



## RESEARCH ARTICLE

### COST BENEFIT ANALYSIS OF THE SCHOOL MEALS PROGRAMME IN THE GAMBIA

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#### ABSTRACT

School meals programme in The Gambia is one of the successful safety net programmes that have been beneficial to vulnerable families in rural dwellings and some families dwelling in urban slums. The programme has evolved over the years necessitating a study to assess its efficacy thereby validating the need for its continuation in the coming decades and beyond. The study was conducted nationwide, thus providing useful insight on the current school meals programme. The monetary benefits of the programme were estimated using reasonable assumptions whilst its actual costs were also calculated. The model used for the study was the Investment Case Economic Model of the Boston Consulting Group. The benefits were categorized into: income transfer, healthier and longer life, educational outcome (enrolment, attendance & dropout) and externalities. Whilst costs were categorized into: food cost, staff cost, transport & logistics, capital cost, running cost and other costs. The study generated six options with various assumptions, the results from the various assumptions illustrated that the Benefit-Cost ratio ranges from 6.1524 to 6.1543 given the options. For the base year the Benefit-Cost ratio was 6.19:1. The net present values ranges between GMD 228,967,046.83 (USD 5,724,176.17) and GMD 648,232,828.48 (USD 16,205,820.71) over the study period. Empirically the results of the study vividly demonstrates that school meals programme is a viable and worthwhile investment. Hence the need for its sustainability and continuance so that learners from poor and vulnerable families will continue to benefit from this social safety net programme. There is however a need for public accountability and proper record keeping in order to ensure that further and future studies on the programme is possible and credible.

#### INTRODUCTION

School Meals Programme (SMP) is a social safety net programme that provide nutritious diet to learners at the Early Childhood Development (ECD) and Lower Basic Sectors of The Gambia's school system. The programme is currently managed by the World Food Programme (WFP) and the Ministry of Basic and Secondary Education (MOBSE) of the government of The Gambia. In the latter part of 2014 WFP, MOBSE and other partners of the school meals programme conducted a mid-term review on the operational effectiveness of the current programme. Emerging from the aforementioned review, was an action plan which recommended that a benefit-cost analysis be conducted for the programme and a transition process to facilitate full Gambian Government ownership of the programme. This study on Benefit Cost Analysis school meals programme is intended to inform policy makers, donors and other partners of the total cost and cost-per child of the programme. The study also provides empirical evidence using monetary benefits associated with the school meal programme in terms of income transfer as a saving to the household, healthier and longer life due to deworming medication received during the programme. Other benefits of the programme are educational outcomes of increased enrolment, increased attendance and a decrease in dropout rates which results in an increase in productivity.

Finally the spillover benefits are also monetized and represented as positive externalities as a result of the programme. The model used for the study is Investment Case Economic Model as expounded on in the methodology section of the study. The study was conducted with utmost respect for the subjects and respondents of the study, by strictly adhering to ethical principles of scientific research. The results of the study amply demonstrated that this safety net programme is a viable and worthwhile investment for the vulnerable and deprived of our communities.

#### Study Objectives

- The main objective is to assess the monetary cost and economic benefits of providing school meals and to identify the value created in terms of increased education, improved health and nutrition and value transfer to the beneficiaries for the academic year 2014/15.
- To provide a realistic estimate of the monetary costs and benefits of The Gambia's school meals programme and provide a forecast for the next 15 years.
- To provide NPV and Benefit-Cost Ratio for School Feeding Programme.

**Literature Review:** The focus of most studies on School Meals Programmes are on impact evaluations of school feeding programmes. Several papers attempt to study the potential impacts that school meal programmes have on educational outcomes variables such as enrolment, cognition,

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dropouts, school attendance, health and nutritional status of children, and academic performances. Little has been known on the overall cost and benefits of school feeding programmes in The Gambia. This review assesses the benefit associated to school meal programmes in academic literature. The Boston Consulting Group developed an investment case model in 2009-2011. This model quantifies the value created per dollar invested in school feeding. The model has been tested in eight WFP-assisted countries (Bangladesh, Ethiopia, Honduras, Malawi, Chad, Cambodia, Tajikistan, and Palestine). The model estimates the benefits of the programmes by grouping the evidences into income transfer to the household, return on investment in the household productive assets, increased productivity, healthier and longer life, and externalities associated with the school feeding. These monetary benefits are thus compared with the costs (opportunity costs inclusive) of the school meals programmes. Comparing the cost and benefits of the programmes, the net present value of the programmes is estimated. The results from these eight countries shows that the school meals programme is an effective safety net. Specifically, the school feeding programmes from these countries resulted in a minimum benefit-cost ratio of 3:1 and maximum of 8:1. Thus showing that indeed school meal programmes are indeed beneficial.

