

HEART

HEALTH & EDUCATION ADVICE & RESOURCE TEAM

Helpdesk Report: School feeding

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Query: Have school feeding programmes led to measurable gains in educational, health outcomes or economic outcomes? If so, under what circumstances and using what approaches?

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1. Overview

School feeding has led to measurable gains in education and health outcomes, as evidenced widely in the literature. There are a few evaluations showing little or no improvement in education and health outcomes. This may be less widely reported or highlighted. Recording of economic benefits has received little attention.

A Cochrane review by Kristjansson et al. (2007) investigated the effects of school feeding on health for disadvantaged children. It concluded that there were some small benefits. Jomaa et al. (2011) conducted a systematic review to look at impacts of school feeding on health and education outcomes. This review found relatively consistent positive outcomes for energy intake, micronutrient status, school enrolment, and attendance. This review notes that the effects of school feeding on growth, cognition, and academic achievement was less conclusive.

This overview presents some of the nutrition, education and economic outcomes identified. It then presents findings on programme costs and design considerations which provide lessons for sustainability and affordability. Finally some cost-benefit analysis findings are presented and trade-offs discussed.

Examples of reported nutrition outcomes

Evidence on improved nutrition from school feeding:

- A randomised control trial (RCT) in Peru (Jacoby et al., 1996) found a school breakfast programme increased energy intake by 15.2%, protein by 16.1%, and iron by 60% among participants.

- Biscuits provided were 97% additional to a child's normal diet and increased body mass index by 4.3% compared to a control group in Dhaka, Bangladesh (Ahmed, 2004).
- A Cochrane review found children who had school feeding gained an average of 0.39 kg over 19 months (Kristjansson et al., 2007).
- Minimal evidence was found that school feeding improves nutrition in Lao People's Democratic Republic (PDR) (Buttenheim et al., 2011). The result is thought to be due to poor targeting.
- Assessment of school feeding in the Atwima-Nwabiagya District of the Ashanti Region, Ghana, found no statistical difference in nutritional status between participants and non-participants (Danquah et al., 2012).

Examples of reported education outcomes

Evidence on increased enrolment due to school feeding:

- 14.2% increase in Dhaka, Bangladesh (Ahmed, 2004).
- Analysis from 32 African countries between 2002 and 2005 found Food for Education (FFE) programmes increased enrolment in schools by 28% for girls and 22% for boys in the first year. However the improvements were only sustained when supplemented with take-home rations (Gelli et al., 2007).
- A school feeding programme in Uganda reduced girls' age at entry to primary school in Uganda (Alderman et al., 2013).

Evidence on improved attendance due to school feeding:

- Increased school attendance in Dhaka, Bangladesh by about 1.3 days a month (Ahmed, 2004).
- Results from a Cochrane review found attendance increased by 4-6 days per year for children who received school feeding (Kristjansson et al., 2007).
- Minimal evidence that school feeding improves participation in Lao PDR (Buttenheim et al., 2011). Result thought to be due to poor targeting.
- School feeding improved seasonal attendance issues in Malawi (Burbano & Gelli, 2009).

Evidence on improved cognition due to school feeding:

- Improved cognition implied in a randomised control trial (RCT) in Peru by improved vocabulary test performance among heavier children (Jacoby et al., 1996).
- An RCT in Jamaica found no difference in Wide Range Achievement test scores but improvement in arithmetic scores among younger children (Powell et al., 1998).
- Improvement in test scores by 15.7 percentage points for participating students in Dhaka, Bangladesh (Ahmed, 2004).
- Lower arithmetic scores when children omitted breakfast in a controlled feeding trial in the West Indies (Simeon and Grantham-McGregor, 1989)
- A Cochrane review found that in controlled before and after studies experimental groups performed higher in maths with a standardised mean difference of 0.66.
- Children in Kenya given meat improved their arithmetic scores by 0.15 standard deviation compared to a control group (Whaley et al., 2003).
- Research from Malawi found significant impact of school feeding on one reversal learning outcome but not on memory or attention outcomes (Nkhoma et al., 2013).

Bundy et al. (2009) suggests that the educational impact may be underrepresented by the absence of educators in teams reviewing school feeding.

Economic outcomes

Economic outcomes are not widely reported in the literature. A few examples are listed below:

- Added demand from school feeding has been found to promote national and local processing capacity in Malawi, the Lao PDR, and Ghana, where local industries produce a fortified corn-soya blend for the program (Bundy et al, 2009).
- Job creation was found to be a benefit in Osun State, Nigeria where cooks are trained and given budgets to manage. Poultry operators also benefited from the improved market (Shaad et al., 2010).
- Economic modelling has suggested that purchasing maize from small holders in Kenya could increase annual incomes of 175,000 farmers by around US\$50 dollars (Bundy et al., 2009).
- Micro-nutrient fortified biscuits were found to contribute about 4% of annual stated household income, and reduce the daily food bill by 4.4% for the most vulnerable households in Bangladesh (WFP, 2010).
- Bundy et al. (2009) estimates that school feeding might supply about 10% of household expenditures for each child who participates.

Programme costs and design considerations

The WFP (2009) found school feeding typically costs half or more of the education budget in low-income countries. With a finite budget they suggest that targeting is essential. Geographical targeting can be used in school feeding but does not lend itself to household targeting. This is an area where cash transfer programmes can be more effective.

Costs of programmes vary widely and there is little evidence explaining why this is. Some cost estimates include:

- Research analysing global WFP data estimated school feeding costs to be was US\$21.59 average yearly expenditure per child excluding school level costs (Gelli et al, 2009). Fortified biscuits was US\$11 and take-home rations US\$52 per child, per annum.
- In Bundy et al. (2009) take-home rations are estimated at US\$50 per capita per year, US\$40 for in-school meals and US\$13 for in-school snacks and biscuits.
- Full costs of school feeding in Malawi are around US\$59 per child per year (Burbano & Gelli, 2009), relatively expensive considering per capita education costs are US\$87 per child.

Box 1. Case study: Osun State, Nigeria

Total programme cost in Osun State is approximately US\$45 per child per year, equivalent to about 43% of the estimated per student cost of education in Nigeria (Shaad et al., 2010). Cost savings are hoped to be achieved through procurement innovations. There is perceived to be a strong system of checks and balances in the Osun State programme. The programme has benefited from strong leadership and engagement in monitoring from stakeholders at different levels. Small holder farmer involvement is thought to be limited by the decentralised procurement model where cooks procure the food every two weeks. Evidence on impacts of the programme is limited. A transition strategy plan for school feeding in Osun State was devised in 2012 (Partnership for Child Development, 2012).

Biscuits represent a significantly lower cost but lower transfer and incentive value. In-school meals have high administrative costs as they require facilities, storage at school, and community involvement but are thought to have a more direct impact on learning. Bundy et al. (2009) highlights the higher non-transfer costs for school feeding compared with other safety net programmes. For example, cash transfer programmes have median administrative costs of 9% compared to 21% for food programmes. Grosch (2008) finds the administrative costs of school feeding programmes to be between 10 and 55%.

Research on school feeding in Chile looked at the impact of higher calorie meals on education outcomes including test scores (McEwan, 2013). There was no significant effects of higher calorie meals suggesting a shift of focus on nutritional composition rather than

calories. Research in Kenya found that providing meat, rather than milk or energy supplements, had improved effects on cognition (Whaley, 2003). Milk has high transport and packaging costs (Bundy et al., 2009). Fortification of foods can present logistical challenges but can be cost effective (Bundy et al., 2009). Fortifying meals with micronutrients through normal cooking processes was assessed to be feasible in a study in India (Bhagwat et al., 2014).

Potable water, washing facilities and latrines are important in the functioning of school feeding (WFP, 2010). Fuel and structures for cooking are also important. Problems with inadequate basic infrastructural facilities and lack of well-trained cooks was found to be a problem in Ghana (Nyarko, 2014). Lack of cooking equipment was noted in Namibia (Ellis, 2012; see Case study in box 2). Food storage is identified as an issue in Botswana (Botswana Institute for Development Policy Analysis, 2013; see Case study, box 3) and Namibia.

Box 2. Case study: Namibia

The Namibian School Feeding Programme was taken over by the government in 1997 after 6 years under the WFP. A review of a programme in highlights the importance of preserving food properly to avoid waste and giving food unfit for consumption (Ellis, 2012). Supply and demand of the maize blend are not managed well. Other cooking problems were unpaid cooks, lack of measures, pots and a heat conserving stove. Further, children often did not have a receptacle or cutlery for hygienic consumption. Parents and community members have provided firewood, cooks and shelters. Home grown school feeding would be difficult in Namibia where not enough food is produced to meet its own needs. Ellis (2012) proposes it may be possible to use locally produced foods but it would be slow and complex. There are staffing problems, and a lack of inter-sectoral coordination.

Analysis in Malawi suggests scaling-up local food procurement to reduce implementation costs (Burbano and Geli, 2009). Linking to local agriculture is only of benefit where farmers can increase their yields. Otherwise there is a risk of price rises for net buyers in the region (Bundy et al, 2009).

Box 3. Case study: Botswana

In Botswana local production is unreliable (Botswana Institute for Development Policy Analysis, 2013). This means government companies are procuring supplies. There are problems with crowding out of the private sector by government companies which transport the centrally procured commodities in bulk. There are also problems with food storage in Botswana. Technical and logistical support is being provided to agricultural cooperatives to try and enhance production levels. There has been some success in local procurement of beef and sorghum. The programme is thought to have empowered school communities through the provision of employment.

For home grown school feeding (HGSF) to be successful a programme must include sensitisation campaigns around improved production practices, income-generation activities in support of school feeding and on improved nutrition practices (Bundy et al., 2013). An emphasis on coordination between the agriculture and education sectors is required.

A framework from the WFP for HGSF suggests incremental implementation (Espejo et al., 2009). In the first stage there should be a relatively small proportion of food provided by local farmers. Procurement should be started where there is a surplus of production. In the second stage the proportion of food sourced locally increases and support is given for agricultural development and market access initiatives. In the third stage the proportion of food provided by local farmers in increased again as farmers have established and strengthened their market position. Robust institutional structures are required. Gelli et al. (2010) recommend sensitisation campaigns around improved production practices for farmers. Sumberg and

Sabates-Wheeler (2011) identify considerations for linking agricultural development to school feeding. The type of procurement system will effect benefits to farmers. They suggest that the primary aim should be reliable, appropriate food production at a reasonable cost rather than stimulation of agricultural development. Also, farmers will require support for market engagement.

Box 4. Case study: Brazil

A policy approach linking school feeding with local production in Brazil has improved the quality of school meals (Sidaner et al., 2013). There have been challenges with conflicts of interest and with ability of farmers to meet demand and comply with technical procedures. Key for linking local production, school meals, nutrition and education in this case were government leadership, strong legislation, civil society participation and intersectoral decision.

It is important to make a clear agreement between government and implementing partners about the duration of assistance and possibilities for external funding as the programme evolves (Bundy et al., 2009). Government capacity to implement the programme should be built throughout. This takes considerable time and investment.

Key points for consideration in programme design:

- Geographical targeting
- Biscuits are a significantly lower cost than in-school meals but have a more limited impact. Fortification of foods can be cost-effective.
- Administrative costs of feeding programmes are high.
- Cooking facility infrastructure, equipment, and hygiene have been an issue in a number of programmes.
- Trained cooks can be lacking. Job creation can be an opportunity in this area if built in to the design.
- Local procurement may be feasible. This should start in an area of surplus production and farmers will need support for effective market engagement. Efforts to coordinate different sectors is important.
- There should be clear agreement from the outset on the duration of donor support and plans for future government funding.
- Time and investment is required to build government capacity throughout to implement the programme.

Trade-offs and cost-benefit analyses

Research focused on Latin America used the Distributional Characteristic Index (DCI) to assess the social welfare impacts of different programmes (Lindert et al., 2006). Higher social welfare is identified for cash transfer programmes compared to school feeding programmes. The net DCI (combined targeting and sizing components) for conditional cash transfers is 2.1, as compared with 1.4 for school feeding programmes. Bundy et al. (2009) emphasise the need for performance analysis such as this in other geographic settings.

