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Cost-Benefit Analysis of the School Meals Programmes in Lao PDR May 2018



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Front cover photo: WFP/Vilakhone Sipaseuth

Acronyms

BCR	Benefit-Cost Ratio
CBA	Cost-Benefit Analysis
CRS	Catholic Relief Services
CSP	Country Strategic Plan
DALY	Disability Adjusted Life Years
DESB	District Education and Sports Bureau
DHS	Demographic Health Survey
EMIS	Education Management Information System
GPI	Gender Parity Index
HDI	Human Development Index
LAK	Lao Kip
MAF	Ministry of Agriculture and Forestry
MoES	Ministry of Education and Sports
MoH	Ministry of Health
NPV	Net Present Value
NutVal	NutVal 4.1 software
PESS	Provincial Education and Sports Bureau
SABER	Systems Approach for Better Education Results
SMP	School Meals Programme
US\$	United States Dollar
VAM	Vulnerability and Assessment Mapping
VEDC	Village Education and Development Committee
WASH	Water, Sanitation and Hygiene
WB	The World Bank
WFP	World Food Programme

Executive Summary

This report presents the findings of the cost-benefit analysis (CBA) of school meals programmes in Lao PDR (Laos), carried out jointly by the Ministry of Education and Sports (MoES), the World Food Programme (WFP) and MasterCard in April/May 2018. It aims to inform evidence-based policymaking and contribute to the overall advocacy efforts for improved investments in a sustainable, nationally-owned school meals programme.

The CBA is an economic model that shows the economic value created by school meals programme over a single beneficiary's lifetime. It is supported by academic literature and country-specific indicators on education and health. It enables governments, donor agencies and development partners, to see at a glance the return of investment on school meals (expressed in a dollar value) over a single beneficiary's lifetime. Developed by WFP, in partnership with the Boston Consulting Group and in consultation with the World Bank, the CBA has previously been carried out in fifteen countries with school feeding programmes. The study is carried out through the WFP-MasterCard Partnership and the MasterCard Employee Engagement Programme, where volunteers from MasterCard provide support this exercise for one month.

In Laos, the CBA was undertaken for two modalities: i) cash-based, i.e. school meals under the government-run National School Meals Programme and ii) food-based i.e. school meals under WFP and CRS.

The CBA results show that for every 1 US\$ invested in school meals programmes, the return of investment ranges from 5 US\$ (cash-based modality) to 6.1 US\$ (food-based modality) over the lifetime. The net present value generated by the school meals is given below, followed by the breakdown into individual benefit drivers (corresponding to the respective Sustainable Development Goals).

Table 1: Total benefit (economic value) generated by school meals programmes in Laos. All values in US dollars represent the value created over the lifetime of a single beneficiary.

Benefit categories		Food-based	Cash-based
Net present value Generated in the country's GDP over their lifetime.		US \$1,271	US\$ 1,419
Value transfer			
	School meals provide a value transfer to beneficiary households through the value of food / cash provided. This additional income support improves food security for the entire household, acting as a critical safety net.	US\$ 264	US\$ 371
Return on investment			
	The value constituted by the food / cash transfer to the households frees up resources, which households, who are active asset managers, then use to partly invest in productive assets.	US\$ 110	US\$ 153
 	Improved education and increased productivity Increase in future revenue through longer schooling and better cognitive abilities, and thus improving their productivity when they become working adults.	US \$750 (for both modalities)	
	Healthier life The health and nutrition benefits of school meals resulting from partially meeting daily requirements for Vitamin A, iron and the benefits of combining school feeding with WASH programmes.	US \$131.09	US \$128.12
	Gender equality Positive externalities associated with reducing the gender gap	\$16.15 per beneficiary	

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1. Rationale and Context

Governments are increasingly interested in expanding their national social protection systems in response to the growing inequity and the frequency of social shocks. Globally, school meals programmes are one of the most effective social safety nets, especially for food-insecure and poor households, and represent a sustainable investment in human capital with multiple benefits in the sectors of education, health and nutrition, social protection, and gender equality.

As a result, an emerging need to assist governments in designing and implementing school feeding programmes which incorporate sustainable investments in human capital is required.¹ While potential benefits of school meals are intuitively recognizable, programme costs may pose a challenge in providing evidence on quantifiable and monetary returns to investment.² In response to these challenges, WFP in partnership with the Boston Consulting Group (BCG) and the World Bank developed the School Feeding Investment Case otherwise known as the Cost-Benefit Analysis in 2011. This report presents the results of the Cost-Benefit Analysis (CBA) study of school meals programmes in Lao PDR, carried out jointly by the Ministry of Education and Sports (MoES), the World Food Programme (WFP) and MasterCard in April/May 2018. The report is designed to inform evidence-based policymaking and contribute to the overall advocacy efforts for improved investments in a sustainable, nationally-owned school meals programme in Lao PDR.

School Meals Programmes in Lao PDR

Nearly 25 percent of all pre-primary and primary school children in Lao PDR receive a daily lunch at school.

The first school feeding programmes were set up in 2002, by the World Food Programme, with the initial aim of improving enrolment rates in disadvantaged districts and providing nutritious meals to children. However, as enrolment rates improved over the course of the decade, the programme focus shifted to improving attendance, nutrition and health in school children, who can concentrate better with a full stomach.

The Government-led National School Lunch Programme was established in 2010 by the MoES, with funding from the World Bank. As part of this establishment, WFP handed over 56 schools to the programme, and signed a Memorandum of Understanding (MoU) titled “Transition Agreement towards a National School Feeding Programme” in 2010, jointly with the MoES and the World Bank, as part of this first takeover. To ensure sustainability and national ownership, the Government of Lao PDR adopted the “National Policy on Promoting School Lunch” in May 2014, establishing a policy framework for a nationally-owned school lunch programme.

Over the years, the National School Lunch Programme has expanded, and is reaching 25,000 children in 312 schools in 10 districts in Houaphanh, Bolikhamxay, Oudomxay, Phongsaly, and Xayaboury. The WFP school lunch programme covers 1,450 schools in 30 districts across 7 provinces including Phongsaly, Luang Namtha, Oudomxay, Luang Prabang, Saravane, Sekong and Attapeu. In addition, Catholic Relief Services also has been providing school lunch to 350 schools in seven districts in Savannakhet province since 2008³.

School lunch programmes in Laos use both cash and food modalities, and also provide many complementary activities in WASH, literacy and nutrition. This integrated approach forwards achievement of sustainable access to food and improved educational performance. The government-run National School Lunch Programme, uses a cash modality, wherein schools receive 800 LAK per child per day per meal (equivalent to US\$0.10 per child) to purchase food from local communities. WFP and CRS use an in-kind food modality (rice, lentils, oil and canned fish⁴), to provide school lunch. In addition to lunch, many schools also receive support to establish school gardens; safe food-storage trainings and hardware; literacy programmes; improved water access and hygiene; and technical assistance to policy and advocacy work at national and sub-national levels.

Table 2: Overview of school meals programmes in Laos by modality, coverage, and implementers

Modality	Beneficiaries	Coverage	Grade	Food basket	Implementing Agencies
Cash-based	25,518 children	10 Districts	Early Child Development (ECD) – grade 5	Varies across schools (based on local procurement)	MoES
Food-transfer	174,175 children	37 Districts	Early Child Development (ECD) – grade 5	White Rice, Lentils, canned fish and vegetable oil	WFP, MoES and CRS

Handover to a sustainable national ownership

Laos is moving towards middle-income country status and as such, the Government of Lao PDR is committed to a graduation from Least Developed Country (LDC) status in 2024, which reflects criteria for gross national income, human assets and economic vulnerability. The country has seen strong economic growth in the past few years, with reduction in poverty levels, however, the country is off-track on stunting reduction and achieving quality education. As such, the Government, as part of its 2030 vision of “a prosperous country, with a healthy population, free from food insecurity, malnutrition and poverty”, is increasing investments in health and education, including school meals.

In addition to the 2014 Policy on Promoting School Lunch, the MoES Plan of Action on the School Meals Programme (2016-2020) also recognizes that provision of lunches contributes favourably to education, food security and nutrition outcomes. School meals is one of the priority actions within the National Nutrition Strategy and Plan of Action 2016-2020, which emphasizes a multi-sectoral and convergence approach to all forms of malnutrition.

