The costs and cost-efficiency of providing food through schools in areas of high food insecurity

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Abstract

Background. *The provision of food in and through schools has been used to support the education, health, and nutrition of school-aged children. The monitoring of financial inputs into school health and nutrition programs is critical for a number of reasons, including accountability, transparency, and equity. Furthermore, there is a gap in the evidence on the costs, cost-efficiency, and cost-effectiveness of providing food through schools, particularly in areas of high food insecurity.*

Objective*. To estimate the programmatic costs and cost-efficiency associated with providing food through schools in food-insecure, developing-country contexts, by analyzing global project data from the World Food Programme (WFP).*

Methods*. Project data, including expenditures and number of schoolchildren covered, were collected through project reports and validated through WFP Country Office records. Yearly project costs per schoolchild were standardized over a set number of feeding days and the amount of energy provided by the average ration. Output metrics, such as tonnage, calories, and micronutrient content, were used to assess the cost-efficiency of the different delivery mechanisms.*

Results*. The average yearly expenditure per child, standardized over a 200-day on-site feeding period and an average ration, excluding school-level costs, was US$21.59. The costs varied substantially according to choice of food modality, with fortified biscuits providing the least costly option of about US$11 per year and take-home rations providing the most expensive option at approximately US$52 per year. Comparisons across the different food modalities suggested that fortified biscuits provide the most cost-efficient option in terms of micronutrient delivery (particularly vitamin A and iodine), whereas on-site meals appear to be more efficient in terms of calories delivered. Transportation and logistics costs were the main drivers for the high costs.*

Conclusions*. The choice of program objectives will to a large degree dictate the food modality (biscuits, cooked meals, or take-home rations) and associated implementation costs. Fortified biscuits can provide substantial nutritional inputs at a fraction of the cost of school meals, making them an appealing option for service delivery in food-insecure contexts. Both costs and effects should be considered carefully when designing the appropriate school-based intervention. The costs estimates in this analysis do not include all school-level costs and are therefore lower-bound estimates of full implementation costs.*

Key words: Costs, evaluation, food aid, school feeding

Introduction

Basic education is one of the most effective investments in improving economies and creating literate, self-reliant, and healthy societies. In the past decade, access to primary education has improved significantly in many parts of the world [1]. Yet, 77 million children of primary school age, 49% of them in sub-Saharan Africa, are not in school, and 57% of them are girls [2]. Governments aiming to achieve the Millennium Development Goals for education are faced with the need to identify and prioritize different educational policies within different national contexts. With this backdrop, the issue of cost-effectiveness is central to the decision process in educational policy making.

The potential benefits of providing food through

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schools, or Food for Education (FFE), in different socioeconomic dimensions, including education, health and nutrition, social equity, and agricultural development, have made FFE an appealing option within Education for All (EFA) strategies. The impact of FFE on educational outcomes is perhaps the most studied. Recent evaluations of FFE programs [3–6], including a Cochrane systematic review [7], have shown that FFE programs can lead to increased access (of girls in particular), reduced dropout, particularly in the lower primary school grades, and improved student learning. Some nutritional benefits of FFE programs have also been identified, particularly in the provision of micronutrient-fortified foods to undernourished school-aged children [8]. The Cochrane review of school meals also identified small, but significant, gains in children's nutritional status. From the nutritional perspective, the design of the food ration, in terms of both caloric and micronutrient content, will be to a large extent determined by the desired intervention outcomes in the specific operational context. Achieving nutritional objectives, however, not only will depend on adequate food-service provision at the school level, but could to a large degree hinge on household dynamics: the issue of substitution of food that children would normally receive at home because they receive food in school is potentially an important problem [9]. Clearly, however, schools provide preexisting systems that can be used as platforms for reaching vulnerable children with different health and nutrition interventions. Although the synergies between health, nutrition, and education are already well established [10], providing food through existing schools also has the potential advantage of being a less costly alternative to delivering food through the health-system infrastructure. However, the recent reviews on the subject have highlighted a significant gap in the evidence on the costs, cost-efficiency, and cost-effectiveness of these interventions [11].