Galloway et al. (2009) conduct cost-benefit analysis of school feeding programmes in three African countries. The cost of school feeding identified ranged from US\$28 to US\$63 per child per year (weighted mean cost of US\$40 per child per year). The cost for an extra day of attendance was less than US\$10 per student, while the cost per extra kilogram of weight ranged from US\$38 to US\$252. Costs for cognitive outcomes were between US\$82.4-185.3 per point on Raven's Progressive Matrices.

School-feeding should be thought of as having longer-term benefits than cash transfer. Children in school rather than contributing at home may reduce household income in the short-term but increase a child's potential to earn in the long-term. This could contribute to breaking intergenerational cycles of poverty.

Research from Uganda found that children in grades six and seven in schools with feeding programmes were significantly more likely to stay in primary school than those without feeding programmes (Alderman et al., 2007). However, the researchers suggest that school feeding may deter children from completing primary school. In Kenya school meals were found to have a positive effect on enrolment but not strong enough to counter the effect that puberty has on attendance and drop-out towards the end of primary school (WFP, 2010a). Results in Bangladesh also found school feeding to have minimal impact on completion and transition to secondary school (WFP, 2010b).

World Bank (2012) research finds school feeding can improve enrolment and learning but is unlikely to make up for the cognitive and physical problems from poor nutrition during pregnancy and the first two years of life. A review by Alderman and Bundy (2011) finds that although there are benefits to education and nutrition, school feeding is not the best way to address nutrition and education issues. Nutrition is better aimed between conception and two years of age. They find evidence that feeding can complement a good education programme but is unlikely the best use of funds for education outcomes. The authors do suggest that school feeding is likely to be valuable as a social protection investment, increasing human capital investments and providing support for poorer households. They suggest that dual objectives here make school feeding difficult to value in a cost-benefit assessment.

In Ghana a feeding programme was managed by the head-teacher and school staff. Essuman and Bosumtwi-Sam (2013) criticise this model as there is less focus on academic work. There is reliance on the community for service delivery where individuals did not feel able to voluntarily give up their time.

Costs of procuring locally can be higher because of losses in economies of scale (Bundy et al., 2013).

2. Key resources

Rethinking School Feeding Social Safety Nets, Child Development, and the Education Sector

Bundy DA, Burbano C, Grosh M, Gelli A, Jukes M, and Drake L. (2009). World Bank Publications.

<https://openknowledge.worldbank.org/bitstream/handle/10986/2634/48742.pdf>

This book was recommended by an expert in the field and is drawn throughout the literature on school feeding. An extended abstract of relevant points is presented below.

Adequacy of school feeding as a social safety net:

The value of transfer of in-school meals appears to fall in the range of transfer common for other safety net programs. The value of school feeding to the household as a percentage of household base income is rarely reported, but a back-of-the-envelope calculation can give us an approximate range that may be plausible. A family wishes their children to eat three meals a day, or 1,095 meals a year. The school year may be 180 days, and the program will serve one meal per school day. Thus, a child may receive about 16% of his or her meals at school. The share in total income for the family will be less, because even poor families must spend on things other than food. Assuming that a generous two-thirds of their expenditure goes to food, and that the schoolchild eats an average amount per person for the family, the program might supply about 10% of household expenditure for each child who participates, a not inconsequential sum, especially as some families will have more than one child participating.

On reaching the poor:

Geographic targeting—including some districts or schools but not others—is ubiquitous in school feeding programs. In-school meals are usually served to all children in the school

including non-needy children, to avoid issues of logistics, jealousies, or stigma that might arise if only some children are fed. The distribution of benefits from school feeding programs often favour the poor over the nonpoor; that is, they differentially benefit the poor, but less than programs that use household targeting systems. The analysis by Lindert et al. (2006, see Section 7) is cited: in-school feeding programs are progressive, in contrast to scholarships in this setting, and provide targeting outcomes that are similar to those of other cash and food interventions, but less effective than conditional cash transfer programs. This type of analysis should be used routinely to assess which of the range of possible safety net options is most appropriate in the local context. There is less comparative evidence elsewhere, and a particular need for studies to explore the performance of social safety net instruments in low-income settings in Africa, where other safety net options, especially conditional cash transfer programs, tend to be small and rare, and where school feeding programs are often part of a very limited choice of immediately available social protection instruments.

On cost effectiveness:

School feeding programs have rather high non-transfer costs compared with other safety net programs. This is largely because all programs must transport and store food, an inherently costly proposition. Programs that serve hot meals must also cook the food, which implies additional labour costs and the provision of at least minimal equipment and infrastructure for this purpose. These costs can run substantially higher than those for cash transfer programs. Median administrative costs for cash transfers are 9%, but 21% for all food programs.

Long-term benefits:

With school feeding programs the objective of increasing independence is sought by encouraging the participation of children in education and, where possible, by promoting their learning. This will not immediately increase household income, and may in fact reduce income by making the children unavailable for work, but in the long run additional schooling should increase the child's income as an adult and help interrupt the intergenerational cycle of poverty. Thus, school feeding programs are among the several safety net programs that can have significant long-term benefits beyond the value of the immediate transfer.

The educational benefits of school feeding:

The literature shows positive effects of school feeding on education. What is less clear is the scale of effect. Educators seem rarely to participate in these studies, and are notably absent from some of the review teams. Perhaps as a consequence, the education perspective is seldom represented in the literature on school feeding, and education texts seldom address school feeding considerations. The authors also note that critical interpretation of cognitive and education test outcomes in some reviews might benefit from expertise in psychometrics and education measurement. One particularly important issue with regard to the effect of health on education is that improved health may have educational benefits for the child, for example, enhancing participation and cognition, but whether this then translates into improved educational outcomes will depend upon endogenous factors such as the quality of teaching and the availability of textbooks. Helping children to be more able and available to learn will not improve education achievement unless it is matched by the delivery of quality education.

Students in school feeding programs have the potential for improved educational attainment, as evidenced by results of several randomised controlled trials.

Nutritional benefits:

The priority in nutrition interventions is to prevent malnutrition during fetal development and the early years of life—the most critical period for growth and development. Thus, the most cost-effective nutrition interventions are those that target the first 24 months of life, and those that promote maternal nutrition and thus intrauterine growth. There is substantial evidence that investing in early nutrition has profound consequences for subsequent development.

Early child development programs show significant long-term impacts on subsequent growth and development, including school performance. Similarly, avoidable early deficits have long-term negative consequences.

From this perspective, providing food to school-age children cannot reverse the damage of early nutritional deficits. A schoolchild who is short for age was stunted by inadequate nutrition at an earlier age, and early nutrition intervention would have been required to address this. Although the most recent systematic review shows that providing meals at schools can have a significant impact on the growth of school-age children (Kristjansson et al. 2007), the effect is small and probably cannot reverse the consequences of earlier malnutrition.

There are intergenerational benefits for younger children. The links between school feeding and increased enrolment point to a positive effect on the well-being of the next generation because both maternal and paternal education levels are strong determinants of child growth and development as measured by stunting.

Micronutrient deficiency can occur at any age and is common in schoolchildren. Current micronutrient deficiencies, unlike stunting and other long-term consequences of earlier malnutrition, are rapidly reversible at any age. There are clear nutritional benefits for schoolchildren of providing foods that have been fortified with micronutrients. While ensuring the fortification of foods included in school feeding programs presents some logistical challenges, it is very cost effective.

Well-designed school feeding programs, which include micronutrient fortification and deworming, can provide nutritional benefits and should seek to complement and not compete with nutrition programs for younger children, which remain a clear priority for targeting malnutrition overall.

Sustainability:

In considering the elements that make a program sustainable there is a tendency to focus on the issues of cost, logistics, and financing, as indeed much of this chapter does. But a crucially important element of sustainability is the continuity of demand for a program, particularly public demand.

Data show that there are meal plus take-home rations programs that are less costly than meals-alone options. The underlying explanation for the cost variation was beyond the scope of this paper, but is clearly a very important area for research given that it implies that there is considerable opportunity for cost containment in precisely those countries where the need is greatest.

It is surprising that there appear to be few studies in the published literature that assess and compare the cost-effectiveness and the relative benefits of different modalities of school feeding. There appear to be few evidence-based sources that can help explain why the costs of programs vary so widely among low-income countries, or evidence-based assistance in selecting options to minimise costs.

A majority of programs rely on community participation for daily implementation activities, while the overall management of the supply chain is often undertaken by an external partner. Such programs are often peripheral to the education sector management processes and the national budget, and are particularly vulnerable to external factors and may not persist beyond external support. Addressing this vulnerability by building in a plan from the outset that allows for transition to a nationally owned and implemented program is key to long-term sustainability. Evidence from El Salvador suggests that the plan should include an agreement between the government and implementing partners about the duration of external assistance, and clear time frames and milestones for the transition process. Countries appear

to benefit from a planned transition process. An initial agreement between the government and donors on school feeding should include a clear understanding of the duration of donor assistance and possible alternatives to external funding as the program evolves.

Full government capacity to manage and implement a programme entirely requires strategies to strengthen the different institutions involved to be planned from the outset and carried out throughout the life of the program. Case studies show that increasing government capacity for school feeding entails time and a large investment in a variety of capacity development tools (for example, assessments, training, infrastructure, information management systems, and equipment). Capacity development strategies seem to yield better results when they are planned in a systematic way, based on an initial capacity-gaps assessment and on in-depth knowledge of the context and institutional characteristics.

Linking school feeding with local agricultural production is still being assessed in a number of countries. In certain contexts, the added demand can help promote national and local processing capacity, as has been the case, for example, in Malawi, the Lao People's Democratic Republic, and Ghana, where local industries produce a fortified corn-soya blend for the program.

There are reservations about including liquid milk in school feeding programs in low-income countries because of the limited evidence that milk improves the impact of meals. Given its cost and frequent ties to political influence, inclusion of liquid milk should be treated with caution. Furthermore, the high costs of transportation and packaging, and the package waste created, present additional problems.

There appear to be no empirical data on the local returns to school feeding programs in Sub-Saharan Africa, but there have been economic modelling exercises. A modelling exercise from 2007 done by WFP, in partnership with the International Food Policy Research Institute (IFPRI) and the Gates Foundation, estimated the potential benefits of a local purchase scheme in Kenya. The study concluded that if the school feeding program in Kenya were to purchase maize from smallholder farmers in a high-potential area for maize, the annual incomes of 175,000 farmers would increase by around US\$50 per smallholder. An important consideration is whether local purchase schemes are more or less expensive than buying internationally. The Kenya study concludes that lower commodity costs to the programme—because local maize prices are lower than international prices—would partially offset higher costs of procuring locally, but that if farmers cannot increase their yields, local purchase schemes might cause a rise in prices, which would harm many net buyers in the region.

The authors advise against school gardens for production. They can be exploitative and have negative implications for education. Production would also be insufficient.

The available evidence indicates that local purchase schemes have the potential to yield significant benefits, and already have been shown to do so in high- and middle-income countries. The ongoing studies of the potential benefits of local procurement in Africa will provide much needed empirical evidence of the benefits of this approach for low income countries, and guidance on implementation. One key point revealed the theoretical analyses is that the potential gains are only possible if small farmers achieve a higher yield for their crops, which, in turn, requires support through agricultural reforms. The design of local purchase schemes for school feeding, therefore, needs to be linked with local efforts to boost agricultural production.

Trade-Offs in the Design of School Feeding Programs:

The effectiveness of school feeding programs is dependent upon several factors, including the selection of modality (in-school meals, fortified biscuits, take-home rations, or some combination of these); the effectiveness of targeting; and the associated costs.

Take-home rations (average per capita cost US\$50 per year) can be more finely targeted and can give high-value transfers, but have significant administrative costs. They have the advantage of not requiring cooking or storage. They require less community involvement but teacher time to monitor attendance and establish entitlement. They have strong safety net potential and appear to result in increases in attendance, and perhaps educational achievement, on a similar scale to in-school meal programs. Thus, from a social protection point of view they may be preferred to in-school meal programs.

In-school meals (average per capita cost US\$40 per year) tend to be less finely targeted and capped in the value of their transfer, have potentially large opportunity costs for education, and incur higher administrative costs, but have the potential not only to increase attendance but to act more directly on learning, especially if fortified and combined with deworming. Require cooking facilities, storage at school, community involvement, and teacher monitoring. Food may be tailored to local tastes and cultural habits. Costs may be contained by modifying the food basket (for example, using micronutrient powders).