**Enrolment and Attendance:** Several studies focused on the impact of school meals programme on enrolment rates. For example, in Malawi, WFP (2008) showed that the school feeding programme over a three-month period, increased enrolment by 5 percent and attendance by 36 percent. Furthermore, in Jamaica, Powell and Grantham-McGregor (1983) showed that after the first semester, schools with a school feeding programme witnessed improvements in school attendance compared to schools without a school feeding programme. However, Meme et al. (1998) disputed the significant effect of school feeding on attendance rates in Kenya. Other studies that show improvement in enrolments due to school feeding programme include Alderman et al. (2009), He (2009), Cheung and Perotta (2010), and Alderman, Gilligan, and Lehrer (2010). Studies conducted on the impact of feeding school children in Bangladesh show significant improvement in enrolment and attendance rates i.e. 14.2 percent increase in enrolment and 1.3 days per month increase in attendance whilst a reduction of 7.5 percent in dropout rate, Ahmed (2004). Thus these empirical studies demonstrate compelling statistics to demonstrate the immense significance of school meals programme on increasing enrolment and attendance and decreasing dropout rates. These results were generated using econometrics models whilst isolating the effects of income and other environmental factors.

**Cognition:** A study by Adroque and Orlicki (2011) shows that nutrition is important for cognitive and brain development; therefore, making healthy food choices becomes vital to a student's academic performance. They further pointed out the adverse effects of malnutrition on the cognitive functioning of children as documented around the world, in particular, they noted the negative effect of under nutrition as captured in studies done by (Averett and Stifel, 2007; Alaimo et al., 2001; Kaestner and Grossman, 2009 and Taras, 2005). Their studies suggested that most empirical findings on school meals programmes have a positive impact on learning achievement, as measured by increases in test scores and low dropout rates. Adroque and Orlicki (2011) cited Ahmed (2004), using an econometric specification to isolate the effects of school

feeding programme in Bangladesh, the study found that students in feeding programme schools score 15.7 percent higher than did students in the control schools. The aforementioned cited study vividly demonstrates how school meals can impact on student's comprehension of a subject done in school which means scoring higher marks in tests as a measure of understanding of a particular subject. Adroque and Orlicki (2011) also cited Tan, Lane, and Lassibille (1999) which evaluated the impact of the school feeding programme in the Philippines, and they found that the impacts of the school feeding programme were not significant at the school level. Kremer and Vermeersch (2004) found that the treatment impact alone was not significantly different from zero. However, school meals increased test scores in schools where the teacher was experienced. This result was found by regressing the test scores on both a treatment variable as well as a treatment variable interacted with the teacher's experience.

**Dropout:** A study on, The Impact of Feeding Children in School: Evidence from Bangladesh, Ahmed (2004) concluded that School Feeding Programme has a statistically significant negative impact on dropout. The results provide an estimated probit regression. The value of the coefficient was  $-0.075$ , which indicates that the participation in School Feeding Programme reduces the probability of dropping out of school by 7.5 percent. Other statistically significant determinants of dropping out of school are household income and whether a child resides in urban slum. The likelihood of school dropout decreases as household income increases. Children living in urban slums are highly at risk of dropping out of school, they are 23.2 percent more likely to drop out of school than children living in rural areas.