The monitoring of financial inputs into FFE is also critical for a number of other reasons, including accountability, transparency, and equity. Measuring the costs of FFE is also crucial for assessing the financial feasibility of scaling up FFE programs. FFE costs are also important for identifying the size of the investments required to reach the EFA goals. Program costs will depend on several different factors, including the composition and size of the ration, the caloric intake per day, the number of beneficiaries, and the number of school feeding days per year. Logistics, security, and climatic conditions will have an impact on program expenditures. The geographic context will also affect the program cost; operations in landlocked countries will generally face greater operational costs than those in countries implementing the same type of program that have access to the sea.

By reaching over 20 million schoolchildren in 2006, the World Food Programme (WFP) has become the largest international organizer of FFE programs. Schools assisted by WFP FFE programs are targeted on the basis of food insecurity and vulnerability analysis and mapping (VAM), which analyzes the causes of food insecurity and vulnerability among populations affected by conflict, natural disasters, or economic decline, as well as an analysis of the educational context in each country. The diversity and complexity of the different WFP operations pose a huge challenge in terms of obtaining a standardized costing methodology that can be meaningfully applied across all relevant projects. To date, two exercises in the estimation of FFE costs per beneficiary have been developed by WFP and not published in the literature. Both analyses used as a basis for the estimations project expenditures per operation, as reported on in the yearly Standard Project Reports. The rationale for this choice is straightforward, as the Standard Project Reports contain audited data on beneficiaries, food distribution, and expenditures, alongside other project information. These data are also signed off by WFP Country Offices, Regional Bureaus, and Headquarters on an annual basis. The first cost per beneficiary exercise was undertaken in 2001: either the proportion of beneficiary numbers, or the food distributed, in school feeding activities over the whole project was used as a proxy to estimate school feeding expenditures in all WFP FFE operations. Different modalities of FFE (biscuits, on-site meals, and take-home rations) were grouped together in the analysis. Documentation on the details of the calculations was not available for study. The results of this exercise estimated an average cost per beneficiary of US$34 per year. The second WFP costing exercise was undertaken in 2004 using project data from 2003 as a basis for a more detailed analysis that included FFE modality type and ration size and composition, as well as school feeding days. WFP Country Offices were requested for inputs at different stages of the process and were involved in the validation of the results. A comprehensive analysis of the data, including a standardization across programs for school feeding days and ration calories, resulted in an estimated average (weighted by beneficiaries) cost per beneficiary of US$21 per year. However, neither of the two estimations provided satisfactory solutions to the challenge of providing reliable FFE costs estimations as part of the regular program monitoring and of ongoing programs.

This exercise therefore builds on previous analyses by WFP and has the objective of providing estimates of standardized expenditures per year per beneficiary using project data from 2005 as well as measures of cost-efficiency. This work also provides a basis for future studies on cost and outcomes and cost-effectiveness.

Methods

Two data sources were used in this exercise. The first was data from WFP Standard Project Reports, including expenditures, beneficiaries, and food distribution, collected through the WFP data-warehouse system. The second was WFP Country Offices' estimated yearly expenditure by beneficiary, collected through the WFP statistics office. WFP project expenditures are captured on an annual basis in the Standard Project Reports. Since the expenditures in the Standard Project Reports are not broken down by project activity, the core of this exercise included an estimation of the amount of expenditures within a project that is accountable only to FFE activities. Generally, project-level expenditures in the Standard Project Reports include direct operational costs (DOC) and support costs. DOC include the costs of commodities, transport, landside transport storage and handling (LTSH), and other direct operational costs (ODOC). Support costs include direct support costs (DSC) and indirect support costs (ISC) overhead. ISC are equal to the sum of DOC and DSC multiplied by a fixed ISC rate, which is usually 7%.

Beneficiary and food distribution data are usually reported according to activity within each country program or development operation. In this exercise, the proportion of food distributed in FFE activities over the total food distribution in each project is used as a parameter that is then used to scale total project expenditure in order to estimate the FFE expenditure. For example, in the Haiti country program in 2005, WFP distributed 1,789 metric tonnes of food for FFE activities, out of a total 2,885 metric tonnes distributed in the project, representing 62% of the food distributed during the year. Therefore, 62% of the total expenditures in the Haiti country program will be used as an estimate for the FFE expenditures in this project for 2005. Having estimated FFE expenditures per year per program, we then divided this figure by the number of FFE beneficiaries as reported in the Standard Project Report, obtaining an estimate for the yearly expenditure per beneficiary.

