# Impact of the school facilities grant on access and learning achievements in the primary education sector in Uganda

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## Grantee Final Report

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## Note to readers

This final impact evaluation grantee report has been submitted in partial fulfilment of the requirements of grant UPW.01 awarded under the Uganda Policy Window. 3ie is making it available to the public in this final report version as it was received. The draft final report had considerable issues in terms of implementation fidelity, analysis and writing quality.

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The 3ie technical quality assurance team comprises Francis Rathinam, Radhika Menon, an anonymous external impact evaluation design expert reviewer and an anonymous external sector expert reviewer, with overall technical supervision by Marie Gaarder.

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It is our sincere hope that this study provides strong insights for strategic decision making and policy direction towards improving infrastructure in primary schools in Uganda.

## List of Abbreviations/Acronyms

| | |
|---|---|
| 3ie | International Initiative for Impact Evaluation |
| ACAO | Assistance Chief Administrative Officer |
| ATET | Average Treatment Effect on the Treated |
| CAO | Chief Administrative Officer |
| CFO | Chief Finance Officer |
| DFID | Department for International Development |
| DID | Difference –in-Difference |
| DEO | District Education Officer |
| DIS | District Inspector of Schools |
| DV | Dependent Variable |
| EAC | East African Community |
| EFA | Education For All |
| EMIS | Education Management Information System |
| Enrol | Enrolment |
| ESC | Education Service Commission |
| ESSP | Education Sector Strategic Plan |
| FGD | Focus Group Discussion |
| FY | Fiscal Year |
| G3 | Grade 3 |
| GoU | Government of Uganda |
| HLG | High Local Government |
| HoD | Head of Department |
| ICC | Inter-Correlation Coefficient |
| IE | Impact Evaluation |
| ITT | Intention to Treat |
| KII | Key Informant Interview |
| LG | Local Government |
| M&E | Monitoring and Evaluation |
| MDGs | Millennium Development Goals |
| MoES | Ministry of Education and Sports |
| MoFPED | Ministry of Finance, Planning and Economic Development |
| NAPE | National Assessment in Progress in Education |
| NCDC | National Curriculum Development Centre |
| NDP | National Development Plan |
| OPM | Office of the Prime Minister |
| PCR | Pupil Classroom Ratio |
| PEAP | Poverty Eradication Action Plan |
| PLE | Primary Living Examination |
| PRA | Participatory Rural Appraisal |
| PSM | Propensity Score Matching |
| PTR | Pupil Teacher Ratio |
| RCT | Randomized Control Trial |
| RDC | Resident District Commissioner |
| RPID | Randomized Phase in Design |
| SDG | Sustainable Development Goals |
| SEO | Senior Education Officer |

| | |
|---|---|
| SFG | School Facilities Grant |
| SMC | School Management Committee |
| THR | Teacher House Ratio |
| ToC | Theory of Change |
| UGX | Uganda Shillings |
| UN | United Nations |
| UNEB | Uganda National Examination Board |
| UPE | Universal Primary Education |
| UPW | Uganda Policy Window |
| US$ | United States Dollar |
| USE | Universal Secondary Education |

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# EXECUTIVE SUMMARY

The study explores the impact of the availability of school facilities (i.e. classrooms, teacher houses and sanitation facilities) on access (i.e., enrolment, attendance) and learning outcomes (i.e., test scores) in primary education in Uganda. It seeks to answer the following question: Do the schools that receive SFG register better learning outcomes than those that do not receive SFG? The evaluation is guided by the following research questions:

i) To what extent has the SFG programme improved learning outcomes (such as test scores)?
ii) Has SFG led to improved access to primary education?
iii) To what extent has SFG programme improved the pupil and teacher school attendance?

The evaluation theory of change provides the causal chain link through which SFG objectives translate into inputs and processes that ultimately lead to immediate and final outcomes. The desired immediate specific outcomes are: i) increased access to education, and ii) increased pupil attendance. The medium and long run impact are: i) reduced teacher absenteeism and improved teacher motivation to work as well as increased pupil academic performance.

The study employed randomized phase in design by randomly assigning surveyed schools into phase i (treatment) and phase ii (control). The selection of the sample schools was based on a multi-stage stratified random sampling design. In the first stage, 20 districts were selected representing the four regions of the country. At the second stage, 14 to 16 schools that the district education officers (DEOs) had listed to receive SFG in the next three years were part of the study sample. The selection was based on the dire need of school physical infrastructure, and pupil-to-classroom ratio of 55:1 and above. Approximately 301 needy schools from 20 districts were identified and surveyed. Within the study schools, a sufficient number of pupils (>20-24) both males and females from grade 3 (at baseline) and grade 5 (at endline) were also selected using random numbers generated by an App Random UX. At the baseline, 160 schools were randomly selected to receive the SFG grant in FY2016/17 and FY2017/18 (Phase I) and considered the remaining 141 schools that will receive the grant after 2019 (Phase II). This part of the study used primary data to establish the short-term impacts considering both the observable and unobservable characteristics. The randomization was participatory and transparent involving the evaluators and district/school officials. The study also employed Propensity Score Matching (PSM) technique on secondary data for 2014 and 2017 to determine the long-term effect of SFG support on access – measured by pupil-to-class ratio. The key results are presented hereunder.

Analysis of the secondary data reveals that the impact of the SFG intervention significantly raise pupil to classroom (PCR) by about 7 pupils relative to the control schools. The results from primary data reveal a positive and significant impact of SFG support on grade 1 enrolment on schools that received the intervention in FY2017/18. The treatment schools enrolled 24.21 more pupils relative to the control schools. Moreover, schools that received SFG intervention in FY2017/18 and FY2016/17 significantly increased enrolment by 24.10 and 23.77 pupils relative to the control schools, respectively. There were impacts in enrolments in lower grades; therefore, focusing on school infrastructure may be viewed as a ploy by school managers to lure parents to enrol their children with their schools in the early stages of the cycle. Moreover, the impact of SFG on grade 1 attendance reveal that attendance in the control schools was 73.6%, and schools that received intervention in FY2017/18 significantly (5%) increased attendance by 15.4% compared to the control group of schools. Likewise, a significant impact (at 1%) in increase of 20.9% in attendance was recorded in schools that received SFG one year earlier. Even at school level, the impacts of SFG support in FY2016/17 and FY2017/18 on attendance is 16.2% and 13.2%, and significant at 1%. Analysis

by gender reveals schools that received support in FY2016/17 and FY2017/18 significantly (at 1%) increased girls' attendance by 15.6% and 14.45%, respectively compared to the control schools. From the analysis, it is noted that the intervention has greatly influenced the attendance for the girl child at the lower grades. The effect of SFG support in FY2017/18 on teacher attendance was positive (=15.06%) but insignificant. The insignificance could be attributed to the fact that regression estimates were from pooled data that may have crowded out the grade level effects. Besides, some of the outcomes could be noticed in the medium to long term.

In terms of impacts on test scores, numeracy is a better-done subject for both the control and treatment schools than literacy, which is often a general trend in other national assessments year in year out. The impact arising from the SFG support reveals that schools that received the grant in FY2017/18 recorded significant increase in numeracy and literacy test scores by 1.28 and 1.05 percentage points more than the control schools. The small effects sizes could be attributed to the short time period of the study. The improved performances in the assessment examinations implies that schools could be equipped with adequate infrastructure to facilitate a conducive learning and teaching environment for the learners and educators.

The study demonstrates that adequate and quality school infrastructure remains a key component of UPE programme because it promotes access to education as well as learning in the short and medium term. However, SFG is conditional and restrictive in nature since it is usually spent on constructing new infrastructure and less or no funds are allocated for rehabilitation of the existing school structures. Indeed, it was found to be the case in some instances where renovation would be cost effective than building a new facility. Further, increasing the participation of parents and communities to support school construction is crucial because it can increase their voice on accountability through social audits. In the long run, what needs to be studied further is the question of the best appropriate and effective model of investment in school infrastructure.

## 1. Introduction

This study provides an understanding of the impact of school physical facilities on equitable access and learning outcomes in government-aided primary schools in Uganda. The importance of schools facilities on learning is drawn from the global agenda of increasing opportunities to learners by providing pre-requisites for them to enrol and remain in school. For instance, in 2000, at the World Education Forum in Dakar, Senegal, 164 governments, including Uganda, agreed on the Framework for Action, Education for All. Several countries launched an ambitious agenda to reach six wide-ranging education goals by 2015, particularly by increasing equitable access of the age-going children. The Millennium Development Goals[1] 2 and 3 also stressed the need for countries to achieve universal primary education and promote gender equality. Progress has been made on these international commitments, but we are not yet there. Between the years 2000 and 2015, almost half of the learners did not complete basic education (EFA report, 2015). The UN Charter on Human Rights development frameworks emphasize increased observance of human rights especially the girl child and the vulnerable. The SDGs are the latest global commitments by member states to refocus on creating an inducive and inclusive environment for learners to enrol, learn and matriculate. Following these global agenda, Uganda government set up school facilities grant (SFG) programme in 1998 as a component of UPE policy to support the construction of school facilities in the neediest[2] government aided schools. Since 2000, there has been many infrastructure developments in Ugandan primary schools, which have contributed to increased enrolment, attendance and overall learning outcomes. However, knowledge of the contribution of school facilities to learning is still lacking in developing countries like Uganda.

Another dimension of importance of undertaking this evaluation is the relevance of SFG, which is anchored on various national development frameworks, including the National Development Plan I – II and Vision 2040. The national development agenda prioritises school facilities for economic and social transformation. Arguably, school shelter especially better physical infrastructure is attractive to learners and parents, particularly new entrants. The already enrolled can stay and learn up to completion of the cycle. The Education Sector Strategic Plan (2016/17 – 2019/20) emphasizes school infrastructure development as a priority in promoting quality teaching and learning. Besides, information is also required on the links between school facilities and learning outcomes in the developing education sector like Uganda. It has been noted that the SFG intervention has been running to date for 18 years with no specific and comprehensive evaluation undertaken. This observation follows a recent process evaluation of the UPE programme (2016) undertaken by Winsor Consult Rwanda and Measure Africa (U) Limited. The key recommendations from the UPE process evaluation was the need to undertake a rigorous impact evaluation exercise to effectively establish whether or not the School Facilities Grant intervention met the objective for which it was designed.

From a scholarly perspective, overcrowded classrooms and schools have a consistently been linked to increased levels of aggression in students that ultimately affects their commitment to learning. On the other hand, classrooms with ample space are more conductive to proving appropriate learning environment for students and associated with increased students engagement and learning. Classrooms with adequate space facilitate the use of different teaching methods that are aligned to 21st Century skills (Duncanson, 2003; Lyons, 2002). It has also been a long-held assumption that physical condition of our schools can influence student achievement, which is evident in developing countries like Uganda. For instance, many pupils and teachers in Uganda study and/or live in squalid settlements or slums. Decent accommodation is still beyond the reach of most teachers (Akinmoladun and Oluwoye, 2007).

[1] Goal 2 - To achieve universal primary education; Goal 3 - To promote gender equality and empower women;
[2] A needy school is characterized to have pupil to classroom ratio (PCR) equal to or above 55:1 and sometimes it is found in hard-to-reach area

Elsewhere, Simons et al. (2010) found significant association between student absenteeism and school building conditions in upstate New York, and suggested future studies to confirm these findings and prioritize strategies for school condition improvements. Bullock (2007) established the significant relationship between high pass grades in English, Mathematics and Science and school building conditions. Other studies (Boese & Shaw, 2005; Crampton, 2009; Tanner, 2009) demonstrate the links between school infrastructure and learning. The overwhelming results of these studies show how counterproductive it would be to push for increased student learning and performance without providing school facilities that integrally support such an achievement. Indeed, the availability (and quality) of the school facilities affects pupil achievement through myriad factors such as pupil and teacher attendance, pupil retention, child and teacher health, and the quality of the curriculum (Gracye & Steve, 2011). Whereas the impact of school facilities on the above factors is evident, there is no evidence of research in Uganda that has established the link between schools facilities and access and pupil academic performance. Therefore, this study sought to provide an understanding of the causal impacts of physical infrastructure on learning and learning outcomes in Ugandan primary schools.