In-school snacks and biscuits (average per capita cost US\$13 per year) have lower administrative costs but also lower transfer and incentive value, though the scale of benefit relative to meals needs to be better quantified. They have the advantage of being easier to serve early in the school day which is important to address short-term hunger. Because they are considered snacks, there is a reduced risk that the child will get less food at home because of substitution but may be considered a less meaningful incentive.

The choice of modality of food delivery in school has considerable implications, both for program objectives and from the costs perspective. On the basis of the current data, in-school meals are approximately three times more costly than fortified biscuits. Furthermore, biscuits are more cost efficient with regard to energy and micronutrient delivery, offering potential advantages in contexts where micronutrient deficiencies in school-age children are widespread and the infrastructure and resources for school meal programs are constrained. However, biscuits fall far short of the overall nutritional benefits offered by a meal and do not substitute for a meal.

Designing effective programs that meet their objectives requires an evidence base that allows careful trade-offs among targeting approaches, feeding modalities, and costs. There is a particular need for better data on the cost-effectiveness of the available approaches and modalities. There are very few studies that compare in-school feeding with take-home rations in similar settings, and the few that have gone further with this suggest that both programs lead to similar improvements over having no program at all.

The key issue is that in selecting any modality, there are important trade-offs dependent upon context, benefit, and cost. In some contexts, for example, school feeding programs combine on-site meals with an extra incentive from take-home rations targeting a specific group of vulnerable children, such as those affected by HIV or girls in higher grades.

Institutional and procurement arrangements:

The appropriate approach to implementing school feeding programs will vary depending on the program objectives; the context, that is, whether the program is implemented in stable, conflict, or emergency situations; the capacity of the government at different levels to manage the program using its staff, infrastructure, and accountability systems; the type of resources available from local and external sources, whether cash or in-kind; and the presence of key implementing partners, especially those organisations specialising in school feeding programs.

Case studies of programs that have transitioned to national ownership show that effective programs have a designated national institution, usually the education sector, and well-developed capacity at the subnational levels. While national ownership appears to be a

critical factor, many different approaches to implementation—including public sector, private sector, and public-private partnerships—appear to be effective.

The management of school feeding programs has become increasingly decentralised, mirroring the trend in the education sector toward school-based management. But the extent of involvement of teachers and education staff is an important issue because there are, for example, very significant opportunity costs of using teachers to prepare food.

The design of school feeding programs should specifically address the following significant issues and challenges: environmental concerns related to cooking fuel and disposal of commodity packaging; inappropriate use of school gardens for food production; and the potential opportunities for corrupt practices in procurement and contracting. The roles and responsibilities of the institutional system depend largely on the procurement modality and sources of food: local procurement is the most common approach within national programs and is emerging as the more common approach overall. Local procurement is being actively evaluated as a means to achieve sustainable school feeding programs and, at the same time, to use the purchasing power of the program as a stimulus for the local agricultural economy. As such, local purchase of food for school feeding is seen as a force multiplier, benefiting children and the local economy at the same time.

In chapter 7 this book presents two new tools, one to facilitate the initial design of school feeding programs, and the other to help update existing programs. These checklists are complemented by an array of design and assessment tools. This review also proposes a research agenda to fill in some important gaps in current knowledge, with the aim of creating a stronger evidence base for future decision making.

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

Gelli A, Al-Shaiba N, & Espejo F. (2009). *Food & Nutrition Bulletin*, 30(1), 68-76.

<http://schoolsandhealth.org/Shared%20Documents/Downloads/Cost%20efficiency%20of%20providing%20food%20through%20schools.pdf>

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.

The objective of this research was to estimate the programmatic costs and cost-efficiency associated with providing food through schools in food-insecure, developing-country contexts, by analysing global project data from the World Food Programme (WFP).

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 standardised 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.

The average yearly expenditure per child, standardised 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.

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.

School food, politics and child health

Bundy DA, Drake LJ, & Burbano C. (2013). Public health nutrition, 16(06), 1012-1019.

http://www.hgsf-global.org/en/bank/downloads/doc_download/271-school-food-politics-and-child-health

An analysis undertaken jointly in 2009 by the UN World Food Programme, The Partnership for Child Development and the World Bank was published as 'Rethinking School Feeding' to provide guidance on how to develop and implement effective school feeding programmes as a productive safety net and as part of the efforts to achieve Education for All. The present paper reflects on how understanding of school feeding has changed since that analysis.

Data on school feeding programme outcomes were collected through a literature review. Regression models were used to analyse relationships between school feeding costs (from data that were collected), the per capita costs of primary education and Gross Domestic Product per capita. Data on the transition to national ownership, supply chains and country examples were collected through country case studies.

School feeding programmes increase school attendance, cognition and educational achievement, as well as provide a transfer of resources to households with possible benefits to local agricultural production and local market development. Low-income countries exhibit large variations in school feeding costs, with concomitant opportunities for cost containment. Countries are increasingly looking to transition from externally supported projects to national programmes.

The role of home grown school feeding (HGSF) in sustainability:

The emerging policy consensus among the stakeholders involved in the scoping analysis that has been underway since 2009 suggests that HGSF in sub-Saharan Africa is a key tool in the transition towards nationally owned school feeding programmes. Three distinct beneficiary groups were identified for HGSF: schoolchildren, smallholder farmers and community-based groups delivering support services to school feeding. At impact level, HGSF had the potential to improve food security for smallholders and other community groups; however, in order for this to happen an explicit programme component, other than food procurement, was required to support agriculture and community development. This component at a minimum included providing sensitisation campaigns around improved production practices, income-generation activities in support of school feeding and on improved nutrition practices. This perspective confirms the key role of Ministries of Agriculture, the relevance of HGSF as a key intervention within Pillar 3 of the Comprehensive Africa Agriculture Development Programme (CAADP) framework and the importance of mainstreaming HGSF within country-level CAADP compacts. The evidence base of the impact of HGSF on food security, alongside the associated incremental costs, however, is still missing and will need to be built to inform policy and programme design.

There are several key areas that require specific attention to move forward, especially issues of programme design, but perhaps the largest challenge is to develop new ways for the agriculture and education sectors to work together and the construction of a coherent evidence base from which to evaluate specific outcomes within each sphere. This is a particular concern, since the cost of procuring locally could be higher than procuring food centrally because of the loss of economies of scale. While the added cost could be offset by the expected benefits to the agriculture sector, the benefits might be less clear to the education sector. These cross-sectoral issues are emerging as the new challenge for policy development in moving forward.

School feeding: Outcomes and costs

Galloway R, Kristjansson E, Gelli A, Meir U, Espejo F, & Bundy D. (2009). Food & Nutrition Bulletin, 30(2), 171-182.

<http://www.schoolsandhealth.org/Shared%20Documents/Downloads/School%20Feeding-%20Outcomes%20and%20Costs.pdf>

The goals of this study were to provide a realistic estimate of the costs of school feeding and combine these estimates with outcome information to obtain the cost per outcome. Cost studies were conducted in three African countries by reviewing school-feeding costs provided by the World Food Programme and interviewing stakeholders in ministries of education and in the community. In another African country, existing costing information was used. To compare across the countries, costs were standardised for a 200-day school year, a 700-kcal per day ration, and when children were not fed. To obtain cost per outcome data, outcomes were obtained from a review of school-feeding studies.

The cost of school feeding identified ranged from US\$28 to US\$63 per child per year (weighted mean cost of US\$40 per child per year). The cost for an extra day of attendance was less than US\$10 per student, while the cost per extra kilogram of weight ranged from US\$38 to US\$252. Costs for cognitive outcomes were between US\$82.4-185.3 per point on Raven's Progressive Matrices.

This analysis estimates a higher average cost but a narrower range of costs when compared with previous estimates, reflecting the greater precision of the current analyses. The cost per outcome was high, but this analysis does not capture the full range of outcomes (e.g., social protection, educational achievement) potentially derived from school feeding.

Home-grown school feeding a framework to link school feeding with local agricultural production

Espejo F, Burbano C, & Galliano E. (2009). Rome: World Food Programme.

<https://www.wfp.org/content/home-grown-school-feeding>

This document focuses mainly on HGSF as it links to small-scale farmers. Small-scale farmers are poor because of inadequate access to assets such as land, water and human capital. In addition, their production practices are characterised by limited use of productivity-enhancing technologies and practices – such as hybrid seeds and fertilizers. They are also poor because even when they do adopt improved production methods, they are often unable to easily sell their produce in markets, which, for smallholders, are thin, volatile and costly. HGSF programmes seek to increase access for small-scale farmers through activities in three distinct but linked focus areas:

Strategic procurement: the purchasing process that supplies food to the school feeding programme in such a way that small-scale farmers benefit by ensuring that the procurement process is “strategic”. This means removing the barriers that small-scale farmers face in accessing the school feeding market, such as lack of information, insufficient capacity to

meet traditional tendering requirements, lack of capacity to supply, store and transport commodities and vulnerability to post-harvest losses.

Agricultural development: activities intended to help small-scale farmers increase productivity, produce better-quality crops, manage natural resources and mitigate risks in a sustainable way. This entails the provision of assistance packages (e.g. improved seeds, fertilizer and other agricultural inputs at subsidised prices) to the least advantaged small-scale farmers so they can produce food in greater quantities and be able to supply the school feeding programme.

Institutional development: support for appropriate design and implementation of the HGSF programme. This includes the policies, standards, rules and strategies related to school feeding, procurement and increased agricultural production and to national capacity building to fund, manage and implement a cost-efficient programme and document results.

Other important issues to be addressed include: assuring minimum nutritional standards are maintained; maintaining a continuous supply of food to schools; ensuring food quality and safety; reducing costs of procurement from small-scale farmers; preventing price increases; protecting farmers' own food stocks; protecting crop diversity; avoiding increasing community's work load; avoiding distracting teachers from other responsibilities; transporting food to food-insecure areas; countering corruption and bureaucratic inefficiency; facilitating institutional coordination; balancing costs and benefits.

Implementation of an HGSF programme happens incrementally over three stages. The first stage is characterised by a relatively small proportion of food purchased from small-scale farmers. It is important to protect the existing food pipeline, while beginning to test new procurement schemes with small-scale farmers. Procurement is started in an area that has surplus agricultural production. Activities and investments during the first stage are geared to establishing the feasibility of using food purchased from smallholders for the school feeding programme in terms of procurement practices and supply and include: conducting initial assessments and baseline surveys, information dissemination, strategic procurement, training small-scale farmers and cooperatives, enhancing smallholder productivity and building institutional capacity.

During the second stage, the proportion of food purchased from small-scale farmers gradually increases and the amount of investment needed rises to its highest level, primarily to support agricultural development and market access initiatives. This stage is focused on overcoming barriers that prevent small-scale farmers from accessing the market such as lack of legal status, lack of associations that consolidate bargaining power, poor productivity, poor capacity to store, handle and transport their production and inadequate means for managing risk.

In the third stage, a greater proportion of food is being purchased from small-scale farmers (all the food that can be bought given the circumstances and challenges of the environment), the previous efforts having strengthened their position in the market. At this point, ideally small-scale farmers will have developed sufficient capacity to deliver food to schools without sacrificing quality, quantity and timeliness. During this stage, activities emphasise the focus area of institutional development.

The HGSF model, as established in this framework, relies on a robust institutional structure to effectively carry out the programme. Successful programmes are embedded within national legislation, helping to enhance sustainability. They require political commitment and a secure funding source. It is also important to document results and good practices.

The degree to which HGSF can increasingly benefit small-scale farmers depends on the interaction between HGSF's three focus areas and, more specifically, on the following six

factors: 1) whether the food given to children is based on local tastes and consumption patterns; 2) the degree of political support for the programme; 3) the institutional capacity to implement it; 4) small-scale farmers' productivity and capacity to respond to the needs of the programme; 5) availability of funds; 6) capacity to maintain the programme over time, even if small-scale farmers' productivity is still low.

Linking agricultural development to school feeding in sub-Saharan Africa: Theoretical perspectives

Sumberg J, & Sabates-Wheeler R. (2011). *Food Policy*, 36(3), 341-349.