Country Office estimates of the expenditures incurred for the year for primary schoolchildren were divided by the official number of primary school beneficiaries to provide estimates used to validate the calculations based on the project reports. Countries where large differences in the two estimates were found were then investigated in more detail. Once validated, the cost estimates were standardized across the different types of FFE modality. The standardization parameters considered in this study were the number of school feeding days, set at 200, and the energy provided by the average ration in each FFE modality, namely on-site meals, biscuits, take-home rations, and combined school meals plus take-home rations.

Estimating standardized costs per beneficiary per year

A year of 200 school feeding days was used to standardize the costs alongside a fixed parameter of 700 kcal for on-site and for combined on-site feeding and take-home rations. The weighted average number of calories distributed per year was used in the standardization for the take-home ration only modality. The ratio of planned food tonnage divided by the actual tonnage delivered was used to account for breaks in the food pipeline. The standardized cost per beneficiary, c_s, was calculated using

$$c_s = c_{pr} \cdot \left(\frac{200}{d_{sf}}\right) \cdot \left(\frac{\bar{k}_{cal}}{k_{cal}}\right) \cdot \left(\frac{T_p}{T_a}\right)$$

where

c_{pr} = actual cost per beneficiary project expenditure,
d_{sf} = number of on-site feeding days,
$\bar{k}_{cal}$ = average planned ration kilocalories per modality,
k_{cal} = planned ration kilocalories,
T_p = planned food tonnage, and
T_a = actual food tonnage delivered.

Output metrics, such as tonnage, calories, and micronutrient content delivered, were used to assess the cost-efficiency of the different delivery mechanisms. Linear regression with standardized costs as the dependent variable and number of beneficiaries as the explanatory variable was used to assess economies of scale.

Results

Accurate data on FFE food distribution from the Standard Project Reports could only be obtained from WFP country programs and development operations, covering more than 8.6 million beneficiaries in 42 countries. Country programs from three countries (Dominican Republic, Laos, and Sierra Leone) were excluded from this analysis because of incomplete project data. In 2005, 48% of WFP FFE beneficiaries belonged to projects distributing a combination of on-site meals and take-home rations, 22% to projects distributing on-site meals alone, 24% to projects distributing a fortified biscuit snack, and 6% to projects distributing take-home rations. The total expenditure for FFE in the data set was approximately US$126 million, out of a total WFP FFE expenditure in 2005 of approximately US$305 million. Fifty-three percent of FFE expenditures were incurred in projects distributing a combination of on-site meals and take-home rations, 27% in projects distributing on-site meals alone, 8% in projects distributing a fortified biscuit snack, and 12% in projects distributing take-home rations. The

percentage shares of beneficiaries and expenditures were fairly similar for combined FFE and on-site programs but were substantially different for take-home rations and biscuits. A separate breakdown of the WFP expenditure by cost category showed that on average 59% of project expenditures were due to commodity costs, 25% to transport costs, 14% to support costs, and 2% to other direct operational costs. The share of commodity cost over total cost was lowest for on-site meal programs (about 58%) and was about 10 percentage points lower than for biscuit and take-home ration programs. Bearing in mind that the data do not include school-level costs, these findings are a first indication of the larger overheads for cooked meals compared with biscuits and take-home rations. The average energy content per daily ration was found to be approximately 800 kcal for on-site meals, 300 kcal for biscuits, and 650 kcal for combined programs. The average cost per beneficiary per year (weighted by beneficiaries) according to FFE modality is shown in **table 1**. Two outliers with values more than 3 z-scores from the mean (Guatemala and Peru) were excluded from the analysis because the food distribution had been interrupted for most of the school year.

The results show that the standardized yearly weighted average FFE expenditure per beneficiary was US$21.59. The yearly costs per child were lowest for biscuit programs (US$11.31) and highest for take-home ration programs (US$52.42). The costs per 100 kcal delivered ranged from US$2.65 for on-site meals to US$4.75 for biscuits. Comparisons of costs across the different choices of food modality suggest that fortified biscuits provide the most cost-efficient option in terms of micronutrient delivery (particularly for vitamin A and iodine). In combined programs, 20% of beneficiaries, or 40% of assisted girls, received both on-site meals and take-home rations. Notably, the proportion of children receiving both modalities varied considerably from country to country, reflecting the targeted, context-specific nature of the extra take-home ration assistance.