The study establishes the relationship between the availability of school facilities (such as classrooms, teachers' houses and sanitation facilities), and access (enrolment, attendance) and learning outcomes (test scores) in primary education. The study seeks to find out whether there is better learning outcomes in schools that receive SFG than those schools that do not receive SFG. The study outcomes could explain the effects attributed to the school infrastructure interventions since many other factors may equally have an impact. The study argues that the optimal classroom size is expected to trigger learning through improved learner and teacher interaction as compared to big classes that would be difficult to manage. This evaluation is timely because the MoES is in the process of reviewing her strategic plan (ESSP 2016/17 – 2019/20). Usually investments in school infrastructure are heavy, costly and time consuming; therefore, it is appropriate to use evidence to guide these policy decisions in the sector.

The unbiased assessment of the effects of SFG intervention on pupils' access and academic performance takes into account the quantitative effects of classroom size, pupil-classroom ratios, provision of school meals, NGO support to schools, school location, pupil-stance ratios, and teacher attendance as well as the overall learning environment. The evaluation used the randomized phase-in design where schools were randomly selected into Phase I (treatment) and Phase II (control) schools. The detailed description of the design is presented in the subsequent sections.

**Research Questions**

The impact evaluation is guided by the following research questions:

i) To what extent has the SFG programme improved learning outcomes (i.e. test scores)?
ii) Has SFG led to improved equitable access to primary education?
iii) To what extent has SFG programme improved the pupil and teacher school attendance?

The research questions are according to the pre-analysis plan (PAP) and the study attempts to address them as proposed at the evaluation design.

This evaluation is to demonstrate the impact (in quantitative terms) of physical infrastructure (newly constructed classrooms, teacher houses and sanitation facilities) on access and learning achievements. These impacts have been established at various levels. At the school level, the evaluation would demonstrate that SFG is significant in increasing access and learning. At the community level, the SFG

impact evaluation would generate data that would close the knowledge gap on the extent to which parents, community leadership and the school management committees participate in school governance and support the school activities. The SFG guidelines, inter alia, stipulate that the community is expected to participate in the day-to-day supervision of the construction and maintenance of the school Infrastructure. The findings of this impact evaluation could potentially inform UPE policy change. Overall, the evidence generated by the impact evaluation is meant to generate information that is critical for policy change at the regional (the East African Community) and international levels (Paris Declaration and Accra Agenda for Action, 2008).

The report structure is as follows: Introduction; SFG programme intervention, theory of change and research hypotheses; evaluation context; timeline; evaluation: design, methods and implementation; impact analysis and results of the key evaluation questions; discussion; implications for policy and practice. The next section describes the evaluation theory of change that depicts the path of SFG intervention to learning and learning outcomes.

## 2. SFG Programme Intervention, Theory of Change and Research hypotheses

### 2.1. Intervention and Context

The SFG programme was an intervention created under the Poverty Action Fund (PAF) in 1998 to assist the populated and neediest schools/communities acquire physical infrastructure. This was a response by the government to respond to the national and international (EFAs and MDGs) commitments of universal primary education. The SFG objectives were to: a) promote equitable access to primary education; b) build capacity within districts and the local communities, particularly for individuals involved in direct procurement of contractors/construction materials, as well as support supervision on sites; and c) alleviate poverty. The SFG programme had three components, namely construction of new classrooms, construction of VIP latrines and construction of teachers' houses.

The total national SFG grant was US$ 18 million per year between 1998 and 2006. It declined to US$ 5 million per year, after the introduction of Universal Secondary Education (USE) in 2007. On average, eligible schools receive US$15,000 - 20,000 to construct school facilities. In terms of flow of resources, the SFG is channelled through the Ministry of Education and Sports and districts/municipalities and utilized strictly in accordance with the Poverty Action Fund general guidelines for planning and operation of conditional grants issued by MoFPED. The SFG implementation is a multi-sectoral intervention, where MoES provides the implementation guidelines; Ministry of Works and Transport (MoWT) provides the relevant school designs and standards while MoFPED provides quarterly releases of the funds through MoES to the districts to implement the SFG programme. Consequently, the target was for every school to have a minimum of 55 pupils per class.

In terms of SFG management structure, the districts are the local administrative units with devolved mandate[3] to implement the SFG programme. At the district level, the Chief Administrative Officer (CAO) together with the district education officer (DEO), and approval from the district council decide on the school that should receive the grant, the amount to be received and its purpose as well as accounting for the funds. The decision to allocate the funds to a particular school is mainly guided by the level of infrastructure needs of the school. The funds are earmarked for definite purposes, that is, to construct new classroom blocks, teacher houses and/or VIP latrines. The CAO working with his/her technical team procure the contractors

[3] Derived from Local Government Act (1997), that empowers them to implement SFG programme

through a competitive bidding process. The process of bidding, award of contract and construction of the facilities usually takes 3-6 months depending on the nature of the construction. The facilities are constructed in the respective beneficiary schools and monitored by local government officials and school management committee. At the school level, the head teacher and the school management committee report quarterly to the DEO and CAO, the state of the school affairs and particularly the facility needs, the conditions of the existing structure. However, they have limited say on how the funds are managed; instead, they are supposed to monitor the construction of physical facilities. In addition, there are regular (quarterly) support supervision visits to all the primary schools, conducted by the DEO's office, and whose findings are submitted to the CAO and district council for remedial action. According to the SFG implementation guidelines, the role of the parents is not emphasized, instead the communities around the school are expected or supposed to not only supply construction materials and labour but also monitor the construction activities.

The introduction of USE in a way created a shift in government spending. The SFG declined to an average of US$ 4.5 million annually; currently, the funding is granted to just a few of the neediest schools, especially those with a high Pupil Classroom Ratio (PCR) of above 55:1. These needy schools continue to experience increase in enrolment and attendance. For instance, the average enrolment and attendance in P1 in the surveyed schools increased from 132.9 and 96 in the year 2010 to 142.4 and 132, respectively in 2018. For a long time, the districts that have not received SFG have inadequate classrooms to accommodate lower primary pupils (P1 – P3), leading to overcrowded classrooms. This has derailed not only construction of new infrastructure but there is also lack of maintenance of the existing ones, which has partly led to pupil and teacher absenteeism and, in extreme cases, pupil dropout. **Figure 1** and **2** indicate that schools have varying PCRs with Maracha and Mpigi districts having the highest and lowest PCR, respectively. The inadequacy of school facilities is also reflected in the stances as noted in Naminsidwa (PSR = 128) and Kalangala (PSR = 22), having wide differences in the toilet stance ratios.

**Figure 1: Pupil classroom ratio for the lowest 5 and highest 5 districts**

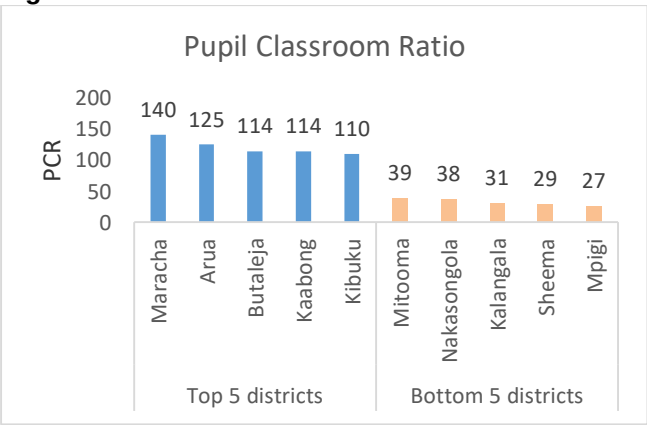
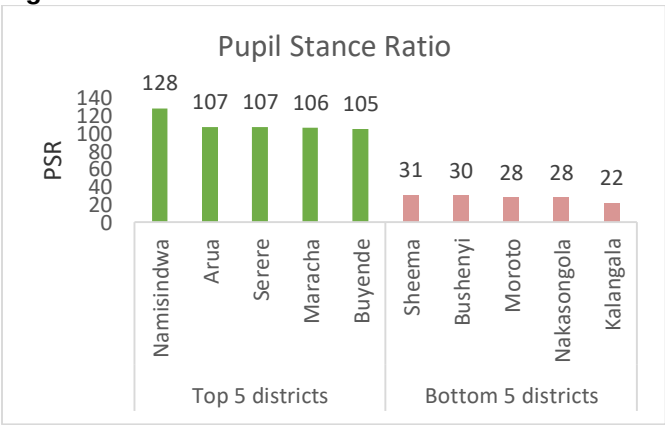



**Figure 2: Pupil stance ratio for the lowest 5 and highest 5 districts**




**Source**: Education Statistical Abstract (2018)

The process evaluation report (OPM, 2016) reveals that majority of the UPE schools have poor learning environments which have had an effect on pupil/teacher safety, pupil/teacher retention, pupil absenteeism and dropout, especially for girls. The poor state of school structures is partly attributed to inadequate funding which is granted to just few schools. The selective provision of SFG has caused imbalances in the teaching and learning environment in primary schools, which is likely to impact learning outcomes. Schools that continue to receive the grant are not only increasing on the stock of classrooms but also the condition of the

buildings is good. However, the midline study reported some challenges that affect implementation of the intervention. They include delays in the release of SFG funds by the government, high enrolments in some schools yet the SFG funds received are limited, political interference by some district leaders, low community ownership and participation in SFG projects, poor workmanship on part of the contractors, stealing/vandalizing of the construction materials community members among others.

## 2.2. Theory of Change

The SFG evaluation theory of change (**see Annex 1**) provides causal chain link that shows how SFG objectives translate into inputs and processes that ultimately lead to immediate and final learning outcomes (). The SFG inputs and activities are anticipated to translate into improved Pupil Classroom Ratio (PCR), Pupil to Latrine Stance Ratio (PSR), increased teacher and pupil attendance and ultimately improved and friendly school environment. If the school facilities are provided, it was assumed the teachers were enough to meet the increasing demand due to increase in enrolment. The District Education Office and SMC are able to monitor and support school activities such as learning; and ultimately that the schools record increased access, increased pupil class attendance, improved teacher availability in class and increased parents' attraction to schools. It was assumed that better test scores are realized if the pupils are available and ready to attend class, but also that teachers provide quality teaching and mentoring despite increased number of pupils.

In particular, the expected immediate benefits of SFG support to schools is the increased enrolment particularly in lower grades and improved learning environment arising from new construction sites equipped with relevant teaching and learning materials such desks and scholastic materials. We measure access through gross enrolment. In the medium term, we anticipate availability of teacher accommodation within school compound to improve pupil and teacher attendance arising from improved teacher supervision. In the end, the SFG support would trigger improved learning and learning outcomes arising from better school environment and committed instructors. The improved education outcomes and skills would increase the likelihood of employment, quality of life of the learners and ultimately improved incomes. Although, a longer period study would be necessary to achieve the full range of the desired specific outcomes, we used the RCT and PSM techniques on primary and Education Management Information System (EMIS) data to establish the short and medium term treatment effects. We anticipate that in the short to medium term, improved school infrastructure through classroom construction, sanitation facilities and teacher houses may lead to improved enrolment and class attendance in lower grades, class attendance and academic achievement. The study focused at primary school enrolment and by grade as well as cognitive skills to grade three pupils as the outcomes.