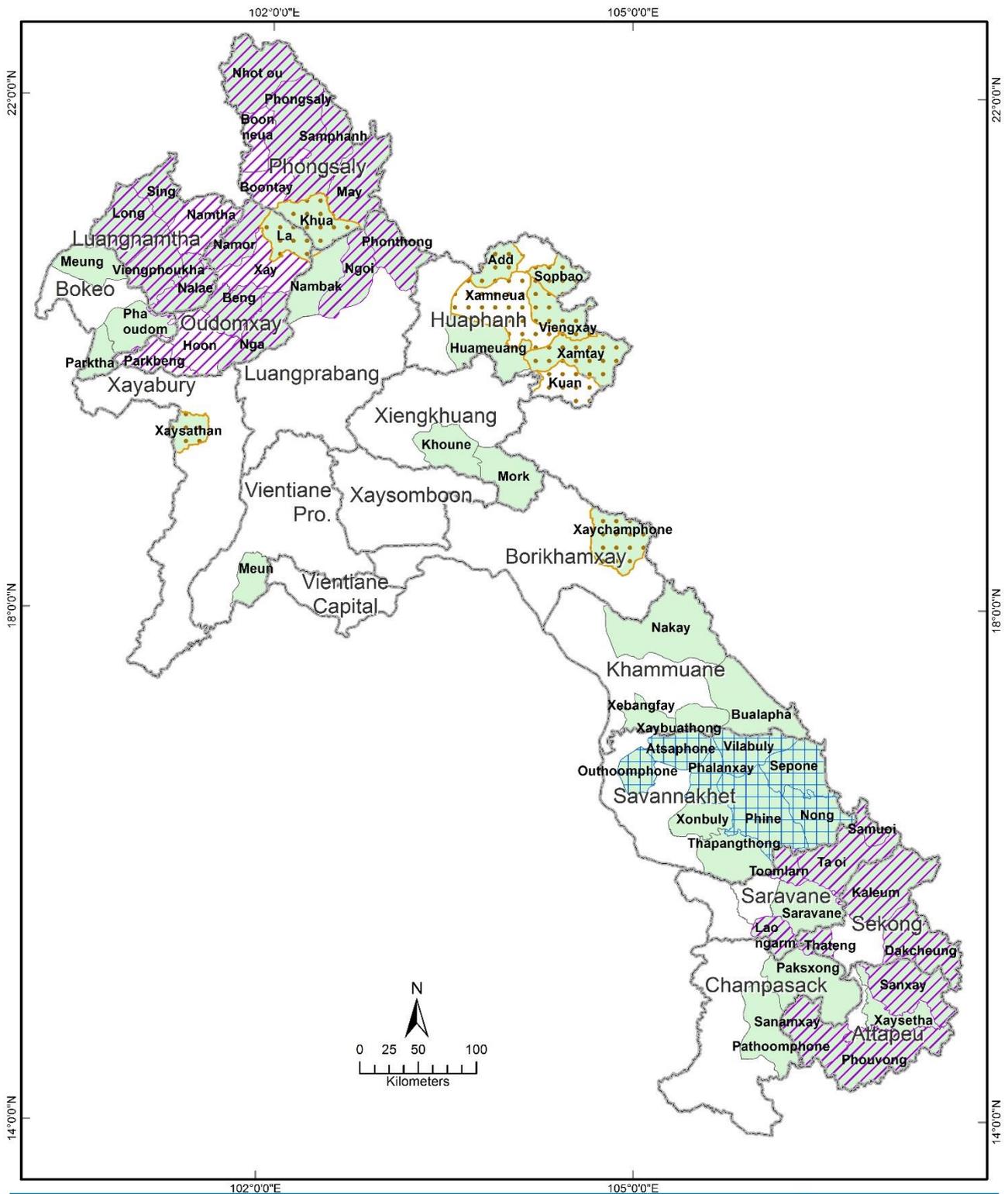
To ensure sustainability of the programme, WFP, CRS and the World Bank are preparing to hand over the programme to the government and beneficiary communities. In June 2019, WFP will hand over 500 schools to be integrated into the national school lunch programme, followed by the remaining 950 in June 2021. The World Bank funding for national programme will also end in June 2019. To facilitate the handing over of school meals to the government, WFP in partnership with MasterCard conducted the Cost-Benefit Analysis (CBA) for school meals in April/May 2018. This study is an investment case to support the Government in scaling up their school meals programmes while reducing costs and increasing sustainability, and also supports advocacy efforts to include school meals in the government’s national budget.

¹ Bundy, Donald et al. 2009. Rethinking School Feeding Social Safety Nets, Child Development, and the Education Sector. Directions in Development; human development. World Bank. <https://openknowledge.worldbank.org/handle/10986/2634>

² Alderman, Harold; Bundy, Donald. 2012. School Feeding Programs and Development: Are We Framing the Question Correctly?. Published by Oxford University Press on behalf of the World Bank. <https://openknowledge.worldbank.org/handle/10986/17114>

³ WFP and CRS both receive funding from the US Department of Agriculture (USDA) McGovern-Dole International Food for Education and Child Nutrition program to run school feeding programmes in Laos. In addition, WFP also receives funds from the Governments of Japan and Australia.

⁴ Canned fish are only part of the WFP school lunch programme



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Legend

- CRS
- National school meal
- WFP
- Government priority district
- Provincial boundary
- District for CBA data collection

Data Sources:
 - Lao Department of Statistics
 - Lao National Geographical Department
 - WFP Lao PDR

The boundaries and names and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

WFP School_meal_district_31Aug2018

LAOS COUNTRY CONTEXT | In Brief

Laos is a landlocked country with 6.5 million people and is one of the fastest growing economies in the Asia and Pacific Region. Witnessing an average annual economic growth of about 7 percent over the past 10 years, Laos has made considerable improvements in the well-being of its people. The country has achieved Millennium Development Goal one (MDG 1) of halving poverty and the proportion of hungry people; and in mid-2015, made primary and lower secondary education compulsory. In 2013, Lao PDR also became a member of the World Trade Organization and expects to achieve middle-income country status by 2024.

Laos' education sector has shown improvement in recent years. The percentage of out-of-school children decreased from 11.5 percent in 2009 to 4.1 percent in 2012, and the primary completion rate rose from 78 percent in 2009 to 95 percent in 2012, with the rate for girls rising from 74 percent in 2009 to 93 percent in 2012. The gender parity index for the primary school completion rate also improved from 0.90 in 2009 to 0.96 in 2012.

However, significant education and nutrition challenges remain, particularly with regards to stunting and literacy. Around 30 percent of the population lives below the poverty line of US\$ 1.25 and Laos ranked 138 out of 188 countries on the 2016 Human Development Index (HDI). The national stunting rate is among the highest in the region at 35.6 percent for children under five, of which 13.6 percent are classified as severely stunted. The 2017 Global Hunger Index still rates hunger levels in the country "serious", with nearly 70 percent of the country's population relying on subsistence farming. The rate of anaemia among women of reproductive age is 31 percent and 53 percent of children under 2 are anaemic. The annual economic cost of undernutrition is estimated at 2.4 percent of the country's GDP or US\$ 380 million a year¹. The causes of malnutrition include lack of diet diversity, low education levels, lack of basic health care and sanitation, poor water access, traditional gender and ethnic norms around food utilisation.

While net enrolment rates have improved substantially in the last two decades, attendance remains a concern. The government does not systematically maintain attendance statistics at district levels, but school records indicate the main drivers of absence are sickness, disability, and supporting families during the harvest season. Literacy is also a major concern – over one quarter of adult population (27.3 percent) is unable to read or write, with Laos having the lowest literacy rate among ASEAN countries.

2. Methodology and Economic Model

Cost-Benefit Analysis is an economic model which substantiates the economic relevance of school meals programmes. It demonstrates the country's development by quantifying, in financial terms, the short and long-term benefits derived from the programme.

This model compares the benefits of school feeding (added value of school meals in the country's GDP) against costs, expressed in US dollars. It quantifies the economic return from the perspective of a single beneficiary's lifetime. In the analysis, the total cost refers to the actual cost of feeding a single child throughout his or her pre-primary and primary schooling. The total benefit refers to the economic return of this investment throughout the child's lifetime.

To quantify the benefits, the model calculates the net present value (NPV) of the various outcomes of school meals throughout the life of a beneficiary. Future benefits are discounted from their NPV to provide a meaningful and realistic figure in current dollar value. The discounted NPV is then divided by actualised costs per beneficiary to derive the benefit-cost ratio (BCR), which gives a measure of the success of an investment. If the BCR is higher than one, the project benefits are greater than their associated costs, indicative of a minimum economic return.

The economic model uses the following theory of change for school feeding impacts:

1. *Increase in enrolment, attendance and cognition while at school, decrease drop-out rates.*
School meals incentivise parents to send their children to school, by providing them with free meals, and reducing the household expenditure on food and health. Children who receive a nutritious school meal tend to have better concentration during classes and obtain higher test results, improving their chances of remaining at school and undertaking higher studies. School meals reduce the dropout rate of schoolchildren, who may otherwise be engaged in labour and household activities.
2. *Increase in household income.*
School meals provide a value transfer at the household level, which allows families to invest funds that would have otherwise been spent on feeding their children on other assets, thus generating an economic return.
3. *Improved nutrition and health.* School meals reduce micronutrient deficiencies, leading to better health and nutrition outcomes in the long term.

The methodology section below details how the cost-benefit analysis is modelled and calculated, starting with a discussion on the cost drivers, followed by benefit drivers, and concludes with the scope of the study in Laos.

COST DRIVERS

The CBA conducts a thorough cost review to estimate the cost of school meals per beneficiary over the course of the programme. Although the cost review is not a full-fledged costing exercise, it provides an accurate and detailed estimate of the costs' level and structure associated within a given school meals programme.

The cost review meets the following two criteria:

- Only *actual* costs are considered, as opposed to planned costs or budgeted expenses, as only effectively incurred expenditures can relate to the actual performance of the programme;

- The cost review is as comprehensive as possible, and considers the operational cost contributed by government and development partners.

