School Meals Programme in Indonesia
Cost-Benefit Analysis

October 2018

Prepared by: Julia Kolesova & Omar El Moataz for WFP

Contents

Acknowledgements

Since 2012, Mastercard and the World Food Programme have been working together to deliver innovative solutions to help create a world with Zero Hunger.

In July of 2017, Mastercard and WFP announced a new commitment in their continued vision to reverse the cycle of hunger and poverty: “100 Million Meals” is a truly global initiative designed to raise funding and “meals” for those in need around the world.

The successful completion of this study was an outcome of collaborative efforts and multiple consultations amongst World Food Programme (WFP), UNICEF, World Bank, and in cooperation with the government in Indonesia including Ministry of Education & Culture, Ministry of Health and Ministry of Economic Planning (BAPPENAS).

A findings workshop and roundtable discussion were held on 10th October 2018 in Jakarta, Indonesia, to gather feedback from stakeholders on the CBA results, as well as preliminary findings to consolidate the exercise and report.

We would like to thank all the participants who took part workshops, and we would also like to thank Mastercard for its Global Partnership with WFP, which allows Mastercard employees to be seconded for WFP for a month to support this exercise.

This report was prepared by Omar El Moataz (Mastercard), Julia Kolesova (Mastercard), with technical guidance and oversight from Nail Lazrak (WFP HQ).

The authors would like to thank Nikendarti Gandini (WFP Indonesia), Tania Barendz (WFP Indonesia), Jeffry Pupella (WFP Indonesia), Sumiaty Sumiaty (WFP Indonesia), Marta Santoboni (WFP HQ) for their technical assistance along with other staff from the WFP Country Office in Indonesia for their support in carrying out this study. Last but not least we would like to thank David Ryckembusch (WFP HQ) and Edwin Van Baalen (Mastercard) for their overall oversight in supporting this exercise.

Finally, we would like to express our sincere condolences to the Indonesian nation for the lost lives due to the devastating emergency in Palu, Sulawesi, after a 7.4-magnitude earthquake and a devastating tsunami.

1. Executive summary

1.1. Country Quick facts

The Republic of Indonesia is the world's largest island country, located in Southeast Asia. It is an archipelagic state that consists of five main islands with a total of more than 17,000 islands

It is the world's # fourth most populous nation, with a current population[1] of 267,506,105 (2018) and is distributed unevenly across the regions: in Java (57%), Sumatera (22%), Kalimantan (6%); and other islands (15%).

It is a middle-income country, with a per capita Gross Domestic Product (GDP nominal) of US$4,052 (estimate 2018). Human Development Index (HDI) in 2017 was 0.694, which puts the country in the medium human development category. The country's poverty rate significantly reduced from 19.1% in 2000 to 10.9% in 2016[2].

National education expenditure increased nearly eleven-fold in nominal terms and quadrupled in real terms over 2001-2016. Two-thirds of education spending is managed by sub-national governments (province and district). Despite the progress made towards universal primary education, there are still 2.3 million children aged 7 to 15 who are out of school.

1.2. CBA Overview and Objectives

This report presents a study of the Cost-Benefit Analysis (CBA) of the School Meals Programme in Indonesia. The study was jointly undertaken by the Ministry of Education and Culture (MoEC), the World Food Programme (WFP) and Mastercard in developing an objective investment case for school meals to children.

WHAT IS THE COST-BENEFIT ANALYSIS?	WHEN TO USE THIS STUDY?
• An **advocacy tool** developed to illustrate to donors and governments the long-run costs and benefits of a particular safety net programme; • An **economic model** leveraging 4 data sources: academic literature, data points collected at the country level, information collected from WFP experts, information collected from government experts.	• To **advocate for the benefits** of a particular safety net programme; • To **highlight the benefits** of a school feeding programme; • To **generate buy-in** among stakeholders.

The results of the study should not be used as a prescriptive tool aiming at defining programme design, implementation or evaluation or a comparative tool to assess the relative efficacy or effectiveness of different types of programmes.

1.3. Key outcomes

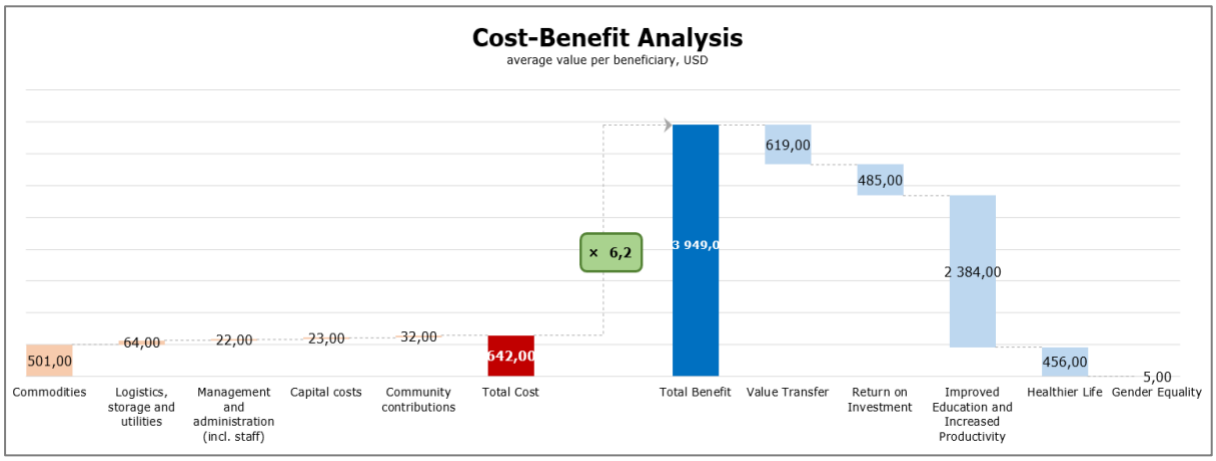
The main conclusion of this study is that the current Indonesian School feeding program "Progas" has a very positive impact on the local economy, the local communities and the life of the beneficiaries, as well as broader outcomes. In particular, this study shows that:

- For every US$ 1 invested in the school meals programme in Indonesia, an economic value return of US$ 6.2 is generated over the lifetime of the beneficiary in the economy of Indonesia.
- The overall cost of the school meal is US$ 642 per beneficiary throughout 6 years of primary schooling. The largest cost driver was the food commodities (US$ 501).

[1] http://www.worldometers.info/world-population/

[2] SABER Country report Indonesia, World bank group, 2018

- The Net Present Value is US$ 3,949 per beneficiary, which is generated in the country's GDP over their lifetime, showing that school meals are a profitable investment.
- The key benefit drivers contributing to this NPV are: Improved Education and Increased Productivity (60.4%) and Value Transfer to the households (15.67%).
- And 40% of the value is created in the short term: the cost of school feeding is recovered in less than six years. A significant share of the value is created on the longer term, supporting the development of Indonesia with a healthier and more productive workforce.
- The programme builds stronger community ties where planning and implementation of school feeding engages parents, teachers, and community at large which increase the potential sustainability and success of the programme



Key Benefit drivers:

- **Value Transfer (15.67%):** Providing school meals represents an indirect income transfer for vulnerable households, as it frees up resources equivalent to the cumulated value of the meals at their local market price.
- **Return on Investment on Saved Assets (12.28%):** As households benefit from the value transfer, they are known to invest a small share of it in productive assets such as livestock, which will generate an additional revenue stream.
- **Increased Productivity (60.37%):** School meals provide an incentive for impoverished and food-insecure households to send their children to schools, thus improving inclusiveness and access to education.
- **Healthier Life (11.55%):** School meals will result in a reduction of private and public healthcare expenditures.
- **Gender Equality (0.12%):** School meals also contribute to narrowing the gender gap, thus increasing access and equity to education and health. In this study there was a limitation with gender-related data, so this benefit impact is limited.

In summary, the CBA results demonstrate clear and quantifiable benefits from investing in school meals for children in Indonesia, yielding economic returns in the development of human capital, and benefitting individuals, communities and the nation both in the short term and long term.

2. Indonesia school feeding programme

2.1. Country Overview

The Republic of Indonesia is an archipelagic state that consists of five main islands with a total of more than 17,000 islands, of which 8000 are inhabited.

The country covers a land area of 1,910,931 sq. km. It is bordered to the north by Malaysia, Singapore, Thailand, Vietnam, Philippines, and the South China Sea, to the south by Australia and Timor Leste and the Indian Ocean, to the east by Papua New Guinea, to the west by the Indian Ocean.

Indonesia is the world's fourth most populous nation, with 267 million inhabitants, and an annual increase of 1.43% (2010-2015). The population is distributed unevenly across the regions: in Java (57%), Sumatera (22%), Kalimantan (6%); and other islands (15%). The median age in Indonesia is 28.0 years; while the age dependency ratio (SUPAS 2015) is 49.2, which indicates a high proportion of people are in the working age (15 – 64) compared to the non-working age (less than 15 and more than 64 years). This age dependency ratio indicates the start of the 'demographic dividend'.

Indonesia, a vast nation, has struggled with the consequences of the Asian financial crisis of the early twenty-first century and faces high unemployment, a fragile banking sector, endemic corruption, inadequate infrastructure, a poor investment climate, and unequal resource distribution[3].

Indonesia became an oil importer in 2004 because of declining production and lack of new exploration. The cost of subsidizing domestic fuel strained the national budget in 2005, and contributed to a run on the currency, prompting the government to raise the average fuel price by 126 percent. The resulting inflation and interest rate increases were expected to dampen growth prospects.

Today export commodities include oil and gas, electrical appliances, plywood, textiles, and rubber.

Starting in 2001, Indonesia embarked on a large-scale decentralization programme, involving a major transfer of administrative, political and financial authority primarily to province, the district (Kabupaten) and municipality (Kota) levels of government.

Decentralization laws give authority to province and district governments to carry out a wide range of responsibilities in areas such as health, education, public works, environment, capital investment, land, cooperatives, labor force, and infrastructure services.

At present, six broad areas - finance, foreign affairs, defense, security, religion, and state administration and justice – remain within the jurisdiction of the central government, while administrative and fiscal decentralization in Indonesia transferred resources and responsibilities for the delivery of basic services directly to the level of local governments.

Decentralization of public administration is expected to bring more responsiveness to local needs and circumstances, and an improved quality of public services by enhancing accountability and transparency through people's participation in decision-making and monitoring of service provision processes.

More than a decade since embarking on this large-scale decentralization programme, Indonesia decided to extend its efforts to the village (desa) level. The passage of village law, gives greater authority and resources to village governments to manage their own affairs.

Decentralizing authority to villages was intended to improve service delivery performance at the lowest administrative tier and reduce social inequality and poverty. Along with receiving greater autonomy, the village governments are now receiving significant money transfers through the village fund (Dana Desa), from the annual state budget (APBN) transferred via the local budget. The village fund is the largest of seven sources of village revenue managed by the village government.

The average budget available for villages (2016), was at least IDR 1 billion per village, dedicated to governance, development, community empowerment, and social activities.

[3] http://www.newworldencyclopedia.org/entry/Indonesia

For more than a decade the Indonesian government has been implementing major education reforms in areas such as education decentralization, free basic education, school-based management, teacher reform, and curriculum and pedagogy. These reforms are supported by the national policy to allocate 20% of government expenditure for education, which is effective since 2009. National education expenditure increased nearly eleven-fold in nominal terms and quadrupled in real terms over 2001-2016. Two-thirds of education spending is managed by sub-national governments (province and district). As a result of these reforms, there have been some improvements in educational outcomes such as increased enrolment in primary and secondary levels, and improved completion and transition rates.