<http://www.sciencedirect.com/science/article/pii/S0306919211000406>

This paper takes as a starting point the proposition that social protection interventions involving food can be used to promote transformational change in family farming systems in sub-Saharan Africa. The purpose is to highlight the complexity of pathways to agricultural transformation associated with the seemingly simple idea of home-grown school feeding (HGSF), an idea that is increasingly held up as "win-win". By reviewing the HGSF literature and the main theories underpinning it – structured demand, localism, family farmer development – the authors expose areas of inconsistency across the literature and programmes as well as possible tensions that may arise in attempting to pursue both market and social objectives in the same initiative. The arguments presented aim to provide a basis for moving towards clarity on (1) a theory of change for HGSF programmes; (2) the conditions under which HGSF programmes are more able to yield positive agricultural development outcomes and; (3) an agenda for moving forward on research and impact evaluation. This research agenda also speaks more broadly to important under-researched areas within the general social protection and agricultural development discourse.

Factors identified for contributing to potential benefits are:

- Procurement strategies and spatial distribution of actors and benefits. Different procurement systems entail multiple trade-offs. Stimulating agricultural development should not be the primary aim of HGSF. The primary objective should be provision of a reliable supply of safe, appropriate food at a reasonable cost.
- Threshold and scale effects. Activities will be required to increase farmer engagements with markets. This may be viewed as 'protectionism'.
- Policy complementarities and sequencing effects. HGSF must be located within a broader, long-term development strategy in which policies relating to input and output markets, as well as investments in infrastructure and agricultural research, are tightly coordinated and logically sequenced.

Learning from experience: Good Practices From 45 Years of School Feeding

WFP (2009) Rome: World Food Programme

<https://www.wfp.org/content/learning-experience-good-practices-45-years-school-feeding>

High quality, sustainable school feeding programmes are found to have certain common characteristics:

- Inclusion in national policy frameworks and processes.
- Multi-year, predictable funding flows enable proper planning of structured, sustainable programmes.
- Robust analysis and informed advice on targeting, costing, implementation modalities, choice of rations and local procurement solutions enable governments to choose the most adequate options for preparing, budgeting and implementing national school feeding programmes.
- Adequate and relevant national institutional structures with a clear mandate are a driver for proper institutional coordination and effective implementation.

- Delivering a comprehensive, integrated package under the leadership of the government in partnership with UN agencies and NGOs, ensures that the multiple benefits of school feeding are maximised and can lead to wider socio-economic impacts.
- At the community level, participation and ownership by parents, teachers and the local community increase the potential sustainability of school feeding programmes.

3. Evidence reviews

School feeding for improving the physical and psychosocial health of disadvantaged students

Kristjansson B, Petticrew M, MacDonald B, Krasevec J, Janzen L, Greenhalgh T, Wells G, MacGowan J, Farmer A, Shea BJ, Mayhew A, & Tugwell P. (2007). The Cochrane Library. <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD004676.pub2/abstract;jsessionid=F9C9AC39861A7C45B54B832207DE3DED.f04t03>

This review included 18 studies. For weight, in the RCTs and controlled before and after studies (CBAs) from Lower Income Countries, experimental group children gained an average of 0.39 kg (95% C.I.: 0.11 to 0.67) over an average of 19 months and 0.71 kg (95% C.I.: 0.48 to 0.95) over 11.3 months respectively. Results for weight were mixed in higher income countries. For height, results were mixed; height gain was greater for younger children. Attendance in lower income countries was higher in experimental groups than in controls; the results show an average increase of 4 to 6 days a year. Math gains were consistently higher for experimental groups in lower income countries; in CBAs, the Standardised Mean Difference was 0.66 (95% C.I. = 0.13 to 1.18). In short-term studies, small improvements in some cognitive tasks were found.

In conclusion school meals may have some small benefits for disadvantaged children. The authors recommend further well-designed studies on the effectiveness of school meals be undertaken, that results should be reported according to socio-economic status, and that researchers gather robust data on both processes and carefully chosen outcomes.

School feeding programs in developing countries: impacts on children's health and educational outcomes

Jomaa LH, McDonnell E, & Probart C. (2011). *Nutrition reviews*, 69(2), 83-98. <http://www.ncbi.nlm.nih.gov/pubmed/21294742>

School feeding programs (SFPs) are intended to alleviate short-term hunger, improve nutrition and cognition of children, and transfer income to families. This review explores the impact of SFPs on nutritional, health, and educational outcomes of school-aged children in developing countries. Peer-reviewed journal articles and reviews published in the past 20 years were identified and screened for inclusion. Analysis of the articles revealed relatively consistent positive effects of school feeding in its different modalities on energy intake, micronutrient status, school enrolment, and attendance of the children participating in SFPs compared to non-participants. However, the positive impact of school feeding on growth, cognition, and academic achievement of school-aged children receiving SFPs compared to non-school-fed children was less conclusive. This review identifies research gaps and challenges that need to be addressed in the design and implementation of SFPs and calls for theory-based impact evaluations to strengthen the scientific evidence behind designing, funding, and implementing SFPs.

School feeding programs face numerous and continuous challenges, some of which are context-specific; however others are more universal and apply to all SFPs implemented in

developing countries. The sustainability of these programs, procurement of food in light of food price fluctuations and environmental and agricultural changes, as well as questions of a program's cost-effectiveness are common challenges faced by SFP planners and designers.

Local procurement of food is another area that seems to be the focus of international non-governmental and governmental organisations and that will be expanding to provide full coverage to the growing number of SFPs, especially in response to the financial and food crises. In addition, home-grown school feeding (HGSF) is a new framework that is suggested to link school feeding with local agricultural production. HGSF seems to be the next revolution in school feeding. Therefore, more interest and funding might be channelled to expand on this new framework. Furthermore, SFPs that offer more nutritious food fortified or supplemented with required micronutrients will also be sought in order to increase the effectiveness of SFPs and their impact on the nutrition, cognition, and health of children.

Impact of school feeding programs on educational, nutritional, and agricultural development goals: a systematic review of literature

Lawson TM. (2012). Doctoral dissertation, Michigan State University
http://fsg.afre.msu.edu/mozambique/lawson_thesis_final_version.pdf

Analysis of the information extracted from studies meeting the review criteria shows that school feeding programs conclusively impact the micronutrient level of targeted children, but have modest and mixed effects on health outcomes as evaluated by anthropometric measurements. While the impact of these interventions on cognitive skills and abilities of students is still uncertain, there is strong evidence that school feeding programs positively affect school enrolment and attendance rates, especially for girls. The review points to several gaps in the literature, including the lack of a systematic analysis of linkages between Food for Education, sustainability, and agricultural development. There is also a lack of evidence on the cost effectiveness of school feeding programs in delivering desirable outcomes. These are identified as topics for further research.

Does provision of food in school increase girls' enrollment? Evidence from schools in Sub-Saharan Africa

Gelli A, Meir U & Espejo F (2007). Food Nutr Bull 28, 149–155.
<http://www.ncbi.nlm.nih.gov/pubmed/24683673>

A retrospective cross-sectional study was designed based on school-level surveys in 32 African countries between 2002 and 2005. The study population consisted of girls and boys in primary schools targeted by the World Food Programme (WFP) and located in food-insecure areas that also suffered from lack of access to education.

Provision of food in schools through the Food for Education (FFE) program contributed to increasing absolute enrolment in WFP-assisted schools by 28% for girls and 22% for boys in the first year. Post year-one enrolment patterns varied according to the type of FFE program. Where provision of take-home rations for girls was combined with on-site feeding for all pupils, the increase in girls' absolute enrolment was sustained at 30% after the first year. However, in schools providing on-site feeding alone, the rate of increase in absolute enrolment after the first year reverted to the rates of increase found in the year prior to FFE implementation. The provision of take-home rations also appeared to reduce the dropout rate of female students, particularly in the higher grades.

In conclusion, FFE programs can have a lasting positive influence on school enrolment and, by providing extra take-home rations to girls, in addition to on-site feeding, can make a strong contribution to the Millennium Development Goals.

4. Case Studies: Africa

Impact Evaluation of WFP School Feeding. Programmes in Kenya: a mixed method approach

WFP (2010) UN WFP Evaluation Brief

<http://documents.wfp.org/stellent/groups/public/documents/reports/wfp230095.pdf>

This evaluation found the benefits of school feeding to be limited if separated from the larger context of learning, health and livelihoods. School feeding in isolation without an appropriate learning environment and family or community support is insufficient to achieve WFP's objectives of healthy educated children. In order to justify investments and meet objectives, the school feeding programme must take better account of social, economic and cultural constraints.

School meals have a positive effect on enrolment, completion and exam scores. However, school meals do not reverse the significant drop in primary school completion rates and attendance rates in the last two years of primary school, as students reach puberty. School meals did make a significant and positive contribution to reducing students' hunger and improving nutritional intake. School meals accounted for more than half of the recommended daily allowance attained by 40% of students. School meals were not found to compensate sufficiently for poor diet at home and households were found to prepare less food at home for children who had a meal at school.

Key elements of the WFP-UNICEF Essential Package, which addresses the school physical environment, were widely absent. First, there is a widespread lack of potable water, washing facilities and adequate latrines. Food is not prepared when there is insufficient water. A second priority element is the use of fuel-efficient cooking facilities in sheltered structures. Currently, the provision of water and firewood has fallen to students and parents. The integration of these elements of the Essential Package requires a much greater level of institutional collaboration that WFP has been able to mobilise in the past.

The quality of the learning environment and the inadequate level of parental involvement are also key constraints. In schools with meals, lack of teacher time, study space and school materials is exacerbated by the higher student population, class size and lower student-teacher ratio. The current School Management Committees do not systematically promote community participation other than to exact contributions (water, labour, money) from parents.

Cooperation between institutions across sectors is necessary to maximise the gains achieved through school meals and increase the value of food provided. The Government of Kenya has taken important steps in this direction by integrating improved health practices into the school context and by introducing Home-Grown School Feeding.

The report makes a number of recommendations including:

- 1) Re-orient the field monitoring system to include indicators of the school environment that affect the effectiveness of school meals, such as seasonal lack of firewood and water, student-teacher ratios, sudden changes in enrolment (e.g. due to violence). WFP Country Office can then anticipate when problems are likely to occur, where, and develop response strategies with other development actors in the district.
- 2) Consider piloting a fortified morning biscuit in the particularly vulnerable ASAL schools and evaluate the intervention rigorously.
- 3) With partners, integrate food-based activities to improve the school environment and encourage community participation, building on past experience of the same. Activities should be based on needs identified under Recommendation 1, such as protection of water sources and dining hall construction. This will make the school a

- community resource where training sessions on health and hygiene or animal husbandry can be organised by WFP partners.
- 4) Develop comprehensive integrated strategies to maximise the development impacts of the school meal, building on the new model for collaboration that exists between the Ministry of Education and Ministry of Public Health and Sanitation. WFP should move to expand the mandate of existing inter-sectoral working groups of which WFP is a member, such as the School Nutrition and Health group in the Ministry of Education.

The Namibian School Feeding Programme, A Case Study.

Ellis J. (2012) WFP, PCD, African Union, NEPAD, Republic of Namibia Ministry of Education. http://hgsf-global.org/en/bank/downloads/doc_download/318-namibian-school-feeding-case-study

The Namibian School Feeding Programme (NSFP) has been in existence for 21 years. Started by the World Food Programme in 1991, it was fully taken over by the Namibian government in 1996/1997.

The NSFP is managed, at the national level, by the Division Management Planning, Appraisal and Training in the Directorate of Programmes and Quality Assurance in the Ministry of Education. At a regional level the NSFP is the responsibility of regional hostel officers, who work with circuit inspectors at a district level and schools at the local level.

The procurement of the food for the NSFP, and its distribution to the participating schools, is managed through three national-level tenders, (1) to provide protein blend, sugar and salt, (2) to mix the protein blend, sugar and salt with maize meal and fortification, and transport it to regional warehouses, and (3) to transport the maize blend from the regional warehouses to schools. Each tender, however, is awarded per region, and a tenderer can be awarded several regions.

The expansion of the programme has necessitated that the amount of maize blend purchased by the Ministry of Education grow by threefold, from 2 294 metric tons in the 2007/8 financial year to 7 040 metric tons in the 2011/12 financial year. The purchase of food in the 2012/13 financial year is estimated at N\$60 million. Although this amount is less than one % of the Ministry of Education's budget, there has been a perennial problem in securing these funds. The cost of the maize blend and its delivery to school, per child per day is in the region of N\$1 or N\$200 per year per child. This is US\$ 00.12 and US\$ 23.50, respectively. Non-food costs, which have not been quantified, are mostly borne by schools and communities.