The cost categories included in the CBA are based on the structure of the programme. In general, cost drivers of school feeding programmes include the following categories:

1. **Commodities:** Cost of all food commodities distributed to the beneficiaries, valued at their local purchase price
2. **Logistics, storage and utilities costs:** Cost of all operations required to deliver the food from warehouses to the schools includes transportation costs from warehouses, distribution, rent of warehouse etc.
3. **Management and administration:** All other operational costs and overheads directly incurred by the programme, including costs of equipment, assets, meeting and training costs;
4. **Staff Costs:** This includes salaries and benefits of personnel involved in school meals programmes. Incentives offered to cooks and storekeepers at the community level are also factored into this category.

Community contributions (which includes the value of goods and services contributed by local communities to the programme) while a crucial element of the programme, were not included in this study, because of time constraints. A small, but thorough cost review of community contributions was undertaken and has been included in chapter 4.

BENEFIT DRIVERS

The CBA economic model quantifies education, nutrition and safety net outcomes and aggregates them into a **Net Present Value** of all the benefits during the lifetime of the beneficiary.

The model draws on the above theory of change and academic evidence of school feeding benefits, extensive experience of actors in country, and country-specific data in estimating the value created through five key benefit drivers:

1. Value transfer to the household
2. Return on investment in the household's productive assets
3. Improved education and increased productivity
4. Healthier life
5. Gender equality

These drivers are linked to the 2030 Sustainable Development Goals Agenda (SDGs), and correspond through the various pathways to impact through which school meals may benefit children, their families, their communities, and the national economy.



Value Transfer to the Household

The value transfer refers to the provision of food assistance itself (a meal or a conditional household transfer in form of cash, voucher or in-kind food). Regardless of the modality, the food assistance provides an additional income to the household, which is a cash or a non-cash social transfer. This additional income support and revenue will improve food security in the entire household, acting as a safety net, especially in low-income countries.

This benefit is calculated by monetizing the value of the actual food basket over the duration of the programme using average local market prices.



Return on Investment on Saved Assets

The return on investment assumes that the value constituted by the food transfer to the households frees up resources, and is then used to partly invest in productive assets. Academic evidence suggests that poor households are active asset managers, and will effectively save and invest a share of this additional income on productive assets such as livestock, farming tools and equipment. Thus, the assumption in this model is that a food or cash transfer frees up household income that would otherwise be used for food consumption.

Assets in developing countries can contribute to the long-term wealth of households, due to their high rates of returns on investment. Assets can generate further revenue that can act as a safety net by improving the household's food security and increasing their resilience to shocks (such as economic or natural disasters), and safeguarding against deeper levels of poverty and food insecurity. This generates a **Return on Investment on Saved Assets**, which is quantified by applying rates of return established by academic evidence to a proportion of value transfer generated.⁵



Improved Education and Increased Productivity

Increased productivity is usually the most significant benefit driver in the CBA economic model. Increased productivity is a result of both *quantity* and *quality* of attendance. Student participation and attendance increases as well as the learning absorption rate due to better concentration and higher cognitive capacities.

Poor health and nutrition not only affects a child's physiological and physical growth, but also negatively impacts cognitive development and in turn, learning outcomes. School meals have a positive effect on enrolment rates, attendance rates, and drop-out rates, by providing an incentive for parents to send their children to school, and reducing the risk of dropout due to food insecurity. Thereby, students who receive school meals tend to have additional years of schooling than those with a similar background but do not receive school meals.⁶

Economics of education consider schooling as an investment in human capital. Human capital, as defined by Gary Becker, is a set of knowledge, skills and social and personal characteristics that increase a worker's productivity. Most of an individual's human capital is developed early during his or her life under the effect of education. In accordance with human capital models, these developments will result in better jobs and health when children become working adults, thus generating more value throughout the beneficiary's lifetime.⁷

⁵ Banerjee, Abhijit V., and Esther Duflo. 2005. Chapter 7: Growth Theory through the Lens of Development Economics. *Handbook of Economic Growth*, 473-552

⁶ Drake, Lesley, et al. 2017. School Feeding Programs in Middle Childhood and Adolescence. *Disease Control Priorities*, Third Edition (Volume 8): Child and Adolescent Health and Development, 147-64.

⁷ Becker, Gary Stanley. 1964. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. Chicago, IL: Univ. of Chicago Press.

This relationship between wages and length of schooling was established by Jacob Mincer, by developing an economic model known as the Mincer equation.⁸ The model shows that for a country's working population, the most significant determinant of the wages earned by these individuals is the number of years of schooling.⁹ This rate of return to education is specific to each country and is based on the quality of the education system in this country, and on the structure of the labour market. In addition, to account for improved cognition, the model includes evidence for improved cognition and test scores from various environments across the globe,¹⁰ which corresponds to an average of 0.17 standard deviation in test scores for every year during which a child benefits from school feeding. In addition, every one standard deviation increase in test scores is associated with an increase in expected wages of 11.0%.¹¹

School meals do not impact the rate of return to education, but as school meals directly lead to lengthening the schooling duration, it is reasonable to assume that school meals will lead to increase an individual's future earnings as he or she becomes a working adult, by a rate corresponding to the rate of return to education.¹²

The CBA relies upon comparison of education indicators between assisted schools and non-assisted schools to substantiate the extent to which school meals will increase the quantity of education received. This is done by calculating the net schooling duration (school-life expectancy or mean years of schooling) for treatment and control schools. This benefit driver for improved education and productivity is calculated using education indicators – enrolment, attendance and drop-out based on a comparison between schools enrolled in the school meals program with a control group of similar schools, which do not participate in the program. The variations in enrolment, attendance, and drop-out are calculated by taking into account the value between the start date and the end of the time under review in schools benefiting from school meals and in those schools not covered by the program (control group).

To substantiate the increase in wages as a result of increased school duration throughout the beneficiary's lifetime, the CBA model uses Gross National Income (GNI) per capita of the poorest 20 percent of the population as the base wage. The reason behind using the poorest income quintile is that school meals are more likely to act as an incentive for this specific sub-group. The base wage grows at a rate proportional to the average GDP growth rate. Using the rate of return to education, the increase in the base wage year-on-year is then applied to calculate the income increase throughout the beneficiaries' working life due to additional years of schooling associated with school feeding. For example, in the case of Zambia, school feeding was proven to increase school feeding duration by 0.57 years, and as such, the children who benefited from school feeding can therefore expect to earn wages of 7.18% higher than the base wage due to additional schooling. Only the difference between this higher revenue and the base wage can be attributed to school feeding, but the base wage itself cannot be associated with school feeding.

In addition, since this effect lasts throughout the working life of the beneficiary, the model discounts the cash flows associated with future wages to calculate their Net Present Value, to make them commensurate with expenditures and costs associated with the provision of school feeding in the present. The discount rate used for social protection programmes does not only rely upon forecasted inflation and economic growth but also considers the forecasted human and social development of the country. This rate, called the Social Discount Rate, uses a 10% rate for Laos, based on a benchmark of various similar studies in developing countries.¹³ Consequently, the Net

⁸ Mincer, Jacob. *Schooling, Experience and Earnings*, New York: National Bureau of Economic Research, 1974.

⁹ Montenegro, Claudio E. and Harry Anthony Patrinos. 2014. *Comparable estimates of returns to schooling around the world* (English). Policy Research working paper; no. WPS 7020. Washington, DC: World Bank Group
<http://documents.worldbank.org/curated/en/830831468147839247/Comparable-estimates-of-returns-to-schooling-around-the-world>

¹⁰ Kristjansson et al 2015. Costs, and cost-outcome of school feeding programmes and feeding programmes for young children. Evidence and recommendations, *International Journal of Educational Development*, 48: 79-83.

¹¹ Jukes, Matthew et al 2007. *School Health, Nutrition and Education for All: Levelling the Playing Field*, Cambridge, CABI Publishing, pp. 97-109.

¹² More information on notions such as Human Capital, the Mincer Equation, Rates of Return to Education and estimates of rates in most countries can be found in the 2014 World Bank publication "Comparable Estimates to Schooling around the World" cited earlier

¹³ Juzhong Zhuang et al. (2007), *Theory and Practice in the Choice of Social Discount Rate for Cost-Benefit Analysis: A Survey*, Economics and Research Department Working Paper, Manila: Asian Development Bank, and Mark Harrison (2010), *Valuing the Future: The Social Discount Rate in Cost-Benefit Analysis*, Visiting Research Paper, Canberra: Productivity Commission.

Present Value of future wages decreases over time even if the nominal wage increases every year, as the discount factor gets higher every year.



Healthier Life

Cognitive learning is positively correlated to the health and nutrition status of a child. When school feeding programmes are designed with a nutritional objective, they can provide approximately 30-40 percent of the international recommended daily intake for school-age children.¹⁴ As such, healthy and nutritious meals, particularly when combined with complementary health interventions such as micronutrient fortification (i.e. addition of iron or vitamin A to food at the processing stage), WASH (water, sanitation and hygiene) programmes and deworming can address deficiencies in micronutrients, critical for a child's cognitive learning, and can help reduce school absenteeism due to illness.^{15 16}

Nutritious and regular school meals therefore help impoverished and food insecure families to overcome challenges such as undernutrition and poor health. This effect can be measured by calculating the Disability Adjusted Life Years (DALYs)¹⁷ averted by school meals and the opportunity cost for the government's preventive measures to address these health and undernutrition issues.