By design of the evaluation, the phase I (treatment) schools received financial support in FY2016/17 and FY2017/18, and the expected changes in outcomes would vary overtime. For instance, in the short term, the schools that received the grant are expected to record strong impact in enrolment in the lower entry grades, namely P1-P3, than the upper ones. According to the Education Sector Strategic Plan (2015/16 – 2019/20), the learners in lower grades are often attracted by the good-looking nature of school buildings as well as inside the classroom. It is often a school management practice and the desire of parents to allocate newly constructed facilities to lower grades learners to make them appreciate education and stay in school. However, this evaluation is not sure if the intervention would have strong impact on pupil life skills given the short period. The next section provides the research hypotheses that have been tested.

## 2.3. Research Hypotheses

The hypothesized causal pathways for the School Facilities Grant are indicated hereunder, which are all measurable in quantitative terms:

i) **Improved school facilities** lead to enhanced learning environment to attract the learners to enrol because of: a) handling pupils that study under a shelter, b) handling pupils that attend regularly. These significantly contribute to improved learning outcomes such as enrolment, pupil class attendance; test scores in numeracy and literacy that later enable the graduates to meaningfully participate in socio-economic activities that improve household economy and community livelihoods.

ii) **Improved pupil motivation to learn**: Improved school infrastructure, such as separate toilets for girls and boys, motivates girls to, among other things, attend school during menstrual periods and contribute to their learning outcomes. In addition, the ambiance that results from constructed classrooms further creates a conducive learning environment for pupils, which leads to improved concentration in class and better learning outcomes.

iii) **Improved teacher attendance and devotion to work** resulting from the new and renovated school infrastructure. While the construction of teachers' houses would generally have a link to the attraction of quality teachers, it also plays a critical role in increasing teachers' devotion to work and reducing teachers' absenteeism due to the reduced distances they have to walk to schools and back to their homes. Teachers' houses further reduce teachers' fatigue and the burden of school authorities to supervise teachers living far away from schools.

# 3. Evaluation Context

In order to ascertain the impact caused by the SFG intervention, it is necessary to understand the rationale for the surveyed districts and schools. The selection of the districts and schools was guided by the process evaluation conducted in 2016[4]. This evaluation found that some districts are in dire need of school physical infrastructure. Even the available facilities in most schools are dilapidated and the funding is inadequate. Consequently, the districts that are in dire need[5] and the schools that have never received SFG were selected for the study.

The evaluation chiefly answered the question, what would be the situation (in pupil access/attendance and learning outcomes) in case there was no SFG intervention (counterfactual), especially if one looks at the recipients of the grant? Therefore, in order to have an adequate assessment of the SFG intervention, the evaluation team had to identify quite similar comparative groups and track trends of different indicators on two groups of schools: treatment and control groups.

In undertaking the SFG impact evaluation, the research team first compiled the list of schools that had received SFG so far. Using EMIS data, the team selected schools that were in the category of schools using PSM method – further analysis on this latter method is presented in the subsequent section. This allowed the research team to analyse what impact each type of SFG had in the outcomes of interest such as access using Annual School Census data. SFG implementation modalities and the eligibility criteria of the SFG beneficiaries, which guide the evaluation process and methods. The SFG implementation was in a phased

[4] See UPE Process Evaluation Report (2016) by Office of the Prime Minister, Uganda
[5] Needy district is defined to have the average PCR equal to or above 55:1

manner and this informed the choice of the Randomized Phased in Design (RPID). The evaluation team collected data at baseline in 2016, midline in 2017 and endline in 2018 on key indicators at the pupil, school and community levels. The data was from the SFG receiving and non-receiving schools, and focused on the access and performance outcomes in progressive assessment and matriculation results.

With respect to the sampling and sample size determination, a sufficient number (i.e. >14-20) of needy schools was identified in each of the selected 20 districts. The selection of districts and schools was guided by the critical review and consideration of external validity items (Anne-Kirstine et al., 2014). All the districts and schools were eligible to participate in the evaluation; the SFG intervention was implemented in all the study districts and particularly the treatment schools; there were indifferences in key output and outcome indicators at the baseline and the study allowed comparison of baseline characteristics for both intervention and control group. Other specifications were: the treatment was delivered as intended and the monitoring of the progress was regular; and the SFG programme operates under clear policy framework and there was clear description of treatment alternatives or models (i.e. classroom, teacher houses and sanitation facilities). There was a clear literature search conducted to identify the knowledge gap and the evaluability of the SFG intervention. Clear sources of data and data management techniques were equally defined beforehand. Ultimately, the outcomes were measurable with clear valid choice of statistics. Other aspects are sufficient sample size particularly of pupils and schools as well as adequacy of the length of follow-up.

The districts were selected to represent the four regional blocks comprising the geographical setting of the country. A representative sample of needy schools was selected from the respective sub-counties and parishes. In conformity with the evaluation design requirement, a sufficient number of pupils (>20-24) both males and females from grade 3 (at baseline) and grade 5 (at endline) were selected from each sampled school. The details on the sample design and selection criteria are described in the subsequent section.

From the process evaluation findings in 2016, it was noted that most of the UPE policy objectives had been realized; yet there seem to be challenges regarding the quality of teaching and learning in primary schools. Currently, there is increasing demand to rethink the post-UPE era so that quality, internal efficiency and effectiveness measures can be undertaken holistically. We are very certain that the findings from this evaluation would feed into several government intervention programmes.

## 4. Timeline

The SFG impact evaluation was executed during the period 2015 - 2019 and in four broad stages; the details are presented in Table 1. Stage 1 was the process evaluation that was conducted in November - December 2015. It involved the analysis of the situation to understand the prevailing circumstances regarding teaching and learning in the larger sample of selected schools in Uganda. Stage 2 was the baseline survey, which was conducted in November 2016. It involved the following activities: design of tools and mapping of the eligible and ineligible SFG schools for impact; and field visits and data collection. It also entailed preparation of field reports processing; cleaning and analysis of field data; preparation of draft baseline report, as well as holding of consultative/ dissemination workshop to validate the study findings.

**Table 1: Timeline of the evaluation**

| Activity stage | Years / Quarters | 2015 | 2016 | | | | 2017 | | | | 2018 | | | | 2019 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| **Process Evaluation** | Design of the process evaluation, tools and collection of quantitative and qualitative data<br>Analysis, report writing and dissemination of the findings | | | | | | | | | | | | | | | | | |
| **SFG Baseline survey** | Defining the design of the evaluation<br>Developing the baseline survey tools<br>Collected data, analyzed and drafted baseline report<br>Conducted randomization exercise into phase I and phase II | | | | | | | | | | | | | | | | | |
| **SFG Midline survey** | Monitored the implementation of the SFG impact evaluation<br>Drafted midline reports and presented to stakeholders | | | | | | | | | | | X | | | | | | |
| **SFG Endline survey** | Reviewed tools for use in endline data collection<br>Corrected data, analyzed and drafted the report<br>Developed policy briefs<br>Presentation of final report to stakeholders<br>Project exit | | | | | | | | | | | | | | | | | |

Stage Three comprised the midline survey activities undertaken in January 2018, which involved among others, review of the midline concept note; sensitization and mobilization of stakeholders at national and local governments (LGs) to implement the SFG evaluation programme effectively; and collection, analysis and reporting on secondary data. Others were development of tools for qualitative study and presentation to evaluation sub-committee; conducting primary data collection; analysis and preparation of draft midline report; holding the consultative/dissemination seminars with stakeholders as well as presentation of final report.

The endline was the final stage of the SFG evaluation process conducted in September 2018. The key activities of this stage included review of the secondary information and design of tools; recruitment and training of research assistants and supervisors; and field visits and data collection. It also involved processing, cleaning and analysis of field data; preparation of draft evaluation report and policy briefs; consultative/dissemination workshops and meetings; presentation of final report to stakeholders and submission of final report and other deliverables.

## 5. Evaluation: Design, Methods and Implementation

### 5.1. Evaluation Design

This is a mixed method study because it invokes both quantitative and qualitative techniques. The quantitative methods are used to measure impact of school infrastructure on access, attendance and ultimately test scores. The qualitative study complements the quantitative findings to explain the 'how', and capture experiences and perceptions regarding the relevance of classrooms, toilet facilities and teacher accommodation to learning and learning outcomes. Quantitatively, the study employed Randomized Phase-in Design by randomly assigning surveyed schools into Phase I (treatment) and Phase II (control). The evaluation team did this immediately after the baseline survey.

### 5.1.1. Selection of the sample schools in treatment (phase I) and control (phase II)

The evaluation team selected and surveyed 301 needy schools from 20 districts across the four regions of the country at the baseline in the months of November 2016. The monitoring and midline activities took place from April 2017 to February 2018. After the baseline, the evaluation team working with the Office of the Prime Minister and local government education department officials randomly[6] selected 160 of the surveyed needy schools to receive the SFG grant in FY2016/17 and FY2017/18 and considered the remaining 141 to receive the grant after 2019 (Phase II). The OPM and MoES officials strongly supported the idea of district officials participating in the random selection of schools into the programme because the SFG implementation and monitoring is mostly done at that level. Besides, when randomization took place at the districts, it improved ownership of the process and outcomes of the intervention. In general, the OPM and MoES supported the evaluation team with all the documentations and helped in overall coordination of the randomization process.

The selection of the sample schools was based on a multi-stage stratified random sampling design. In the first stage, the selection of the districts was based on the regions. Twenty[7] districts that had significant number of schools that were receiving SFG and schools that were not receiving SFG were selected. After the districts were selected, 14 to 16 schools (except Kasese district which had only 13 schools) that the district education officer (DEO) had listed (some of them according to the district 3-year work plan) to receive SFG in the next three years were part of our sample. Other schools were selected from the needy ones but because of inadequate funding, they were not part of the 3-year work plan. The districts (i.e. 20/112) and schools selected were a representative sample of those that receive SFG. The schools were then randomly selected into Phase I (treatment) and Phase II (control) groups so that Phase I (i.e. 64/160=40% and 96/160=60% of the schools) received SFG during FY2016/17 and FY2017/18, respectively. The details of the schools from each district are presented in Table 1.

In each of the study schools, at baseline, 20-24 pupils[8] (boys and girls) were selected randomly from Grade 3 using random numbers generated by an App Random UX. Pupils selected were assessed using written standard literacy and numeracy tests under the invigilation of research assistants who had been trained at a central location. The tests were constructed by practicing teachers, and experts on assessment and primary school curriculum. The pupils selected at baseline were subsequently tested at endline survey.