For the purposes of this case study, the NSFP is described and assessed by making use of international standards for school feeding as stated in the joint World Food Programme and World Bank publication, Rethinking School Feeding (Bundy et al., 2009).

Two thirds of the schools visited had experienced cases of food going bad, and sometimes took inappropriate action to try and restore it. Cooking arrangements are not optimal because of unpaid cooks, a shortage of measures and pots, and an absence of heat conserving stoves. Most learners do not have the bowls and spoons that are needed for the hygienic consumption of the porridge. The food commodities used in the maize blend, and centralised procurement do not favour small-scale local production. The availability of the maize blend depends largely on Namibia's ability to import food products from its neighbours, particularly South Africa and sometimes Zambia. Currently, Namibia does not produce enough food to meet its own needs and any changes in the NSFP to use more locally produced food products will be slow and complex, though not impossible. Supply and demand of the maize

blend are poorly calibrated and balanced, and there appears to be a lot of inefficiency in the system, due to inadequate record keeping and measurement of the amount of food to cook, the provision of smaller portions than planned to children, and cooks receiving more maize blend as compensation than is allowed for in the guidelines.

The NSFP is understaffed at national, regional and circuit levels. Staff assigned to perform various functions does not have the time, and often the training, to properly perform their duties. Amongst other functions, the building of alliances and links with potential partners and donors is not given sufficient attention. There is no formal inter-sectoral body to coordinate the activities of the NSFP.

Funding is unpredictable and complex and this affects the quality of the implementation of the programme. Formulating a policy, strengthening the school feeding sub-division with a proper staffing structure and dedicated budget line, strengthening monitoring and evaluation, and generally raising the profile of the NSFP, would make the funding of the NSFP more sustainable.

It would seem that the NSFP does enjoy a degree of community participation and ownership. Parents and community members have provided firewood, cooks and shelters. Occasionally local businesses have made donations to school feeding in their area. However, parents and caregivers have not been able to provide cooking and eating utensils, soap and pot scourers, and, crucially, adequate storage space. The matter of inadequate storage space is a weakness in the design of the programme, in that the capacity of poor communities to provide storage was over-estimated.

Stakeholders interviewed during the study, suggest that the NSFP:

- attracts needy learners to enrol in school
- keeps them attending regularly
- enables them to concentrate and learn in class
- enables them to participate actively in learning
- improves the health of learners

The Botswana School Feeding Programme, A case study

Botswana Institute for Development Policy Analysis (2013) AU/NEPAD and PCD

http://hgsf-global.org/en/bank/downloads/doc_download/290-botswana-nsfp-final-report

Strategic leadership from the New Partnership for Africa's Development (NEPAD) guided Governments in sub-Saharan Africa to include HGSF as a key intervention within the Pillar three of the Comprehensive Africa Agriculture Development Programme (CAADP). Many countries including Cote d'voire, Ghana, Kenya, Mali and Nigeria are already implementing national school feeding programmes sourced with local agriculture production. Many more countries are now requesting for technical assistance in the design and implementation of these programmes. Since 2008, the World Bank Group, World Food Programme and Partnership for Child Development (PCD) have been working together to support countries in the transition and help governments develop and implement cost effective, sustainable national SFPs. One such support is to strengthen the evidence in the cost and benefits of HGSF. This is done through case studies. In 2011, PCD commissioned a study to be done by the Botswana Institute for Development of Policy Analysis (BIDPA). The aims of the study were: (a) to provide an overview of the Botswana school feeding programme (b) to provide a profile of intervention nuggets across the HGSF supply chain that led to the success of the Botswana SFP.

The findings showed that most children appreciated the programme and reported that it enhances their concentration levels in class. However, concerns were raised about the quality of the menu by some children (who did not like some of the foods) and also

participants of the national stakeholder workshop (on nutritional quality). An overwhelming majority of participants visited in Districts as well as pupils reiterated the need to include locally produced foods in the menu.

The MLG primarily uses a centralised procurement model to buy dry and non-perishable food supplies in bulk and delivers them to districts. In districts, the food supplies are managed by the District Administration's District Commissioners who supervise the programme through the district based Division of Food Relief Services (DFRS). At schools, the Head of the Middle age Stream supervises the programme.

Decentralised procurement is a much smaller component and is managed by the District Councils, who purchase fresh food and perishable items. Money is disbursed from the DLGFPS to the Councils to procure such food items as bread and bread spreads from local suppliers but through a tender system. However, some funds are also transferred from the Council to the school heads to purchase fresh agricultural produce from the local villages. Inclusion of fresh produce in SFP was introduced in 2009, when the Government through a Presidential Directive in 2008 introduced the "Letlhafula Initiative" to promote the purchase of fresh food supplies for SFP.

A major concern in both procurement models is the late delivery of commodities. In addition, some of the food commodities do not comply with the set quality standards. The private sector's involvement in the procurement system is limited and does not have adequate capacity to support the school feeding programme. Procurement from local farmers is said to be a challenge because of unreliability of the local production. As a result, government companies (parastatals) are playing an important role in the procurement of major school feeding supplies such as cereals, legumes and beef.

The Department of Local Government Finance and Procurement Services (DLGFPS) relies on suppliers to transport commodities from source to receiving depots but provides transport to distribute food commodities from the receiving depots to district depots and to individual schools. Since transport is not always available, the smooth delivery of food to depots is affected. Again, the role of the private sector in transportation is limited as it only applies to the transport of the few commodities they provide. This implies that the private sector is crowded out by the parastatals that transport the centrally procured commodities in bulk.

In terms of storage, concerns were raised about the poor warehouse conditions in some stores, resulting in food spoilage, and in other districts the warehouses were reported to be very old. It was recommended that the government should consider the use of private storage facilities. Currently, the role of the private sector in storage of food supplies is not known.

Regarding food production and smallholder linkages, it was reported that the government of Botswana has committed to enhance production levels to achieve household food security by supporting small scale farmers in rural areas through subsidised services, inputs, skills and the promotion of clustering through service centres. The Department of Agribusiness in the MOA registers agricultural cooperatives and associations and provides them with technical and logistical support but not financial. There is a limited market for small holder farmers through the school feeding programme. However, only individual farmers as opposed to farmer groups participate in the school feeding programme supply chain by selling fresh farm produce to schools.

SFP is coordinated as one of several vulnerable group feeding and food security programmes implemented under the National food strategy and supervised by the Ministry of Finance and Development Planning. MLG then implements and coordinates the programme.

The monitoring of SFP mainly applies to checking whether supplies have been received at the depots and subsequently at the schools. For this, there is a systematic and regular

monitoring system. There was no evidence of monitoring other aspects of the programme and particularly the outcomes. A major constraint in monitoring the implementation of SFP is the lack of adequate personnel and inadequate collaboration and participation of players involved. In addition, there is inadequate monitoring of the food that actually reaches the school child's plate.

The MLG is responsible for budgeting and the budget is prepared annually. The total budget for school feeding has been increasing over the years and for the 2012-2013 year is 295,141,548.64 Pula (US\$39,401,395.23). This budget includes the cost of food (including the local purchases since 2008), hand stampers, supervisors, pallets, pest control, transport and fuel.

Although Botswana experiences unfavourable climatic conditions for farming they have managed to produce some of the commodities for the SFP such as beef and sorghum. In recent years the local procurement of agricultural produce has gone some way in meeting the SFP's demand for food but also created a market, albeit seasonal, for the small holder farmers. The SFP has empowered school communities through the provision of employment. For a universally targeted programme in Africa, the Botswana programme has done well and offers useful lessons for other African countries.

There have been no impact evaluations on nutritional status of the children.

The impact of dietary intervention on the cognitive development of Kenyan school children

Whaley SE, Sigman M, Neumann C, Bwibo N, Guthrie D, Weiss RE, ... & Murphy SP. (2003). *The Journal of nutrition*, 133(11), 3965S-3971S.

<http://jn.nutrition.org/content/133/11/3965S.short>

Previous observational studies in developing countries have suggested that diet quality, particularly increased animal source food (ASF) consumption, is positively associated with child cognitive development. This report presents findings from a study in rural Kenya, designed to test the impact of three different diets on the cognitive development of school children. Twelve schools with a total of 555 Standard 1 children (equivalent to U.S. Grade 1) were randomised to one of four feeding interventions: Meat, Milk, Energy or Control (no feeding). Feeding continued for seven school terms (21 months), and cognitive tests were administered before the commencement of feeding and during every other term of feeding. Hierarchical linear random effects models and associated methods were used to examine the effects of treatment group on changes in cognitive performance over time. Analyses revealed that children receiving supplemental food with meat significantly outperformed all other children on the Raven's Progressive Matrices. Children supplemented with meat, and children supplemented with energy, outperformed children in the Control group on tests of arithmetic ability. Children who were given meat improved their arithmetic scores by 0.15 SD and their performance on the Raven's Progressive Matrices Test (a test of nonverbal reasoning) by 0.16 SD, but they did not improve on verbal comprehension. There were no group differences on tests of verbal comprehension. Results suggest that supplementation with animal source food has positive effects on Kenyan children's cognitive performance. However, these effects are not equivalent across all domains of cognitive functioning, nor did different forms of animal source foods produce the same beneficial effects. Implications of these findings for supplementation programs in developing countries are discussed.

School Feeding, seasonality and schooling outcomes: A case study from Malawi

Burbano C & Gelli A. (2009) Seasonality revisited conference paper.

http://hgsf-global.org/en/bank/downloads/doc_download/203-school-feeding-seasonality-and-schooling-outcomes-a-case-study-from-malawi

Different evaluations have already established the benefits of the school feeding programmes in terms of support to the education of girls and vulnerable children in Malawi. However, there is a gap in the evidence on seasonal attendance patterns and the potential role for School Feeding in reducing seasonal school absenteeism. In this paper the authors attempt to capture seasonal trends in school participation in rural areas of Malawi, in schools with and without School Feeding.

The analysis of WFP school level survey data identified small seasonality effects on school attendance, in the range of 2-5% points across the primary school grades. Comparisons of seasonal attendance gaps between schools with and without school feeding indicated that school feeding is associated with more stable attendance patterns, with differences of about 1-2% points across the school grades. The largest differences were found in the higher grades, suggesting that the extra take-home rations were providing additional incentives for children to attend school. Though small, at the school level, differences of about 1% in monthly attendance would, using a back of the envelope calculation, translate to over 230 pupil days of added schooling over a single month for an average school in Malawi (in this data set with enrolment of 1,158 pupils). These findings would benefit from validation from household level analysis, as working at the school level inevitably smoothes any variations within specific pupil subgroups.

The full costs of school feeding in Malawi are in the range of US\$59 per child per year for on-site meals; WFP costs are about US\$ 22 per child per year. School feeding is a relatively costly program to run in Malawi considering that the estimated per capita cost of education there is US\$ 87. It will therefore require continued support from donors until investments in education increase. At the same time the school feeding programme could seek opportunities to reduce some of the implementation costs. For example, a preliminary analysis of alternative sourcing of commodities used for school feeding indicated the opportunities of improving overall cost-efficiency by scaling-up local food procurement. These opportunities are currently being explored by the WFP Purchase For Progress (P4P) initiative in Malawi.

Osun State Home Grown School Feeding and Health Programme (OSHGSHFHP) Case study

Shaad B, Jaisinghani N & Gelli A. (2010) PCD & HGSHF

http://hgsf-global.org/en/bank/downloads/doc_download/94-osun-state-hgsf-and-health-programme-case-study

The main target of the OSHGSHFHP are to get primary school children from kindergarten through to primary 2 in all public schools. Other target groups include cooks employed to provide the school meal service. Potential beneficiaries also include smallholder farmers from within the assisted communities, though no specific programme activities have been explicitly designed yet to address this target group.

While there are no specific quality standards for the programme, the programme mandates a menu based on the national guidelines adjusted to accommodate seasonality and local availability. School cooks purchase all meal items and decide on appropriate substitutions based on the menu requirements, ingredient availability and price. Prior to certification, the cooks undertake a three-month training course on food quality, preparation and basic hygiene and must also pass a health check-up. Once the training is completed, the cooks are responsible for managing budgets and procuring ingredients for the daily meals. Each cook is provided a flat budget of N30 (US\$0.20) per student per meal (N150 per week per child) irrespective of the actual price of food. The programme currently provides one meal a day for 129,318 children in kindergarten through to primary 2 in all 1,352 public schools in the state.