2.2. Education and Health in Indonesia

Access to basic education has improved over the last decade, and Indonesia is now close to achieving universal primary education. According to the most recent national data, in 2017 the gross enrolment rate is 108.5%, and the net enrolment rate is 97.19%. Despite the progress made towards universal primary education, there are still 2.3 million children aged 7 to 15 who are out of school. Children from the lowest income quintile are approximately five times more likely not to attend school than those belonging to the highest quintile.

On the other hand, available evidence and scientific literature indicate that school feeding programmes could contribute to increase student attendance and performance, reducing the prevalence of out of school students, and improved learning outcomes.

Despite encouraging progress in increasing enrolment, the improvement of learning outcomes remains a challenge. Results from international student tests, such as PISA and TIMSS revealed that, despite some progress, the performance of Indonesian students remains below international averages. These findings, among others, underline the importance of strengthening the teaching force.

The government has long put considerable efforts into providing quality health services for all. There have been improvements in health outcomes over the last two decades, with life expectancy rising from 63 years in 1990 to 71 years in 2015, under-five mortality falling from 97 deaths per 1000 live births in 1991 to 26.2 deaths in 2015, and infant mortality falling from 68 deaths per 1000 live births in 1991 to 22.23 deaths in 2015. However, progress on maternal mortality (maternal deaths per 100,000 live births) has been persistently slower, from 390 in 1991 to 305 deaths in 2015.

Starting from 1 January 2014, the government launched the National Health Insurance Programme (JKN-Jaminan Kesehatan Nasional) aims at providing comprehensive health care for the entire population, with government-subsidized coverage for low-income groups. This scheme aims to speed up universal health coverage in Indonesia by 2019.

As a result of these investments, substantial progress has been reported in improving the health status of the population. Nevertheless, the nutritional status of under-five children remains problematic. The prevalence of under-five stunting (low height for age) was 36.8% in 2007 and slightly increased to 37.2% in 2013. Stunted children are at higher risk for illness and death and may face delayed mental development. Children from the most vulnerable households face an increased likelihood of stunting. Results from studies conducted elsewhere indicated that countries with a higher prevalence of undernutrition whether measured as stunting or as underweight, tend to have larger socioeconomic inequalities.

Factors that contribute to childhood stunting include poor maternal health and nutrition, inadequate infant and young child feeding practices, and infection. Given the fact stunting results from several households, socioeconomic, environmental, and cultural factors, reduction of stunting requires a multi-sectoral approach, in which direct nutrition interventions are integrated and implemented in conjunction with nutrition-sensitive interventions, including improved hygienic practices, safe water supply, and sanitation facilities.

In 2017, the government launched a multi-sectoral programme to reduce the high prevalence of stunting in Indonesia, which focusses interventions in the districts with high rates of stunting and poverty. The number of targeted districts and municipalities for stunting intervention has been set out to grow from 100 in 2018, to all 514 districts by 2021. As part of this effort, the ministerial school feeding flagship programme – Progas –, will be implemented in a number of the priority districts for the stunting reduction programme starting from 2018.

Regarding access to improved water supply and sanitation, Indonesia has met the MDG target for population access to improved water sources, in which the population covered by improved water sources rose from 69% in 1990 to 87% in 2015. The population

using improved sanitation facilities increased from 35% in 1990 to 61% in 2015. The latter achievement represents good progress towards the MDG target. However, there are still gaps between urban and rural populations in their access to improved water sources and sanitation facilities.

Indonesia is undergoing a rapid epidemiological transition, in which non-communicable diseases (NCDs) are increasingly important while the relative share of infectious diseases is decreasing.

- Children aged 4-12 years old experienced with 35% energy intake deficit and 20% protein intake deficit
- 37.2% of Indonesian children under 5 years of age were stunted, 19.6% were underweight, 12.1% were wasted and 11.9% were overweight (2013)
- 20% children have eating habit < 3 times per day
- 89.3% population of >10years old have insufficient vegetables & fruits consumption
- Only 47.2% washing their hands correctly before eating
- Children with no breakfast habit was observed 17% (Jakarta) to 59% (Yogyakarta)
- 90.2% school aged children consumed breakfast with low nutritional quality

2.3. History of School Feeding in Indonesia

A national-scale school feeding programme was launched in Indonesia in 1997 following the issuance of Presidential Instruction No.1/1997 on School Feeding (PMT-AS). This programme, which was funded by the central government, targeted primary school students with the objective of improving student physical fitness, increase attendance and learning outcomes. This programme provided a snack (not a complete meal) for breakfast three times a week throughout the school year. Following the decentralization policy in 2001 this programme was then handed over to the local government, but only about 30% of local governments continued this programme.

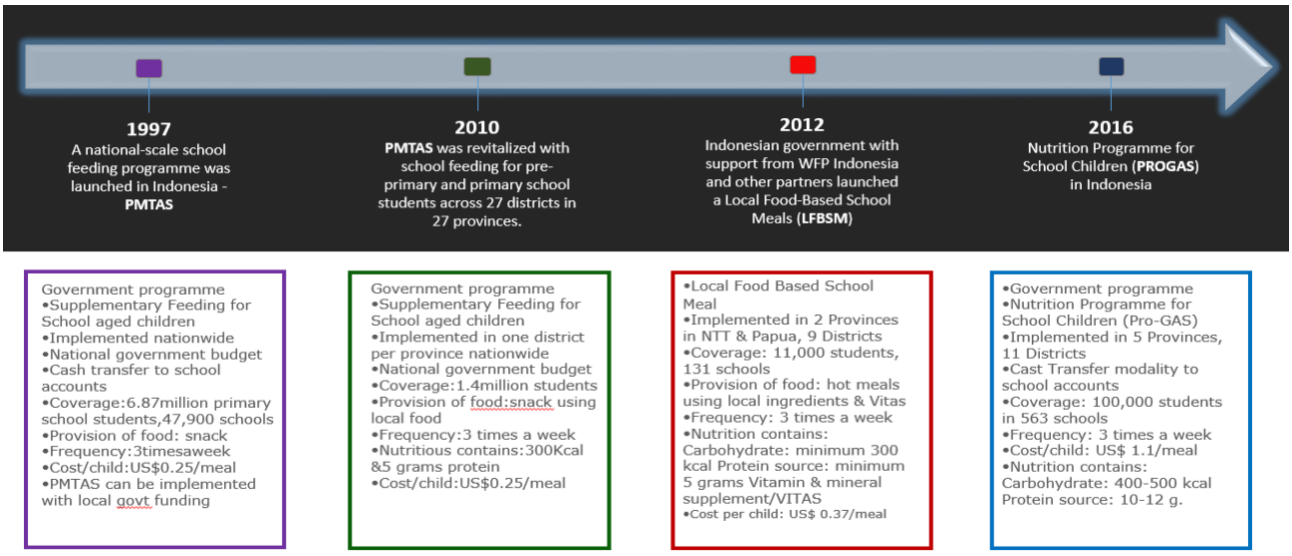


Figure 1: School feeding history in Indonesia

From 2005 to 2011, WFP Indonesia and its NGO partners implemented a school feeding programme in the provinces of East Nusa Tenggara (NTT) West Nusa Tenggara (NTB), East Java, and Jabodetabek (Jakarta, Bogor, Depok, Tangerang, Bekasi). This programme provided a fortified biscuit delivered on school days, complemented with health and nutrition education.

From 2010 to 2011, as part of government efforts to speed up the achievements of Indonesia's development priorities (based on Presidential Instruction No.1/2010) PMT-AS was revitalized with school feeding for pre-primary and primary school students across 27 districts in 27 provinces. This school feeding programme was interrupted after 2011

From 2012 to 2015, WFP Indonesia in partnership with the local government implemented a Local Food-Based School Meals (LFBSM) program targeting areas with high prevalence of undernutrition among school-aged children in East Nusa Tenggara and

Papua. This programme, which delivered a complete breakfast three times a week sourced from local food, was aimed at enhancing the nutritional status of the children, improving learning outcomes and supporting better personal hygiene and healthy behaviors. During the programme's life, more than 30,000 primary school children in Timor Tengah Selatan (TTS) and Kupang districts of NTT province and Jayapura city and districts of Jayapura, Jayawijaya, Merauke, Biak and Nabire of Papua province received school meals and health and nutrition education. Results of the evaluation study on this LFBSM program revealed statistically significant differences on the students' attendance, ability to concentrate during learning at school, school dropout, personal hygiene and dietary diversity practices, in which the LFBSM students demonstrated greater attendance and learning concentration, lower dropout, better personal hygiene, and dietary diversity practices compared to the non-LFBSM students.

2.4. Program Gizi Anak Sekolah (Progas)

Program Gizi Anak Sekolah (Progas) is a ministerial flagship programme of the Ministry of Education and Culture targeted to primary school children. The programme objective is to **increase balanced nutrition intake, improve hygienic and healthy living behavior and student learning abilities to shape the character of healthy, intelligent, productive, resilient and competitive Indonesian**. The programme specific objectives include:

- Improve nutrition intake of primary school-age children through the provision of breakfast following the principle of balanced nutrition diet
- Improve physical resilience of primary school-age children
- Increase knowledge, attitudes and practice of balanced nutrition primary school-age children
- Increasing the presence and an interest of primary school-age children in learning activities
- Increase primary school-age children preference on local food
- Increase community participation and provision of local food

2.4.1. Progas Coverage

Areas	2016	2017	2018
Provinces	2	5	20
Districts	4	11	64
Schools	146	563	632
Students	38,457	99,988	100,136

In 2016 and 2017 this pilot programme targeted the selected primary schools located in disadvantaged districts selected based on 2015 FSVA (Food Security and Vulnerability Analysis Mapping) produced by the Food Security Agency (Badan Ketahanan Pangan) supported by WFP. During 2017 about 99,988 students at 563 primary schools across 11 selected districts located in 5 provinces (Papua, West Papua, East Nusa Tenggara, Maluku, and Banten) benefitted from this programme. Each of the participating districts received two years of funding for Progas from the central government, with the hope that the programme will subsequently be further scaled up and funded by local government.

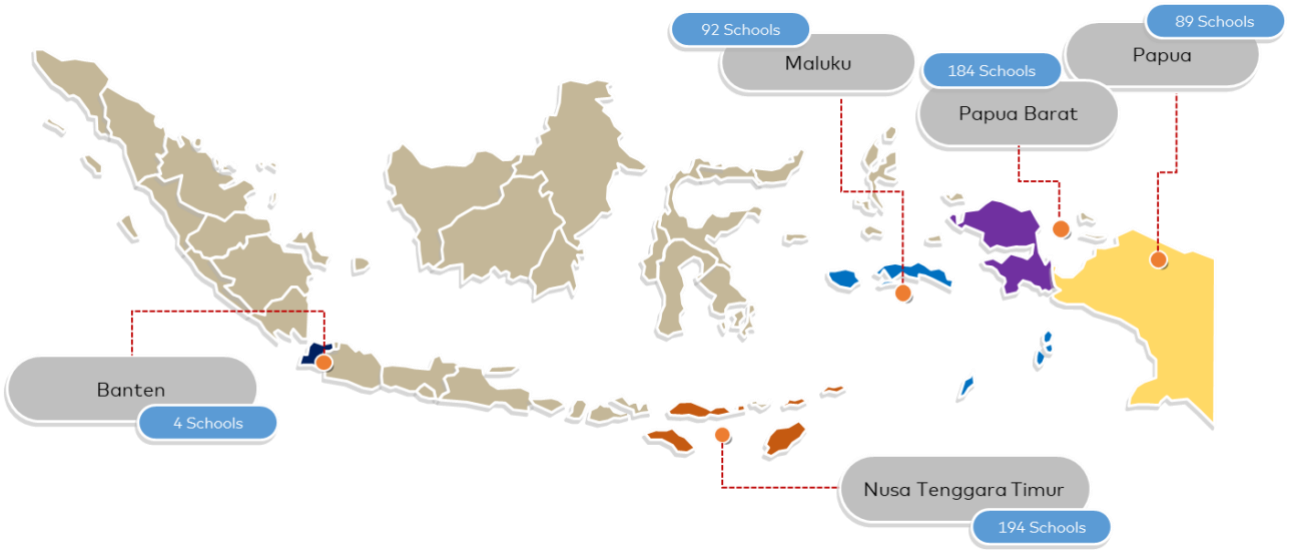


Figure 2: Progas coverage in 2017

Starting in 2018, as support towards the government's multi-sectoral approach to stunting reduction, the school feeding programme under study (Progas) will be targeted at the priority stunting districts, with the target of establishing Progas in 64 out of 100 priority stunting districts in 2018. While Progas does not directly address the under-five stunting prevalence, it aims at reducing short-term hunger and undernutrition among primary school age children in the disadvantaged areas. This is important, at least, to increase regular school attendance by both girls and boys, and this serves as a basis for better educational achievements.