**Table 2: Number of schools per district that received SFG in FY2016/17 - FY2017/18 and Control schools**

| District | Apac | Arua | Budaka | Bukedea | Busia | Ibanda | Kasese | Kayunga | Kiboga | Kisoro | Kitgum | Lira | Mayuge | Mityana | Nakasongola | Namisindwa/Manafwa | Ntoroko | Pader | Rubirizi | Wakiso | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FY2016/17** | 4 | 1 | 0 | 1 | 5 | 0 | 5 | 2 | 4 | 9 | 4 | 6 | 7 | 1 | 1 | 3 | 8 | 1 | 0 | 2 | **64** |
| **FY2017/18** | 3 | 7 | 8 | 7 | 4 | 8 | 3 | 7 | 4 | 1 | 2 | 4 | 1 | 6 | 7 | 4 | 1 | 6 | 8 | 5 | **96** |
| **Total - Treat** | 7 | 8 | 8 | 8 | 9 | 8 | 8 | 9 | 8 | 10 | 6 | 10 | 8 | 7 | 8 | 7 | 9 | 7 | 8 | 7 | **160** |
| **Control** | 7 | 8 | 8 | 8 | 7 | 8 | 5 | 7 | 7 | 6 | 9 | 6 | 6 | 7 | 8 | 7 | 6 | 7 | 8 | 7 | **141** |
| **Total** | **14** | **16** | **16** | **16** | **16** | **16** | **13** | **16** | **15** | **16** | **15** | **16** | **14** | **14** | **16** | **14** | **15** | **14** | **16** | **14** | **301** |

[6] Randomization was done scientifically using simple random sampling without replacement

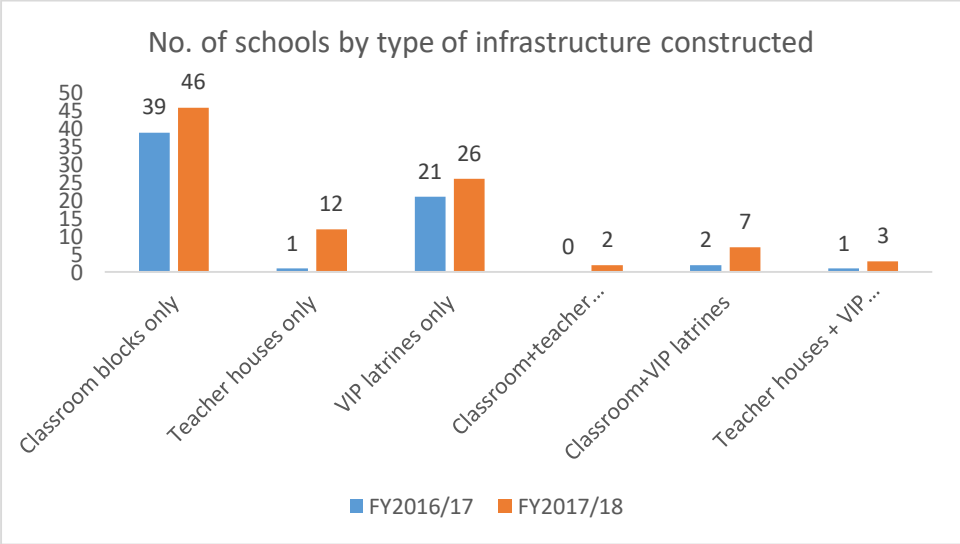
[7] In 2017, Manafwa district was split into two, thus creating an additional district called Namisindwa (i.e. from 20 to 21)

[8] The number of pupils varied in some schools depending on the class enrolment and attendance at the time of the survey. For example, some schools enrolled as low as 12 pupils, this was compensated by slight increase of survey participants in the other eligible school within same district, but that had similar conditions as the former school visited.

**sample**

The treatment schools received infrastructure in form of a single type or a combination of the two types of facilities. It is worth to note that 39 and 46 schools received classroom grants in FY2016/17 and FY2017/18. Classroom blocks are investment heavy and each three-classroom block would cost on average of US$20,000 including furniture. In fact, enrolment and actual learning is triggered by the availability and quality of classrooms. About 10% of schools received a combination of any type of facilities as presented in Figure 3 below.

**Figure 3: The number of schools that received the grant by type of facility**




Prior to selecting the schools for the study in 2016, a team was sent to all districts included in the study to meet with District Education Officers and seek their support in collecting the lists of schools that had received SFG so far. Procedurally, the randomization exercise in each district was conducted at the district headquarters with a team of evaluators, representative from OPM and MoES and the District Officials i.e. the CAO, DEO, DIS, Senior Education Officer, District Sports Officer, Principal Education Officer, Chairperson Education Community Affairs, the Speaker to District Council, District Community Development Officer, LCV Chairperson, etc. The evaluation team then introduced the randomization procedure in the presence of the participants who after agreeing to the procedure would go ahead to carry out the actual randomization exercise by selecting both Phase 1 and Phase II schools. The exercise enlisted different participants about the impact evaluation of school facilities grant on access and learning achievements in Uganda.

The contextual tool was administered to 12-20 pupils per school (of those that sat the test assessment). Given that the survey had to be conducted at the time when schools were nearing closure of term III, and amidst the large scope of work, the team decided to select a sample of 12-20 pupils. The remaining pupils were interviewed during the first term of 2017.

### 5.1.2. Attrition and Balance

By the time of the endline, all the districts and schools had complied with the randomization; save for pupils, some of whom dropped[9] out while others had been transferred to different schools. The pupil attrition was on average 3% per year. A pupil follow-up exercise revealed that most learners who had dropped out were re-admitted to schools outside the study sample. The pupil attrition was tested on the data for both the control and treated schools, and it was found that there was equilibrium between the two groups at the baseline and endline (**see Annex 11**), and besides, robustness check of results was done with and without including them. In terms of balance, the average enrolment in treatment schools was 293 and 296 for boys and girls, respectively, but statistically indifferent (i.e. P-value = 0.785 & =0.652) from control schools (Table 2). Similar patterns are observed in both numeracy and literacy tests.

**Table 3: Balance test on numeracy and literacy scores, and enrolment**

| | Test scores | | Enrolment | | Pupil-to-classroom ratio | Pupil-to-teacher ratio |
|---|---|---|---|---|---|---|
| **Group/Category** | **Numeracy** | **Literacy** | **Boys** | **Girls** | | |
| Control | 43.9 | 26.7 | 288 | 287 | 120.4 | 54.8 |
| Treatment | 43.8 | 25.9 | 293 | 296 | 138.9 | 57.2 |
| Difference | -0.12 | -0.77 | -5.61 | -9.18 | -18.53 | -2.41 |
| (p-value) | (0.791) | (0.05) | (0.785) | (0.652) | (0.241) | (0.439) |

Throughout the evaluation process, the evaluators conducted on spot checks at schools to monitor implementation of the intervention, made call backs to communities, reviewed SFG district work plans/reports to ensure that the evaluation design, critical assumptions and other planned activities were adhered to, particularly those concerned with random selection of schools for both the treatment and control groups. The M&E framework was already developed to track progress at the national, district and school/ community levels, so the midline and endline surveys envisaged providing data to update the framework. The test items for the baseline and endline surveys were developed by Uganda National Examination Board (UNEB) and were similar to those in National Assessment of Progress in Education (NAPE).

### 5.1.3. Power and sample size calculation

The power calculations of our evaluation largely followed Djimeu and Houndolo (2016). We adopted a two-stage sampling process. In the first stage, 301 clusters of primary schools were randomly assigned in the treatment and control groups. In the second stage, students were selected from each grade. We assumed the significance level to be 5% and the desired power of the test to be 0.8. We also estimated the intra-class correlation (ICC) and population average "within" standard deviation of percentage test scores to calculate Minimum Detectable Effect (MDE). We used statistics from the National Assessment for Progress in Education (NAPE) conducted for Grade 3 and 6 students in 2014 to calculate these estimates. The within-school correlation for numeracy and literacy test scores are 0.43 for numeracy and 0.46 for literacy, respectively; we used the higher score. Similarly, the standard deviation of test score is 20.1. For the power of the test to be 0.8, the MDE for the two-tailed study is 6.5 percentage points. This resulted into the minimum pupil sample size of 6000 determined beforehand, of which 50% was treatment and the other half was in the control schools. Further details on sample size calculations are included in Annex 6.

### 5.1.4. Estimation techniques and rationale for the use of mixed methods

[9] Some of the reasons for pupil drop out were: rural to urban migration of the parents; failure to pay for school requirements such as uniform and mid-day meals; family shocks such as death of a parent/guardian; and regularly involving pupils in home socio-economic activities during school days.

Whereas the primary data analysis allows us to estimate the short-term impact of the SFG on access in a short term and in a comprehensive manner, the analysis using secondary data provided insights on the medium to longer-term impact of SFG. The research team analysed the existing data from EMIS to establish the impact of SFG on access using Propensity Score Matching (PSM) technique. The PCR was used as the outcome variable and the potential variables used for matching included pupil-to-teacher ratio, proportion of female teachers to total enrolment, teacher to house ratio, proportion of female repeaters to total.

As explained earlier, the qualitative study was developed to complement the quantitative particularly in attempting to explain the 'how'; the respondents' experiences and perceptions regarding the relevance of SFG to learning and learning outcomes. By design, the key informants at each school/community level (i.e. the head teacher, class teachers, SMC chairperson and some parents) were selected purposively. There was an FGD conducted at each of the school community level. The key informants selected at the district level were the Chief Administrative Officer (CAO), District Education Officer (DEO), District Inspector of School (DIS), the head of teacher association and Resident District Commissioner (RDC), and political leaders. The number of key informants required was determined by taking into consideration the cost and operational limitations, and the efficiency of the design. **Annex 3** presents a list of districts visited at the baseline and endline, number of needy schools visited per district, number of pupils tested and interviewed contextually and other categories of the key informants. From the selected sample, there was 100% and 97% response rate for schools and pupils, respectively. **Section 6** provides clear identification and estimation strategy, and including the matching and estimation methods.

### 5.2. Data and Methods of Data Collection

#### 5.2.1. Data and Data Sources

Both primary and secondary data as well as quantitative and qualitative data were collected as guided by the estimation techniques employed in the study. The primary data was obtained from schools, pupils, teachers as well as school management committee. We administered a specific tool to each of these respondents. The school level questionnaire was used to collect data on enrolment, pupil/teacher attendance, staffing, infrastructure, and whether a school provides mid-day meals or not. It also elicited data on school location whether a school has ever received support from NGO or not among other data. Key information collection from the teacher and SMC questionnaires was on their demographic, experiences and perceptions on the relevance of school infrastructure on learning. Pupil questionnaire contained data on demographic characteristics, pupil living conditions at home and school, and their experiences on the learning and learning environment. Besides, the numeracy and literacy tests administered to the pupils was another key primary source of data. Other primary data and sources were the qualitative information gathered from key informants and FGDs explained in the previous section. EMIS and official reports from MoES and districts were the other sources of data on school enrolment, infrastructure, and school facilities funds.

#### 5.2.2. Development of Survey Tools

The SFG evaluation objectives and indicators were used to generate questions for the school and pupils questionnaires, the key informant interview guide and the FGD question guide. The tools were later discussed with the MoES and OPM for comments/input and finally approval. The electronic version of the tools were developed and uploaded on the tablets. A pre-test was conducted in Kampala and Wakiso districts but in a different sub-county that seem to have similar socio-economic conditions, and adjustments were made based on the findings from the pre-test.

### 5.2.3. Training of Enumerators and Supervisors, and Pilot Study

An instruction manual for the field operations was developed for the field teams to guide the enumerators and supervisors to ensure quality. The evaluation team recruited 30 graduate and undergraduates who come from the districts where the data collection was conducted. Two-day training was conducted for supervisors followed by a four-day training for enumerators. This included a one-day classroom training on the tools, Pen and Paper Interviews (PAPI); a two-day training on Computer Aided Interviews (CAI); and two-day field exercise on CAI with enumerators interviewing respondents and conducting interviews in the local languages. The training ended with a feedback session for one day.

### 5.2.4. Data Collection

Data collection tools/instruments were developed in line with the defined respondents and sampling plans. The tools were developed for each category of stakeholders to be interviewed or consulted – pupils, teachers and head teachers, SMCs, DEOs, CAOs, District Planner and Chief Finance Officers (CFOs).

***Collection of primary data*:** As a follow-up from the baseline and midline surveys, numeracy and literacy tests were administered to 14-26 pupils of Grade 5 in each of the 301 schools from 20 districts in the country. In addition, the contextual tool was administered to pupils, class teachers and school head teachers in August - September 2018. Further details on the steps for primary data collection are presented in Annex 2.

