beneficiary per day for food, 2.00 PHP (0.038 USD) per beneficiary per day for operational expenses, 1.00 PHP (0.019 USD) per beneficiary per day for iron supplements, and 25.00 (0.48 USD) PHP per beneficiary for the hygiene kit provided (toothbrush, toothpaste and soap). For the daycare, the DSWD allocates 13.00 PHP (0.25 USD) per beneficiary per day for food. The City LGU takes care of the other expenses in the CSFP operations, such as the salaries of the central kitchen staff and the feeding coordinators; central kitchen renovation, equipment and utilities; and tokens for volunteers. ACED may also be considered as an aid provider, since the Project Coordinator is paid by it.

4.2. Internal Factors

Supply Chain Strategy. As mentioned previously, the CSFP employs the SBFP LGU-led centralized operating model using the ABCK template for large-scale feeding. The food preparation and cooking are done in one central kitchen, and then delivered to the 78 daycare centers and 42 elementary schools for the actual feeding. As shown in Table 1, the main administrative activities, such as procurement, accounting and liquidation, project management, and monitoring and evaluation, are all done by the City LGU with the help of the ACED Project Coordinator. The centralized nature of the CSFP relieves the burden on the school beneficiaries, but increases the complexity of the daily feeding operations and the distribution.

Supply Chain Capabilities and Processes. Procurement is handled mainly by the City LGU, with bidding conducted by the Bids and Awards Committee. Overall, procurement procedures and management of suppliers are handled by personnel of the Purchasing Department of the City LGU, while the preparation of purchase orders is undertaken by the ACED Project Coordinator every other week. There are no warehousing issues, since the meat is delivered on the day of use, while the vegetables and fish are delivered a day before they are needed. The central kitchen is run by 37 personnel, who are employed by the City LGU and assisted by a minimum of 50 volunteers daily from grassroots organizations and the BHW. The food distribution for the 78 daycare centers is done by seven vehicles, which are provided by the City LGU. The distribution for the elementary schools is decentralized, with each school providing a vehicle. The actual feeding in each school is managed by a school feeding coordinator, with assistance from a group of parent volunteers.

HR. The most complicated aspect of the ABCK model is the daily operations in the central kitchen. For this reason, ACED deploys its own personnel to assist the City LGU in this matter. The ACED Project Coordinator (PC) ensures the proper implementation of the ABCK model

and handles monitoring and evaluation. The ACED PC coordinates with the City LGU through the CSFP Focal Person (who is the Vice-Mayor of the City). In the central kitchen, the ACED PC is assisted by two kitchen managers, and the kitchen core group consists of the managers and all kitchen staff under them. They are all hired and paid by the City LGU, and are trained and evaluated by the PC. An integral part of the HR in the CSFP central kitchen are the kitchen volunteers; a minimum of 50 volunteers are needed daily for the entire operation. While the volunteers are not paid, they get free meals during their shift and gifts on special occasions. Full-time feeding coordinators are hired for each elementary school to manage the feeding and to recruit and manage the volunteers. They are also tasked to make and collate the necessary reports for monitoring of the grades, attendance and nutritional status of the beneficiaries three times a year: baseline (for nutritional status only), mid-year, and year-end.

Information. For the day-to-day operations, a Daily Feeding Monitoring Sheet and Daily Attendance Sheet are completed by the school feeding coordinators. These forms give daily feedback to the central kitchen about problems in the quality and quantity of the food dispatched and the number of beneficiaries present in the actual feeding. For the purposes of monitoring and evaluation of the K-6 beneficiaries, the feeding coordinators need to complete two types of forms: one set required by DepEd, and another set required by ACED/City LGU. The latter is used by ACED to prepare the CSFP Annual Report, which is submitted and presented to the City LGU. These reports have been useful for annual monitoring and evaluation; however, the soft copies on the level of individual beneficiary data, such as BMI, grades and attendance, are not stored in digital form for longitudinal study. It is therefore necessary to have the appropriate software and hardware to gather and store these reports.

4.3. Performance

Resource and Output Performance. In terms of operational performance, ABCK implementation is running well. Despite the lack of kitchen volunteers on some days, the production output of the kitchen remains constant. The program coverage has been consistently effective over the years, reaching all targeted beneficiaries (an average of about 16,000 per year, as shown in Table 2) and going beyond the required 120 feeding days. The average daily production time is around 14 hours. Capacity planning might be useful to improve the efficiency of the kitchen in order to cut the production time.

Table 2 Total number of CSFP beneficiaries (ACED, 2018)

SY	K-6	Daycare	Total
2012-13	5,265	-	5,265
2013-14	8,542	8,128	16,670
2014-15	7,116	8,269	15,385
2015-16	6,409	8,864	15,273
2016-17	5,756	9,396	15,152
2017-18	5,726	11,413	17,139

Although the meal cost per student per day is pegged at 16.00 PHP (0.31 USD), or 1,920.00 PHP (37.00 USD) for 120 days, due to the economies of scale in the centralized kitchen model, the actual meal cost per child is estimated at 11.50 PHP (0.23 USD) or less per day, or 1,380.00 PHP (27.00 USD) for 120 days. This is almost equal to the global average of 44.00 USD for 200 days, or 26.40 USD for 120 days (Gelli et al., 2011), excluding operational expenses.