The CBA builds on the DALYs metrics to measure the impact of school meals on children's health on any country. DALYs are defined as: a year of healthy life lost due to illness, disability or early death.¹⁸ DALYs associated with every known illness and health risk factor are periodically published for each country across the globe and each age group in the Global Burden of Disease Study, published by the Institute for Health Metrics and Evaluation.¹⁹ According to WHO, disability can be offset if equivalent years of healthy life are gained as a result of the positive impact of school feeding on health and nutrition outcomes. The DALYs averted associated with school meals is proportional to the daily nutritional intake provided to the beneficiaries throughout the lifespan of the programme (ages 4 -10), and therefore assumes an increased number of wages due to increased number of productive life years.



Gender Equality

School meals are effective in promoting gender parity, thereby increasing access and equity to education and health, by providing an incentive to parents who might otherwise keep children of a disfavoured gender at home for financial or cultural reasons. Globally, more girls and women are disproportionately out of school and have a higher vulnerability to hunger and malnutrition than boys.²⁰

¹⁴ Drake, Lesley, Donald Bundy and Carmen Burbano (2015), Nutrition in international education and development debates: The impact of school feeding, *Routledge Hand of International Education and Development*, Taylor & Francis Group

¹⁵ Ibid

¹⁶ Bundy, Donald et al. 2009. Rethinking School Feeding Social Safety Nets

¹⁷ Institute for Health Metrics and Evaluation. Global Burden of Disease. <http://www.healthdata.org/>

¹⁸ Ibid

¹⁹ Ibid

²⁰ FAO (2010). *Gender and Nutrition*. Rome: FAO <http://www.fao.org/docrep/012/al184e/al184e00.pdf>

When gender-disaggregated data is available for the benefit driver of healthier life, the model can disaggregate the benefits for boys and girls, and as such the model can capture any benefits to the disadvantaged gender.

SCOPE OF THE STUDY IN LAOS

The study took into account both cash-based and food-transfer school meals modality. Given that the costs, benefits and districts targeted are different for each modality, the economic model was applied to calculate net present values and the cost benefit ratios (CBR) for each modality. To contextualise the CBA study for Laos, a thorough data review was conducted, including a secondary data review and a primary qualitative data collection in field sites, in close collaboration with MoES, WFP and CRS. Prior to the data review and collection, the CBA methodology and economic model was presented in various technical fora in country, including the School Meals Technical Working Group meeting and a High-Level meeting on school meals. In addition, consultation meetings were held at the inception and kick-off phases of the study, to solicit feedback on data availability, methodology and key assumptions to fitting the study in the Lao context. The full list of meetings and consultations is listed in the Annex.

Secondary Data

A secondary desk review and analysis of documents and data was conducted to identify the availability of quantitative data and information relating to macroeconomic, education and health indicators.

Macroeconomic and health indicators were collected at the national level. Data from the MoES' Education Management Information Systems (EMIS) was used to inform key education statistics at the district level, in order to calculate the benefit driver "Improved Education and Increased Productivity". The secondary review phase also included actual costs associated with both modalities over the past three years.

Sampling for the model

To calculate the Benefit driver "Improved Education and Increased Productivity", the CBA economic model uses districts as the unit of sampling, as within EMIS, the lowest possible administrative and geographic level for which the key education statistics (enrolment rates, drop-out rates) disaggregated by gender are available. The model also relies on the government's classification of 66 priority districts to determine control and intervention areas for sampling. To ensure comparability of control and intervention districts, only districts from among the 66 priority districts were sampled as the criteria includes both intervention and control areas. From among these districts, districts with a coverage rate of 70 percent or more of schools receiving school meals were included in the treatment group. Districts with a coverage rate of 0 percent were included in the control group. The full list of districts used in the model are listed in Annex 1.

Primary data collection

In addition to the quantitative indicators at national and sub-national levels, qualitative data was also collected in select schools in thirteen districts, including both school feeding and non-school feeding (control) areas (Annex 4). The objectives of the qualitative data collection were:

- i) Verify and confirm key assumptions behind the school feeding theory of change and pathways to impact in the Laos context;
- ii) Understand perceptions, challenges and other spill over effects of school feeding from the perspective of communities; and
- iii) Conduct a cost review of the contributions from communities (Chapter 4)

Semi-structured interviews were conducted with a diverse range of stakeholders to obtain qualitative data and cost information on the implementation and management of the school meals programme. Stakeholders included key staff from the Provincial and District Education and Sports Bureaus, school teachers and principals, Lao Women's Union members, parents, cooks and other members of the Village Education District Committee (VEDC).

Data collection on cost included a thorough review of contributions borne by the community – both in cash and in-kind. This included contributions towards school lunch (in-kind food contribution or cash), materials for school infrastructure, and time involved in preparing meals, developing school gardens, and constructing kitchens etc. Labour contribution was monetized using the average number of hours worked and local wages in unskilled labour. Given the limited time frame of the mission, data collection was limited to fewer schools but the cost review conducted as thorough as possible. Purposive sampling was applied to select schools for the primary data

collection. The qualitative data collection included schools in priority districts in both northern and southern regions, receiving school meals from WFP, CRS, National School Lunch Programme as well as not receiving any school meals at all.

Limitations

The Gross Enrolment Rate (GER) was inputted into the model for enrolments due to the limited availability of census data reflecting the actual ages of students within each grade level. The demographic data used to calculate the enrolment rate was obtained from the latest EMIS data report 2017.²¹ Attendance rate was excluded from the CBA model as official data on attendance is not available. As a result, the impact of school meals on reducing absenteeism for boys and girls was not captured in the model.

²¹ Ministry of Education and Sports. 2017. Education Management Information Systems (EMIS) Database

3. Data and Results

This section presents the key data and results for the CBA model. The section starts off by presenting key national level data used in the CBA model, followed by results for the overview and the benefit drivers.

KEY NATIONAL LEVEL DATA USED IN THE CBA MODEL

The Cost-Benefit Analysis relies upon a number of macro-economic data indicators and variables which are common to all schools in the country, regardless of their enrolment in the school feeding programme. These data come either from peer-reviewed academic literature or international sources such as the World Bank.

The programme duration is seven years for both food and cash modalities. Data for macro-economic indicators and population statistics are used from official sources. A weighted average of students over past three academic years (2016-17, 2015-16, and 2014-15) was used to determine the total number of students for each modality for the model.

The figures for discount rate, rate of return to education, average increase in wages per one standard deviation in test scores are based on academic literature (Table 3).

Table 3: Key national level indicators used in the CBA model

Indicator	Unit	value
Duration of the programme	years	7
GDP growth rate (2015)	%	7.27%
Poverty headcount ratio at national lines in 2007-17 (Average)	%	25.40%
Average GNI per capita in Lao PDR in 2007-17	US\$	1,331
Base wage (lowest population quintiles GNI per capita)	US\$	515.76
Average start of working life ²²	years	14
Average end of working life	years	60
Life expectancy at birth	years	66.7
Discount rate	%	10
Rate of Return to Education	%	5.1
Average increase in wages per one standard deviation increase in test scores	%	11
Number of students (food-based programme)	#	174,175
Number of students (cash-based programme)	#	25,518
Number of feeding days per year	#	175

Sources: National Statistical Institute, World Bank, WFP (2017).

²² Ministry of Labour and Social Welfare, Lao PDR. 2013 Lao Labour Law

OVERVIEW OF COSTS

The sub-sections below discuss an overview of costs associated with school feeding for both modalities.

Food-transfer modality

The average cost of the food-transfer school meals programme is estimated at **US\$30.08 dollars per child per year**. The breakdown of these cost is listed in Table 4.

Commodity costs account for the highest proportion, followed by staff costs. As such, for the entire programme duration over seven years, the total cost of the food-transfer based school meals programme is US\$210 per beneficiary.

Table 4. Summary of the overall costs required for the food-transfer school meals programme

Cost drivers (food-transfer programme)	Total value Average per year (US\$)	Value per child per year (US\$)
Commodities	3,511,100	15.06
Logistics, Storage and Utilities	1,317,791	5.75
Management & Administration	727,961	3.17
Staff Costs	1,379,215	6.09
Total	6,936,076	30.08

Source: WFP and CRS

Cash-transfer modality

The average cost of the cash-based school meals programme is estimated at **US\$ 40.51 dollars per child per year**, with staff costs accounting for the highest proportion. As such, for the entire programme duration over seven years, the total cost of the cash-transfer based school meals programme is US\$284 per beneficiary.

Table 5. Summary of the overall costs required for the cash-based school meals programme

Cost drivers (cash-based programme)	Total value Average per year (US\$)	Value per child per year (US\$)
Cash Transfer	740,767	7.77
Cash Related Costs	0	0.00
Management & Administration	91,666	10.30
Staff Costs	240,907	25.51
Total	1,073,341	40.51

Source: WFP (2017), MoES (2017)

OVERVIEW OF BENEFITS

The sub-sections below discuss an overview of benefits associated with school feeding for both modalities. It starts with the results for each of the benefit drivers, followed by net present value and the cost-benefit ratio.