Despite limited geographical and school coverage, Progas is currently the main national-based school feeding programme in Indonesia targeting primary school students.

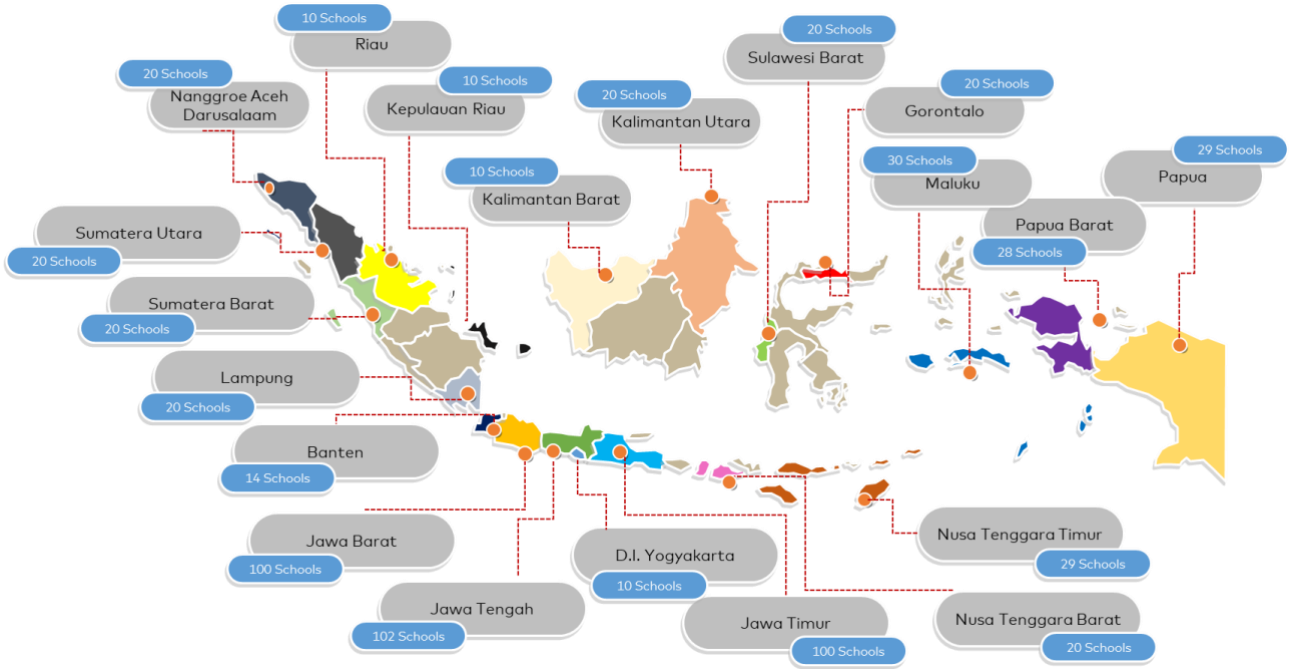


Figure 3: Progas coverage in 2018

2.4.2. Progas Funding

This in-school feeding programme is funded through Ministry of Education and Culture's (MOEC) budget through cash transfers from national to school accounts (in two tranches a year). Funding is made available for a period of 1 to 2 or 3 years. There is the expectation that districts will continue funding from their own sources in the following years.

Source of Fund:	APBN (National Budget of Ministry of Education & Culture)
Progas target:	All students of grade 1-6 of targeted schools
Number of School Meals Day/Year	108 (2018)
Progas breakfast cost/student	IDR 15,000
Total Progas Fund/school:	(Number of students grade 1-6) x 108 x IDR 15.000
Fund for cooking utensils purchase/school	IDR 1,449,000 (2018)

The programme is designed and implemented at the Ministry level, using a top-down approach, with limited input from lower levels regarding targeting. The implementation guidance from the central level is adopted by schools however there is limited guidance regarding modalities.

The schools are responsible for providing a complete healthy breakfast consisting of 400-500 kcal, 10-12 grams protein, and fruit and vegetables three times a week during the whole academic year. The cost of meal per serving is **US$1.1 per child (IDR 15,000)**, this includes administrative overheads and payments for the cooks.

Item	Share (%)	Value in IDR
Food cost	75%	11,250
Fuel cost	3%	450
Transport cost	7%	1,050
Cooking group incentive	12%	1,800
Management cost	3%	450
Total	**100%**	**15,000**

There is a collaboration between Progas management committee at school and nutritionists at a local health center in adjusting the food menu to local context when needed. However, an adequate monitoring and evaluation plan is not yet in place.

In addition to the school meals, the programme also delivers lessons on health and nutrition education and character building. The MOEC developed a Progas manual to be used as guidance for programme implementation at various levels.

Parents are involved in the preparation of the school meals, in return for payment. There is limited actual community involvement regarding cash or in-kind contributions, feedback, and accountability.

2.4.3. Progas Components

Progas consists of 3 components: provision of healthy breakfast, nutrition education, and strengthening of character education as detailed below:

1. **Provision of healthy nutritious meals**
    - ✓ Providing nutritious breakfast three times a week
    - ✓ Nutrient content meets 25% of RDA (Recommended Daily Allowance) for school-age children
    - ✓ Use nutritious Progas recipes or local recipes
    - ✓ Using local food ingredients
    - ✓ Each Progas breakfast contains 400-500 kcal and 10-12 grams of protein
    - ✓ Promoting food diversification nutritionally balanced diet

2. **Nutrition Education**
    - ✓ Transfer knowledge on nutritionally balanced meals from Puskesmas nutrition staff to the cooking group, teachers & students
    - ✓ Hand washing practice at school before eating activity
    - ✓ Printed educational material such as:
        - Comic Come on Breakfast Healthy
        - Snake and Ladder Game
        - Hand Washing with Soap
        - Poster Let's Get used to Hand Wash with Soap
        - Poster Diversification of Diverse, Nutritious, Balanced & Safe Foods

3. **Character Education**
    - ✓ Queueing when distributing food in class
    - ✓ Queueing in hand washing with running water and soap, always practiced before eating.
    - ✓ Praying before and after meal
    - ✓ Finishing all the food
    - ✓ Collect dirty dishes to the dishwasher

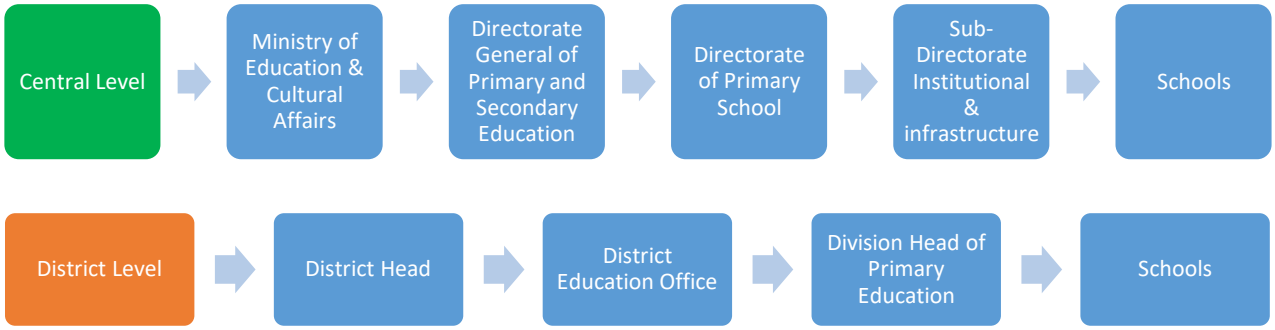
2.4.4. Progas Operating model

A well-designed school feeding policy that is based on evidence is critical to the implementation of a quality school feeding programme.

Progas is a national school meals programme funded by the Ministry of Education and Culture, and implemented in coordination with relevant Government stakeholders including:

- ✓ BAPPENAS/BAPPEDA
- ✓ Coordinating Ministry of Human Development & Culture
- ✓ Ministry of Education/District Education Office
- ✓ Ministry of Health/District Health Office
- ✓ Ministry of Agriculture/District Agriculture Office
- ✓ Ministry of Fisheries/District Fishery Office
- ✓ Ministry of Village/Village Community Empowerment
- ✓ Food & Drugs Supervision Agency
- ✓ Food Security Agency

This programme coordination set-up is designed around the key roles of central and district government under the MoEC as follows:



Supply Chain:

1. **Fresh food** is bought every meal day, both from local farmers, local markets or kiosks by cooking team:
    - There are no special agreements between schools and local farmers
    - Only informal agreements between schools and local farmers
    - The purchase price is lower than the price in the local market
    - Prices include transportation costs to school
    - Local farmers deliver food directly to the school in some area where local farmers are reliable to supply the school needs
    - Food quality is fresher and more guaranteed
    - Food commodities are bought from the local market if:
        - Absence of local farmers
        - Lack of supply from local farmers
2. **Dry food** ingredients (purchased in large quantities and stored for the needs of a week)
    - There is no refrigerator in the school to store fresh food
    - There is no special storage area for dry food ingredients
    - There is no special kitchen for cooking
3. **Kitchen/cooking place:**
    - Most of the kitchens are in the school environment
    - A small part of the kitchen is outside the school environment (the distance is not too far from school)
4. **Prices** vary based:
    - Location (remote / urban / coastal / mountain)
    - The type of recipe used
    - The main food ingredients used (chicken / beef / fish)
    - Seasonal (harvest /scarcity)
    - Weather conditions (rainy / dry season)
    - The unit price of food is based on the type of recipe from the cheapest to the expensive one:
        - ✓ Yellow rice with mixed of vegetables + fruit (IDR 4,276)
        - ✓ Healthy tuber porridge + fruit (IDR 4,672)
        - ✓ Chicken porridge with yellow sauce +fruit (IDR 5,198)
        - ✓ Savory rice+ fish vegetable yellow sauce + fruit (IDR 6,213)
        - ✓ Corn noodle + fried chicken + fruit (IDR 8,427)
        - ✓ Rice + chicken soup with vegetables + fruit (IDR 9,646)
        - ✓ Rice + mung bean soup+ fruit (IDR 11,088)

Online Reporting & Monitoring:

On-line Reporting & Monitoring Instruments &Program Monitoring SOPs prepared by WFP and Ministry of Education and Culture in 2018.