Emerging field level experience on the benefits of the OSHGSFHP includes improved school participation and learning for school children receiving the school meals. Perceptions within the community suggested that the improved health, nutrition and sanitary practices of the pupils had also impacted positively on the health status of the community, through reduced health maintenance cost and reduced infant mortality rate, for example. Job creation and empowerment of the women cooks were also acknowledged as an important benefit of the programme. In addition, farmers, especially poultry operators, were also reported to have a ready market for their products. Based on budget figures obtained from programme staff, the total programme cost is approximately US\$45 per child per year, equivalent to about 43% of the estimated per student cost of education in Nigeria.

At the Federal level, a national school health policy was launched in 2006 that recognises the pivotal role of school health and nutrition in terms of achieving health and education for all goals. The policy identifies cross-sectoral responsibilities in the delivery of the school feeding services, including the Ministry of Agriculture and Rural Development amongst others. At state level, Osun State has positioned the HGSF programme separate from other Ministries with the State Programme Officer within the programme secretariat reporting directly to the Governor. Supporting institutions include the Ministry of Education, Ministry of Health and Ministry of Agriculture operating at different levels in the state. At State level, a law, including budget provisions, is currently being drafted by the State Attorney General and is expected to be passed by the Osun State House of Assembly later this year to ensure the permanence of the programme. Osun State has continued funding beyond the Federal Government's initial contribution of N88 million made in February 2006, spending N3.2 billion to date. Strong support from the State's Governor and other leading political figures has ensured continued funding for the programme and has reduced potential political blockages. In order to address the funding challenges arising from the proposed scale up, the programme aims to increase resources through partnerships and introduce cost savings through procurement innovations. While communities have not been asked to provide financial resources, community members play an important role in the programme through their participation in the PTA and the School Based Monitoring Committee.

The endurance of the OSHGSFHP is in itself a credit to a programme that has continued to provide beneficial services to over a hundred and thirty thousand school children. The benefits of the OSHGSFHP documented in this analysis include children's education, health and nutrition, as well as community and agriculture development. The innovative system of checks and balances that has been developed over the years has ensured that the governance of the OSHGSFHP has become a model of good practice within the country and the region. The OSHGSFHP has not only benefitted from the inspiring leadership of the programme; the engagement in the programme monitoring from different stakeholders at many levels has provided a strong platform for improved transparency and accountability. The decentralised procurement model where cooks procure the food every two weeks has resulted, on the one hand, in improved transparency and accountability; on the other it affected the quality, quantity and frequency of the food procurement which in turn limited the opportunities for smallholder farmers' engagement in the sourcing process. This trade-off has been tackled in other countries with different degrees of success, and it is important that in the future the OSHGSFHP can incorporate the lessons from these experiences.

This analysis has found very little quantitative data on the school feeding outcomes and processes, underscoring the need for more robust data collection, analysis and reporting as part of the programme monitoring activities. The lack of strong empirical evidence on the impact of the OSHGSFHP also highlights the pressing requirement for more systematic and rigorous evaluations to be undertaken. This is particularly important as the OSHGSFHP is planning to scale-up its coverage to reach all primary school children in the state. This case study is the first step in the systematic planning of a set of support activities in support to the

OSHGSHFP. In order to maintain the momentum on ground whilst the longer term plan is being developed, some short-term support actions, including learning visits and other knowledge exchange activities have already been underway.

Elementary School Feeding and Health Programme Transition strategy

The Partnership for Child Development (2012).

http://hgsf-global.org/en/bank/downloads/doc_download/252-elementary-school-feeding-and-health-programme-transition-strategy-osun-state-nigeria

The State of Osun school Feeding Programme (O'Meals) was initiated as a pilot from the federal Government in 2006. O'Meals had progressively grown to serve 1,382 public schools with over 190,000 pupils in all the 31 LGAs in the state of Osun.

This Transition strategy plan has been developed at the request of the Government of the state of Osun to support the delivery of the O'Meals programme. The aim of this document is to strengthen the capacity needed to implement the programme effectively so as to benefit schoolchildren as well as smallholder farmers. In particular, the Transition strategy plan aims at strengthening smallholder farmer participation, as well as strengthening and formalising the links with agricultural partners to move from a local procurement programme to a local production programme.

Stakeholder mapping identified the following enabling environment dimensions:

- Development of links between demand from school feeding and small holder production.
- Development of State cross-sectoral policy.
- Strengthening cross-sector coordination at all levels including clearer roles and responsibilities across line ministries.
- Development of a fundraising and advocacy campaign to ensure sustainability of the O'MEALS Programme and to engage with key partners through established systems and ongoing activities including exploring opportunities with the private sector, development partners as well as other stakeholders.
- Improved coordination and definition the roles and responsibilities of community involvement.

School feeding programs, intrahousehold allocation and the nutrition of siblings: Evidence from a randomized trial in rural Burkina Faso

Kazianga H, de Walque, D, & Alderman H. (2014). Journal of Development Economics, 106, 15-34.

<http://www.sciencedirect.com/science/article/pii/S0304387813001223>

This paper evaluates the impact of two school feeding schemes on health outcomes of pre-school age children in Burkina Faso: school meals which provide students with lunch each school day, and take home rations which provide girls with 10 kg of cereal flour each month, conditional on 90% attendance rate. The authors investigated the pass through to younger siblings of the beneficiaries and found that take home rations have increased weight-for-age of boys and girls under age 5 by 0.4 standard deviations compared to a control group. In the same age range, school meals did not have any significant effect on weights of siblings. The

authors provide suggestive evidence indicating that most of the gains are realised through intra-household food reallocation.

Early-Stage Primary School Children Attending a School in the Malawian School Feeding Program (SFP) Have Better Reversal Learning and Lean Muscle Mass Growth Than Those Attending a Non-SFP School

Nkhoma OW, Duffy ME, Cory-Slechta DA, Davidson PW, McSorley EM, Strain JJ, & O'Brien GM. (2013). *The Journal of nutrition*, 143(8), 1324-1330.

<http://jn.nutrition.org/content/143/8/1324.full.pdf+html>

In developing countries, schoolchildren encounter a number of challenges, including failure to complete school, poor health and nutrition, and poor academic performance. Implementation of school feeding programs (SFPs) in less developed countries is increasing and yet there is mixed evidence regarding their positive effects on nutrition, education, and cognition at the population level.

This study evaluated cognitive and anthropometric outcomes in entry-level primary school children in Malawi with the aim of generating evidence for the ongoing debate about SFPs in Malawi and other developing countries. A total of 226 schoolchildren aged 6–8 y in 2 rural Malawian public primary schools were followed for one school year. Children attending one school (SFP school) received a daily ration of corn-soy blend porridge, while those attending the other (non-SFP school) did not. Baseline and post-baseline outcomes included the Cambridge Neurological Test Automated Battery (CANTAB) cognitive tests of paired associate learning, rapid visual information processing and intra-extra dimensional shift, and anthropometric measurements of weight, height, and mid-upper arm circumference (MUAC).

At follow-up, the SFP sub-cohort had a greater reduction than the non-SFP sub-cohort in the number of intra-extra pre-dimensional shift errors made (mean 18.5 and 24.9, respectively; P-interaction = 0.02) and also showed an increase in MUAC (from 16.3 to 17.0; P-interaction <0.0001). The results indicate that the SFP in Malawi is associated with an improvement in reversal learning and catch-up growth in lean muscle mass in children in the SFP school compared with children in the non-SFP school.

These findings suggest that the Malawian SFP, if well managed and ration sizes are sustained, may have the potential to improve nutritional and cognitive indicators of the most disadvantaged children.

In the above abstract the favourable result was highlighted. Taking a closer look at the results from the other CANTAB tests there are many results which are not significant. Six learning memory outcomes do not show significant difference. Four attention outcomes do not show significant difference. And three reversal learning outcomes do not show a significant difference. This suggests that the impact of school feeding on cognition is minimal.

Assessment of the school feeding programme in Ghana: A study of primary schools in the Abura-Asebu-Kwamankese district in the Central region of Ghana

Nyarko SH. (2014). *International Journal of Research in Social Sciences*, 4(2), 13.

<http://www.indianjournals.com/ijor.aspx?target=ijor:ijr&volume=4&issue=2&article=002>

The basic idea of the school feeding programme is to provide children in public primary schools and kindergartens in the poorest areas of the country with one hot, nutritious meal per day, using locally-grown foodstuffs. This study seeks to assess the impact of the school feeding programme in the Abura Asebu Kwamankese District in the Central Region of Ghana from the perspective of teachers including head teachers. A descriptive survey design was

used for the study, and data were obtained from eighty teachers and head teachers in the beneficiary schools in the district.

The study revealed that the school feeding programme has improved the nutritional status of pupils in the beneficiary schools in the district to some extent; even though it could not improve the body mass index and height of some pupils. Also, the programme has helped to improve the academic performance of some pupils in terms of pass rates, thinking ability, understanding, concentration in class and discipline. The study further revealed that the programme has helped to improve enrolments, attendance and retention of pupils in the beneficiary schools in the district. However, it has been plagued by several challenges including inadequate basic infrastructural facilities and lack of well-trained cooks among others.

Generally, the school feeding programme had a positive impact on the lives of the inhabitants of the district. It is recommended that adequate basic infrastructural facilities in the beneficiary schools in the district should be provided.

Nutritional Status of Participating and Non-participating Pupils in the Ghana School Feeding Programme

Danquah AO, Amoah AN, Steiner-Asiedu M, & Opare-Obisaw C. (2012). *Journal of Food Research*, 1(3), p263.

<http://www.ccsenet.org/journal/index.php/jfr/article/view/19250/12735>

The Ghana Demographic Health Survey indicates that the major nutritional challenges in Ghana among school children are protein-energy malnutrition and micro-nutrient deficiencies. School Feeding Programmes are one of the main interventions addressing malnutrition and its related effects on children's health and education. The purpose of this study was to assess the influence of Ghana School Feeding Programme on nutritional status of school children in Atwima-Nwabiagya District of Ashanti Region, Ghana. A total of 234 pupils between 9 and 17 years of age, comprising 114 participants and 120 non-participants from three participating and three non-participating schools, respectively, with similar characteristics, took part in the study. It was hypothesised that the nutritional status of participants was better than that of non-participants. Results did not indicate any association between the school lunch and nutritional status. There was no statistically significant difference in the nutritional status of participants and non-participants. The programme did not impact the nutritional status of participants.

School feeding and educational access in rural Ghana: Is poor targeting and delivery limiting impact?

Essuman A & Bosumtwi-Sam C. (2013). *International Journal of Educational Development*, 33(3), 253-262.

<http://www.sciencedirect.com/science/article/pii/S073805931200140X>

In an effort to address social imbalances and equity in Ghana's education delivery and to achieve her Education for All (EFA) agenda, some pro-poor programmes have been introduced. Among these is the Ghana School Feeding Programme (GSFP) that aims among others, at providing safety nets for the poor, increasing school enrolment in addition to boosting domestic food production. While this programme has been implemented since 2005, there is paucity of information on the experiences of beneficiaries and implementers. The GSFP has been designed as a national programme to feed children in public kindergarten and primary schools, based on a single implementation framework. This single implementation framework does not make room for contextualisation of programme implementation and allow the tapping into the knowledge base of both the school and the community in making judgments about who is really needy and who is not. Thus, the study

sought to explore the experiences of beneficiaries and implementers of the programme within three rural communities in Ghana, using interviews and observations. Challenges of programme delivery, which include prolonged time spent on serving, eating and cleaning up, counter effective teaching and learning and pose a threat to education quality. There are policy conflicts, funding challenges and issues about targeting and sustainability of the programme. These give credence to the need to understand the local dynamics of poverty and how they affect demand for educational access in rural contexts. The paper finally proffers ways in which insights gained from these experiences can contribute to the current discourse on School Feeding Programmes in the context of developing economies.

School Feeding Programs in Kenya: Transitioning to a Homegrown Approach

Langer N. (2011). *Stanford Journal of International Relations*, 13(1), 30-37.

<https://web.stanford.edu/group/sjir/13-1/kenya.pdf>

The effects of the school meal program on the wellbeing of rural Kenyans cannot be overstated. Through providing daily meals, schools are able to meet immediate food needs, provide future safety nets, and offer long-term assistance and empowerment to children, families, and communities. As the WFP prepares its exit strategy from the region as the main agent of school feeding, much care should be undertaken in ensuring that the transitional period be free of potential crises.