**Nutritional Benefits and Status:** According to Kaziana et al. (2009) the benefits of School Feeding Programmes are, arguably, very large (Adelman, Gilligan, and Lehrer, 2007, Adelman et al., 2008; Ahmed, 2004). Foremost, nutritional and health statuses have powerful influences on a child's learning and on how well a child performs in school. Poor nutrition among school-age children impacts their cognitive functions and reduces their ability to participate in learning experiences in the classroom. Secondly, malnourished or unhealthy children are likely to attend school irregularly leading to poor academic performances. In addition, it has been shown in the nutrition literature that even short-term hunger (common in children who do not eat before going to school), can have severe adverse effects on learning and academic performances in general. Finally they concluded that, school meal programmes can have a far reaching influence on children nutritional and health status and how they perform in school. Mothe and Molinas (2009), stressed that poor health and nutritional status is barrier to education (Jukes *et al.* 2008; Bundy 2011). They pointed out that school meals can alleviate child malnutrition if the distributed food is fortified with micronutrients, thus removing one of the major obstacles to better health, educational attainment and performance. According to them, enhanced nutritional and health status of primary school children enables the way to improve learning and decrease morbidity and ultimately for better health throughout the school lifecycle. They further buttressed that, the impact of school feeding on nutrition, is beneficial in alleviating micronutrient deficiencies (Latham *et al.* 2003; Van Stuijvenberg 2005; Solon *et al.* 2003; Grillenberger *et al.* 2003). The aforesaid is important as micronutrient deficiencies

are highly prevalent among school-age children in developing countries. Because of these deficiencies, children are more susceptible to infections which, in turn, lead to absenteeism, impaired learning capacity, and weakened cognition. Enhancing children’s micronutrient status through food fortification or micronutrient contributes directly to improved cognition and learning capacity because of the improvement of their nutritional status.

**Economic Benefits:** According to Mothe and Molinas (2009) as cited in (Gordon *et al.*, 2011) in a World Bank Report on School Feeding Investment Case, in 2010 and 2011, WFP conducted three external impact evaluations of school meal programmes in Cambodia, Kenya, and Cote d’Ivoire. These impact evaluations concluded that the opportunity costs related to sending children to school were significantly reduced for households with school feeding beneficiaries and that the value transferred through school feeding represented a significant share of the households’ monthly income. The income transferred to a family through school feeding is equivalent to the monetary value of the same amount of food that can be purchased by households in the local market. This scenario buttressed the economic impact of school meals programme since the programme evidently redistributes income giving beneficiary families the ability to spend their income on other needs and necessities.

**METHODOLOGY**

The study used Investment Case (IC) Economic Model of the Boston Consulting Group (BCG). Using the IC model the study was able to assess the monetary costs and monetary economic benefits of the school meal programme by the means of a Cost-Benefit analysis. Using this methodology, the actual cost of the programme was estimated whilst reasonable assumptions were also made to estimate the programme’s benefits. The benefits were ascribed a monetary value in Gambian Dalasi (GMD) and in United States Dollars (USD). This was done for all the benefits indicators namely: Income Transfer, Healthier & Longer life, Educational outcomes or Increase in Productivity (Enrolment, Attendance & Dropout) and finally Externalities. The model also calculated the Net Present Value (NPV) and Benefit-Cost Ratio (BCR) to demonstrate the profitability/viability of the school meals investment. The BCR is the ratio of discounted net present value over actualized costs and gives a measure of success of the school meal programme investment. A BCR lower than 1 means that the programme is not viable. On the other hand a BCR of more than 1 implies that the programme’s benefits are higher than its costs, hence the investment is worthwhile economically. Finally the NPV is the summation of the total future benefits resulting from the school meals programme less the total actualized programme costs. A positive NPV means SMP is a viable investment while a negative NPV means the SMP is not viable.

**Model Specification:** The 2 components of the model are benefits and costs, i.e. total benefits from SMP and total costs from SMP.

$$\text{Benefits } (B_t) = \sum (\text{IT, EN, HL, DR, EX, AT})$$

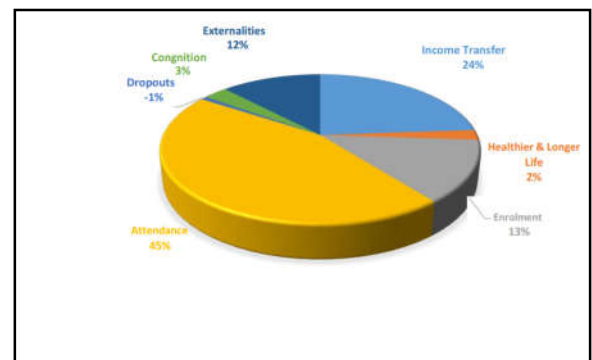
$$\text{Costs } (C_t) = \sum (\text{FC, SC, TL, CA, RC, OC})$$