BENEFIT DRIVERS ANALYSIS

Value Transfer

The value transfer equates to the cost a family would need to bear in order to provide the closest market substitute to the food basket in terms of nutritional value at the household level. The **food-transfer modality** creates a value transfer of US\$ 37.75 per child per year, resulting in a value transfer of **US\$ 264 per child** over the programme period of seven years (Table 6). The cash-transfer modality (for local procurement) creates a higher transfer value, US\$ 53 per year per child (Table 7), thus creating a value transfer of **US\$ 371 per child** over the programme period.

In providing a comparable, locally available food corresponding to this food basket, qualitative interviews revealed that families would incur a much higher cost, if they had to pay out of pocket for an equivalent lunch. Households would also opt for a less expensive and less nutritious meal than currently provided by the school meals, depending on the household's vulnerability and the time of the year.

As also noted in qualitative interviews, the value transfer is likely to be higher in schools with more developed and well-maintained assets and systems of community contribution, such as all-year round vegetable gardens, fish ponds and livestock raising initiatives, which supply additional protein to school children.

Table 6. Cost of a daily food basket for one beneficiary for the food-based programme

Food Item	Equivalent daily ration (g)	Local market price	Annual value transfer (US\$)
Rice (ordinary, second quality)	100g	0.79 US\$/kg (6,575 KIP)	13.86
Vegetable oil	10g	1.98 US\$/L (16,412 KIP)	3.46
Lentils	40g	1.2 US\$/Kg (10,000 KIP)	8.43
Canned Fish	6g ²³	2.39 US\$/kg (19,800 KIP)	2.5
Vegetables ²⁴	45g	1.2 US\$/kg (10,000 KIP)	9.49
Total	201g		37.74

Table 7. Cost of a daily food basket for one beneficiary for the cash-based programme

Food Item	Equivalent daily ration (g)	Local market price	Annual value transfer (US\$)
Rice (ordinary, second quality)	100g	0.79 US\$/kg (6,575 KIP)	13.86
Beans	25g	1.2 US\$/Kg (10,000 KIP)	5.27
Meat or Egg	37.5g	3.93 US\$/kg (32,616 KIP)	25.79
Salt/ Soy Sauce/ Fish sauce/ Brown Sugar	1g	0.98 US\$/Kg (8,125 KIP)	0.17
Vegetables	37.5g	1.2 US\$/kg (10,000 KIP)	7.91
Total	201g		53.0

Return of Investment on Saved Assets

The return on investment represents the share of the additional income provided by the value transfer that is invested by the households in productive assets and measures the benefits they can receive from these assets.

²³ Canned fish ration is distributed one day per week, with a ration of 30g per child per day

²⁴ Provided by school gardens or community contributions

The model assumes that households will spend 85 percent of the additional revenue made available by the value transfer, with the remaining 15 percent of it being invested into productive assets.²⁵ The model accounts that these micro-investments will have a rate of return on investment of 54 percent per year over a period of 10 years.²⁶

This finding was also confirmed in the Laos context during the qualitative interviews. Parents and communities noted that they were able invest in stationery for their children and other productive assets as a result of funds saved from freed up resources.

This return on investment effectively generates a cash flow beyond the years of school attendance. **The additional income associated with these assets, net of their cost price, is US\$110 for the food-transfer modality and US\$153 for the cash-transfer modality.**

Improved Education and Increased Productivity

School feeding has proven to increase the duration and quality of beneficiary education. In schools where children are served a daily lunch, the average schooling duration (net of attendance and dropouts) is equal to 8.7 years for both food and cash-based modalities, while children who do not receive school meals achieve only 8.2 years of schooling on average, showing a 6.1 percent increase in total schooling duration directly attributed to school feeding. The indicators for the impact of school meals on education between children receiving school meals (treatment group) and children not receiving school meals (control group) is displayed in the table below (percentages are based on an average of the three years)²⁷. It should be noted that districts enrolled in the school feeding programme, although commensurate to the control group (as both groups are sampled from the list of government's priority districts), remain more severely affected with economic constraints, which would have otherwise led to worse educational performances than the control group in the absence of school feeding. During qualitative interviews, teachers also shared that school meals have reduced afternoon absenteeism, enabling students to stay longer at school and increasing their cognitive ability in the classroom.

Table 8. Control vs. treatment group results on key education indicators for the food-based transfer programme

Food-transfer Programme Control Group (no school meals)		Food-transfer Programme Treatment Group (school meals)	
Gross Enrolment Rate	116.9 %	Gross Enrolment Rate	121.71 % (+4.81 pp)
Attendance Rate	N/A	Attendance Rate	N/A
Drop-out Rate	6.21 %	Drop-out Rate	6.54 % (+ 0.33 pp)
School-Life Expectancy	8.2 years ²⁸	School-Life Expectancy	8.7 years (+ 0.5 year)

Source: MoES (EMIS), 2017

Cash-Based Programme Control Group (no school meals)		Cash-Based Programme Treatment Group (school meals)	
Gross Enrolment Rate	116.90 %	Gross Enrolment Rate	119.58 % (+2.69 pp)

²⁵ Abhijit Banerjee and Esther Duflo (2005), "Growth Theory through the Lens of Development Economics", in Philippe Aghion and Steven Durlauf (ed.), *Handbook of Economic Growth*, Amsterdam: Elsevier, pp. 473-552.

²⁶ Banerjee, Abhijit and Esther Duflo (2007), "The Economic Lives of the Poor". in *Journal of Economic Perspectives*. Vol 21 (1). Pp 141 – 168.

²⁷ As per methodology segment, data over the last three Lao PDR fiscal years (2014/15, 2015/16 and 2016/17) was collected and assessed for any outstanding outliers or missing data.

²⁸ School-Life Expectancy can be higher than the total duration of the programme (7 years) as it is calculated based on Gross Enrolment Rates, which can be superior to 100% when children enrol in a given school level while they do not belong to the corresponding age group (which is often the case of late-comers). However, only Gross Enrolment Rates allow to capture the impact of school meals on all children regardless of their age, and not only on children aged 5-10.

Attendance Rate	N/A	Attendance Rate	N/A
Drop-out Rate	6.21 %	Drop-out Rate	3.79 % (- 2.42 pp)
School-Life Expectancy	8.2 years	School-Life Expectancy	8.7 years (+ 0.5 year)

Source: MoES (EMIS), 2017.

The Rate of Return of Education is equal to 5.1% in Laos (increases in wages associated with one additional year of schooling).²⁹

In Laos during the 2007-2017 decade, the GNI per capita was on average equal to US\$1331 per year per person, but the GNI per capita of the poorest 20% of the population³⁰, used a base wage in this study, was equal to US\$515.76 per year per person. The base wage grows at a rate proportional to the GDP growth rate, which is 7.27 percent for 2015 in 3.45 percent from 2016 to 2025 (projected).³¹ As school feeding has proven to increase school duration in Laos by 0.5 year, the children who benefited from school feeding can therefore expect to earn an 2.55 percent higher wages than the base wage. Only the difference between this higher revenue and the base wage can be attributed to school feeding, but the base wage itself cannot be associated with school feeding.

In addition, since this effect lasts throughout the working life of the beneficiary, i.e. from 14 years of age to 60 years of age (i.e. taking into the official start of working age and age of retirement), the CBA model uses a 10 percent social discount rate for Laos, and the impact of improved cognition of wages to calculate the Net Present Value for improved education and increased productivity over the lifetime of a beneficiary.

As a result of the above, **the total benefit associated with increased productivity of the beneficiary when he or she becomes a working adult corresponds to a Net Present Value of US\$750 (for food-transfer programmes) or US\$751 (for cash-based districts)**, which corresponds to the marginal part of the revenue they will earn in addition to the base wage during their entire lifetime, compared to a child who did not receive meals at school. This increased productivity outcome occurs mainly in the long term as it begins with the working life of the beneficiaries and ceases with retirement. It is concentrated on the first years of this working life as further years are more discounted, therefore corresponding to a lower Net Present Value.

Better Health

School feeding directly contributes to reduction of the DALYs associated with the following health risk factors: iron, vitamin A and iodine deficiency; unsafe water, sanitation and handwashing; and intestinal worms. In Laos, the DALYs associated with risk factors that are averted by school feeding in the age group 5-14 are listed in Table 10.

Table 10. DALYs which can be addressed through school meals programmes in Laos

Key nutrient	DALYs (girls)	DALYs (boys)
Iron deficiency	0.0097	0.0137
Vitamin A	0.0000	0.0000

²⁹ Claudio Montenegro and Harry Patrinos (2014), *Comparable Estimates of Returns to Schooling Around the World*, Policy Research Working Paper, The World Bank, p. 36. See also George Psacharopoulos (2006), "The Value of Investment in Education: Theory, Evidence, and Policy", *Journal of Education Finance*, 32, 2.

³⁰ World Bank National Accounts Data <https://data.worldbank.org/indicator/NY.GNP.ATLS.CD>

³¹ Organisation for Economic Cooperation and Development. GDP long-term forecast.

Iodine deficiency	0.0001	0.0000
Unsafe water, sanitation and handwashing	0.0088	0.0101
Intestinal worms	0.0005	0.0005
Total	0.0191	0.0243

The food-transfer modality provides schoolchildren with 21 percent of their daily requirements of vitamin A, 25 percent of their daily requirements in iron and overall 37 percent of their energy requirements for the day.³² The cash-transfer modality also advocates for weekly menu planning that promotes diet diversity based on local ingredients, however, it does not have mandatory nutritional guidelines to systematically reduce iron and vitamin A deficiencies. Based on the Nut-Val estimates for the food basket, the cash-based programme meets 6 percent of daily recommended vitamin A requirements, 19 percent for iron, 37 percent for both iodine as well as overall energy requirements.