Online (real time) Program Data collection was launched in June 2018, and is used to monitor the following data points:

- School profile data

- Program Financial Data (receipts, expenses, and balances at banks and in the school)
- Realization of planned meal days
- Data on the provision of nutritional intake
- Nutrition Education data
- PHBS data and character education
- Data on Puskesmas involvement
- Interview data with elementary school students
- Data on the involvement of the Education Office in monitoring the Program

Community participation:

The community participation in Progas is a direct involvement of parents and local farmers in the programme. In some cases the cooking group also acts as the suppliers. The cooking group consists of parent's representatives from grade 1-6 with the following elements:

- Practiced the hygiene through apron, head cover, masks during cooking activity.
- Received cooking incentive from PROGAS budget allocation
- Understood the food selection & storage
- Responsible for cooking utensils and eating ware
- Local farmers/parents have supplied the food ingredients to school

2.4.5. Progas Key Challenges and Way forward:

- Low capacity of teacher for transferring of nutrition knowledge to the students
- Nutrition education is yet to become an integral part of the school curriculum
- Effective nutrition behavior changed required a frequent practiced at the school level
- School garden/Fishpond activity is good for nutrition learning, however not all Schools have sufficient space
- No gender & age segregation for school meals distribution at the school level
- Policy: The Progas policy framework does not yet exist, and still relies on policy arrangements relative to PMT-AS and GERMAS
- Funding: APBN support is limited to 1-2 years because it is stimulant, then it is expected that there will be APBD support for the sustainability of the Program
- Institutional Capacity & Coordination: There is no dedicated unit managing the Progas in the Ministry of Education and Culture, the coordination mechanism across ministries is not yet systematized.
- Design & Implementation: The approach is carried out centrally / regionally including the determination of target areas, monitoring of the implementation of the program is still being rolled out.
- Community participation: The participation of parents as members of cooking groups who get incentives, but community participation in cash or non-cash as well as involvement in providing inputs to the programme remains limited

Vision for the School Feeding Programme (in 5-10 years):

- Sustainability for longer-term period until 2025 (following the RPJPN)
- Scale-up to cover more provinces and districts all over Indonesia
- Replicated and scale-up by local government in all provinces/districts

2.4.6. Results and Achievements of the School Feeding Programme

- ✓ Children have more motivation to go to school
- ✓ Knowledge of the children on nutrition & hygiene improved
- ✓ Students are healthier and washing hand practice improved
- ✓ Eating habits on vegetables and fruit improved
- ✓ Characters of children improved on waiting for the turn, appreciate peers and teachers, reducing food waste

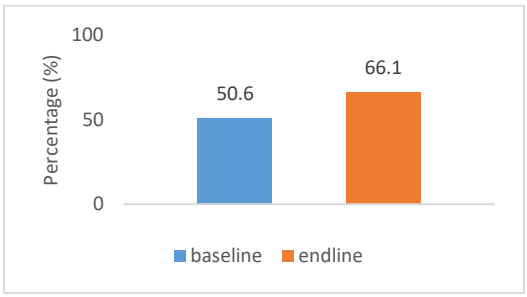
- ✓ Improve small/kiosks business opportunity surrounding communities/school
- ✓ Create a stable market for local farmers/parents
- ✓ Improve the relationship of the parents and school/teacher
- ✓ Improve the nutrition awareness of the parents & community surrounding
- ✓ Improve the nutrition & hygiene behavior of the cooking group
- ✓ Improve community participation/involvement in nutrition programme and nutrition behavior change

Impact versus non-programmed schools

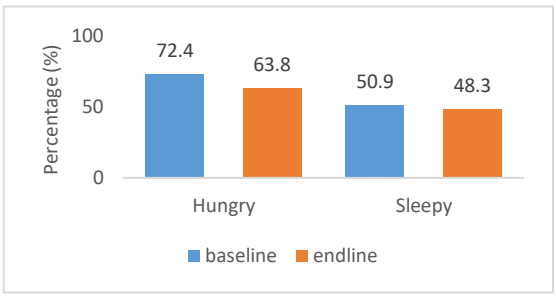
- ✓ Higher attendance: 97.3% vs. 93.3%
- ✓ Lower Dropout: 8 of 4431 vs. 24 of 3747
- ✓ More Diverse Diet: 49.2% vs. 38.1%
- ✓ More students wash their hands with soap: 95.6% vs. 88.7%
- ✓ More students brush their teeth twice a day: 73% va.61.7%
- ✓ Nutrition; lower prevalence of anemia: 25.9% vs. 32.8%

Progas Survey by the SEAMEO RECFON (South East Asia Ministry of Education Organization Regional Centre for Food and Nutrition) for the Ministry of Education and Culture

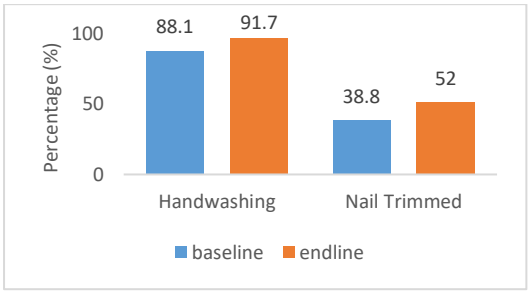
Students' Knowledge of Nutrition Improved



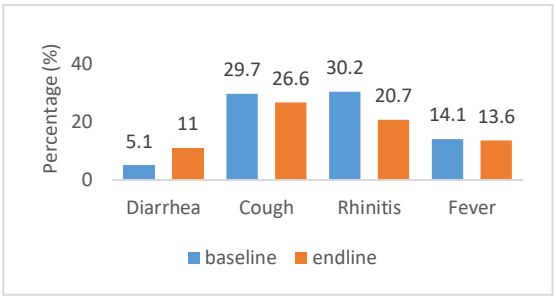
Students Were Able to Concentrate Better



Students' Personal Hygiene Improved



Children Reported Falling Sick Less Frequently



3. Cost-Benefit Analysis – Methodology and Economic Model

3.1. CBA background

The Investment Case Cost-Benefit Analysis (CBA) aims at quantifying, in financial terms, the benefits derived from school feeding. The main objective is to assess and compare the monetary cost and the economic benefit of providing school feeding, and to estimate the value created in terms of increased education, improved health and nutrition to the beneficiaries. It shows that school feeding is a valuable investment in the short and long-term for the children, for the communities and the country's growth and development.

WFP developed this tool in partnership with The Boston Consulting Group (BCG). It is based on academic evidence, WFP's experience and country-specific data on nutrition, health, education, and income transfers. The CBA attempts to quantify the costs and benefits in dollar value per child and demonstrate the benefits over costs in providing school meals to the child. This analysis provides evidence that school feeding is a beneficial investment in human capital development.

The model draws upon academic evidence on the benefits of school feeding, WFP's extensive experience, and country-specific data in estimating the value created through five key benefit drivers:

a) Value transfer to the household;
b) Return on investment in the household's productive assets;
c) Improved education and increased productivity;
d) Healthier and longer life; and
e) Gender equality

The School Feeding Investment Case, otherwise known as the Cost-Benefit Analysis is undertaken through the WFP-MasterCard Partnership in benefitting from both organizations' know-how through the Mastercard Employee Engagement Programme.

3.2. Economic model

The economic model underlying this analysis assesses the effects of Indonesia National School Meals Programme in respect to the country's development intervention as a quantifiable outcome valued in US dollars. It is important to outline that the results of this tool should be used only for advocacy purposes and not for programme design

The model underlying this analysis assesses the effects of school meals using the net present value (NPV) and the benefit-cost ratio (BCR) to quantify the outcome of implementing a school meals programme throughout the life of a beneficiary in US dollars.

The BCR is the ratio of the discounted net present value over actualized costs, which gives a measure of an investment's ability to generate benefit streams. If the BCR is higher than 1, the project benefits are greater than their associated costs, indicative of a minimum economic return.

The economic model is based on the following theory of change of school feeding impacts:

1. **Increase in enrolment, attendance, and cognition while at school, decrease in drop-out rates**. School meals incentivize parents to send their children to school, by providing them with free meals, thus 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 to remain at school and undertake higher studies. School meals reduce the dropout rate of schoolchildren, who may otherwise be engaged in labor 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.

3.3. Scope

The CBA relies upon a review of the costs of the Progas. Although this review is not a full-fledged costing exercise, it provides an accurate and detailed estimate of the costs' level and structure associated with a given school meal programme.

More specifically, this review is carried out to meet two criteria:

- Only actual costs are taken into account, 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 takes into account the operational cost to the government and development partners. Where relevant, it also includes an estimate of the value of contributions made by the local communities, either in goods or services.

The cost categories included in the CBA are based on the structure of the programme. In general, cost drivers of the School Meals Programme in Indonesia fall under the following categories:

- **Commodities**: the cost of all food commodities provided to the beneficiaries, valued at their purchase price;
- **Logistics, transportation, storage, utilities, and handling**: the cost of all operations involved to deliver the food from their point of uplift to the schools;
- **Management and administration (incl. staff)**: all other operational costs and overheads directly incurred by the programme;
- **Capital costs**: the cost associated with tangible assets required by the programme;
- **Community contributions:** the value of goods and services contributed by local communities to the programme.

Benefits associated with school feeding programmes are broken down following the conceptual framework indicating how school meals contribute to the Sustainable Development Goals (SDGs) of the 2030 Agenda, which corresponds to the various pathways-to-impact through which school meals may benefit children, their families, their communities, and the national economy.

These benefits are broken down into five benefit drivers as follows:

Value Transfer

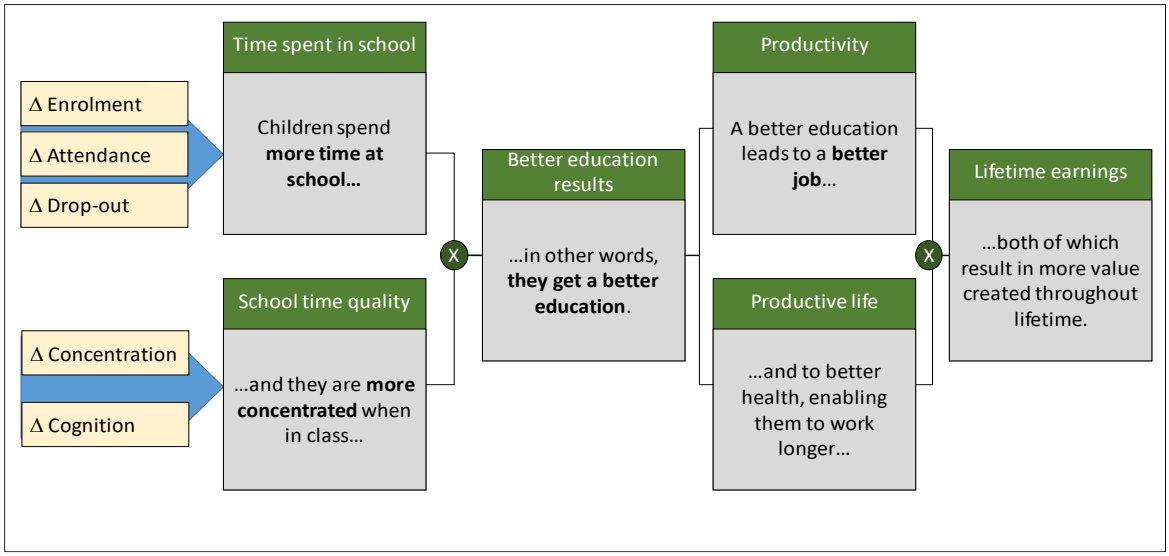
The direct value transfer refers to the provision of income support or additional income to the household equivalent to that of the breakfast meal, as a result of the distribution of a food ration at school at local prices.

Return on Investment on Saved Assets

The return on investment is based on the assumption that the value constituted by the food transfer to the households frees up resources, which are partly used to create productive assets at the household level. Academic evidence suggests that disfavored households are known to be active asset managers, and will effectively save and invest a share of this additional income on productive assets such as livestock, which will generate a subsequent revenue stream to the family over a certain period of time or products that improve crop quality and production. Such assets can contribute to the long-term economic and food security of households, by improving their resilience to shocks.