Where:

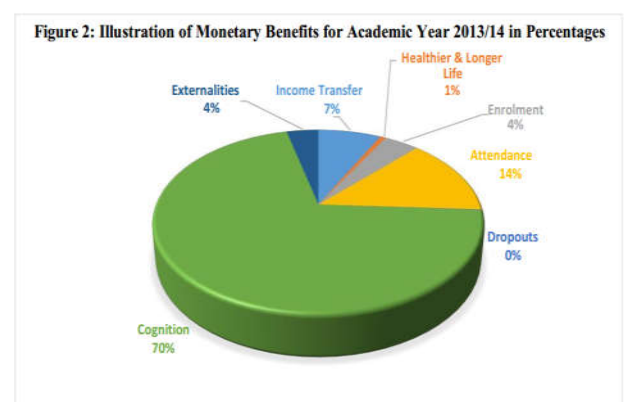
- IT = Income Transfer
- EN = Enrolment
- DR = Dropout
- HL = Healthier and Longer life
- AT= Attendance
- EX = Externalities
- FC = Food Cost
- SC = Staff Cost
- TL = Transport and Logistics
- CA = Capital Cost
- RC = Running Cost
- OC = Other Cost

$$\text{Net Present Value (NPV)} = \sum_{t=0}^{t=15} (B_t - C_t)$$

**Usefulness of the Model:** This model is an advocacy tool developed, to illustrate to donors and governments the long run costs and benefits of school meals programme as a safety net programme. It is an economic model leveraging three data sources: firstly from academic literature, secondly data collected country wide and finally information collected from WFP experts. The model advocates for the benefits of a government to continually justify the need for a school meals programme. The analysis of this model can be performed by academics, government staff/planners, WFP expert staff or external independent consultants and other stakeholders.



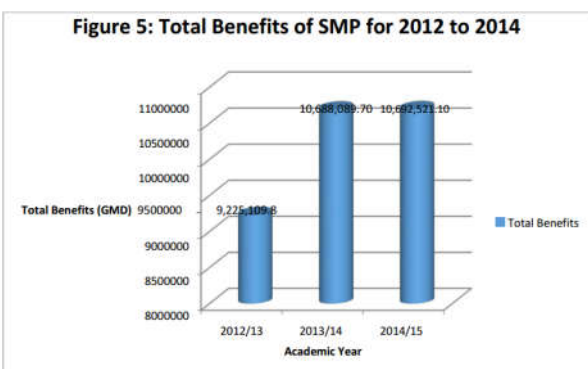
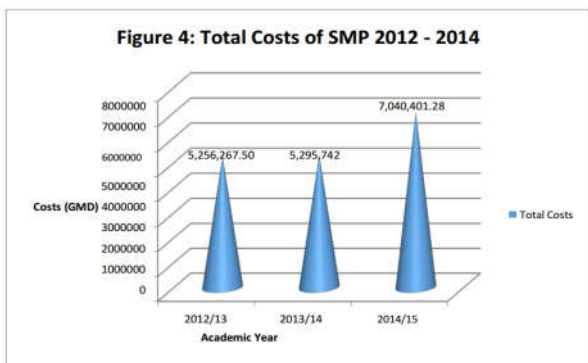
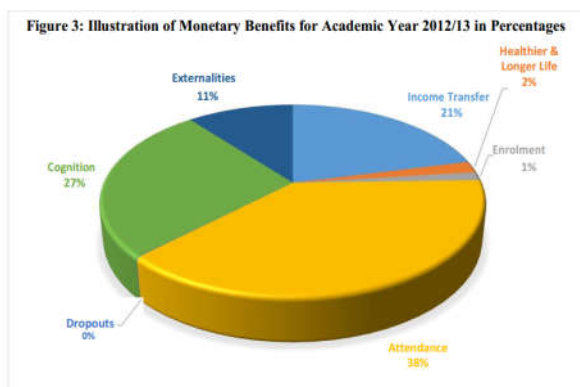
**Figure 1. Illustration of Monetary Benefits for Academic Year 2014/15 in Percentages**