Generally, the estimates based on the Standard Project Reports compared well with those obtained from the Country Office estimated expenditures, with few exceptions. Where large differences existed between these two figures, the Country Office cost figures were validated and used instead of the Standard Project Reports. **Table 2** shows the breakdown of the WFP costs by country.

A scatter plot of standardized costs per beneficiary per year against number of beneficiaries suggests that large programs benefit from economies of scale, as shown in **figure 1**. Results from the linear regression model with standardized costs per beneficiary

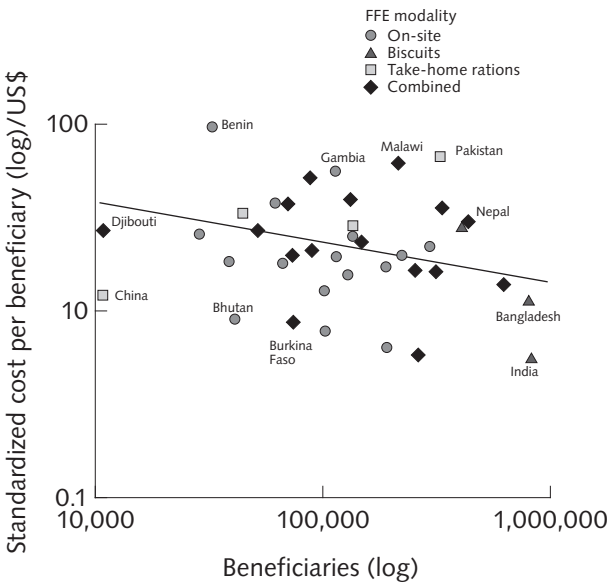

FIG. 1. Standardized cost per beneficiary plotted against number of beneficiaries

TABLE 1. Average (weighted by beneficiary) yearly costs (US$) per beneficiary according to FFE modality and caloric and micronutrient delivery units

Modality	Standardized cost/ beneficiary[a]	Range of standardized costs/beneficiary	Cost/100 kcal delivered	Cost/mg iron delivered	Cost/100 µg vitamin A delivered	Cost/100 µg iodine delivered
On-site	20.40	5.41–96.81	2.65	2.05	8.74	1,593.16
Biscuits	11.31	4.51–26.98	4.75	2.24	6.06	30.98
Take-home rations[b]	52.42	10.98–66.69				
Combined[c]	24.27	4.94–62.09	4.35	2.67	10.82	499.88
Total	21.59	4.51–96.81	3.60	2.33	8.73	813.32

a. Standardized costs over 200 days of on-site feeding.
b. For take-home rations, the ration was standardized by yearly caloric content.
c. For the combined program, only the on-site ration was considered, since not all beneficiaries received take-home rations.

as the dependent variable and number of beneficiaries as the explanatory variable (R^2 = 0.092, p = .000) indicate that the standardized cost per beneficiary would drop by approximately US$2 per extra 100,000 children reached.