Increased Productivity

Increased productivity is usually the largest benefit driver of school feeding programmes. 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. They also contribute to reducing afternoon absenteeism, as it provides an incentive for parents to send their children to school, and reduces the risk of dropout due to food insecurity. Thereby, students who receive school meals tend to have additional years of schooling, on average, than those who do not receive school meals, at an equivalent level of economic status and food security. In accordance with human capital models, the combination of these outcomes will result in better employment opportunities and an increased productivity when children become working adults:



Healthier Life

When school feeding programmes are designed with a nutritional objective, they can provide approximately 30% of the international recommended daily intake for school-age children. Given the correlation between nutritional status and cognitive abilities, healthy and nutritious school meals can address deficiencies in micronutrient, particularly when they are combined with complementary health interventions such as micronutrient fortification (i.e. adding micronutrients such as iron or vitamin A to foods at the processing stage), WASH (water, sanitation and hygiene) programmes. Nutritious and regular school meals therefore help impoverished and food insecure families to

overcome challenges such as undernutrition and poor health, which often result in a higher cost of healthcare supported by both households and public administrations. School feeding will result in a healthier life for beneficiaries and reduced Disability Adjusted Life Years (DALYs).

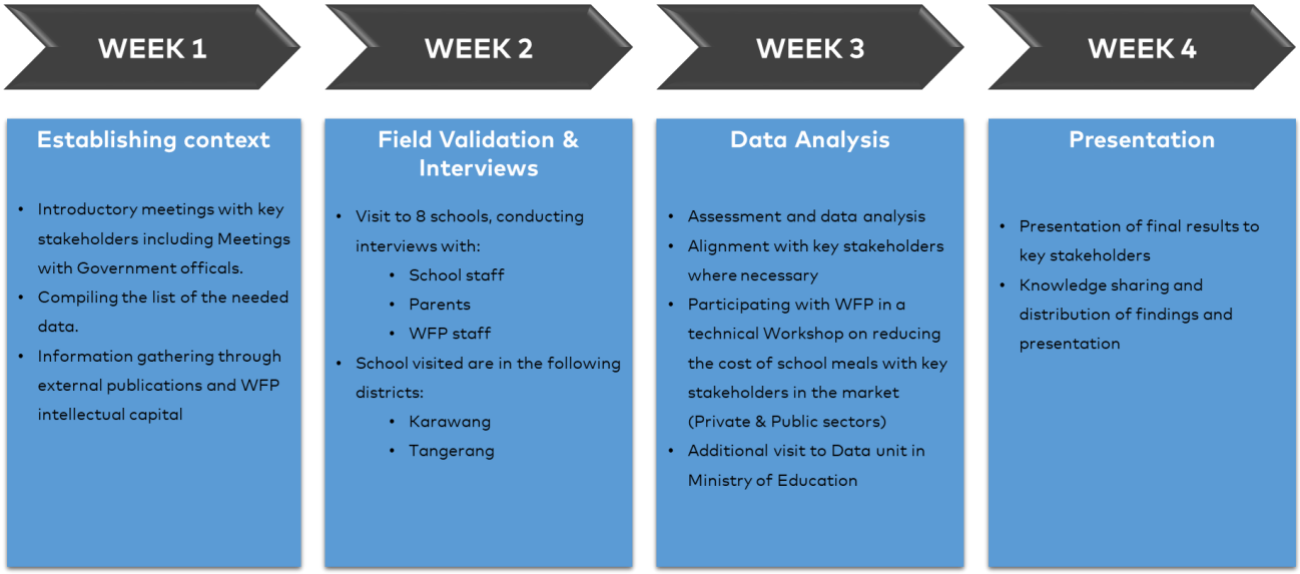
Gender Equality

As health and education are often affected by gender imbalance, school meals will often improve the status of the most disfavoured gender group by providing an incentive to parents who might otherwise keep their children at home for financial or cultural reasons. This effect promotes gender parity by increasing access and equity to education and health. Globally more girls and women are disproportionately out of school and have a higher vulnerability to hunger and malnutrition than boys[4].

3.4. Methodology and Approach in Indonesia

3.4.1. Methodology

The mission was structured for a four-week duration.



1. **Establishing Context - Week 1:** Time was spent on engaging with stakeholders as well as gathering and analyzing existing documentation. Our activities during this stage included internal meetings, government interviews and data collection.

   We interviewed several individuals from the Ministry of Education and Culture to understand the current challenges better. Our primary objectives during these sessions were to introduce the CBA methodology and to understand their roles and their positions on school feeding.

   Additionally, we gathered existing documents which included previous studies and reports (including the SABER Country report Indonesia, 2018 and the Food Security Monitoring Bulletin Indonesia, Volume 9, December 2017), government policies and programmes as well as other analytical data.

2. **Field Validation & Interviews – Week 2**: This week was dedicated visits and interviews with the local WFP staff and 8 schools in two districts, two provinces. Kab. Karawang (prov. Jawa Barat) Schools: SDN Kutagandok III, SDN Kalangsurya 2, SDN Mulyajaya I, SDN Dewisari 3 and Kab. Tangerang (prov. Banten): SDN Kohod I, SDN Karang Serang, SDN Kohod II, SD Negeri Sukadiri.

[4] FAO (2010). Gender and Nutrition. Rome: FAO

School visits focused on validating and collecting data on various school performance parameters (number of students, enrollment rate, drop-outs, attendance rate) and the specific questions related to the Progas in covered schools.

The CBA relies on education data on attendance, enrollment and drop-out rates for both assisted and non-assisted schools respectively – in total six data sets.

Primary observations were also made during school visits on the presence of a kitchen, accessibility of water, utensils, means of food storage and the process of meal preparation and distribution to the school children.

3. **Data Analysis - Week 3** was dedicated to assessment and data analysis, to the alignment with key stakeholders where necessary. Moreover, we participated with WFP in a technical Workshop on reducing the cost of school meals with key stakeholders in the market (Private & Public sectors). Additional visit to the Data unit in the Ministry of Education and Culture also took place in this week to validate some data elements.

4. **Presentation & buy-in - Week 4:** We socialized our findings and presented our study results to WFP internally then for key stakeholders from the Government, including a round table discussion with the different ministries representatives.

3.4.2. Key Investment Case Input

The Cost-Benefit Analysis quantifies the costs and benefits of school meals programmes, using macro-economic, statistical, education and health indicators, as well as programme design features.

It focuses on school-aged children aged from 7 to 12, for a School feeding duration of 6 years. Data over the last three years (2015, 2016, 2017) was collected and assessed for any outliers or missing data. As Progas started in 2016, 2017 was selected as the year of reference for this CBA exercise to ensure at least 2 years out of the 3 included school feeding.

The below table summarizes general key investment inputs for the economic model:

Duration	• Data analysis and assessment **is done** for school years from 2015 to 2017 • Feeding days per school year: 120 days (2017 government budget) • Primary schooling duration - age 7 to 12 (6 years) • Model calculations also **covers** beneficiary's lifetime (schooling and working life)
Sampling and Target	• Targeting all primary students grade 1 to 6. • 12 districts sampling from 5 provinces • Sampling include 6 programmed and 6 non-programmed districts
Costs and Investments	• All costs are calculated based on actual market prices (captured during field visits) • All mentioned investments and dollar values are per single beneficiary
Nutrition Facts	• Ministry of Education & Culture recommended 7 different types of meals using a recipe that can meet 25% of RDA (Recommended Daily Allowance) of age 7-12 • Nutrition facts were calculated based on actual served meals and ingredients from visited schools
Operating Model	• School feeding is 3 times a week, total feeding days is assigned by the government (based on fund) • Schools are responsible to buy meal ingredients, water, transport, fuel and pay cooks' incentives • No special storage nor refrigerator for food

3.4.3. Sampling Methodology

The group sampling was done based on comparing districts with school meal program to those without – ensuring regional similarities in social & economic indicators.

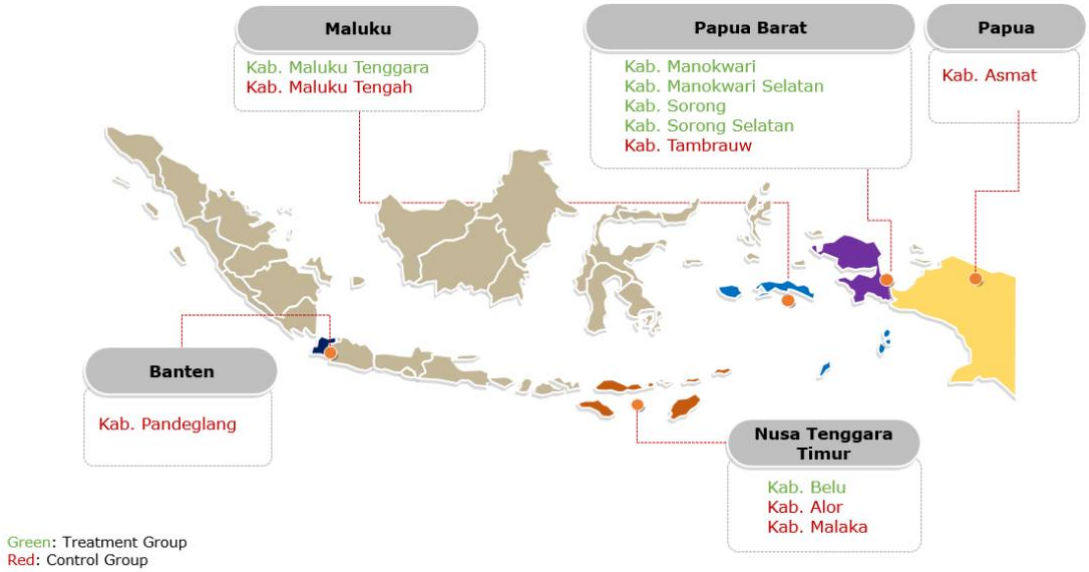
Based on government data, WFP country office data and field visits, the selection was done based on the following elements:

- Indonesia is geographically divided in 34 provinces 514 districts
- School feeding (Progas) is implemented in 11 districts in 2017
- Government provided data for 72 districts for 2015 till 2017
- Analysis is done on the 5 provinces of 72 districts that include the 11 Progas districts in 2017

Eligible districts were selected for the sample size of the treatment groups (children who received school meals) and control groups (children who did not receive school meals) according to the following criteria:

Criteria	Rational
1. Existence of the School meals programme	• School feeding in 2017 is implemented in **5 provinces in 11 districts.** • Out of the 5 provinces we **sampled 12 Districts** (6 Treatment and 6 Control group)
2. Similarity in geographic conditions	• Districts were chosen based on and topographic conditions (East Indonesia – Papua , Papua Barat & Maluku , Mid-West/Central – Banten & NTT)
3. Similarity in social and economic conditions	• Taking into account similarities in # of schools and student population • Similar characteristics and measurements in (Poverty gap, Nutrition indicators, main source of earning and child deprivation of school needs)

12 Sampling districts (6 Treatment and 6 Control group)



Province	District (Kab.)	Total Schools	Progas schools	Total Students	# Progas Students	Sampling Group
Banten	Kab. Pandeglang	860	-	141,303	-	**Control**
Nusa Tenggara Timur	Kab. Belu	145	50	28,265	15,534	**Treatment**
	Kab. Alor	275	-	28,730	-	**Control**
	Kab. Malaka	204	-	29,080	-	**Control**
Maluku	Kab. Maluku Tenggara	142	92	14,804	10,849	**Treatment**
	Kab. Maluku Tengah	388	-	47,698	-	**Control**
Papua Barat	Kab. Manokwari	115	48	23,526	12,005	**Treatment**
	Kab. Manokwari Selatan	26	22	3,944	3,300	**Treatment**
	Kab. Sorong	127	83	13,920	10,140	**Treatment**
	Kab. Sorong Selatan	83	31	10,508	4,812	**Treatment**
	Kab. Tambrauw	48	-	4,589	-	**Control**
Papua	Kab. Asmat	129	-	18,692	-	**Control**
	Totals	**5,148**	**563**	**926,725**	**99,988**	

3.4.4. Key Limitations of Data

Limitations due to data unavailability:

1. The education data did not contain a segregation by gender, hence the benefit of gender equality is limited to health.
2. The education data did not include attendance rate, hence the rates were based on national averages and estimates from field visits.
3. The analysis is made at the district level due to lack of data on sub-districts.