Strategic Objectives. Although the implementation of the ABCK model in the CSFP operations is supervised by the ACED PC, all the kitchen personnel and volunteers are from the City. In fact, ACED is already transitioning the kitchen to be fully managed by the City LGU in 2020. Moreover, the political will of the successive local chief executives of the City in implementing

CSFP has strengthened the LGU-level policy framework of the program through the ordinances and resolutions passed by the City Council over the years.

4.4. Established Strategic Objectives

Education and Equitable Access. One of the aims of ACED and the City LGU in implementing CSFP is to improve the academic performance of the beneficiaries, as measured by their grades. Table 3 summarizes the percentage of beneficiaries with overall average pass mark (>75%) and overall average fail mark (<75%), and those who dropped out of school within the school year. The table shows that more than 93% of the beneficiaries achieve pass marks at the end of each school year. However, an in-depth impact assessment needs to be conducted.

Table 3 Year-end general average of CSFP beneficiaries and their dropout rate (ACED, 2018)

SY	>75%	<75%	DO
2012-13	4,810 (93.80%)	318 (6.20%)	137 (2.6%)
2013-14	8,319 (98.43%)	133 (1.57%)	90 (1.05%)
2014-15	6,932 (99.30%)	49 (0.70%)	135 (1.09%)
2015-16	6,134 (98.95%)	65 (1.05%)	80 (1.27%)
2016-17	4,671 (94.65%)	70 (1.42%)	194 (3.93%)
2017-18	3,747 (95.10%)	25 (0.63%)	168 (4.26%)

Nutrition and Health. Consistently, the CSFP has achieved its aim of rehabilitating about 90% of the beneficiaries to normal BMI by the end of the feeding cycle.

Table 4 Year-end BMI status of CSFP beneficiaries (ACED, 2018)

SY	% Improved BMI	% Remain Undernourished
2012-13	86.53%	11.66%
2013-14	88.42%	10.52%
2014-15	90.53%	7.57%
2015-16	89.60%	9.19%
2016-17	86.37%	9.73%
2017-18	87.80%	9.73%

In Table 4, we give the year-end percentage of the beneficiaries who recovered from undernourishment (% Improved BMI) and the percentage of those who remain undernourished (% Remain Undernourished). The City LGU has recently undertaken a post-feeding medical intervention for those CSFP beneficiaries who remain undernourished by having them checked by medical professionals.

Referring back to Table 2 with regard to the total number of K-6 beneficiaries, there was a consistent drop in the numbers of beneficiaries from SY 2013-14 (2nd year) up to SY 2016-17 (5th year). It would be interesting to establish if this is an impact of the CSFP which covers students from daycare through to K-6. This is also part of the on-going impact evaluation by the research team. The value transfer and resulting safety net of the CSFP is also being evaluated; it can be measured in terms of the income it frees at the household level for other uses.

5. CONCLUSION AND OUTLOOK

The supply chain profile of the ABCK model as implemented in the CSFP shows that it is a viable template for efficient and effective large-scale LGU-led school feeding operations. The sustainability of the program, however, is largely dependent on the context and capabilities of the implementing LGU. Due to its scale, the implementing LGU needs to have sufficient

functional and managerial capabilities to deal with the main administrative activities, such as procurement, accounting and liquidation. The complexity of the daily operations of the CSFP requires strong support for the program, not just among LGU employees and officials, but also in the community, among the school heads and teachers, and among the central kitchen employees themselves.

The support of the LGU Council is necessary to establish strong policy frameworks and strong institutional structure and coordination for the program; for example, by establishing and cultivating partnerships with other government institutions such as DepEd and DSWD. To make the program implementation as cost effective as possible and to foster program ownership, community participation is important as a source of volunteers and community champions of the program. The consistent delivery of quality meals to thousands of beneficiaries for 120 days is not just a function of sound program processes, but also of the commitment and support of the central kitchen core group. Hence, a complete buy-in to the program by the kitchen core group is important. Fortunately, all these requirements are currently satisfied in the CSFP of the City.

One of the strengths of an LGU-led model (and social intervention programs in general) is the presence of political champions, who can rally support for the program. If the political champion has enough political capital and grassroots support, such as the mayor of the City, this can translate into vital human resources support in the daily operations of the central kitchen. However, the personal character of such political capital can also be a source of weakness for the program. Hence, mainstreaming SFP in local policies and plans is vital. In the City LGU, aside from the local ordinances passed in support of the program, the CSFP is one of the main components of *Education 360 Investment*. Launched in 2014, Education 360 is based on a holistic approach, which aims to improve the quality of the basic education of the City. Aside from investing in nutrition through CSFP, it is also an investment in other vital aspects of basic education: school supplies, curriculum, parental involvement, teacher competency, and infrastructure.

The primary goal of the SCF is to identify the aspects of the school feeding supply chain that foster sustainability. As this study has shown, it can also be a useful tool to obtain a better understanding of the complex dynamics of a centralized school feeding model. Future studies could include determination of which of the SBFP operating models in Table 1 are effective, efficient and sustainable. The impact and value transfer of feeding programs should also be evaluated.

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