**Figure 2: Illustration of Monetary Benefits for Academic Year 2013/14 in Percentages**

**DISCUSSION OF RESULTS AND FINDINGS**

**Percentage Share of Monetary Benefits of SMP for 2014/15, 2013/14 and 2013/12:** Figure 1 above demonstrates the monetary benefits in percentages using the IC model for the academic year 2014/15. It is can be seen that due to school meals, percentage benefits associated with learners school



attendance accounts for 45%, this is followed by income transfer which is 24% i.e. the saving to the household as a result of the school meals programme. Enrolment is 13% of the percentage shares of benefit whilst externalities is 12%. Externalities are the spillover benefits to third party as a result of the school meals programme. Cognition was estimated at 3%. The portion of benefits that is attributed to healthier and longer life is just 2%, these benefits are as a result of deworming medication administered to learners as part of the school meals programme. Finally dropouts percentage benefit share is very low at -1% which mean it has the least percentage of benefits when compared with the other variables for academic year 2014/15. Hence less number of learners are dropping out of schools due to the fact that school meals programme serves as a safety net for poor households and families. Figure 2 shows the IC models benefits for school meals programme for academic years 2013/14. Unlike the case for academic year 2014/15, learners' cognition and attendance are 70% and 14% respectively of the shared percentage benefits. In academic year 2013/14 cognition had the highest percentage share thus is as a result of school meals serving as an inducement for learners to pass their school test score (National Assessment Test for Grades 3 & 5) which is in agreement with existing literature cited earlier. Enrolment and Externalities accounts for 4%.

Externalities percentage share demonstrates a lesser spillover benefits from the school meal programme than previous academic year 2014/15. Income transfer share of benefit is 7% of the total benefit received for that academic year. Healthier and longer life is 1% of the total percentage benefits received during 2013/14 academic year. Finally the dropouts percentage benefits is 0% hence lesser (no dropout) percentage of learner are dropping out of school as a result of the school meals programme. Figure 3 shows the various apportionment of percentage benefits using the IC model for academic year 2012/13. Attendance percentage share benefit for the period is 38% while cognition is 27% of benefit shares. Enrolment percentage share is just 1% for the same period, however the previous academic years enrolment percentage increased as demonstrated on figures 2 and 3. Percentage share benefit as a result of income transfer is 21% for that period. Externalities share is 11% while healthier and longer life as a result of deworming medication administered as part of the school meals programme is 2% for academic year 2012/13. Dropouts as a percentage share of benefits is 0% for the academic year.

**Total Costs and Benefits of SMP 2012/13 to 2014/15:** Both costs and benefits have been increasing over the period 2012/13 to 2014/15. Comparing figure 4 and 5 it is observed that the monetary benefits of school meals outweigh the costs of the programme. The cost drivers of the programme are commodity/food cost, capital cost, transport and logistics cost, staff, running costs and other costs. The benefit components/variables are income transfer, attendance, enrolment, healthier and longer life, dropouts, and externality as seen earlier. Empirically, from a social investment perspective it could be inferred that since the benefits outweighs the costs of SMP, this makes the program socially and economically viable.

**Cost Benefit Analysis during the Academic Year 2014/15:** The average benefit per child was GMD 3,483.23 (USD 87.08) and the average cost is GMD 562.76 (USD14.07). This results in a benefit cost ratio of 6.1895 (6.19:1).

**Benefit Cost Ratio is 6.19:1:** For every USD1 invested in The Gambia's School Meals Programme the programme realizes a benefit 6 times the cost, hence School Meals Programme in The Gambia is a worthwhile investment both in the short and long run.