TABLE 2. WFP standardized costs (US$) per schoolchild: Estimations by country

Modality	Country	Cost per beneficiary	School feeding days	Beneficiaries	Cost/ 100 kcal delivered	Cost/ mg iron delivered	Cost/100 µg vitamin A delivered	Cost/100 µg iodine delivered
On-site	Benin	96.81	110	32,825	10.17	7.42	34.33	8,800.71
	Bhutan	8.02	287	41,396	0.77	0.46	1.18	18.23
	Bolivia	11.92	161	101,600	1.72	1.38	1.52	3.84
	Cape Verde	6.88	155	102,975	1.00	0.88	2.27	6.34
	Central African Republic	17.61	115	38,844	2.68	1.94	1.86	16.72
	El Salvador	14.54	121	128,440	2.45	1.49	3.02	49.22
	Gambia	55.45	146	112,979	10.07	12.60	61.61	60.86
	Guatemala	248.27	55	75,701	42.83	30.89	100.59	1,989.31
	Haiti	21.29	126	293,390	1.67	1.41	3.51	30.58
	Honduras	5.41	270	191,248	0.87	0.47	1.32	29.75
	Kenya	20.07	195	1,156,062	2.86	1.14	8.21	3,649.30
	Madagascar	36.43	135	61,376	1.88	0.72	1.70	25.22
	Mauritania	18.83	140	114,996	2.09	1.69	9.61	24.82
	Peru	136.19	116	4,243	20.81	6.47	13.65	212.00
	São Tomé and Principe	24.61	164	28,671	3.32	3.53	11.64	16.23
	Senegal	24.41	180	135,979	2.98	4.65	13.56	1,109.49
	Sudan	18.94	210	222,084	2.36	4.25	10.52	20.54
	Tanzania	16.37	174	190,379	1.52	0.68	1.76	35.12
	Zambia	17.09	160	66,870	2.44	—	—	—
Biscuits	Bangladesh	10.19	240	805,356	3.01	1.23	2.88	13.77
	Cuba	26.98	210	412,787	15.05	8.18	22.48	117.05
	India	4.51	201	818,383	1.26	0.25	0.90	4.51
Take-home rations[a]	China	10.98	—	10,820	—	—	—	—
	Ghana	32.56	—	44,710	—	—	—	—
	Pakistan	66.69	—	326,874	—	—	—	—
	Yemen	28.00	—	136,300	—	—	—	—
Combined	Burkina Faso	7.77	198	74,580	0.87	0.85	—	353.23
	Cameroon	18.94	165	73,670	2.56	4.35	14.03	12.49
	Chad	20.21	160	89,549	2.60	4.65	1.79	1,224.71
	Djibouti	26.03	189	10,884	1.86	0.83	1.99	10.98
	Egypt	4.94	50	259,133	1.36	4.53	—	—
	Ethiopia	12.82	167	626,736	2.08	0.49	1.04	7.29
	Guinea	39.27	187	131,848	5.38	7.48	43.63	3,569.58
	Lesotho	22.76	180	147,021	2.64	2.86	1.94	1,034.36
	Malawi	62.09	183	213,894	16.51	—	—	—
	Mali	51.42	180	88,220	4.83	4.83	15.85	3,116.17
	Mozambique	35.25	180	332,155	4.46	6.44	39.17	38.70
	Nepal	29.61	215	440,262	7.99	1.67	7.00	—
	Nicaragua	15.15	240	311,238	2.82	1.35	3.29	63.50
	Niger	26.07	200	52,556	1.28	1.00	—	948.08
	Rwanda	15.62	171	255,667	1.64	1.22	4.60	17.15
	Uganda	36.77	182	70,403	3.49	1.75	4.13	83.99

a. For take-home rations, the kilocalories represent an estimate over the whole year.

Cost drivers and intercountry variations

The standardized cost per beneficiary varied substantially from one country to another. For example, in Guatemala and Peru, the yearly standardized cost per beneficiary was well over US$100, which was the highest among the yearly cost per beneficiary estimates. In both of these countries, food distribution had effectively stopped very early in the school year, thus making the tonnage adjustment in our standardization calculations skew the cost over 3 z-scores from the mean for the two countries. On the other hand, India had the lowest cost per beneficiary at US$4.51, which was considerably below a more recent estimate of US$11.14 obtained by a detailed case study using data from 2006 [12]. **Table 3** lists the five most expensive FFE programs according to country, where costs are presented as food costs and nonfood or support costs broken down by component.

In general, commodity costs were found to be the main cost driver within all FFE modalities. In combined programs, the proportion of children receiving both on-site meals and take-home rations out of the total assisted population was the main driver of higher costs. The food ration and the prices of the different foods varied considerably across the different countries; further analysis was therefore carried out excluding the food cost and considering only the nonfood or support costs. The average support cost for delivering 1 metric tonne of food was US$250. Countries such as Madagascar and the Central African Republic were found to have the highest support costs per metric tonne, US$637 and US$597, respectively, whereas China had the lowest support cost, with US$60 per metric tonne.

Support costs were further broken down by component (transportation costs, LTSH, DSC, ODOC, and ISC) in order to understand the main cost drivers. Transportation and LTSH costs were found to be driving the high costs for countries with above-average standardized costs per beneficiary.

Government support

In several WFP country programs, the host governments contribute to the running of FFE programs by providing the logistics for food distribution. Pakistan, India, Cuba, El Salvador, Honduras, Guatemala, and Peru all reported no LTSH expenditures in the Standard Project Report, indicating that the government had taken over the logistics. If we exclude such countries from the cost analysis, we can attempt to estimate the cost of WFP's running the full FFE program. Our dataset was too small to offer meaningful comparisons across all the different modalities. However, for on-site meals programs, the five countries that had no LTSH data (implying government contributions for the LTSH) had an average standardized cost per beneficiary of US$27.18, as compared with an average of US$22.34 in 14 countries where WFP implemented the whole program. However, WFP project data do not systematically cover government contributions, so these findings will need further investigation.