Other considerations:

1. The programme was scaled to 64 districts in 2018, but this was not taken into account since they just operated for less than 3 months at the time of the study
2. Allocated budget for capital costs (assets) by central to schools was based on 2017 data, which may vary every year and was not reflected in CBA in projected years.
3. Depreciation of assets was not taken into account in the model.
4. All community costs incurred for School Feeding (Cooks' incentives) included in the model was gathered during personal interviews with school representatives at the performed field visits.
5. National fund in many cases was delayed hence schools started school feeding program after 4-5 months of the 2nd semester (Jan-June), this has not been taken into account as we assumed SF is for 120 days in 2017 as per government direction (3 days a week).
6. Homegrown School Feeding leads to more food-security by stimulating local agricultural production. The quantified effect on community and local suppliers, is not reflected in the CBA model.

4. Cost-Benefit Analysis – Calculations and Results

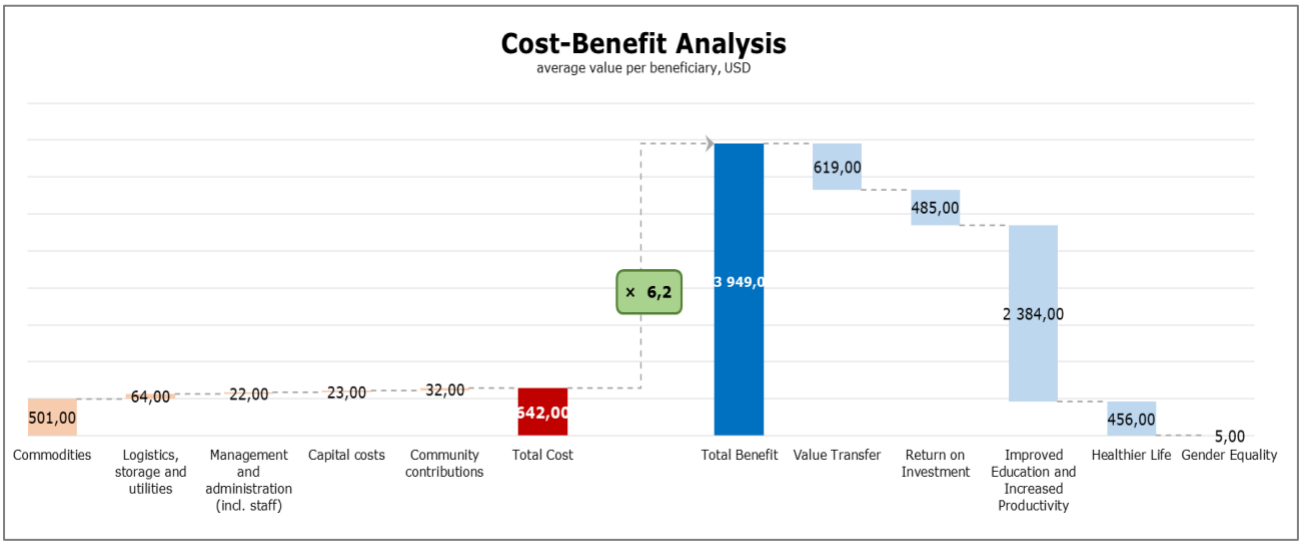
This CBA in Indonesia highlights that there is no doubt that investment in school meals is a profitable investment in the development of human capital, benefiting individuals, communities and the nation both in the short term and long term.

Investment case: By investing US$1 in school meals, an economic value return of up to US$ 6.2 will be generated over the lifetime of a beneficiary in Indonesia.

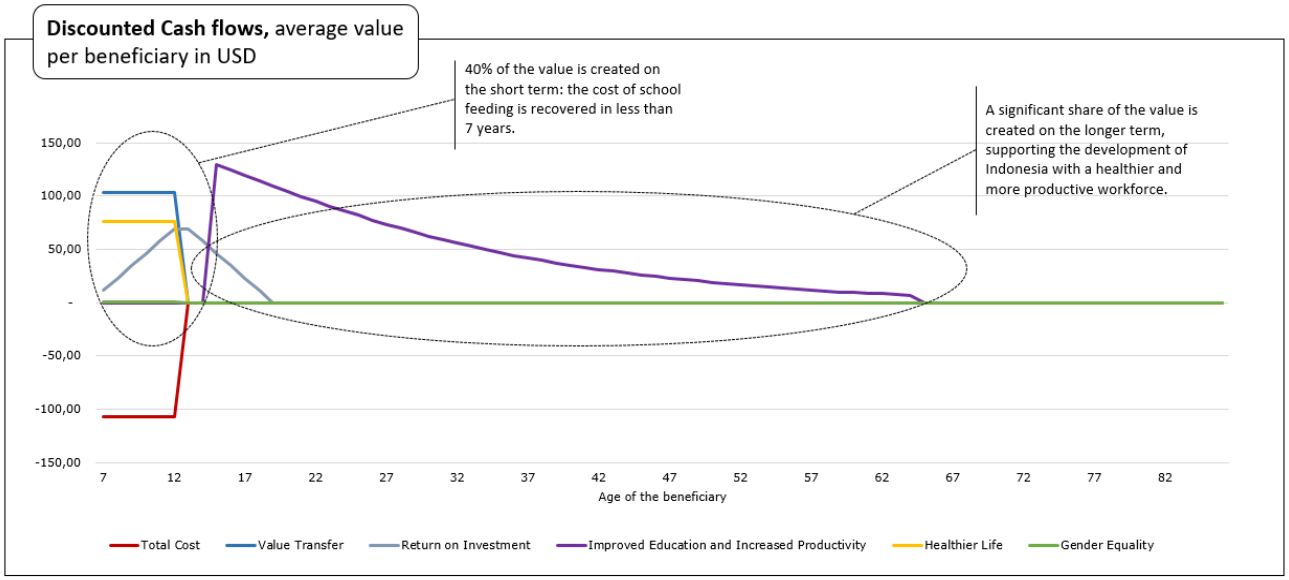
Costs: The total cost of the School Meal for Progas (taken from the field visits) amounts to US$~642 per student for 6 schooling years in Primary school.

Benefits: Estimated value (Net present value) of $3,949 to each beneficiary over their lifetime. The key benefit drivers contributing to this cost-benefit ratio is mainly Improved Education and Increased Productivity (60.37%) and Value Transfer to the households (15.67%).

The charts below, display an overview of the cost and benefit drivers taken into account in this study, and also indicate how each of the key driver values are generated over the lifetime of the beneficiary (with all future benefits being discounted at their Net Present Value).



All costs of the school meal program are recovered in less than 7 years, the positive effects of improved education and productivity benefits Indonesia for an additional ~50 years.



4.1. Key data & assumptions – macroeconomic & educational factors

Variables	Metric	Value
Macroeconomic	GDP Growth Rate % (2015)	4.88%
	Average GNI per capita (USD/year)	$ 2,954.55
	Avg. start working Life	15
	Avg. End working Life	64
	Life expectancy at birth (2008)	66.7
	Exchange rate USD/Rupiah (as of Oct 2018 ?)	14,899 Rp
	Discount rate	10%
	Poverty headcount ration at national line	5%
	Increase in wages	11%
Educational	Age of beginning of School	7 years
	Age of end of School	13 years
	Years of primary school	6 years

Variable	Metric	Value
Meal Cost	Commodities (based on consumed food quantity)	$83.5 per year
	Fuel and Transport	$10.71 per year
	Management Fees (based on Progas budget 2017)	$3.62 per year
Capital Costs	Kitchen Equipment (based on Progas budget 2017)	$335.39 per year
	Eating tools (plates, spoons) per student	$2.01 per year
Community Cost	Cooks' salary	$ 5.26 per year

Variable	Metric	Value
Value transfer	Annual Transfer value - Meal (USD/child)	$103.8 per year
Return on Investment	Return on investment	54%
	Investment rate	15%
	Lifetime of an investment NB: the model assumes that interests are not reinvested in the capital.	7 years

Variable	Metric	Value
Education Indicators	Return to another year	10.4%
	3-year average enrollment rate (2015-2017) - Treatment	109.72%
	3-year average enrollment rate (2015-2017) - Control	106.34%
	3-year average attendance rate (2015-2017) - Treatment	96.33%
	3-year average attendance rate (2015-2017) - Control	92.00%
	3-year average drop-out rate (2015-2017) - Treatment	0.26%
	3-year average drop-out rate (2015-2017) - Control	0.41%

Variable	Metric	Value
Healthier Life	Average private healthcare expenditure	$1011.86
	Average public healthcare expenditure	$614.4
	Calorific intake shares of daily needs	31%
	DALYs averted as % of total DALYs in age group 5-14	3.9%
	De-worming intervention in place	No
	Sanitation infrastructure (water, soap)	Partially available

4.2. Cost Overview

The total cost of the School Meal Program in Karawang and Tangerang districts amounts to US$ ~107 per student per year. Field visits assisted with the validation of the Progas The total operational cost taken into account for this CBA is inclusive of the following cost drivers:

- **Commodity costs**

  Commodity costs include the total cost of the food purchased and distributed at its actual price. All the calculations were made with the real prices taken from the field visits. Commodities include chicken, rice, beans, vegetables, oil, spices, fruits etc.

- **Logistics, storage & Utility**

  Transport, storage costs include all associated costs for the distributed commodities. This includes fuel and transportation of the food from markets to the schools.

- **Management & Administration**

  Fixed fee set up in the Progas by the Government to cover the administration efforts.

- **Capital Cost**

  Budget allocated by Government in 2017 for the assets per each targeted school.

- **Community Cost**

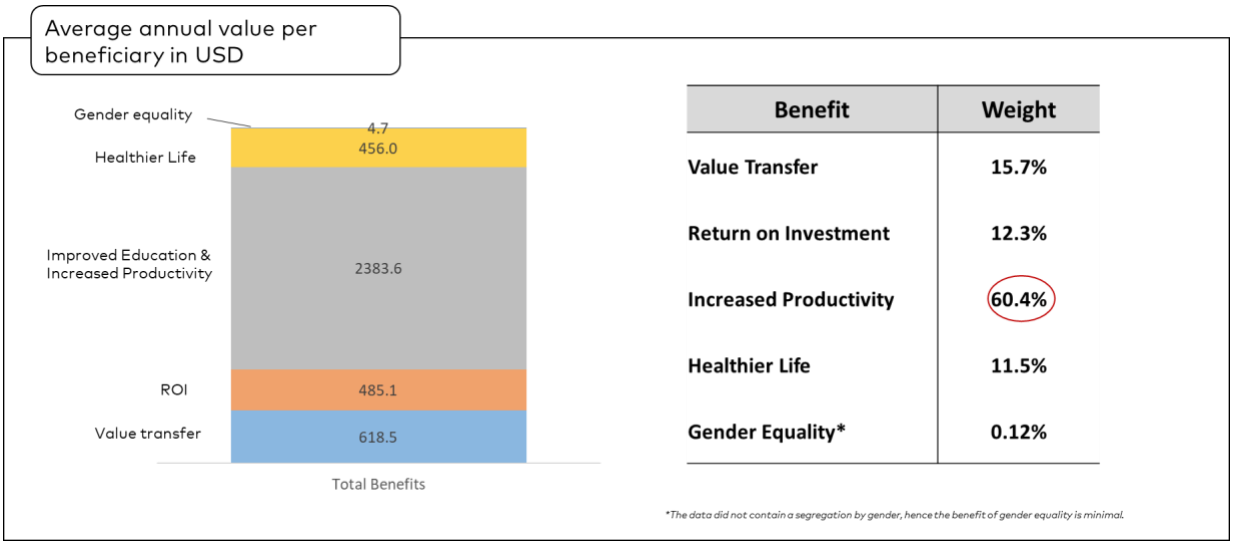
  Community contributions include all opportunity costs (time and money) incurred by the community for the school feeding. This part includes cooks' incentive in schools, almost all the cooks are the parents of the children in the treated school, part of the local community.