**Option 1:** This option is based on the following assumptions: Public Sector Discount Rate of 22% (from Central Bank of The Gambia), Average inflation Rate of 5.94% (in 2014), and dropout rate of 4% and appraisal period of 15 years. Results from option 1: *The net present value is GMD230,392,606 (USD575,9815.15) and the benefit cost ratio is 6.1524. This shows that the SMP is a viable investment for The Gambia.*

**Option 2:** This option is based on the following assumptions: Public Sector Discount Rate (2002 - 2015) of 19.21% and Average Inflation Rate (1962 - 2015) of 8.18%, dropout rate of 4% and appraisal period of 15 years. Results from option 2: *The net present value is GMD293,429,298 (USD7,335,732.45) and the benefit cost ratio is 6.1543. This shows that the SMP is a viable investment for The Gambia.*

**Option 3:** This option is based on the following assumptions: Public Sector Discount Rate of 22%,

Table 1. Investment Case Model

BENEFITS				Number of Pupils	12551			Average
				Average GMD		US\$ per		pupil
		Benefit 1		GMD		US\$		pupil
		(income						5.3103284
Income Transfer		transfer)		2665999.5	212.4133137	66649.99		2
		Benefit 2						
Healthier and		(Healthier	and					0.48422436
Longer Life		longer life)		243100	19.36897458	6077.5		5
Increase		Benefit	3					2.97426499
Productivity		(Enrolment)		1493200	118.9706	37330		9
		Benefit	4					9.98838658
		(attendance)		5014569.6	399.5354633	125364.2		3
		Benefit 5 (Drop						-
		outs)		-77350	-6.162855549	-1933.75		9
		Benefit	7					65.0125799
		(Cognition)		32638915.65	2600.503199	815972.9		7
				39069335.25	3112.846407	976733.4		7
		Benefit 6						2.69500836
Externalities		(Externality)		1353002	107.8003346	33825.05		6
Return on								0.76999826
Investment					30.79993048			2
TOTAL					3483.22896			87.080724
COSTS								
								4.66379551
Food		Cost 1 (Food)		2,341,411.90	186.5518206	58535.3		4
								31.0711456
Staff		Cost 2 (Staff)		263,997.00	1242.845825	6599.925		2
		Cost 3						
Transport and		(Transport and						0.02852760
Logistics		Logistics)		14,322.00	1,141,104,294	358.05		7
								167.781312
Capital		Cost 4 (Capital)		1,425,559.38	6711.252488	35638.98		2
		Cost 5 (Running						3865.86159
Running Cost		Cost)		2,995,111.00	154634.4638	74877.78		6
								0.04543960
Other		Cost 6 (Other)		22,812.50	1.817584256	570.3125		6
								14.0690259
TOTAL				7,063,213.78	562.7610374	176580.3		3
Average	Benefit-							6.18953468
Cost Ratio		6.19: 1			6.189534685			5

Table 2. Summary illustrating 6 Options on Benefit Cost Ratio Analysis for a Period of 15 Years

		Option 1	Option 2		Option 3		Option 4		Option 5		Option 6		
		(Public Sector Discount Rate and Average Inflation Rates for 2014)	(Public Sector Discount Rate (2002 - 2015) And Average Inflation Rate (1962 - 2015))		(Public Sector Discount Rate and Average Inflation Rates for 2014)		(Public Sector Discount Rate and Average Inflation Rates for 2014)		Discount Rate and Average Inflation Rates for 2014) using		(World Bank Discount Rate and Average Inflation Rates for 2014)		
									a	Drop	Out	Inflation	Rates
Appraisal	period	15	15		30	15	15					15	
Public	Sector												
Discount Rate		22%	19.21%		22%	22%	22%					5%	
Average Inflation													
Rate		5.94%	8.18%		5.94%	5.94%	5.94%					5.94%	
Capital Costs		0.00	0.00		0.00	1,425,559.00	0.00					0.00	
Whole Life Costs		197,601,860.84	241,553,452.57		632,653,231.98	199,027,419.84	197,601,860.84					197,601,860.84	
Cost-benefit													
analysis	of												
monetary	costs												
and benefits	at												
the Public Sector													
Discount Rate													
Present Value of													
Benefits		275,107,770.94	350,358,447.30		298,914,257.01	275,107,770.94	275,160,510.04					773,979,423.63	

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Present Value of							
Costs		44,715,165.11	56,929,149.17	48,580,938.40	44,715,165.11	44,715,165.11	125,746,595.15
Benefit	Cost						
Ratio		6.1524	6.1543	6.1529	6.1529	6.1536	6.1551
Net	Present						
Value		230,392,605.83	293,429,298.13	250,333,318.61	228,967,046.83	230,445,344.93	648,232,828.48