Both modalities include a WASH component through hygiene promotion and construction of handwashing stations, therefore DALYs for WASH have been included for both programmes. Field visits confirmed that good hygiene practices such as washing hands before and after eating, brushing teeth were observed in schools where teachers were trained on hygiene promotion messages and handwashing stations were installed.

The average public healthcare cost averted due to better nutrition in Laos is US\$1.17 per person for public healthcare and US\$1.15 per person for private healthcare due to better nutrition.³³ School feeding can reduce the prevalence of these health risk factors, pro rata the daily nutritional intake covered by the programme, which corresponds to up to 37 percent of nutritional needs as per the food basket for both food and cash-based programmes. Taking into account the cumulated DALYs over the seven-year duration of the school feeding programme, and monetizing them against averted health expenditure costs, school feeding leads to a value creation equal to US\$131 per child for the food-transfer modality and US\$ 128 for the cash-transfer modality.

Gender Equality

The school meals programme contributes to reducing the gender gap with respect to health benefits only. In Laos, boys are the most disadvantaged gender as they are more likely than girls of the same age group to have iron deficiencies. The gender equality positive externalities account for 16 US\$ value created per child.

Net Present Value

Feeding one child during his or her entire pre-primary and primary schooling costs US\$210 (for food-transfer) or US\$284 (for cash-transfer) generates a Net Present Value generated in Gross Domestic Products (GDP) is estimated at US\$ 1,271 and US\$ 1,419 over the lifetime of a school meals beneficiary for the food-transfer and cash-based school meals programmes, respectively.

Cost-Benefit Ratio

For every **US\$ 1 dollar** invested in school meals, an economic value return of **US\$ 6.1 (for food-based programme) or \$5 (for cash-based programmes)** is generated over the lifetime of a beneficiary in the country's economy, predominantly attributed to improved education and increased productivity, additional income to impoverished households, and better health outcomes as a result of school meals programmes. It is important to note and interpret the differences in the cost-benefit ratios for food and cash-based programmes by looking at the total costs and net benefits created by each programmes. The main reason behind the differences in the modalities is the "cost per beneficiary" factor, which is higher for cash-based programmes because the cash-based programmes have much fewer beneficiaries, compared to food-based programmes. As a result of this, the cost-benefit ratio for cash-based modality is slightly lower. However, at the same time, the cash-based modality generates more value for the household compared to the food-based modality, and as such has a higher net present value over the beneficiary's lifetime.

³² Estimated using NutVal 4.0 software <http://www.nutval.net/>

³³ World Health Organization. 2017 Global Health Expenditure database. <http://apps.who.int/nha/database>

The charts below (Figures 1 and 3) display an overview of the cost and benefit drivers taken into account in this study for both modalities, whereas Figures 2 and 4 indicate how each of the key driver values are generated over the lifetime of the beneficiary (with all amounts being discounted at their Net Present Value).

Figure 1: Costs and Benefits generated by food-based modality (Figures denote average value per beneficiary in US\$)

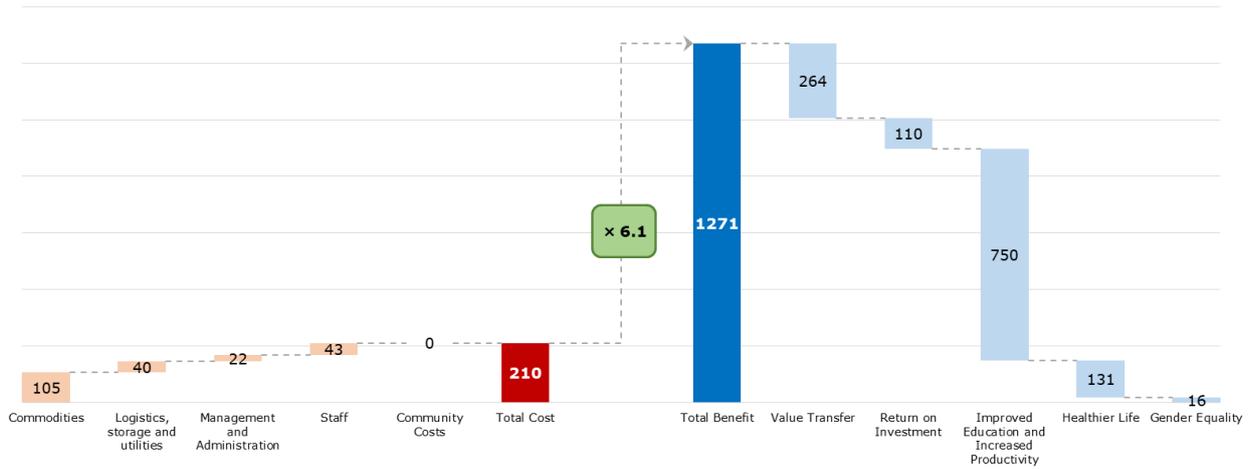


Figure 2: Breakdown of various outcomes of school feeding over the beneficiary's lifetime (food-based programme)

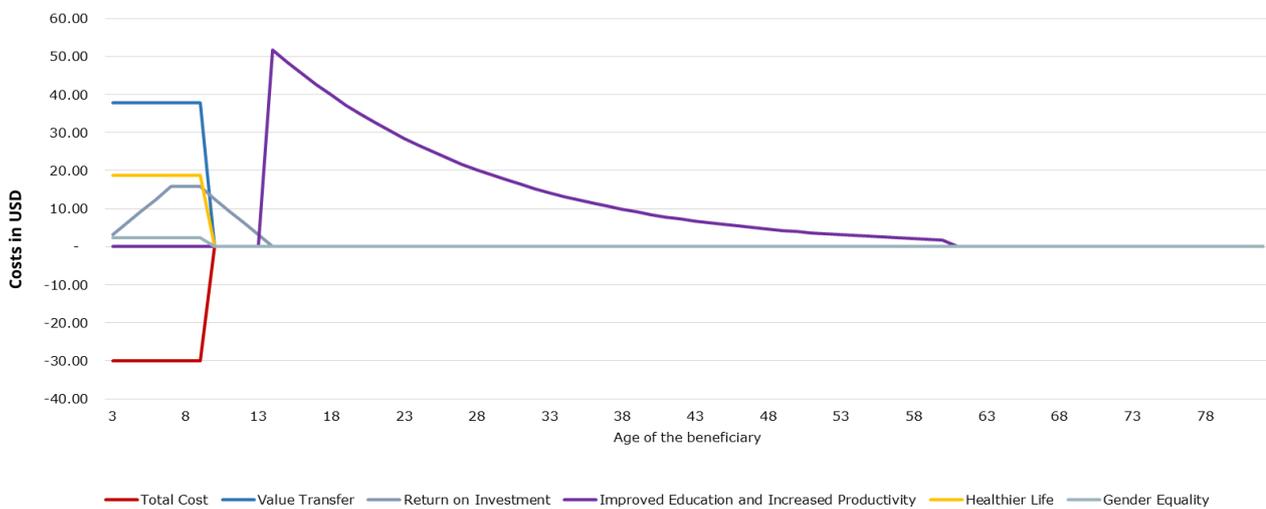


Figure 3: Costs and Benefits generated by food-based modality (Average value per beneficiary in US\$)