If HGSP has a secure foundation within Kenya with both funds and management sourced internally, the program will no longer need to rely on fluctuating and often conditional donor support. In addition, a successful transfer of the food provision program to the Kenyan government would foster inter-ministerial cooperation and involvement and better integrate the program with a wide range of national and economic goals. In order to effect lasting positive change in the lives of Kenyan children, the government must instate policies that work toward achievable goals.

If the Kenyan government hopes to ensure the success of Free Primary Education, there must be considerable and consistent investment in programs that increase educational access, participation, and quality, especially among the most vulnerable and historically marginalised social groups. In addition to supporting programs like HGSFP, the ministries of Education and Agriculture must also invest in rural infrastructure by building roads and schools, improve agricultural capabilities by improving irrigation systems, farming technologies, and indigenous plant knowledge, and allocate more funds for basic school supplies and new teachers. Without these necessary additions to the current system, the rewards of FPE will remain elusive for a large and promising segment of the Kenyan population.

The Impact of Food for Education Programs on School Participation in Northern Uganda

Alderman H, Gilligan DO, & Lehrer K. (2013). Available at SSRN 2207796.

http://www2.econ.iastate.edu/faculty/orazem/TPS_papers/Alderman_Gilligan_Lehrer_FFE_School_Participation_04_2010.pdf

There is a general consensus that Food for Education (FFE) programs increase primary school participation. Although this view is widely held, there is limited causal evidence to support it, making it difficult to anticipate the size of expected impacts. Moreover, little is known about how the design of FFE programs affects schooling outcomes. This paper presents evidence of the impacts of alternative methods of FFE delivery on schooling in Northern Uganda using a prospective, randomised controlled evaluation conducted from 2005-2007. The authors compare the impacts of the World Food Programme's in-school feeding program (SFP) with an experimental take-home rations (THR) program conditional on

school attendance to examine how outcomes are affected by the timing of meals and the placement of incentives with children versus parents. Results show that the in-school meals program increased enrolment for those children who were not enrolled at baseline, but who had reached the recommended age of school entry. For many outcomes the authors cannot reject that the THR impact is equivalent to that of the SFP. Both programs had large impacts on school attendance, with impacts varying by grade and gender. Moreover, both the SFP and THR programs reduced grade repetition, with larger impacts coming from the SFP program. The SFP program also reduced girls' age at entry to primary school. Neither program affected progression to secondary school. In fact, children in grades 6 and 7 in SFP schools in 2005 were significantly more likely to remain in primary school in 2007, suggesting that school meals induce hungry children to delay completing primary school.

5. Case Studies: Asia

Bangladesh School Feeding Impact Evaluation

WFP (2010a) UN WFP Evaluation Brief

<http://documents.wfp.org/stellent/groups/public/documents/reports/wfp242813.pdf>

The WFP provide school feeding in Bangladesh using micro-nutrient fortified biscuits. The evaluation concludes that the achievement of learning outcomes arises from a complex set of interrelated factors, of which school biscuits are one input. While the evaluation showed some positive impacts on attendance and drop-out rates, there is no consistent pattern of the effect on overall performance in programme schools relative to control schools. This limited impact on critical education outcomes reflects shortcomings in the education system – limited contact hours, high student-to-teacher ratios, large class sizes, poor infrastructure, etc. – and economic pressures on households.

Parents and teachers perceive school biscuits as an important input; in addition, they help attract children in lower grades to school, and provide a critical supplement to a nutritionally inadequate diet. In spite of the commitment to education expressed by most households, children drop out because they are needed to contribute to the precarious household economy especially for the most poor and vulnerable families. Thus, the value of the biscuit is diminished as the child grows and becomes a more important economic asset to the household. This livelihood reality presents a major challenge because while the biscuit attracts students to school, it does not keep them there.

The biscuits contribute about 4 % of annual stated household income, and reduce the daily food bill by 4.4% for the most vulnerable households. This constitutes an important value transfer, although this is insufficient for the poorest and most marginal households to offset the cost of keeping a child in school as compared to having them work. There is need to examine the school feeding programme strategy and alternative modalities to help offset these factors for older children. Value transfer and other impacts are reduced if pipeline breaks mean that planned school biscuits are not actually delivered and consumed. Actual delivery ranged between 74.2 percent and 91.8 percent of planned from 2007-2010.

The major problem identified in this evaluation has been the lack of impact of school feeding on dropout in the higher grades, completion rates and transition to secondary school. Given the success of the primary school enrolment effort, the evaluation suggests that a priority for Bangladesh is to create the environment for enhancing completion of primary school and transition to secondary school, so that children are able to acquire the skills needed to improve their livelihoods.

Cambodia School Feeding Impact Evaluation

WFP (2010b) UN WFP Evaluation Brief

<http://documents.wfp.org/stellent/groups/public/documents/reports/wfp230143.pdf>

The school feeding programme was aligned with the Government's education goals and strategy. In the past ten years it has achieved its aim of supporting primary education by contributing to increased enrolment, attendance and promotion and to reduced drop-out rates. Improved learning was not found.

The school feeding programme had marked effects on nutrition and value transfers to households, but the school meals programme and take-home rations affected education, nutrition and value transfer in different ways.

The take-home ration was worth up to 26 % of incomes in households with the fewest assets; among school meals beneficiaries the figure was 14 %. The school meals modality had the effect of saving time in beneficiary families, especially for women.

Impact Evaluation of School Feeding Programs in Lao PDR

Buttenheim AM, Alderman H, & Friedman J. (2011). World Bank Policy Research Working Paper, (5518).

http://hgsf-global.org/en/bank/downloads/doc_download/123-impact-evaluation-of-school-feeding-in-lao

Despite the popularity and widespread implementation of school feeding programs, evidence on the impact of school feeding on school participation and nutritional status is mixed. This study evaluates school feeding programs in three northern districts of the Lao People's Democratic Republic (PDR). Feeding modalities included on-site feeding, take-home rations, and a combination. District-level implementation of the intervention sites and selective take-up present considerable evaluation challenges. To address these limitations, the authors use difference-in-difference estimators with propensity-score weighting to construct two plausible counterfactuals. They find minimal evidence that the school feeding schemes increased enrolment or improved children's nutritional status. Several robustness checks and possible explanations for null findings are presented.

Previous research has suggested that school feeding programs are most effective in areas with low enrolment and household resource constraints. In this sample, larger and less remote villages with higher baseline enrolment were selected into the school feeding programs. Greater effects may have been apparent if the program had 100% take-up or had been targeted to relatively disadvantaged villages. More consistent implementation might also have produced more compelling effects.

Improving the nutrition quality of the school feeding program (Mid-Day Meal) in India through fortification: a case study

Bhagwat S, Sankar R, Sachdeva R, Joseph L, & Sivaranjani. (2014). Asia Pacific journal of clinical nutrition, 23(S1), s12-s19.

<http://apjcn.nhri.org.tw/server/APJCN/23%20Suppl%201/S12.pdf>

Micronutrient malnutrition is widely prevalent in school children in India. India's national school feeding program, the Mid-Day Meal (MDM) scheme, is the largest in the world and caters to 120 million children in primary schools. Complementary strategies such as deworming or fortifying meals provided through the MDM scheme could increase the nutritional impact of this program. India's Supreme Court has directed that only hot, cooked meals be provided in MDM, through a decentralised model. However, in urban areas, big

centralised kitchens cook and serve a large number of schools, with some kitchens serving up to 150,000 children daily.

The objective of this project was to test the operational feasibility of fortifying the school meal in centralised kitchens, as well as the acceptability of fortified meals by recipients. A pilot was conducted in 19 central kitchens run by the Naandi Foundation in four different States. Several food vehicles were used for fortification: wheat flour, soyadal-analogue and biscuits. More than 750,000 children were reached with fortified food on all school days for a period of one year. Fortified food was found to be acceptable to all stakeholders. The government is in favour of continuing fortification. The Naandi Foundation has adopted fortification as their norm and continues to fortify all meals provided from their central kitchens. In conclusion: fortification of school meals with micronutrients can be integrated in the normal cooking process and is well accepted by all stakeholders. This pilot could hold lessons for other states in adopting fortification in MDM.

Impact of Feeding Children in School: Evidence from Bangladesh

Ahmed AU (2004) IFPRI

http://www.lcgbangladesh.org/fsn/reports/ifpri%20final%20report_school%20feeding%20in%20bangladesh.pdf

In July 2002, in order to diminish hunger in the classroom as well as to promote school enrolment and retention rates, the Government of Bangladesh and the U.N. World Food Programme launched the School Feeding Program (SFP) in chronically food-insecure areas of Bangladesh. SFP is the first effort in Bangladesh to provide incentives directly to primary-school children themselves, as opposed to cash or food to parents for sending their children to school. The SFP provides a mid-morning snack consisting of eight fortified wheat biscuits to some one million children in approximately 6,000 primary schools in highly food-insecure rural areas, plus four slum areas in Dhaka City. At a cost of U.S. 6 cents per packet of eight, the biscuits provide 300 kilocalories and 75 % of the recommended daily allowance of vitamins and minerals.

Evaluation found the SFP raised school enrolment by 14.2 percent, reduced the probability of dropping out of school by 7.5 %, and increased school attendance by about 1.3 days a month. These results are obtained from econometric models that captured the impact of the SFP alone, isolating the effects of income and other factors.

SFP improves children's diets. Calories consumed from SFP biscuits are almost entirely (97 %) additional to the child's normal diet. The child's family does not give him or her less food at home for eating the SFP biscuits at school. Even poor households do not substitute child calorie intakes from SFP biscuits. These findings are based on a specifically designed experiment and an econometric model to assess the impact of SFP on child energy intake. After rice, SFP biscuits are the most important source of energy, protein, and iron in the diet of program participants. Average energy intake of participating students are 11 % and 19 % higher in rural and urban slum areas, respectively, than energy intake of primary school students in corresponding control areas.

Participating students also appear to share SFP biscuits with younger siblings and sometimes other household members. Sharing creates an interesting spillover effect: energy from SFP biscuits account for seven % of total energy intake of children ages two to five in beneficiary households in the rural area. An extremely high percentage of mothers report several positive effects of the SFP on their children. They note that children's interests in attending school and concentration on studies have increased; they are livelier and happier than before, and their incidence of illness has declined.

SFP improves child nutritional status. It increases the body mass index (BMI) of participating children by an average of 0.62 points. This represents a 4.3 %increase compared to the average BMI of schoolchildren in the control group—a sizable increase that is partly due to the fact that most participating children were malnourished to begin with. Most of the program children had been eating SFP biscuits every school day for more than a year before the IFPRI surveys. SFP improves academic performance.

Participation in the SF program increases test scores by 15.7 % points. Participating students do especially well in mathematics. Students from urban slums do better in achievement tests than do students from rural areas, probably due to the difference in quality between urban and rural primary schools.

6. Case Studies: Latin America and the Caribbean

Benefits of a school breakfast programme among Andean children in Huaraz, Peru

Jacoby E, Cueto S & Pollitt E (1996) Food Nutr Bull 17, 54–64.

<http://archive.unu.edu/unupress/food/8F171e/8F171E0b.htm>

A randomised, controlled trial measured the short-term impact of the Peruvian school breakfast programme on the diet, school attendance, and cognition of fourth- and fifth-graders. Ten schools on the rural outskirts of the Andean city of Huaraz were randomly assigned to a control or a treatment group. The programme significantly increased ($p < .01$) dietary intakes of energy by 15.2%, protein by 16.1%, and iron by 60%, and improved rates of attendance. Analysis of covariance also showed improved performance on a vocabulary test among heavier children, as indicated by a positive and significant weight x treatment interaction (parameter = 0.37; $F = 4.97$; $p < .05$). It is plausible that among stunted children, being relatively overweight (by the weight-for-height index) poses a cognitive risk that can be partially reversed by a school breakfast.

Effects of missing breakfast on the cognitive functions of school children of differing nutritional status

Simeon DT, & Grantham-McGregor S. (1989). The American journal of clinical nutrition, 49(4), 646-653.