***Collection of secondary data***: The evaluation team collected and analysed annual school census data from 2006 to 2017 using Propensity Score Matching (PSM) Technique. The team matched the schools that received SFG with those that did not receive the grants to estimate the impact of SFG beginning from 2007. Data was collected from MoES, Office of the Prime Minister, Ministry of Finance and from District local governments. Annex 4 provides a summary of the key indicators used in the two kinds of estimation techniques, Propensity Score Matching (PSM) and Randomized Phase in Design (RPID)

***Data collection challenges:*** During the study particularly at data collection stage, some challenges were encountered that included but not limited to: i) long distances travelled by enumerators to access the schools given the terrain of the districts of the study, where vehicles and motorcycles could not reach, and this had an impact on their time on task that caused the data collection exercise to be extended by 5-7 more days; ii) poor network connection hindered communication between the evaluation team and school management. This led to increased budget and delays in data collection as the teams could at times visit the school twice or more times; iii) transfer of teachers which made interviews in some schools difficult because the team could hardly find some of the eligible respondents to the study, particularly subject teachers – instead class teachers were interviewed where necessary; iv) at times it rained heavily which made some rural roads impassable, which forced research teams to use motorcycles which were expensive and risky to lives; and v) power outage was rampant in most rural areas and yet the tablets had to be charged for the next day‘s work.

## 5.3. Data Entry, Cleaning and Analysis

Data entry was done in various ways. Primary data from the interviews was captured directly on the tablets and entries, all monitored on the central server by the IT specialist. To ensure reliability and truthfulness of the entries, field supervisors conducted random checks on the field data collectors and in some instances

conducted re-interviews. This data entry method minimized several errors particularly related to recall, memory lapse and other direct entry errors. Secondary data was captured using the designed templates depending on the data type and level of detail required by the consulting team. School-level data regarding the pupil enrolments, school facilities, teachers, dropouts, repeaters, receipt of SFG grants, etc., were collected. At district level, information obtained was mainly related to the grants received from MoES and the distribution of the funds across the schools by year.

Data cleaning and analysis involved the team looking at both the qualitative and quantitative data and analysed responses fit-to-purpose in relation to the evaluation terms of reference. This stage included data analysis and content analysis, and feeding the data into the evaluation structure of the report and drafting of the first draft. The difference-in-difference (DID) technique was employed, together with the various robustness checks. Our dependent variables were changes in enrolments by gender and by grade, student test scores in numeracy and literacy by gender, and pupil and teacher attendance. In addition to whether the pupil was in the treatment or control group, the explanatory variables included pupil's gender and age, and whether the pupil was living with both parents or not. We also controlled for whether the school had received funds from NGOs for construction of school facilities. The regression also controlled for school-level variables such as school size, school location (rural-urban), school co-educational type, and whether the school provided mid-day meals or not.

Impact of interventions may be heterogeneous on girls, marginalized ethnic groups, and academically weaker students. To capture heterogeneity, just like the baseline, during the endline data collection, the evaluation team collected observable characteristics of treated and non-treated individuals and school-specific characteristics, which were taken into account to estimate impact of treatments on different sub-groups.

### 5.4. Measurement of Learning Outcomes

Measurement of literacy and numeracy is justified by the SFG evaluation theory of change that focuses on enhancing the generation of evidence on the impact of SFG on access and learning achievements for primary school pupils in Uganda. Pupils were tested in both numeracy and literacy. The competencies tested in literacy included "associating pictures to their written names", "completing words with missing letters", "describing activities in pictures", "reading comprehension", and "cloze tests". The numeracy competencies tested included "counting in ones or tens", "associating number symbols to their word names", "identifying place value", "statistics that involved interpreting pictograms", "completing sequences", "recognizing fractions", and "measures". The overall achievement level in each subject area was in terms of mean score and the percentage of pupils reaching the desired level of proficiency. Proportion proficient, here after, represents the percentage of pupils who obtained the minimally acceptable score that corresponds to what is the minimally expected level of mastery of a pupil. The overall average of the modified Ang-off cut-off estimated by NAPE for literacy and numeracy was 23% and 50%, respectively. Therefore, a pupil who scores 23% and above in literacy or 50% and above in numeracy is considered proficient in the respective subject areas. The **Annex 2** provides details on the test item writing or development, setting score cut-offs, test scoring as well as administration.

### 5.5. Quality Control and Ethical Considerations for the Study

Throughout the data collection, the evaluators observed some quality checks. For instance, interviewers were accompanied by the supervisors to ensure that the identification and selection of all the respondents and the interviews are being conducted according to protocol. The data management team provided all the

necessary checks on the interviews conducted immediately after completion of interview with respondent. At least, the checks were done to ensure completeness and accuracy. Back-checks were conducted via phone calls to confirm that the interview took place as per protocol. During the call, the back-checkers randomly picked questions on the questionnaire to confirm the responses. Research team also reviewed the daily updates template to assess fieldwork progress. Moreover, the field teams trained on the importance of the details and the interviewer and supervisor reviewed contact information on a daily basis. Incomplete entries were rejected until they were complete.

### 5.5.1. Validity analysis

Kothari (2004) defines validity as the indication of the degree to which an instrument measures what it is supposed to measure. Findings of a study are considered valid if the measurement instruments are reliable. Validity itself is the measure of trustworthiness or strength of the findings or conclusion. Therefore, the evaluators focused on arrangements or approaches that increased our confidence on the originality and truthfulness of the results. For instance, contamination was one of the primary concerns for internal validity in randomized experiments. To minimize possibility of 'mistakenly' treating some of the schools from the control group (Phase II), the evaluation team assigned a member in our research team to work closely with MoES and the respective local governments to keep track of the implementation process.

As explained in **Annex 2** and **Annex 13** the sets of questionnaires, namely questionnaire for the households, and qualitative tools - KII guide and FGD guide that were used to collect data, were created to ensure they have content validity by allowing adequate coverage of the objectives of the study. In addition, the evaluation team also ensured the existence of construct validity by creating the research instruments, which have a sound base in theory and conforming to the theoretical body of knowledge that showed a relationship among the variables of other empirically tested constructs in similar studies.

### 5.5.2. Reliability analysis

Reliability is the extent to which the applied data collection techniques provide consistent findings (Saunders *et al.,* 2009). The reliability scale ran first for each individual variable and for all variables in STATA version 12. The reliability (internal consistency) of the study measured using Cronbach's Alpha (α) approach (Cronbach, 1951)[10]. Miller *et al.* (2003) stated that for better reliability, the Cronbach's alpha should at least be 0.50 but a higher score reflects better reliability. Therefore, all the constructs measures that had α above 0.5 provided an indication that there was reliability and internal consistency since α is within the recommended and acceptable range above the minimum of 0.5.

## 6. Impact analysis and results of the key evaluation questions

### 6.1. Identification and Estimations

The evaluation used the existing data in EMIS to establish the impact of SFG using Propensity Score Matching (PSM)[11]. The schools that had received SFG so far, for the period 2014/15 to 2016/17 were identified and compared with those schools that were similar in characteristics (based on both output and input variables prior to receiving SFG). We employed the probit/logit model for the propensity of observations

[10] Cronbach's alpha is the most common measure of internal consistency ("reliability"). It is most commonly used when you have multiple Likert questions in a survey/questionnaire that form a scale, and you wish to determine if the scale is reliable.
[11] Since the PSM method has a drawback because selection is done on observables, the evaluation complemented secondary data analysis by collecting primary data at the endline phase to provide a more comprehensive view of the SFG programme.

that were assigned into the treated group. The propensity score model with Treatment D (=0/1) as the dependent variable and 'x' explanatory variables are as follows.

$$p(x) = prob(D = 1/x) = E(D/x)$$

The treatment effect on the treated (ATET) is estimated using the following basic equation:

$$ATET = E(\Delta / p(x), D = 1) = E(y_1 / p(x), D = 1) - E(y_0 / p(x), D = 0)$$

The study employed several matching techniques (i.e. nearest neighbour, Radius, Kernel and Stratification) where each treated observation 'i' was matched with several control observations, with weights inversely proportional to the distance between the treated and the control observations. A t-test between the outcomes (y) for the treated and control groups was also performed. The variables used for matching included enrolment (girls and boys), number of teachers, and repeaters.

## 6.2. Impact Analysis Results using Propensity Score Matching

This section presents the results on Propensity Score Matching to understand the medium term treatment effect of SFG on access. Access in this case is measured by the pupil-classroom ratio (PCR) at school level. One of the key objectives of SFG was to reduce on the overcrowding by accommodating atmost 55 pupils per class. From the descriptive analysis, out of 2,625 schools analysed, 338 (12.8%) schools received SFG in FY 2014/15. Therefore, we found matches for the treated schools with the untreated and then compare their outcomes. Note that the matching is one to many, and not all the control observations can be used as matches for all the treated schools. Some of the variables used as control are pupil-teacher ratio (PTR), proportion of female pupils, teacher-house ratio for permanent houses, and proportion of female repeaters to total number of repeaters. The descriptive statistics for these control variables is summarized in the Annex 8.

The initial step involved estimating a regression with a dummy variable for treatment followed by another regression with a dummy variable for treatment controlling for the other covariates. The results from Table 4 reveal that the marginal change in PCR attributed to the treatment only and/or treatment controlling for covariates is positive but insignificant. This implies that schools that received SFG support increased their PCR by 2 and 5.4 units over and above the control mean of 81.8 and 55, respectively. Among the control schools, the attributions of PTR and teacher-house ratio (THR) on PCR are positive and significant (at 1%), implying that adjustments in PTR and THR upwards, say by 1 unit each, raises the PCR by 0.360 and 1.46 units and vice versa. Controlling for other covariates increases the effect size on the PCR, but insignificantly.

**Table 4: Impact on PCR from the treatment and with covariates**

| | Regression estimates | | Pscores estimates |
|---|---|---|---|
| **Dependent Variable (DV) – PCR (1)** | **Treatment only (2)** | **Treatment + covariates (3)** | **DV-Treatment (0/1) (4)** |
| Treatment | 2.12<br>[4.183] | 5.404<br>[5.436] | n.a. |
| Pupil Teacher Ratio (PTR) | | 0.360***<br>[0.029] | 0.003<br>[0.007] |
| Female proportion to total | | -17.58<br>[36.642] | -0.175<br>[1.027] |
| Teacher to house ratio | | 1.46***<br>[0.389] | 0.008<br>[0.009] |

| | | | |
|---|---|---|---|
| Female proportion to total repeaters | | 6.41 [18.84] | 0.246 [0.509] |
| Control means | 81.85*** [1.491] | 55.01*** [17.09] | -1.203** [0.479] |
| N | 2,558 | 998 | 1,009 |
| $R^2$ | 0.001 | 0.139 | 0.003 |

*** P<0.01, ** P<0.05, * P<0.10

The probit estimation reports the propensity scores (p-scores) with their standard errors. The dependent variable is whether the school participated in the SFG programme or received SFG support. Results reveal that schools with high PTR, high ratios of teachers to house for accommodation and high in the proportion of repeaters to total repeaters are more likely to receive the SFG intervention, while the reverse holds for schools with high female proportions to total enrolment. SFG allocations at districts were partly influenced by the level of need of teacher accommodation, and classrooms to accommodate the lower grade learners, who are often the majority in primary schools.

The diagnosis of the algorithm to pscore estimation reveals that the common support option was selected with 0.1165 and 0.2014 as lower and upper inferior of block of pscores/bounds, respectively. The balancing property (similar characteristics between treated and control observations) is balanced. The lower inferior block comprises 137 treatment and 856 control schools, while the upper block contains just 1 treatment and no control schools. The evaluation also estimated the treatment effect on the treated (ATT) using matching methods such as nearest neighbour matching, Kernel matching and stratification matching techniques. The results are presented in Table 5.

**Table 5: Results of the Treatment Effect on the Treated using bootstrapped standard errors**

| Estimation Method | Number of treated schools | Number of controlled schools | ATT |
|---|---|---|---|
| Nearest neighbour matching | 138 | 124 | 3.077 [6.674] |
| Kernel Matching | 138 | 856 | 6.743* [4.077] |
| Stratification Matching | 137 | 857 | 6.271*[3247] |

*** P<0.01, ** P<0.05, * P<0.10

Results of the treatment effect reveal that after matching the treated and control schools, the effects of the SFG intervention raise PCR by about seven pupils. For instance, Kernel matching shows that schools receiving SFG increase their PCR by 6.743 more than the control schools. The same argument can be made for stratification matching results, where PCR raises by 6.27 pupils per class more than the control schools. Results from the nearest neighbour matching reveal an increase in PCR of 3.077, though insignificant. However, a potential draw back with the PSM is that the selection is done on observables. It is possible that there were certain unobservable characteristics (i.e. influential local leaders with access to officials in the district) in those schools that made them more likely to be selected to receive the grants. As a result, it is very difficult to ascertain, a priori, whether there is an upward or downward bias to the estimates we get on SFG impact. The next section presents estimates of the treatment effects using primary data.