Summary of the costs required for the School Meals Programme 2017

Cost category	Description	Value per beneficiary per year (Collected during field visits)	Weight
• Commodities	• Meal components	$83.5	78%
• Logistics, storage & Utility	• Fuel and Transportation	$10.71	10%
• Management & Administration	• IDR 450 set by Government	$3.62	3.4%
• Capital Cost	• Budget allocated by Government in 2017 for assets (5Mn per school + 30K per student)	$3.9	3.6%
• Community Cost	• Cooks' incentive	$5.26	4.9%
Total per beneficiary per year		**$106.99**	

4.3. Benefits Overview

The total value created as an effect of the school feeding includes the following benefit drivers:



Benefit	Weight
Value Transfer	15.7%
Return on Investment	12.3%
Increased Productivity	60.4%
Healthier Life	11.5%
Gender Equality*	0.12%

*The data did not contain a segregation by gender, hence the benefit of gender equality is minimal.

Value Transfer

Value transfer considers the value of the food provided to the schoolchildren based on local food prices. It equals the cost a family would need to bear in order to provide an equivalent meal to their child. The Progas offering a meal creates a value transfer of $618 per student, in savings for his or her households.

Key variables	Value
Composition of the school meals ration (based on actual market prices)	• Fresh food: Chicken, Beef, Fish, Vegetables, Fruit. • Dry food: Rice, Egg, Noodle, Beans beans, Herbs, onions, Sugar, salt, soy sauce • Each meal : 400-500 kcal and 10-12 grams of protein
Value of the ration at local market prices	• 107 USD / year
Programme duration	• 6 years

Return on Investment

School feeding serves to alleviate some of the cost of children's feeding and schooling. It thereby works to offset the cost of food for the family as well as alleviate the opportunity cost of lost labor to the family. Marginalized, food-insecure people typically spend the majority of their income on food. By providing their children with a daily meal at school, poor families can save the meal cost and use some of the freed income for small investments, e.g. in livestock or agricultural inputs, which will generate additional income to the households over a certain period of time. The Progas meal creates a cumulated ~~ROI~~ Return of Investment of $485 per student through asset creation at the household level.

Key variables	Value
% of additional income invested (Investment rate)	• 15% annual income
Rate of return	• 54%
Investment duration	• 7 years
Additional income (Value transfer and HC factor)	• $142.5 USD /year

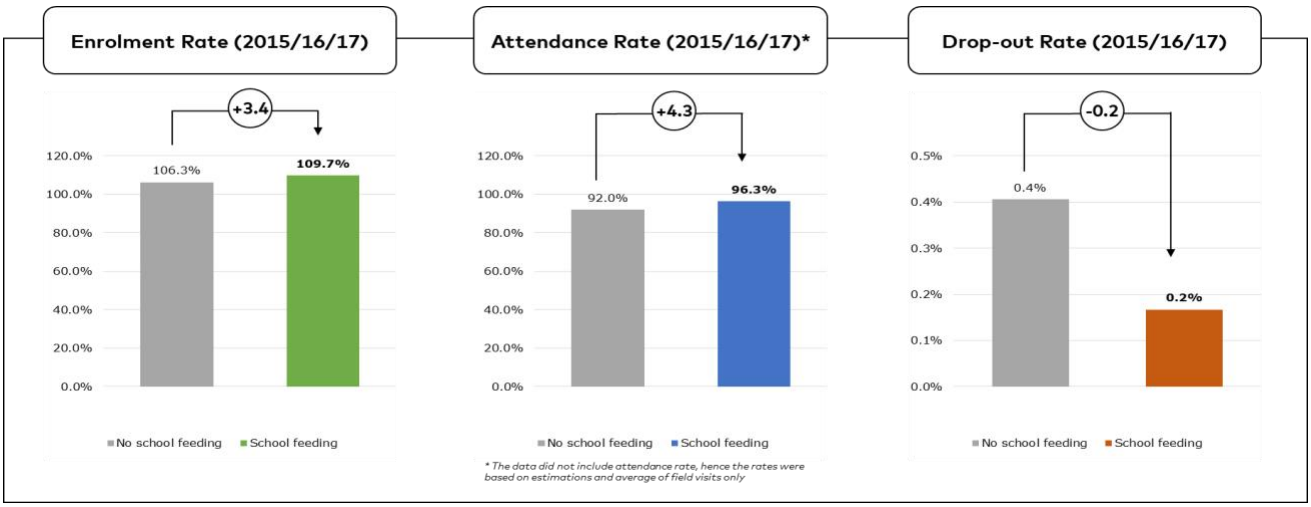
Improved Education and Increased Productivity

School Feeding has effects on both the quality and the quantity of education. One of the main drivers is the Gross Enrollment Rate (GER), which is defined as the number of pupils enrolled in a given level of education regardless of age, divided by the population of the age group which officially corresponds to the given level of education.

School meals have a positive effect on enrollment (+3.4%), attendance (+4.3%) and drop-out rates (-0.2%), since the food incentive motivates parents to send their children to school and reduces the risk for students to leave school during the year, especially for

food insecurity reasons. Thereby, students tend to have a higher number of education years than students with similar background who do not receive school meals.

	Control Group	Treatment Group
Gross Enrolment	106.34%	109.72% (+3.4 pp)
Attendance	92%	96.3% (+4.3 pp)
Drop-out	0.41%	0.26% (-0.2 pp)
School-Life Expectancy	5.86	6.34 (+0.48 year)



School meals enable students to stay longer in school, which has significant impact on schooling performance and end of year results of students, leading to better performance and end of year results of students, leading to better education in terms of quantity and in quality by improving children's cognitive capacities and test scores.

The economics of education considers schooling as an investment in human capital. Human capital can be defined as a set of knowledge, skills, social and personal attributes that increases a worker's productivity. Most of an individual's human capital is developed early during his/ her life under the effect of education, but gradually increases during his/her working life through training and experience. The Mincer Equation reflects the correlation between an individual's earning capacity and the length of schooling. From this, the Rate of Return to Education is calculated to express how an individual's earnings will increase as a result of additional years of schooling. The Rate of Return to Education applied is that of 10.4 percent for Indonesia (increase in wage associated with one additional year of schooling in the given country).

The GNI per capita in Indonesia was on average US$ 2,954.5 during 2007-2017. The CBA model considers the GNI per capita of the poorest 20 percent of the population as the base wage, as school meals are more likely to act as an incentive for this specific sub-group. The GNI per capita of the two poorest quintiles, over the same period, is equivalent to US$ 1,063.6 per year per person and is considered as the baseline i.e. the yearly revenue an average individual can expect to earn regardless of whether or not he received school meals while in school. As the base wage grows at a rate proportional to the GDP growth rate, which is forecasted to be on average 5.65 percent in the 2016-2025 projection. 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.

The CBA results indicate that school meals contribute to additional time spent in schooling by 0.48 years in schools receiving school meals compared with those who did not receive school meals.

According to a study conducted by the University of Ottawa, it measured that children receiving school meals display higher cognitive capacities, such that their test scores increased by 0.17 standard deviation compared with those who did not receive school meals. Every 1 standard deviation increase in test scores notably brings an additional 11 percent increase in wages when children become working adults.

Based on Progas Survey by SEAMEO for the Ministry of Education and Culture

Subject	Baseline test score (avg)	Endline test score (avg)
Mathematics	68	70
Science	71	73
Bahasa Indonesia language	72	75

The CBA economic model forecasts income cash flows over the lifetime of a non-beneficiary and that of a school meals beneficiary, i.e. from 15 years of age to 64 years of age. The latter is expected to earn a higher income due to his or her additional time spent in schooling as a result of receiving school meals, and therefore expected increase in productivity due to better test scores.

The net value created from improved education and increased productivity is equal to US$ 2384 over the life span of one single beneficiary.

	Key Variable	Value
1. Increased wages due better primary education	▪ Δ Enrolment *(2015 / 2017)*	3.38%
	▪ Δ Attendance *(2015 / 2017)*	4.33%
	▪ Δ Dropout *out (2015 / 2017)*	-0.14%
	▪ Base wage (WB)	1,063.64 USD
	▪ Rate of Return to Education (World Bank)	10.4%
2. Increased wages due to better cognition	▪ Average years of school feeding (program duration)	6 years
	▪ Δ increase in wages due to better test scores	11%

Healthier Life

According to the Food Security Monitoring Bulletin Volume 9, December 2017 "Food Security in 100 districts prioritized for reduction of stunting", despite the overall progress in poverty reduction, Indonesia's rates of stunting and malnutrition are critical. 37.2% of Indonesian children under 5 years of age were stunted, 19.6% were underweight, 12.1% were wasted and 11.9% were either overweight or obese.

Nutritious and regular meals allow treated students to overcome under-nutrition and poor health. The use of fortified foods for feeding in schools is an effective means to address specific nutritional needs and deficiencies such as Vitamin A or iron.

By increasing the beneficiary's health throughout his life, school feeding contributes to reducing the necessary cost for both private and public healthcare. The averted Disability Adjusted Life Years (DALYs, calculated according to WHO's methodology) amount to 0,35% of overall DALYs per student, considering vitamin A, iron deficiency and unsafe water, sanitation and handwashing.

Key variables	Value
Average years of school feeding (program duration)	▪ 6 years
Daily nutritional intake covered by the program [%]	▪ 31%
Micro-nutrient daily need covered by meal	▪ 0% - iodine ▪ 16% - iron ▪ 48 – vitamin A
Impact of the programme on adjusted DALYs due to nutrition irrespective of gender [%]	▪ 0.35%
Value of one DALY	▪ 1 GDP per capita, or US$ 3570.28

The CBA builds on the DALY (Disability Adjusted Life Years) metrics to measure the impact of school meals on children's health of any particular country. DALYs can be defined as a year of healthy life lost due to illness, disability or early death. 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. 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 7-14), and therefore assumes an increased number of wages due to increased number of productive life years.

No. of DALYs associated with health conditions which can be addressed in School Meals Programme among children in Indonesia 5-14 yrs.

	DALYs (girls)	DALYs (boys)
Iron deficiency	0.0113	0.0126
Vitamin A deficiency	0.0000	0.0000
Iodine deficiency	0.0001	0.0000
Unsafe water, sanitation and handwashing	0.0076	0.0093
Total	**0.0190**	**0.0220**

The Progas provides schoolchildren with 31 percent of their daily Caloric requirements. A reduction of 0.0035 DALY was calculated for both boys and girls, as the cumulative effects considering the full duration of the Progas.