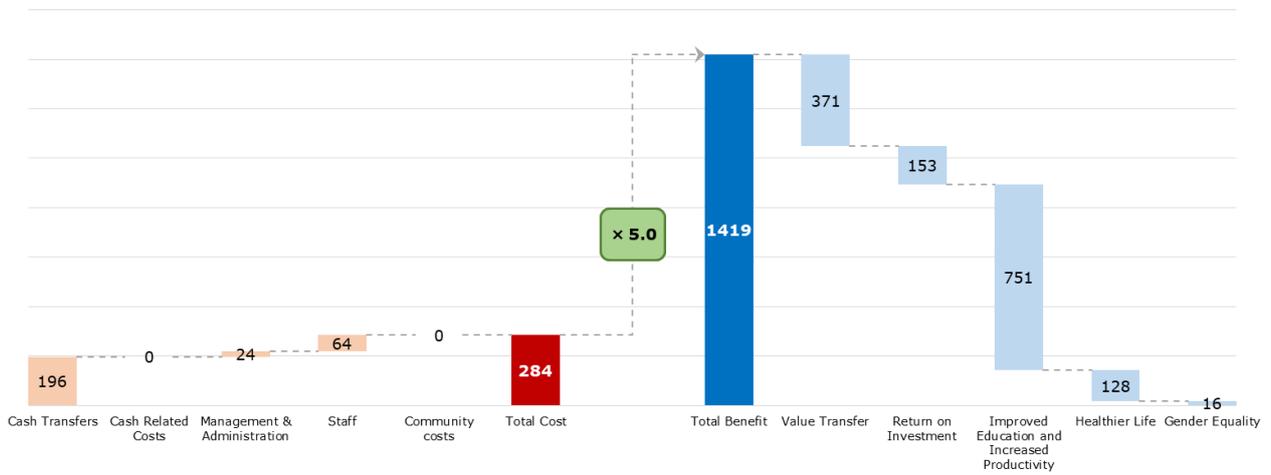
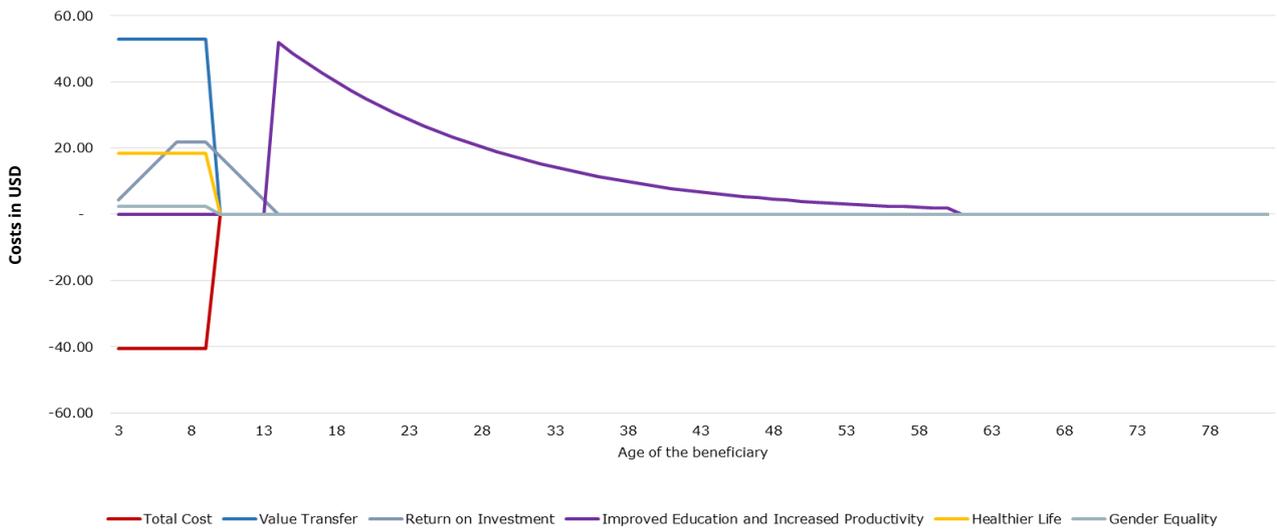


Figure 4: Breakdown of various outcomes of school feeding over the beneficiary's lifetime (cash-based programme)

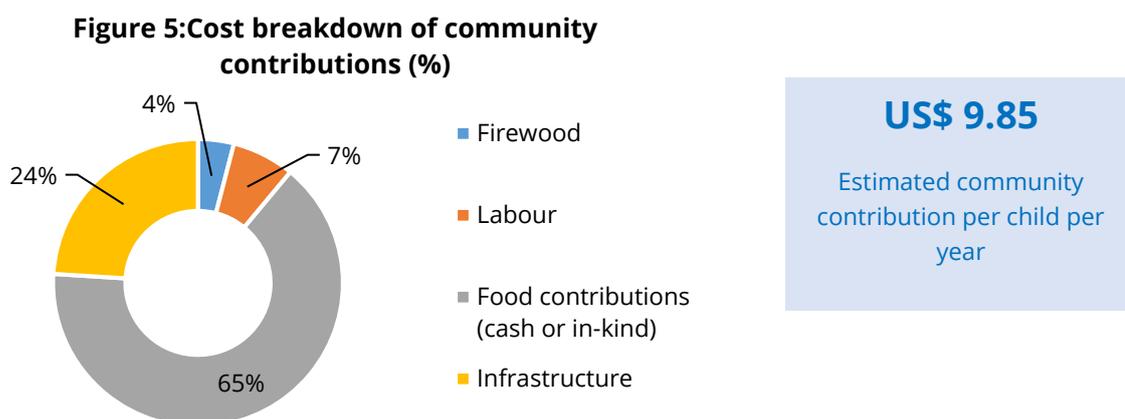


4. Community contributions

The CBA study included a one week of a qualitative field survey conducted by the MasterCard volunteers, WFP staff and staff from the Provincial and District Education and Sports Bureau in thirteen schools.

The school feeding model in Laos involves a substantial community investment, as outlined also in the 2014 National Policy on Promoting School Lunch. Communities are expected to support schools by contributing labour for cooking, organising school meals, building infrastructure (like kitchens and storage facilities), providing in-kind contributions such as fresh food (like vegetables and eggs) to improve diet diversity, firewood for cooking, and timber for infrastructure. Some communities also organise cash contributions from parents to hire a permanent cook and pay them a cash incentive.

While each school/community has its own way of organising themselves to provide for school meals, the qualitative survey included a small sample of schools to monetize the cost of community contribution. While the sample size was small, the cost review of community contributions was as thorough as possible. In the future, the actual community costs based on a more statistically representative sample will be added to the overall costs of the school feeding programme.



Based on the small sample of 13 schools, the average community contribution per child per year in USD was estimated to be US \$9.85. Food contributions, either in-kind in terms of vegetables, eggs, or meat, or additional cash contributions to schools to purchase these food items, constituted nearly two-thirds of the community contribution costs. This indicates a high willingness and readiness from communities to share costs for school feeding programmes.

Community interviews revealed that it was cheaper for communities to contribute small amounts of money to the school feeding programme than spending out-of-pocket to cover the cost of an entire lunch while the child is at school. Infrastructure costs were also high, but as these costs are mostly start-up costs that occur every couple of years, these costs are expected to dilute over the course of the programme period and as such were corrected in the cost review.

5. Conclusion

The overall results of the Cost-Benefit Analysis of school meals programmes in Lao PDR conclude that school meals provide positive short and long-term impact in the lives of beneficiaries, in addition to broader social and national outcomes.

This Cost-Benefit Analysis exercise highlights that there is no doubt that investment in school meals is a profitable investment as a society safety net and in the development of human capital, benefiting individuals, communities and the country's economy in the short term and long term.

This CBA exercise demonstrates an economic return value of up to US\$ 6.1 in the country's GDP for every US\$ 1 dollar invested in school feeding over the seven-year schooling period. Whilst some economic outcomes of school feeding can be monetized through the CBA model, it is important to note the existence of multiple benefits not quantified within the model itself: health and nutrition, social protection, and local agriculture and economy boosts can also be linked to school feeding.

The key benefit drivers contributing to this cost-benefit ratio are improved education, increased productivity and value transfer to the household. These reflect the instrumental role that school meals play as a safety net for impoverished and food insecure families, and in attracting children to school and enabling them to stay longer at school.

Through this study, it can be observed that school feeding programmes have stronger impact and outcomes when combined with other complementary programs including initiatives to address nutritional and health needs (such as WASH and deworming) and quality education. When designed with a nutritional objective, school feeding programmes can address a substantial portion of the recommended daily allowances of energy and micronutrients. When schools purchase locally procured food, community farmers and local economies can simultaneously benefit from an increase in household incomes and providing relief to food insecure households.

The evidence generated from this study can be used as an advocacy tool in leveraging relevant stakeholders' involvement and commitment, particularly to advise policymakers of Laos for future investment in scaling up the National School Lunch Programme.

Annexes

Annex 1. Sampling for treatment and control districts used for calculation of benefit driver “Improved Education and Increased Productivity”

All districts used in the sampling below are part of the Government’s 66 priority districts.

Control Districts (for comparison with both cash and food modality): Bokeo Province – Meung, Pha Oudom, Parktha; Luang Prabang Province - Nambak; Xiengkhuang province – Khoune, Mork; Khammouane province – Nakay, Bualapha, Xebangfay, Xaybuathong; Savannakhet province – Xonbuly, Thaphangthong; Saravane province – Saravane; Champasack province – Paksong and Pathoomphone; Attapeu – Xaysettha province.

Treatment Districts (cash): Bolikhamxay province (Xaychamphone district); Huaphanh (Add, Sopbao, Viengxay, Xamtay, Xaysathan), Oudomxay province (La); Phongsaly province (Khua).