Discussion and limitations

Basic education is one of the most effective investments for improving economies and creating literate, self-reliant, and healthy societies. The provision of food in schools in the form of cooked meals, snacks, or take-home rations is considered to be a cost-effective way

TABLE 3. The five countries with the most expensive WFP FFE interventions[a]

Country	Total no. of beneficiaries	C_s [b]	Food costs	Transport costs	Landside transport shipping and handling costs	Other direct operational costs	Direct support costs	Indirect support costs
Guatemala[c]	75,701	248.27	110,864.74	3,349.86	0.00	2,107.86	4,276.40	8,792.94
Peru[c]	4,243	136.19	143,620.90	16,328.41	0.00	1,398.82	8,548.01	7,820.00
Benin (on-site)	32,825	96.81	909,470.67	224,490.50	102,215.54	44,720.06	66,523.69	101,017.86
Pakistan (take-home ration)	326,874	66.69	6,134,293.53	510,194.57	0.00	47,770.17	327,000.27	463,685.65
Malawi (combined)	213,894	62.09	3,340,528.47	229,137.63	625,937.67	98,424.00	477,250.49	437,042.81

a. All costs are in US$.
b. = standardized FFE cost per beneficiary per year.
c. Countries excluded from the analysis because the food distribution had been interrupted for most of the school year

of supporting the education, health, and nutrition of school-aged children. However, there is a considerable gap in the evidence base on the costs, cost-efficiency, and cost-effectiveness of FFE programs in developing countries. In this study, we aimed at beginning to bridge the gap in the evidence on cost-effectiveness studies by analyzing WFP project-level data from 2005 in order to estimate both the actual yearly FFE expenditure per beneficiary and the projected yearly cost per beneficiary for a standardized FFE intervention. Calculations based on the 2005 data showed that the weighted average yearly expenditure per beneficiary over all projects was US$15.79, whereas the projected yearly cost per beneficiary, standardized over a 200-day on-site feeding period and an average ration, was US$21.59. The cost per beneficiary was found to vary substantially according to choice of FFE modality, with fortified biscuits providing the least costly option, at roughly US$11 per year, and take-home rations providing the most expensive option, at approximately US$52 per year. The cost figures in this analysis fall in the lower range found in earlier work by the World Bank [13], where the cost of programs providing food through schools standardized over 365 days and 1,000 kcal varied from US$19.35 to US$208.59. The same study found costs of US$74 per 1,000 kcal delivered, compared with an average of US$36 found in our analysis. Comparisons of costs across the different choices of food modality also suggested that fortified biscuits provide the most cost-efficient option in terms of micronutrient delivery (particularly vitamin A and iodine), whereas on-site meals appear to be more efficient in terms of calories delivered. The higher costs for take-home rations were mostly due to the larger volumes of food distributed to each child; in this data set, over a school year, take-home rations delivered approximately twice as much food per child as on-site meals. Moreover, the standardization methodology used in this analysis may not always be appropriate for take-home ration programs, where food is distributed conditional to attendance. Adjusting costs by planned tonnage over distributed tonnage is likely to overestimate costs for take-home rations.

Within the different modalities, the standardized cost per beneficiary varied substantially from one country to another. Commodity costs were generally found to be the main cost drivers, with the food basket and ration nutritional content varying considerably from country to country. Because of in-kind donations to WFP in several countries, commodities were used in the food basket that might have otherwise been replaced by foods procured on the market at lower prices. Because of the variation in the cost of the food commodities provided for FFE interventions in each country, further analysis was carried out excluding the food cost and considering only the nonfood or support costs. This analysis enabled us to assess the efficiency of delivering 1 metric tonne of food in the different countries. The average support cost for delivering 1 metric tonne of food was found to be US$250. Countries such as Madagascar and the Central African Republic were found to have the highest support costs per metric tonne, US$637 and US$597, respectively, whereas China had the lowest support cost, with US$60 per metric tonne. Support costs were further broken down by component in order to identify the main drivers of the higher costs. Transportation and LTSH costs were found to be the main elements in the high costs for countries with above-average standardized costs per beneficiary. Landlocked countries, such as the Central African Republic, Malawi, and Mali, or countries with poor road networks to assisted areas, such as Madagascar, were found to face high transportation costs. This finding may reflect the nature of WFP programs, in which the bulk of the food is not generally purchased in close proximity to assisted schools, which are generally found in food-insecure areas. Often, logistics on difficult roads are compounded by volatile security situations, as in WFP-assisted areas in Pakistan, Sudan, and Uganda, for example. Further analysis of cost drivers was limited by the aggregate nature of the cost categories in the data. Staff costs, for example, were aggregated alongside maintenance and other recurrent costs with the Direct Support Costs category. More in-depth country analysis will be required to determine specific cost drivers.