Average inflation Rate of 5.94%, dropout rate of 4% and appraisal period of 30 years. Results from option 3: *The net present value is GMD250,333,319 (USD6,258,332.97) and the benefit cost ratio is 6.1529. This shows that the SMP is a viable investment for The Gambia.*

**Option 4:** This option is based on the following assumptions: Public Sector Discount Rate of 22%, Average inflation Rate of 5.94%, dropout rate of 4%, appraisal period of 15 years and initial capital cost of GMD1, 425,559. Results from option 4: *The net present value is GMD228,967,047(USD 5,724,176.17) and the benefit cost ratio is 6.1529. This shows that the SMP is a viable investment for The Gambia.*

**Option 5:** This option is based on the following assumptions: Public Sector Discount Rate of 22%, Average inflation Rate of 5.94%, dropout rate of 1% and appraisal period of 15 years. Results from option 5: *The net present value is GMD230,445,345(USD5,761,133.62) and the benefit cost ratio is 6.1536. This shows that the SMP is a viable investment for The Gambia.*

**Option 6:** This option is based on the following assumptions: World Bank Discount Rate of 5%, Average inflation Rate of 5.94%, dropout rate of 4% and appraisal period of 15 years. Results from option 6: *The net present value is GMD648,232,828.48 (USD 648,232,828.48) and the benefit cost ratio is 6.1551. This shows that the SMP is a viable investment for The Gambia.*

### Conclusion and Policy Recommendation

This study amply manifested that the current school meals programme in The Gambia is beneficial given the various scenarios presented in the study. The empirical results illustrates that the benefits of the programme by far outweighs the programme's costs. Hence the programme is a beneficial social safety net for the deprived poor and vulnerable families of rural dwellings and some peri-urban dwelling families. The programme serves as an income savings for some families. Income is transferred through the following transmission mechanism, when a child eats at the school that child would not eat lunch at home hence reducing the money spent on meals on that child during schools days, thereby saving the household food ration.

The study estimates that the Benefit-Cost ratio given various assumptions ranges from 6.1524 to 6.1543. For the base academic year (2014/15) Benefit-Cost Ratio was 6.19:1. While the return on investment ranges from 58.57% to 60.49%, which demonstrates that the programme is a worthy investment. The net present values approximately ranges from D228,967,046.83 (USD 5,724,176.17) to D293,429,298.13 (USD 648,232,828.48) over the study period of 15 to 30 years. The facts generated from the study shows that all stakeholders of this ventures should endeavor to collectively support the programme so the future generations can also enjoy the benefits of the programme.

### We hereby proffer the following 10 recommendations:

- There is an urgent need for improved data/records management collection and storage at both the school and regional levels, if possible the Ministry of Basic and Secondary Education should use appropriate software for this purpose.
- All partners of the school meals programme should endeavor to coordinate and collaborate to ensure that programme becomes more effective and efficient for long-run sustainability for future generations.
- There is a need to fully involve the Department of Social Welfare of the Ministry of Health and Social Welfare in future policy development of the programme, since school meals have a social safety net dimension.
- Schools should complete use their monthly returns forms, indicating total enrolment, attendance/numbers of learners fed, food received/distributed/balances, community contributions in cash and/or kind and what the contributions were spent on, in an accurate and timely manner for accountability purposes.
- We recommend a tracer study, to assess and evaluate the performance and contributions of previous beneficiaries of the programme in The Gambia's labor market. The aforementioned study can be used to compute beneficiaries Return on Education (ROE) over time.
- To ensure sustainability for school meals programmes, given that there are quantified benefits, the government should continue to contribute to the school meals programme.
- Development of an implementation plan for the school meals programme should be prioritized and in addition, a National School Meals Programme Blueprint is essential to guide policy makers and donors, this initiative led by MoBSE/WFP.
- Basic training for School Managers on data entry
- MoBSE and WFP to engage the National Assembly on the importance and significance of SMP
- To harmonize all safety net programmes in The Gambia for synergy.

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