Treatment Districts (food): Attapeu province (Phouvong, Sanamxay, Sanxay); Luangnamtha province (Long, Nalae, Sing, Viengphouka); Oudomxay province (Beng, Namor, Nga); Phongsaly province (May, Nhot-ou, Phongsaly, Samphanh); Saravane (Laongarm, Samoui, Ta-oi, Toomlarn); Sekong province (Dakcheung, Kaleum, Thateng); Savannakhet (Atsaphone, Nong, Outhomphone Phalanxay, Phine, Sepone, Vilabuly)

Annex 2: Key nutrition statistics for the daily food basket determined using NutVal software

Table 12: Key Nutrition Statistics for daily food basket (food-based programme)

Food Items	Daily Ration	Energy	Protein	Fat	Iodine	Iron	Zinc	Vitamin A	Thiamine Vitamin B1	Riboflavin Vitamin B2	Niacin Vitamin B3	Pyridoxine Vitamin B6	Folate Vitamin B9	Cobalamin Vitamin B12	Vitamin C
	g/person/day	kcal	g	g	µg	mg	mg	µg RAE	mg	mg	mg	mg	µg DFE	µg	mg
RICE, WHITE, MEDIUM GRAIN	100	360	6.61	0.58	0	0.8	1.16	0	0.07	0.048	1.6	0.145	9	0	0
LENTILS OIL, VEGETABLE [WFP]	40	137.2	10.32	0.424	0	3.016	1.912	0.8	0.3492	0.0844	1.042	0.216	191.6	0	1.76
CANNED FISH, MACKEREL PIKE	10	88.4	0	10	0	0	0	90.0901	0	0	0	0	0	0	0
PIKE	6	9.36	1.392	0.378	0	0.12	0.0612	7.8	0.0024	0.0126	0.372	0.0126	0	0.4164	0.054
CABBAGE, RAW	15	3.75	0.192	0.015	0	0.0705	0.027	0.75	0.00915	0.006	0.0351	0.0186	6.45	0	0
EGGPLANT (AUBERGINE)	15	3.75	0.147	0.027	0	0.0345	0.024	0.15	0.00585	0.00555	0.09735	0.0126	3.3	0	0
ONION	10	4	0.11	0.01	0	0.021	0.017	0	0.0046	0.0027	0.0116	0.012	1.9	0	0
CASSAVA, RAW	5	8	0.068	0.014	0	0.0135	0.017	0.05	0.00435	0.0024	0.0427	0.0044	1.35	0	0
Ration totals:	201	614.46	18.839	11.45	0	4.0755	3.2182	99.6401	0.44555	0.16165	3.20075	0.4212	213.6	0.4164	1.814
Beneficiary requirements for 5-10 years old		1640.4	41.01	30.99	108	16	10.56	480	0.78	0.78	10.4	0.84	260	1.56	33
% of requirements supplied by ration:		37%	46%	37%	0%	25%	30%	21%	57%	21%	31%	50%	82%	27%	5%

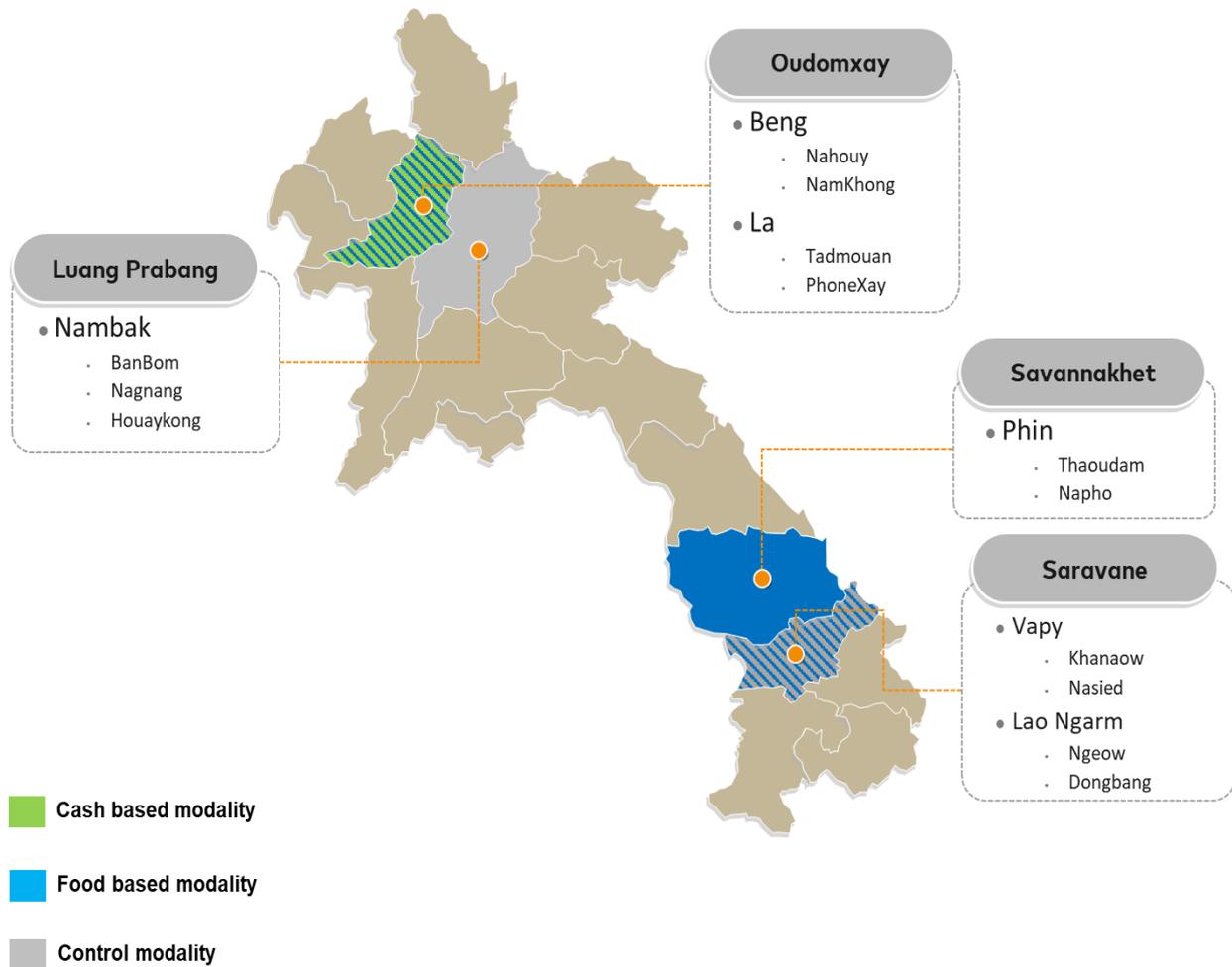
Table 13: Key Nutrition Statistics for daily food basket (cash-based programme)

Food items	Daily Ration	Energy	Protein	Fat	Iodine	Iron	Zinc	Vitamin A	Thiamine Vitamin B1	Riboflavin Vitamin B2	Niacin Vitamin B3	Pyridoxine Vitamin B6	Folate Vitamin B9	Cobalamin Vitamin B12	Vitamin C	
	g/person /day	kcal	g	g	µg	mg	mg	µg RAE	mg	mg	mg	mg	µg DFE	µg	mg	
RICE, WHITE, MEDIUM GRAIN	120	432	7.932	0.696	0	0.96	1.392	0	0.084	0.0576	1.92	0.174	10.8	0	0	
BEANS, BLACK SALT, IODISED [WFP]	25	85.25	5.4	0.355	0	1.255	0.9125	0	0.225	0.04825	0.48875	0.0715	111	0	0	
BEEF, MODERATELY FAT	5	0	0	0	40	0	0	0	0	0	0	0	0	0	0	
EGG, WHOLE, CHICKEN, FRESH	18	42.12	3.3624	3.087	0	0.3438	0.675	0	0.018	0.0288	0.5814	0.0702	1.08	0.531	0	
CABBAGE, RAW	18	25.74	2.2608	1.7118	0	0.315	0.2322	28.8	0.0072	0.08226	0.0135	0.0306	8.46	0.1602	0	
EGGPLANT (AUBERGINE)	12	3	0.1536	0.012	0	0.0564	0.0216	0.6	0.00732	0.0048	0.02808	0.01488	5.16	0	4.392	
ONION	12	3	0.1176	0.0216	0	0.0276	0.0192	0.12	0.00468	0.00444	0.07788	0.01008	2.64	0	0.264	
CASSAVA, RAW	10	4	0.11	0.01	0	0.021	0.017	0	0.0046	0.0027	0.0116	0.012	1.9	0	0.74	
RATION TOTALS:	3	4.8	0.0408	0.0084	0	0.0081	0.0102	0.03	0.00261	0.00144	0.02562	0.00264	0.81	0	0.618	
Beneficiary requirements for 5 - 10 years old	223	599.91	19.3772	5.9018	40	2.9869	3.2797	29.55	0.35341	0.23029	3.14683	0.3859	141.85	0.6912	6.014	
% of requirements supplied by ration:		1640.4	41.01	30.985	3	108	16	10.56	480	0.78	0.78	10.4	0.84	260	1.56	33
		37%	47%	19%	37%	19%	31%	6%	45%	30%	30%	46%	55%	44%	18%	

Annex 3: Timeframe of the Cost-Benefit Analysis in Laos, including key meetings and workshops

Dates	Key event
January 2018	Support from MasterCard for the Cost-Benefit Analysis Exercise in Laos confirmed
22 nd February 2018	Cost-Benefit analysis exercise announced at the High-Level Workshop of School Meals, chaired by Minister of Education and Sports, H.E. Madam Sengdeuane Latchanthaboune and WFP Country Director Ms. Sarah Gordon-Gibson
28 th February 2018	Overview of scope and methodology of the cost-benefit analysis presented at the School Meals Technical Working Group meeting
15 th March 2018	Inception Meeting held at Ministry of Education and Sports, with Cost-Benefit Analysis Expert from WFP HQ in Rome presenting detailed methodology, followed by a discussion on the scope and sampling of the study
23 rd April 2018	Arrival of MasterCard Volunteers in Laos
30 th April 2018	Kick-off meeting at the Ministry of Education and Sports
30 th April – 4 th May 2018	Qualitative Data collection
18 th May 2018	Dissemination of Preliminary Results to key stakeholders Departure of MasterCard volunteers
14 th August 2018	Discussion of Final Results to key stakeholders and technical approval of the results and the summary report

Annex 4: Qualitative Data collection – Locations of Field Visits



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