<http://ajcn.nutrition.org/content/49/4/646.full.pdf+html>

The authors examined the effects of omitting breakfast on the cognitive functions of three groups of children: stunted, nonstunted controls, and previously severely malnourished in the West Indies. They were admitted to a metabolic ward twice. After an overnight fast half the children received breakfast on their first visit and a cup of tea the second time. The treatment order was reversed for the other half. When breakfast was omitted, both the stunted and previously malnourished groups responded similarly. The malnourished groups had lower scores in fluency and coding whereas the control group had higher scores in arithmetic. The children were divided into wasted and nonwasted groups. Wasted children were adversely affected in the digit span backwards tests, and wasted members of the malnourished groups were adversely affected in efficiency of problem solving and those in the control group in digit span forwards. These results indicate that cognitive functions are more vulnerable to missing breakfast in poorly nourished children.

The impact of Chile's school feeding program on education outcomes

McEwan PJ. (2013). Economics of Education Review, 32, 122-139.

<http://academics.wellesley.edu/Economics/mcewan/PDF/meals.pdf>

Chile operates one of the oldest and largest school feeding programs in Latin America, targeting higher-calorie meals to relatively poorer schools. This paper evaluates the impact of

higher-calorie meals on the education outcomes of public, rural schools and their students. It applies a regression-discontinuity design to administrative data, including school enrolment and attendance, first-grade enrolment age and grade repetition, and fourth-grade test scores. There is no evidence, across a range of specifications and samples, that additional calories affect these variables. The paper suggests that the focus of Chilean policy should further shift to the nutritional composition of school meals, rather than the caloric content.

Chile's school feeding programme: targeting experience

Kain J, Uauy R, & Taibo M. (2002). *Nutrition Research*, 22(5), 599-608.

http://hgsf-global.org/en/bank/downloads/doc_download/20-chiles-school-feeding-programme-targeting-experience

The Chilean School Feeding Programme's (SFP) main objective is to provide social and food assistance to low income children attending public schools. It targets 1,2 million children daily with meals provided by local food companies. These have different caloric content, depending on the child's age and the school's vulnerability index, which is indirectly related with the poverty level of its students and determined yearly by a targeting model. There are two models, one for children in primary and the other for those in secondary schools, both based on variables gathered from first and ninth graders respectively and determined by a logistic regression analysis. This methodology provides a vulnerability index per school which allows these to be ranked; a cut-off (established by available fiscal budget) determines the type and amount of meals received by the school. The decision of who receives the meal inside the school is determined by a committee. Presently coverage amounts to 40% of all primary schoolchildren in public schools.

Evaluations of the targeting models have shown that targeting has improved over time; 80% of total SFP funding for primary schools is concentrated on the two lowest income quintiles, while at the secondary level, it only targets around 21% of potential beneficiaries, because coverage is much lower. Because the SFP provides a significant proportion of the daily energy needs, it has shown to be an excellent incentive for poor parents to send their children to school.

The Brazilian school feeding programme: an example of an integrated programme in support of food and nutrition security

Sidaner E, Balaban D, & Burlandy L. (2013). *Public health nutrition*, 16(06), 989-994.

<http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=8923089&fileId=S1368980012005101>

Brazil's integrated food and nutrition security policy approach promoted intersectorality in the food system, articulating actions to guarantee access to healthy food and to strengthen family farming. The quality of school meals has progressively improved; in particular, the availability of fruits and vegetables increased. However, national standards regarding menu composition have not yet been met. Regulations were an important factor, along with the policy approach linking food production, nutrition, health and education. Challenges are related to conflict of interests and to farmers' insufficient capacity to meet supply requirements and comply with technical procedures.

In conclusion, local food production, school meals and nutrition education can be linked through integrated programmes and policies, improving access to healthier foods. Government leadership, strong legislation, civil society participation and intersectoral decision making are determinant.

Nutrition and education: a randomized trial of the effects of breakfast in rural primary school children

Powell CA, Walker SP, Chang SM et al. (1998) *Am J Clin Nutr* 68, 873–879.

<http://ajcn.nutrition.org/content/68/4/873.full.pdf>

Hunger during school may prevent children in developing countries from benefiting from education. Although many countries have implemented school feeding programs, few programs have been rigorously evaluated. The authors conducted a randomised, controlled trial of giving breakfast to undernourished and adequately nourished children. The undernourished group comprised 407 children in grades 2–5 in 16 rural Jamaican schools (weights-for-age ≤ 21 SD of the National Center for Health Statistics references) and the adequately nourished group comprised 407 children matched for school and class (weights-for-age > 21 SD). Both groups were stratified by class and school, then randomly assigned to breakfast or control groups. After the initial measurements, breakfast was provided every school day for 1 school year. Children in the control group were given one-quarter of an orange and the same amount of attention as children in the breakfast group. All children had their heights and weights measured and were given the Wide Range Achievement Test before and after the intervention. School attendance was taken from the schools' registers. Compared with the control group, height, weight, and attendance improved significantly in the breakfast group.

Both groups made poor progress in Wide Range Achievement Test scores. Younger children in the breakfast group improved in arithmetic. There was no effect of nutritional group on the response to breakfast. In conclusion, the provision of a school breakfast produced small benefits in children's nutritional status, school attendance, and achievement. Greater improvements may occur in more undernourished populations; however, the massive problem of poor achievement levels requires integrated programs including health and educational inputs as well as school meals.

7. Further resources

On the transition to sustainability: an analysis of the costs of school feeding compared with the costs of primary education

Bundy D, Burbano C, Gelli A, Risley C, & Neeser K. (2011). *Food & Nutrition Bulletin*, 32(3), 201-205.

<http://www.ncbi.nlm.nih.gov/pubmed/22073793>

Data on the costs of school feeding in different countries were collected from multiple sources, including World Food Programme project data, reports from government ministries, and, where such searches failed, newspaper articles and other literature obtained from internet searches. Regression models were then used to analyse the relationships between school feeding costs, the per capita costs of primary education and GDP per capita.

School feeding programs in low-income countries exhibit large variations in cost, with concomitant opportunities for cost containment. As countries get richer, however, school feeding costs become a much smaller proportion of the investment in education. The per capita costs of feeding relative to education decline nonlinearly with increasing GDP.

These analyses suggest that the main reason for this decline in the relative cost of school feeding versus primary education is a greatly increased investment per child in primary education as GDP rises, but a fairly flat investment in food. The analyses also show that there appears to be a transitional discontinuity at the interface between the lower- and middle-income countries, which tends to coincide with changes in the capacity of governments to take over the management and funding of programs. Further analysis is required to define these relationships, but an initial conclusion is that supporting countries to maintain an investment in school feeding through this transition may emerge as a key role for development partners.

Redistributing income to the poor and the rich: Public transfers in Latin America and the Caribbean

Lindert K, Skoufias E, & Shapiro J. (2006). Social Safety Nets Primer Series.

<http://siteresources.worldbank.org/SOCIALPROTECTION/Resources/SP-Discussion-papers/Safety-Nets-DP/0605.pdf>

This paper uses the Distributional Characteristic Index (DCI) to look at welfare gains in Latin America and the Caribbean. The DCI is a summary indicator which allows comparison between the redistribution and social welfare impacts of programmes relative to each other independently of the (different) sizes of their budgets. The research finds that within social assistance, conditional cash transfers result in higher social welfare (DCIs) than other types of cash or food-based transfers. On average, the net DCI (combined targeting and sizing components) for CCTs is 2.1, as compared with 1.4 for school feeding programmes.

Feed minds, change lives school feeding: highlights and new directions

WFP (2009)

<http://documents.wfp.org/stellent/groups/public/documents/newsroom/wfp204709.pdf>

The costs of school feeding and whether countries can afford the programme have always been prominent concerns. Studies show that school feeding becomes more affordable as countries develop. In countries with a low GDP per capita, a school feeding programme typically costs half or more of their education budget. The programmes become relatively less expensive as countries develop and may be as low as 10 % of the education budget in richer countries.

Given a finite budget, targeting is essential to ensure that programmes provide the most benefit to the intended beneficiaries. During programme design, it is critical to carefully assess costs, benefits and trade-offs and plan realistically to ensure costs are contained and the programmes expand gradually. Donors and development partners have a significant role to play in supporting the poorest countries with both funding and technical support to ensure costs are contained, are affordable and sustainable

For Protection and Promotion: The design and implementation of effective safety nets

Grosh ME. (2008). World Bank Publications.

http://siteresources.worldbank.org/SPLP/Resources/461653-1207162275268/For_Protection_and_Promotion908.pdf

This paper estimates that administrative costs for school feeding programmes account for between 10 and 55 % of total program costs.

Food for thought: Are school feeding programmes effective in improving educational outcomes?

Thapa R. (2009) 3ie Enduring Questions Brief Number 6

http://www.3ieimpact.org/media/filer_public/2012/05/07/19-2.pdf

Many studies evaluating the educational outcomes of school feeding programmes are limited by post-programme data collection, despite the relative ease of establishing control groups and using enrolment and attendance rates with test scores to determine impacts. However, there are a number of studies that do establish a clear link between school feeding and enrolments, and some showing also an impact on learning outcomes.

Do School Feeding Programs Help Children?

Human Development Network (2012). World Bank.

<http://siteresources.worldbank.org/INTHDOFFICE/Resources/SchoolFeedE2P.pdf>

In Burkina Faso, Lao People's Democratic Republic (Laos) and Uganda, World Bank researchers teamed up with the UN World Food Programme to evaluate the impact of school feeding and take-home rations programs. The evaluations found that when the food was distributed properly, as was the case in Burkina Faso and Uganda, enrolment rose and students did show some gains in learning. In Laos, where delivery of the food was hampered, gains in enrolment were difficult to quantify and there were no visible improvements in learning. Taken as a whole, the experiences of the three countries point to the possibilities and limitations of school feeding programs: when properly implemented, they can raise enrolment and possibly lead to better learning. But even then, feeding programs are unlikely to make up for the cognitive and physical lags that result from poor nutrition during pregnancy and the first two years of life.

Is there an intrahousehold 'flypaper effect'? Evidence from a school feeding programme

Jacoby HG. (2002). The Economic Journal, 112(476), 196-221.

<http://onlinelibrary.wiley.com/doi/10.1111/1468-0297.0j679/abstract>

Are public transfers targeted toward children neutralised by the household, as the theory of altruism implies, or is there an intrahousehold 'flypaper effect' whereby such transfers 'stick' to the child? This paper studies the impact of a school feeding programme on child caloric intake in the Philippines using a quasi-experimental methodology. The empirical results confirm an intrahousehold flypaper effect; indeed, they indicate virtually no intrahousehold reallocation of calories in response to the feeding programme. In poorer households, however, children's gains from the programme appear to be 'taxed' more heavily.

School Feeding Programs and Development: Are We Framing the Question Correctly?

Alderman H, & Bundy D. (2011). The World Bank Research Observer, Ikr005.

<http://wbro.oxfordjournals.org/content/27/2/204.abstract>

School feeding programs are politically popular interventions. They are, nevertheless, difficult to assess in terms of effectiveness since their impact is partially on education and partially on school health. They are, additionally, a means to augment consumption by vulnerable populations. The authors look at recent evidence from in-depth studies and argue that while school feeding programs can influence the education of school children and, to a lesser degree, augment nutrition for families of beneficiaries, they are best viewed as transfer programs that can provide a social safety net and help promote human capital investments.

Home Grown School Feeding: linking small holder agriculture to school food provision

Gelli A, Neeser K, & Drake L. (2010). London: Partnership for Child Development.

<http://www.schoolsandhealth.org/Shared%20Documents/Downloads/HGSF%20working%20paper%20series%201-%20Home%20Grown%20School%20Feeding%20Linking%20Small%20holder%20agriculture%20to%20school%20food%20provision.pdf>

The purpose of this paper is to provide an overview of the Partnership for Child Development (PCD) HGSF programme approach aimed at clarifying what HGSF is, "unpacking" the different elements involved in the HGSF system as a set of interventions aimed at delivering benefits across education, health, nutrition and agriculture development. This paper is

structured as follows: description of the scoping analytical framework that was developed to examine the HGSF framework and possible designs for HGSF impact evaluations, then description of some of the findings of the initial scoping analysis and then conclusion. The paper highlights a need for sensitisation campaigns around improved production practices, income generation activities in support to school feeding and on improved nutrition practices. The framework presented here is proving the basis for the design of the HGSF impact evaluations and feed into the integrated country level assessments of gaps, needs, and constraints that led to the development of HGSF technical assistance country plans.

8. Additional information

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