## 6.3. Treatment Effects on Access by gender and by grade

The evaluation study employed difference-in-difference (DID) technique to estimate the short term impact of SFG using Intention to Treat (ITT) effects to compare changes in access and learning outcomes in treated

and control schools. The estimates are generated with clustered robust standard errors. The DID was used in this case to cater for fixed effects at the baseline. The study also applied t-test difference in means of covariates between the control and treated groups.

The standard difference in difference specification is:

$$Y_{ijt} = \phi_t + \phi_j P + \delta_t T + \delta_j P*T + X'_{ijt}\beta + u_{ijt}$$

Where $Y_{ijt}$ is the schooling outcome (= enrolment, attendance and academic performance) for pupil i in school j and cohort period t. $\Phi_t$ is the mean outcome for the control group on the baseline, and $\Phi_j$ is a locality fixed-effect equal to 1 for treatment and 0 otherwise (i.e. P=0/1). $\delta_t$ is the average mean outcome between the treated (T=1) and control (T=0); $\delta_j$ is the measure of the impact attributable to SFG intervention, that is equal to 1 for schools that received SFG in FY2016/17 and FY2017/18, and 0 for schools that will receive SFG after 2019. $X'_{ijt}$ is a vector of school and pupil covariates including pupil sex, school location, whether the school provides meals, whether the school ever received NGO. Given that previous analysis identified different impacts by gender (Atanasio and Espinosa, 2010), we estimate separate regressions for girls and boys.

This section presents results on impact analysis at three levels: impacts on access (i.e. enrolment by gender and by grade), attendance by gender and by grade, and on test scores by subject of assessment. Results of the descriptive statistics reveal that enrolments are usually high in the entry grade (i.e. P1 with mean enrolment of 135 pupils) but with wider variations as reported by standard deviation (=75.2) (see Table 6). The enrolments tend to decline with a raise in the grade level. Observing the mean enrolments reveals that about one third of the children enrolled in Grade[12] 1 can complete Grade 7. The wide variations noted in Grade 1 grow even wider for enrolments in Grades 5, 6 and 7. There are about 107 pupils per class as observed from the median value of PCR. There are about 52 pupils for every teacher in primary education in Uganda, which is still high and above the recommended ratio of 40:1.

**Table 6: Descriptive statistics**

| Variable | Observ. | Mean | Std. Dev. | Median |
|---|---|---|---|---|
| Enrolment in P1 | 600 | 135.4 | 75.2 | 123.5 |
| Enrolment in P2 | 600 | 96.1 | 58.4 | 85.0 |
| Enrolment in P3 | 600 | 94.5 | 59.5 | 78.5 |
| Enrolment in P4 | 600 | 93.9 | 66.2 | 73.0 |
| Enrolment in P5 | 592 | 82.0 | 63.2 | 64.0 |
| Enrolment in P6 | 584 | 64.6 | 45.9 | 54.0 |
| Enrolment in P7 | 560 | 41.1 | 26.6 | 36.0 |
| PCR | 471 | 154.6 | 176.7 | 107.5 |
| PTR | 593 | 58.4 | 40.5 | 52.2 |

***The marginal mean differences in enrolment of the treated relative to the control schools***

The results in Table 7 present the marginal increases in mean enrolment attributed to SFG support in FY2016/17 and FY2017/18 in the lower grades (i.e. P1-Boys to P4-Girls). For instance, for P1-Boys (P1-B), the mean enrolment for the control schools was 64 pupils and schools that received SFG in FY2017/18 significantly (at 1%) increased enrolment by 9.67 relative to the control group. The intervention is seen to have caused more increases that are significant during FY2017/18. The greatest increase was noted in P3-

[12] Grade and P are used interchangeably but mean the same thing. For instance P1 is synonymous with Grade 1

G where the intervention in FY2017/18 significantly (1%) increased enrolment by 11.98 above the control schools. Moreover, P3-G registered the highest significant increase (at 1%) in its enrolments of 11.91 in FY2016/17 relative to the control schools.

**Table 7: Marginal differences in mean enrolments by grade and by gender**

| | Grades and by Gender | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **P1-B** | **P1-G** | **P2-B** | **P2-G** | **P3-B** | **P3-G** | **P1-P7-B** | **P1-P7-G** |
| Treated 1 - 2016/17 (0/1) | 5.88 [4.064] | 6.00 [4.134] | 6.54** [3.295] | 8.06*** [3.085] | 2.67 [3.356] | 11.91*** [3.245] | 16.81 [19.16] | 37.12** [17.276] |
| Treated 2 - 2017/18 (0/1) | 9.67*** [3.563] | 9.13** [3.636] | 6.57** [2.888] | 7.18*** [2.713] | 3.697 [2.942] | 11.98*** [2.854] | 20.65 [16.79] | 29.84* [16.89] |
| Control means | 64.14*** [2.273] | 63.00*** [2.313] | 44.6*** [1.843] | 44.29*** [1.726] | 43.83*** [1.877] | 43.09*** [1.815] | 288.54*** [10.719] | 286.87*** [10.78] |
| N | 602 | 600 | 602 | 600 | 602 | 600 | 602 | 602 |
| $R^2$ | 0.012 | 0.011 | 0.011 | 0.016 | 0.003 | 0.037 | 0.003 | 0.008 |

*** P<0.01, ** P<0.05, * P<0.10

The mean enrolment in P2-B for the control schools was 45 pupils and schools that received SFG in FY2016/17 significantly increased (5%) enrolment by 6.54 above the control group. The same observation is noted in FY2017/18 where enrolment increased by 6.57 relative to the control schools. In P3-G where the mean enrolment for the control schools was 43 pupils, schools that received the SFG intervention in FY2016/17 and FY2017/18 had the enrolment significantly increased (1%) by 11.91 and 11.98 above the control schools. This demonstrates that the SFG intervention recorded potential impacts at the lower than the upper grades.

The results in Table 8 present the marginal increases in enrolment attributed to SFG support in FY2016/17 and FY2017/18 for streams P5-B to P7-G. For streams P1 to P7-G, the mean enrolment for the control schools was 287 pupils, and schools that received the intervention in FY2016/17 and FY2017/18 significantly increased enrolment by 37.12 (5%) and 29.84 (10%), more than the control schools.

**Table 8: Marginal differences in mean enrolments by grade and by gender**

| | Grades and by Gender | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **P5-B** | **P5-G** | **P6-B** | **P6-G** | **P7-B** | **P7-G** | **P1-P7-B** | **P1-P7-G** |
| Treated 1 - 2016/17 (0/1) | 1.92 [3.119] | 5.80 [4.227] | 1.24 [2.499] | 2.705 [2.611] | -0.83 [1.500] | 0.45 [1.650] | 16.81 [19.16] | 37.12** [17.276] |
| Treated 2 - 2017/18 (0/1) | 1.01 [2.742] | 1.13 [3.728] | -0.30 [2.190] | 2.49 [2.295] | -1.36 [1.299] | 0.385 [1.434] | 20.65 [16.79] | 29.84* [16.89] |
| Control means | 39.47*** [1.749] | 40.52*** [2.370] | 31.54*** [1.393] | 31.56*** [1.453] | 21.23*** [0.827] | 20.31*** [0.910] | 288.54*** [10.719] | 286.87*** [10.78] |
| N | 594 | 592 | 586 | 585 | 562 | 560 | 602 | 602 |
| $R^2$ | 0.001 | 0.003 | 0.001 | 0.003 | 0.002 | 0.0002 | 0.003 | 0.008 |

*** P<0.01, ** P<0.05, * P<0.10

***The treatment effect of SFG on Enrolment***

The results of the treatment effect of SFG on enrolment are presented in Table 9. The analysis presents the impacts on the treated and effects after controlling for myriad factors such as school location, whether the

school provides midday meals or not, and whether the schools ever received NGO support to construct the school infrastructure or not. Results in column 1 show a positive and significant impact of 28.7 pupils (10%) of SFG intervention on enrolment in FY2016/17 compared to the control schools. Likewise, a significant (10%) effect in increase of 24.2 in enrolment was recorded in schools that received SFG after one year. After controlling for the covariates, the treatment effect was maintained. Results also reveal that rural schools recorded 20.52 in enrolment (Column 2) more than their urban counterparts, and relative to the control schools. This could be attributed to most of the schools surveyed being in rural settings. Surprisingly, the correlation between schools that provided midday meals and enrolment was negative and significant, particularly for the lower grades. This could be attributed to the fact that for schools where midday meals were provided, parents were required to either pay for the food or pack food for the child. Since most UPE schools are a preference for the poor parents, any monetary requirement could have an inverse effect on enrolment of children in the lower grades because they may not endure studying without a meal.

Results in column 3 also indicate positive and significant impacts of SFG on grade 2 enrolment. The schools that received SFG in FY2017/18 and FY2016/17 significantly increased (5%) enrolment by 24.10 and 23.77, respectively compared to the control schools. Although the impacts on enrolments remained significant, they reduced slightly after controlling for the covariates (Column 4). Results in columns 6 and 7 show the positive treatment effects of SFG on grade 3 enrolment even after controlling for the covariates, though insignificant.

**Table 9: Impact of SFG on enrolment by grade and overall total**

| | Grade 1 (1) | Grade 1+ (2) | Grade 2 (3) | Grade 2+ (4) | Grade 3 (5) | Grade 3+ (6) | Grade 1-7+ (7) |
|---|---|---|---|---|---|---|---|
| Treated 1 - 2016/17 (0/1) | -2.47 [11.24] | -5.87 [11.128] | 2.719 [8.711] | 1.051 [8.703] | 5.25 [8.908] | 4.00 [8.925] | 8.252 [53.495] |
| Treated 2 - 2017/18 (0/1) | 5.79 [9.87] | 6.569 [9.746] | 0.818 [7.650] | 1.298 [7.622] | 6.02 [7.823] | 6.438 [7.816] | 18.289 [46.709] |
| Time (0/1) | 0.33 [8.887] | 9.30 [9.592] | -3.024 [6.888] | 0.696 [7.501] | -0.796 [7.044] | 1.051 [7.693] | 7.904 [46.112] |
| Treated 1 * time | 28.72* [15.88] | 28.71* [15.687] | 23.77** [12.313] | 23.61** [12.268] | 18.65 [12.591] | 18.45 [12.581] | 79.818 [75.415] |
| Treated 2 * time | 24.21* [13.97] | 23.35* [13.855] | 24.10** [10.828] | 23.34** [10.836] | 16.20 [11.073] | 15.436 [11.112] | 65.219 [66.353] |
| Rural (=1) | | 20.522* [12.313] | | 8.10 [9.630] | | 5.099 [9.876] | 13.029 [58.506] |
| Pupil meals (Yes=1) | | -24.62*** [6.500] | | -13.57*** [5.083] | | -10.93** [5.213] | -49.974 [31.164] |
| NGO-fund (Yes=1) | | -10.43 [8.604] | | -2.609 [6.729] | | 0.741 [6.900] | 7.129 [41.315] |
| Control means | 126.97*** [6.295] | 114.4*** [13.136] | 90.42*** [4.879] | 86.44*** [10.273] | 87.33*** [4.989] | 85.44*** [10.535] | 575.90*** [62.644] |
| N | 600 | 600 | 600 | 600 | 600 | 600 | 602 |
| $R^2$ | 0.027 | 0.058 | 0.031 | 0.044 | 0.025 | 0.032 | 0.016 |

*** P<0.01, ** P<0.05, * P<0.10

From the analysis, parents would select schools with adequate school infrastructure from a list of schools they can afford. For those that can afford sending their children to a public school, the choice would be highly dependent on the adequacy of the school infrastructure provided by government. In contrast, the results show that parents cannot afford to sustain their children in the same schools if they are to provide midday meals to the pupils.