By looking at countries where there was no explicit government contribution in the project data, we were able to estimate the cost of FFE programs run entirely by WFP. For on-site meals, the standardized cost per beneficiary per year was about US$5 higher in countries with explicit government contribution to food distribution than in countries where the government provided no logistical support. This finding suggests that WFP operations appear to be more cost-efficient when run without explicit government logistics. The data on government contributions, however, are not reported on systematically in WFP Standard Project Reports, making this analysis rather difficult at this moment, and this issue will have to be investigated further.

This study has shown that the estimated expenditure per FFE beneficiary appears to be considerably lower than the US$34 estimated by WFP in 2001. Plausible reasons for the difference of more than US$10 per child per year between the 2001 figure and current estimates are difficult to find in the absence of details on the 2001 estimation methodology. However, since 2001, the share of WFP FFE beneficiaries reached by fortified biscuits, the least costly option of FFE, has increased considerably, mainly due to large programs in India, Indonesia, and Bangladesh. This will have contributed to lowering the estimates of overall cost per child in the more recent calculations. Economies of scale will also

have played a large part in reducing the cost estimate since 2001, as the number of beneficiaries reached by WFP between 2001 and 2004 increased by 44% during this period.

Programming implications

This analysis shows that the choice of modality of food delivery in school has considerable implications for both program objectives and costs. On-site meals are approximately twice as costly as fortified biscuits, even without factoring in the school-level costs required to prepare and distribute the meals. This is a very considerable overhead, particularly if we consider that assisted schools are located in vulnerable, food-insecure areas, and communities around the schools will generally have to bear these costs. Furthermore, biscuits appear to be more cost-efficient in terms of micronutrient delivery, making them an ideal choice in contexts where micronutrient deficiencies in school-aged children are widespread and the infrastructure and resources for school meal programs are constrained.

Local food purchases could be used to offset the transportation costs associated with traditional food-aid programs. However, the decisions to buy locally should be made with care after a thorough market analysis to ensure that any resulting price shifts do not create unnecessary pressure on food buyers.

Combining on-site feeding for all students with take-home rations targeting only older girls, or other vulnerable children identified by the problem analysis in the specific operational context, would achieve lasting benefits at a modest additional cost per child per year.

From the food ration perspective, considering that WFP operates in food-insecure areas, the nutritional value of the rations showed that some systematic improvements in micronutrient content could be introduced to maximize the program benefits. The flexibility of the FFE program design, however, is often limited by the in-kind donations to WFP, which result in higher costs and therefore lower the overall cost-efficiency of the program.

Limitations

In general, WFP expenditures portray only a subset of actual costs. For example, costs incurred by local communities in preparing the food and by teachers in managing the distributions, and other real costs of implementing FFE programs, are not included in these estimates. A more detailed analysis of these hidden costs is currently being conducted jointly by WFP and partners [14]. Obtaining FFE expenditures by using food distribution could be fairly accurate if FFE is a main component of a country program. An analysis of the percentage of FFE food distribution showed that on average 60% (minimum of 2% and a maximum of 100%) of overall project distribution was due to FFE. However, an analysis of results from 22 countries where the percentage of food distributed in the FFE activity was greater than 60% of the total food distributed in the project suggests that the estimated cost per beneficiary of US$22 per child per year was fairly robust.

Country program and development data do not account for the majority of WFP operations. However, an analysis of Country Office expenditures per beneficiary by project category showed that in 2005, development and country programs estimates (US$14.08) were comparable to estimates from protracted relief and recovery operations (US$16.65) and were much higher than those for emergency operations (US$8.95). This analysis, however, will have to be validated by a more detailed study in the future.

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