The total value created by Progas as a result of DALY reduction is US$ 456 per child.

Gender Equality

Three main forms of gender inequality practices can be identified in the food security context. It is a common practice for men to be prioritized when it comes to food access and distribution within the household. Secondly, the nutrition of pregnant women is not prioritized. Thirdly, because of the perception that the main responsibility of women is to take care of household work, including caring for and feeding the children. Girls too, end up with less leisure and study time than boys.

In areas where no school meal is provided, educational indicators display lower enrollment, attendance and dropouts' rates among boys. While the program is distributed to both, boys and girls, we have seen a greater impact of the feeding program on boys as they are the most disfavored gender. Possible causes of such variance include child labor, since boys are more likely to pursue a job as they wouldn't be in a position to afford going to school if it wasn't for school feeding.

One of our limitation was the absence of the gender segregated data for many indicators on the district level, so the benefit of gender equality is minimal.

4.4. Sensitivity analysis

In order to demonstrate the boundaries of the underlying assumptions, a sensitivity analysis was conducted. This was done to ensure that the overall result is not over-determined by a single parameter, thereby decreasing the likelihood of error. While unlikely that all variables would skew the model in the same direction (above or below its current output), the sensitivity analysis replicates possible scenarios whereby a range of parameters are subject to error in current findings and data assumptions, and may translate differently in the context of Indonesia.

Besides the Base Case used in the model, a Worse and a Better Case was calculated for the following variables: (i) Discount rate, (ii) Average reference income (GNI), (iii) Return on Investment, (iv) Investment rate, (v) Percentage increase in wage per extra year of schooling, (vi) Percentage increase in wage per standard deviation in test results

Based on this sensitivity analysis, the Net Present Value ranges between US$ 7,210 and US$ 2,150 in "better" and "worse" case scenarios, as compared compared to the "base" case.

	Parameter	Worse	Base	Better	Cost-Benefit Ratio	Net Present Value ($USD x000)
	Discount Rate	12%	10%	8%	4.99 (-1.2) 8.14 (+1.94)	3,201 (-747) 5,225 (+1,277)
Individual parameter analysis	Rate of investment on household income	10%	15%	20%	5.9 (-0.3) 6.4 (+0.20)	3,786 (-162) 4,110 (+162)
	Return on investment from saved assets	25%	54%	75%	5.74 (-0.5) 6.44 (+0.24)	3,687 (-261) 4,136 (+189)
	Lifetime of an investment	5	7	10	5.93 (-0.3) 6.47 (+0.27)	3,809 (-139) 4,156 (+208)
	Base wage	$800	$1,063	$1,200	5.23 (-1.0) 6.63 (+0.43)	3,357 (-591) 4,253 (+306)
	Rate of return to education	8.00%	10.40%	12.00%	5.9 (-0.3) 6.32 (+0.12)	3,785 (-163) 4,056 (+108)
	Increase in wages per 1 SD increase in test scores	9.00%	11%	13.00%	5.67 (-0.5) 6.63 (+0.43)	3,643 (-305) 4,253 (+305)
Output	**Cost-Benefit Ratio**	**3.4**	**6.2**	**11.2**	3.4 (-2.8) 11.2 (+5.03)	2,914 (-1,034) 7,210 (+3,262)
	Net Present Value ($USD)	**$2,150.57**	**$3,947.83**	**$7,209.59**		

Worse scenario Better scenario

5. Non-quantifiable benefits

The visits and interviews also highlighted several benefits not quantified in the Cost-Benefit Analysis:

5.1. Social and Economic Inclusion

One of the positive impacts observed was the increased cohesiveness brought about by school meals. Social inclusion was supported by the provision of Progas in which all school children can share the same meal together. This enables a cohort structure both inside and outside the classroom.

5.2. Healthy Behavior and Practice

The programme contributes to building a positive behavior and social interactions. For example, schoolchildren will usually learn to queue during the service, queuing in hand washing stations and understating the importance of using running water and soap, collecting dirty dishes to the dishwasher, and most importantly helping each other to be served and enjoy eating together

5.3. Improves Schools' infrastructure

Field visits showed that Progas also contributes to improving to the schools' infrastructure. This includes kitchen, handwashing and other facilities, which are more closely managed and maintained with the support and, sometimes, with financial provision by the district government.

5.4. Community Ownership

By allowing for institutional school meal programme, the communities feel encouraged to do their part by contributing in cooking, cook's salary and other expenses of the Progras. This allows for interactive participation and understanding of the challenges and joint ownership of the local issues by community.

6. Visits and Interview Observations

The observations and corresponding recommendations cover the qualitative aspects discussed during the field visits while speaking with teachers, principals, parents, government officials, involved in the implementation of the school feeding programme.

6.1. Funding

Challenges	• Central government financial support is limited to 1-2 years**, then** it is expected that there will be APBD support for the sustainability of the Program • Funding Timeliness. In 2018 schools started the feeding programme late (~August) due to delayed installment from the government. • Funding provided supports only **3** feeding days – 50% of school days **only**. • The community participation in cash or non-cash **as well as involvement in providing advice / ideas / input** is still **very limited**.
Positive Observation	• If the school to prioritize their funding from center it would be for Infrastructure and competitive activities (sports, science...etc.) as it encourages kids and also used to evaluate teachers. • Pocket money. • The participation of parents as members of cooking groups who get incentives is noticeable

6.2. Reach

Challenges	• **100,136** students **were impacted** in 2018 (>2 mn students are in the elementary schools). Some of **schools** had only 1-2 years of Progas and then **were excluded**, that doesn't allow to get the impact of the school feeding for the six years. • Some non-programmed schools are not aware of Progas program in other schools and **in** the same time in other cases. • The approach is carried out centrally / regionally including the determination of target areas, monitoring of the implementation of the program has not been carried out optimally • The Progas policy framework does not yet exist and relies on policy frameworks developed for previous school feeding programmes • **There is no dedicated unit that handles** the Progas in the Ministry of Education and Culture, the coordination mechanism across ministries is not **yet** systematic.
Positive Observation	• Many parents are aware of the programme and acknowledge its value.

6.3. Cost

Challenges	• Prices vary based **on:** location, type of recipe used. Local prices for the food itself are very close to the prices in urban areas (such as Jakarta) • Seasonality also impact ingredients costs and specifically fruits
Positive Observation	• Some Progas schools report expenses to the government, and maintain records, to prepare for reporting to the center. This data could support a future cost-efficiency optimization exercise.

Average actual Cost per meal				*Per year*
Average Meal	10 365,61	$ **0,70**	*81%*	$ **83,49**
Average Fuel	429,43	$ **0,03**	*3%*	$ **3,46**
Averag Transport	900,90	$ **0,06**	*7%*	$ **7,26**
Average Cooks incentive	652,78	$ **0,04**	*5%*	$ **5,26**
Average Mgm fees	450,00	$ **0,03**	*4%*	$ **3,62**
Total per meal	12 799	$ **0,86**		$ ***103,08***

Average price range of Progas food (data taken from the fields and real prices):

- Ayam Goreng + Bihun Jagung = IDR 7667.
- Bubur ayam sayur kuah kuning = IDR 7938
- Bubur Umbi Sehat = IDR
- Ikan masak Kuah Kuning + Nasi Gurih = IDR 5643
- Nasi kuning + Orak arik = IDR 4144
- Nasi Putih + Sop Ayam Campur = IDR 8879
- Nasi Putih + Sop Kacang Hijau Sehat = IDR 10365

6.4. Availability

Even if financial resource challenges can be addressed there is an additional variable to consider of the quality and availability of food resources. This includes the logistical challenge of getting the right products from the right supplier to the right end consumers. In that regard here are some observations on availability that we have made

Challenges	• There is no comprehensive insight or roadmap on the capacity at the local districts. The ability of the schools or districts to satisfy an increased demand is anecdotal. There is no formal capacity building plan at local districts. Needs are met on an ad hoc basis based on demand. It is not clear what would happen if demand increases current supply. • Drinking water is not provided by school in most cases, kids need to take it from home or buy from the kiosk • Fruits are not offered every day. • In Dry season, the availability of water for may be an issue. • The community participation in cash or non-cash as well as involvement in providing support is still very limited.
Positive Observation	• Fresh food is bought every meal day, both from local farmers and local markets: chicken meat/beef/fish/vegetables, we did not observe any issues with the availability in the visited schools. • Also, no issues with the cooking water, it was bought from local market or through tap. • One school provides water and cups (8 gallons per day for 380 students). • Local kiosk owners benefit from Progas because they are a supplier to schools and also get paid in cash.

6.5. Health and nutrition

While there are clearly defined nutritional parameters in the school feeding programme the reality on the ground highlight other considerations

Challenges	• There is limited consistency in tracking quantities used daily in relation to number of students • While there is an allocated amount per child, actual allocation could vary based on the preparation method. • Some schools may provide additional food items which are not recommended - one of the visited school provides milk, which is not recommended. • One school has no lavatories, they use same village one provided by the community. • Food has low Iron and Iodine rates as per table below. • No gender & age segregation for school meals distribution at school level • Nutrition education is not yet an integral part of the school curriculum • Effective nutrition behavior change requires a frequent practice at school level
Positive Observation	• Children reported they appreciate the meal diversity • Students are healthier and washing hand practice improved. • Cooking teams have been trained to cook the recommended recipes. • Eating habits on vegetables and fruit improved. • In some schools' teachers eat in class with the kids to encourage them • One school has regular meetings with parents to encourage and remind them about breakfast at home. • Children mentioned they like Progas as they eat together and it's more delicious. • Teachers are encouraging kids by explaining to them how the feeding important, including breakfast. • Washing hands practice were improved significantly, with soaps in treated schools.

Average nutritional value per meal		
Vitamin A	**48%**	*Avg. per Meal*
Iron	**16%**	*Avg. per Meal*
Iodine	**0%**	*Avg. per Meal*

6.6. Infrastructure

Infrastructural challenges have been reported for school feeding. These have included the costs to set up cooking and feeding infrastructure. In fact, the government has spent a considerable amount of money on building capability for the feeding infrastructure. The community has also been a significant contributor in enabling feeding. Yet it's not enough for scale to cover or targeted areas in the next few years. Below are some observations as it relates to infrastructure

Challenges	• There is no refrigerator in most schools to store fresh food. • There is no dedicated storage area for dry food ingredients. • In some schools, cooking equipment and infrastructures such as kitchens are limited. • Kitchen equipment may break, leading schools to borrowing from neighbors (homes). • School garden/ponds can be utilized for home-grown practice, however not all Schools have sufficient space
Positive Observation	• Some schools use cookware, some - individual containers that allows to keep the desk clean. The container has disadvantage- children can close it and not to finish food.

Conclusion

During the transition from external funding to national budgets, scaling up and adopting school feeding programmes may be perceived as a high-cost intervention for national governments. However, this Cost-Benefit Analysis highlights that school meals is a profitable investment as a society safety net, as an education support activity, and as a school health and nutrition intervention. It contributes to developing human capital, benefitting individuals, communities and the nation in the short term and long term.

This CBA exercise demonstrates an economic return value of USD $6.2 in the country's GDP for every $1 USD dollar invested in school feeding, over the lifetime of beneficiaries. Whilst some economic outcomes of school feeding can be quantified in this Cost-Benefit Analysis, it is also important to mention that multiple, additional benefits are not quantified within the model itself across health, nutrition, social protection, and agricultural economies when linked to smallholder farmers.

The key benefit drivers contributing to this cost-benefit ratio is Improved Education and Increased Productivity and Value Transfer to the household, reflecting that school meals play an instrumental role as a safety net for impoverished and food insecure families, and in attracting children to school and enabling them to stay longer in school.