## 6.4 Treatment Effects on pupil and teacher attendance

This section presents results on impact of SFG on class attendance by gender and by grade (Table 10). As was the case with enrolments, results of the descriptive analysis reveal that pupil class attendance is usually high in the entry grade (i.e. P1) but with wider variations as seen from the standard deviation values. Class attendance is observed to decline with a raise in level of grade. Observing the mean class attendance reveals that by the 7th grade, only about a quarter of the children that were attending class in grade 1 are attending grade 7, and the patterns are similar across gender. There are wide attendance variations noted for all grades.

**Table 10: Descriptive statistics of pupil class attendance**

| | Boys | | | | Girls | | | |
|---|---|---|---|---|---|---|---|---|
| Grade | Observ. | Median | Mean | Std Dev. | Observ. | Median | Mean | Std Dev. |
| P.1 | 292 | 100.0 | 92.4 | 17.5 | 291 | 100.0 | 93.3 | 26.0 |
| P.2 | 292 | 100.0 | 93.1 | 21.8 | 291 | 100.0 | 92.6 | 18.6 |
| P.3 | 292 | 100.0 | 92.4 | 16.9 | 291 | 100.0 | 95.1 | 30.0 |
| P.4 | 292 | 85.9 | 85.6 | 57.5 | 291 | 88.2 | 90.5 | 72.4 |
| P.5 | 290 | 86.1 | 86.6 | 54.5 | 289 | 87.1 | 85.6 | 26.6 |
| P.6 | 287 | 85.7 | 84.7 | 34.3 | 285 | 88.3 | 85.9 | 29.2 |
| P.7 | 275 | 93.3 | 88.2 | 22.7 | 273 | 94.4 | 88.4 | 28.1 |

***The marginal mean differences in class attendance***

The results in Table 11 present the marginal increases in mean class attendances attributed to intervention in FY2016/17 and FY2017/18 for both boys and girls. Across grades 1 to 3 where the intervention in FY2017/18 had a greater difference on pupil class attendance, there was a significantly higher increase in attendance for girls as compared to the boys. The mean class attendance for boys and girls in the control schools was 78.18% and 79.41% in Grade 1, respectively. Boys' and girls' attendance in schools that received the intervention in FY2017/18 for the same grade significantly (at 1%) increased by 9.85% and 7.71% above the control schools. The intervention in FY2016/17 significantly (at 5%) increased attendance for the boys and girls in Grade 1 by 6.88% and 5.55% above the control group. Moreover, pupil class attendance for both boys and girls in Grades 2 and 3 significantly increased after the interventions in FY2016/17 and FY2017/18, respectively, as presented in the Table hereunder.

**Table 11: Marginal differences in pupil class attendance by grade and by gender**

| | Pupil class attendance by Grades and Gender | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | P1-B | P1-G | P2-B | P2-G | P3-B | P3-G | P4-B | P4-G |
| Treated 1 - 2016/17 (0/1) | 6.88*** [2.469] | 5.55* [2.992] | 4.92* [2.773] | 7.70*** [2.556] | 7.16*** [2.524] | 5.069 [3.189] | -2.516 [4.776] | 7.066 [5.857] |
| Treated 2 - 2017/18 (0/1) | 9.85*** [2.168] | 7.71*** [2.635] | 8.77*** [2.435] | 8.69*** [2.251] | 9.93*** [2.216] | 4.392 [2.809] | 0.186 [4.193] | 5.053 [5.159] |
| Control means | 78.18*** [1.396] | 79.41*** [1.692] | 79.72*** [1.568] | 79.35*** [1.446] | 78.45*** [1.428] | 82.25*** [1.804] | 81.24*** [2.701] | 79.43*** [3.313] |
| N | 593 | 591 | 593 | 591 | 593 | 591 | 593 | 591 |
| $R^2$ | 0.036 | 0.015 | 0.022 | 0.029 | 0.035 | 0.006 | 0.000 | 0.003 |

*** P<0.01, ** P<0.05, * P<0.10

The results further reveal that schools that received SFG intervention in FY2017/18 significantly (at 1%) increased attendance for boys and girls by 8.23% and 8.48% above the control schools, respectively (Table 12). The intervention of FY2016/17 significantly (at 5%) increased attendance for boys and girls by 5.18%

and 5.64% more than the control school. There were marginal changes (+/-) in enrolment in grade 5 through 6 to grade 7, though the differences were insignificant. Changes in enrolment as noted previously, would trigger pupil class attendance but not necessarily in proportionate manner.

**Table 12: Marginal differences in pupil class attendance by grade and by gender**

| | Pupil class attendance by Grades and Gender | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **P5-B** | **P5-G** | **P6-B** | **P6-G** | **P7-B** | **P7-G** | **P1-P7-B** | **P1-P7-G** |
| Treated 1 - 2016/17 (0/1) | -6.981 [4.627] | -3.626 [2.783] | -1.090 [3.263] | -2.312 [2.990] | 0.513 [2.90] | -1.832 [3.236] | 5.18** [2.450] | 5.64** [2.434] |
| Treated 2 - 2017/18 (0/1) | -4.055 [4.073] | 0.640 [2.457] | 0.440 [2.856] | -0.327 [2.629] | 3.042 [2.513] | 2.116 [2.814] | 8.23*** [2.148] | 8.48*** [2.140] |
| Control means | 83.42*** [2.623] | 82.10*** [1.578] | 81.97*** [1.837] | 82.84*** [1.68] | 83.17*** [1.616] | 84.14*** [1.806] | 76.84*** [1.371] | 77.27*** [1.361] |
| N | 585 | 583 | 575 | 573 | 550 | 547 | 602 | 600 |
| $R^2$ | 0.004 | 0.004 | 0.000 | 0.001 | 0.002 | 0.002 | 0.024 | 0.027 |

*** P<0.01, ** P<0.05, * P<0.10

***The Treatment Effect of SFG on Class Attendance***

Results of the effect on attendance attributed to SFG support reveal that schools that received intervention in FY2017/18 significantly (at 5%) recorded positive impacts by 15.4% in grade 1 relative to the control schools (Table 13). Likewise, a significant (at 1%) impact of 20.9% in attendance was recorded in schools that received SFG one year earlier. After controlling for the covariates, the SFG support in FY2017/18 significantly (at 5%) had an impact on attendance by 15.4% pupils. Schools that received SFG in the FY2016/17 recorded significant (at 1%) increase by 20.9% relative to the control schools. The correlation between schools that provide mid-day meals and attendance was negative but insignificant. As earlier noted, this could be attributed to the fact that for schools where midday meals are offered, poor parents find it difficult to comply with this requirement and ultimately their children stay at home and/or dropout completely.

**Table 13: Regression on Impact of SFG on pupil class attendance (derived from classroom roll calls as percent of enrolment)**

| **DV – pupil class attendance** | **Grade 1 (1)** | **Grade 1+ (2)** | **Grade 2 (3)** | **Grade 2+ (4)** | **Grade 3 (5)** | **Grade 3+ (6)** | **Grade 1-7 (7)** | **Grade 1-7+ (8)** |
|---|---|---|---|---|---|---|---|---|
| Treated 1 - 2016/17 (0/1) | -3.962 [3.127] | -4.190 [3.134] | -3.488 [3.129] | -3.588 [3.141] | -2.018 [3.069] | -1.977 [3.082] | -2.728 [3.211] | -2.749 [3.221] |
| Treated 2 - 2017/18 (0/1) | 1.559 [2.746] | 1.591 [2.745] | 1.344 [2.747] | 1.244 [2.751] | 0.213 [2.696] | 0.128 [2.699] | 1.838 [2.811] | 1.858 [2.812] |
| Time (0/1) | 9.410*** [2.514] | 11.626*** [2.742] | 8.447*** [2.515] | 9.332*** [2.748] | 10.197*** [2.468] | 11.178*** [2.696] | 4.012 [2.539] | 5.980** [2.777] |
| Treated 1 * time | 20.938*** [4.444] | 20.993*** [4.441] | 20.084*** [4.446] | 20.264*** [4.451] | 17.399*** [4.362] | 17.516*** [4.367] | 16.228*** [4.539] | 16.223*** [4.541] |
| Treated 2 * time | 15.416*** [3.914] | 15.454*** [3.927] | 15.250*** [3.916] | 15.660*** [3.936] | 15.167*** [3.842] | 15.448*** [3.862] | 13.257*** [3.979] | 13.196*** [3.996] |
| Rural (=1) | | 1.797 [3.470] | | 3.107 [3.477] | | 1.279 [3.411] | | -0.146 [3.523] |
| Pupil meals (Yes=1) | | -1.347 [1.847] | | 1.120 [1.851] | | 1.432 [1.816] | | -0.361 [1.876] |
| NGO-fund (Yes=1) | | -4.765* [2.461] | | -2.864 [2.466] | | -3.136 [2.420] | | -4.510* [2.488] |
| Control means | 73.612*** [1.751] | 72.302*** [3.702] | 74.956*** [1.752] | 71.804*** [3.710] | 74.421*** [1.719] | 72.874*** [3.640] | 74.981*** [1.798] | 75.209*** [3.77] |
| N | 591 | 591 | 591 | 591 | 591 | 591 | 602 | 602 |
| $R^2$ | 0.231 | 0.236 | 0.212 | 0.215 | 0.225 | 0.228 | 0.120 | 0.125 |

*** P<0.01, ** P<0.05, * P<0.10

Results in column 3 also show the significant (at 1%) positive impact of SFG on grade 2 class attendance in schools that received support in FY2017/18 and FY2016/17 by 15.2% and 20.0% compared to the control schools. The impact remained the same after controlling for covariates (Column 4). Even at school level, the impacts of SFG support in FY2016/17 and FY2017/18 on attendance is 16.2% and 13.2%, and significant at 1%. The correlation between schools that provided mid-day meals and attendance was positive and insignificant but weaker in comparison with that for Grade 1. Analysis by gender reveals that impacts of SFG support on girls attendance is positive and significant. For instance, schools that received support in FY2016/17 and FY2017/18 significantly (1%) increased girls' attendance by 15.6% and 14.45%, respectively. Even after controlling for the covariates, effect sizes, signs and significance levels are maintained. This demonstrates the relevance of schools infrastructure to girls' schooling in UPE context.

***The Treatment Effects of SFG on PCR, PTR, PSR and Teacher Attendance***

Results in Table 14 show the effects of SFG support on Pupil Classroom Ratio (PCR), Pupil Teacher Ratio (PTR), and Pupil to Toilet Stance Ratio (PSR) and teacher attendance. Although there is a notable treatment effect on the four output indicators, significance was observed for SFG intervention in FY2017/18 on the Pupil Teacher ratio. While the mean Pupil Teacher Ratio for the control schools was 54.86, the SFG treatment effect in FY2017/18 was 13.12 and significant at 10% relative to the control schools.

**Table 14: Regression results on Impact of SFG on PCR, PTR, PSR and Teacher Attendance**

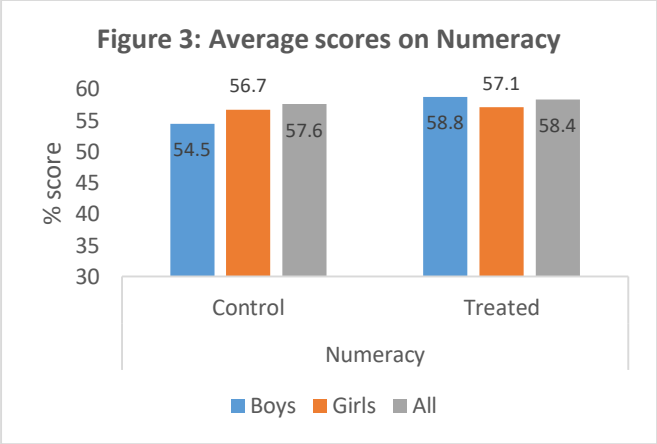
| | PCR | PTR | PSR | Teacher Attendance |
|---|---|---|---|---|
| Treated 1 - 2016/17 | 31.78 | 1.924 | 1.577 | -2.419 |
| (0/1) | [27.40] | [6.145] | [27.797] | [12.086] |
| Treated 2 - 2017/18 | 9.855 | 2.741 | -0.310 | -0.726 |
| (0/1) | [23.865] | [5.393] | [24.818] | [10.560] |
| Time (0/1) | 34.84 | -1.52 | 14.126 | 19.785** |
| | [24.035] | [4.849] | [22.788] | [9.528] |
| Treated 1 * time | 69.043 | 8.776 | 35.214 | -15.94 |
| | [42.238] | [8.660] | [41.531] | [17.130] |
| Treated 2 * time | 24.231 | 13.12* | 40.167 | 15.067 |
| | [37.187] | [7.582] | [36.169] | [14.947] |
| Control means | 120.40*** | 54.86*** | 244.01 | 73.395*** |
| | [15.01] | [3.466] | [15.750] | [6.749] |
| N | 471 | 593 | 518 | 595 |
| $R^2$ | 0.050 | 0.019 | 0.014 | 0.028 |

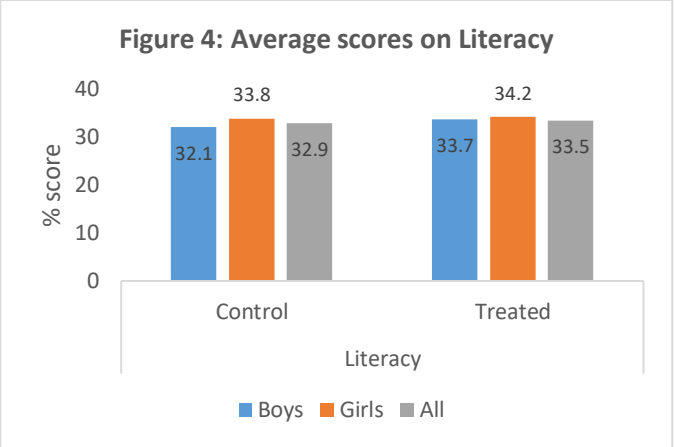
*** P<0.01, ** P<0.05, * P<0.10

The rest of the effects attributed to the support in two FYs on PCR, PTR, PSR as well as teacher attendance were positive but insignificant. For instance, the effect of SFG support in FY2017/18 on teacher attendance was positive (=15.06%) but insignificant. The insignificance could be attributed to the fact that regression estimates were from pooled data that may have crowded out the grade level effects. Besides, some of the outcomes could be noticed in the medium to long run.

## 6.5. Treatment Effects on pupil test scores in numeracy and literacy

The results presented in Figure 3 and 4 show that numeracy is the best-done subject compared to literacy in both the control and treatment schools. There are marginal differences between genders, with girls in control schools performing better than boys do by a percentage point. Assessment of performance in literacy for boys was a percentage point better than that for girls.




Results in Table 15 show the balance tests on numeracy and literacy scores at both the baseline and endline surveys. The test aimed to establish whether there is significant difference in mean tests between the treatment and control groups. The differences in balance tests on literacy and numeracy were not statistically significant ($p<0.05$).

**Table 15: Balance tests on numeracy and literacy scores between the control and treatment groups**

| | Baseline | | Endline | |
|---|---|---|---|---|
| **Group/Category** | **Numeracy** | **Literacy** | **Numeracy** | **Literacy** |
| Control | 43.9 | 26.7 | 57.6 | 32.9 |
| Treatment | 43.8 | 25.9 | 57.3 | 33.4 |
| Difference (p-value) | -0.12 (0.791) | -0.77 (0.05) | -0.20 (0.679) | -0.44 (0.375) |

Table 16 shows the descriptive analysis of the test scores for numeracy and literacy. Median numeracy test scores for the control schools were the same as those for schools that received the SFG intervention were. It is worth noting that the median test scores for the control schools and schools that received SFG intervention had wide variations observing the minimum and maximum values. For schools that received the SFG intervention, the median test scores for literacy was about 25 percentage points lower than literacy test scores recorded by the control schools.

**Table 16: Descriptive Analysis of numeracy and literacy test scores**

| **Variable** | | **No. of observation** | **Median score** | **Std. dev.** | **Min.** | **Max.** |
|---|---|---|---|---|---|---|
| Test scores for control | Numeracy | 5,460 | 50.9 | 19.4 | 0 | 100.0 |
| | Literacy | 5,460 | 25.2 | 16.8 | 0 | 90.2 |
| Test scores for treatment | Numeracy | 6,322 | 50.9 | 19.6 | 0 | 100.0 |
| | Literacy | 6,322 | 25.2 | 17.5 | 0 | 94.2 |

***The Treatment Effect of SFG on Academic Achievement***

The results in Table 17 are the effects on the numeracy and literacy outcome measures in schooling. Columns 1 and 4 show results on the direct treatment effects, while columns 2 and 5 present results on effects of SFG support relative to the control schools. For instance, schools that received SFG in FY2017/18 recorded significant impacts (1%) in numeracy and literacy test scores by 1.28 and 1.05 percentage points (columns 1 & 4) relative to the control schools. On the contrary, the treatment effect of SFG in FY2016/17 was negative and significant (1%) in numeracy and literacy test scores by -2.54 and -2.10 percentage points relative to the control schools. The negative effect size could be attributed to the fact that there were

disruptions to teaching and learning due to the on-going SFG activities in treatment schools. Moreover, there was positive significant correlation between provision of mid-day meals and performance in numeracy and literacy test scores which is not surprising and consistent with the norms. The test scores in literacy and numeracy for pupils in rural areas were significantly lower than those pupils in urban schools, which is also not surprising. This is because the socio-economic status of parents, the quality of schools and schooling is better in the urban than rural. There was a significant decline (1%) in the males' literacy test scores of -1.25 percentage points, but recorded positive significant effect (1%) of 1.29 percentage points in numeracy than their female counterparts. In the regular national assessment, boys often display high cognitive abilities in numeracy as does girls in literacy, respectively.

**Table 17: Impact of SFG on academic achievement (test scores) in Numeracy and Literacy**

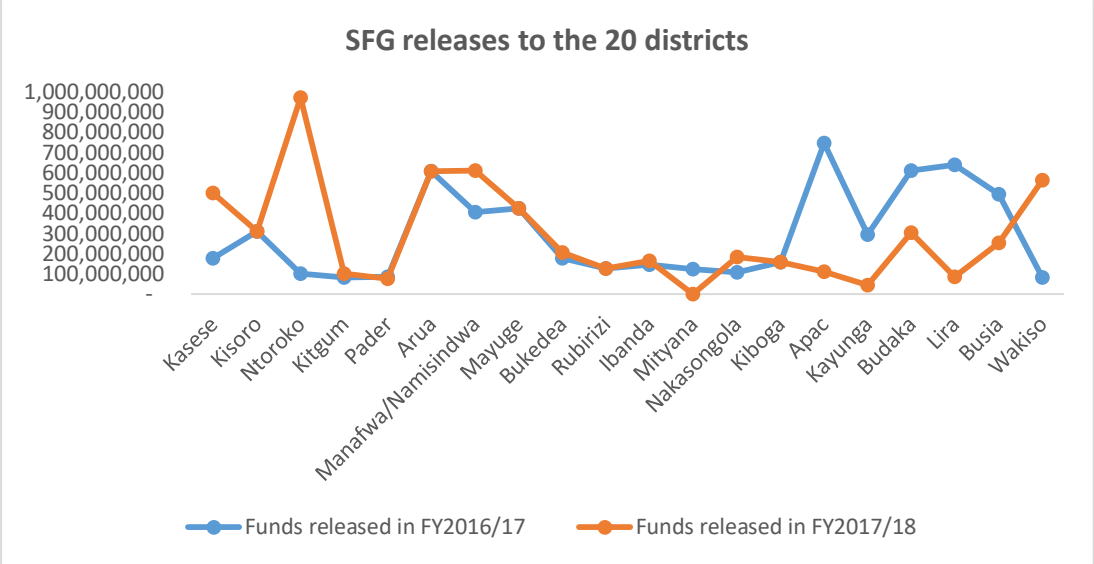
| | Numeracy | | | Literacy | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Treated 1 - 2016/17 (0/1) | -2.54*** [0.466] | -2.19*** [0.610] | -2.11*** [0.609] | -2.10*** [0.421] | -1.72*** [0.576] | -1.406** [0.573] |
| Treated 2 - 2017/18 (0/1) | 1.28*** [0.413] | 1.31** [0.543] | 1.22** [0.542] | 1.05*** [0.373] | -0.113 [0.513] | -0.343 [0.510] |
| Time (0/1) | | 13.65*** [0.495] | 14.43*** [0.539] | | 6.23*** [0.467] | 6.67*** [0.507] |
| Treated 1 * time | | -0.39 [0.875] | -0.51 [0.875] | | -0.632 [0.826] | -0.800 [0.823] |
| Treated 2 * time | | 0.094 [0.776] | -0.275 [0.777] | | 2.46*** [0.732] | 2.10*** [0.731] |
| NGO-fund (Yes=1) | | | -1.84*** [0.490] | | | -1.495*** [0.461] |
| Pupil meals (Yes=1) | | | 0.686* [0.376] | | | 2.945*** [0.354] |
| Rural (=1) | | | -4.09*** [0.767] | | | -5.46*** [0.721] |
| Pupil sex Male=1) | | | 1.29*** [0.337] | | | -1.25*** [0.317] |
| Control means | 50.69 [0.26] | 43.94 [0.348] | 47.11 [0.846] | 29.82 [0.238] | 26.74 [0.326] | 31.88 [0.796] |
| N | 11,782 | 11,782 | 11,733 | 11,782 | 11,782 | 11,733 |
| $R^2$ | 0.005 | 0.125 | 0.131 | 0.004 | 0.043 | 0.056 |

*** P<0.01, ** P<0.05, * P<0.10

## 6.7. Cost-Effectiveness Analysis

For the two financial years, all the 20 districts, in particular the treatment schools, received SFG. Total releases amounted to US$ 1.57 million and 1.54 million for FY2016/17 and FY2017/18, respectively. The amounts largely remained unchanged, and to cater for the infrastructure needs of the treatment schools. Apart from Ntoroko, there are no substantial variations in the overall cost per district per year (Figure 4). It is important to note that another entry point into the impact analysis of SFG programme is the unit cost and effectiveness analysis as suggested by Beam et al. (2018). Cost-effectiveness ratio (CER) analysis is an approach to inform decision-making and the ratio simply shows how much it costs per pupil to attain certain amount of units of output in the treated relative to the control schools.

**Figure 4: Trends of SFG releases to the 20 districts during FY2016/17 and FY2017/18**




Per unit cost and outcomes are computed and related as ratios. The costs are the facility grants disbursed to schools during the intervention period, while per unit cost is the cost per pupil in the treatment schools. Outcome measures in this case are enrolments, attendance and test score gains. We have measured or established the cost per student in the intervention schools by simply dividing all the total SFG spending in the survey schools by the number of students. We then used the three phases of SFG implementation to assess the effectiveness of the programme. If we let Pre1 stand for pre-SFG period, and Pre2 (2014/15 to 2016/17), we can then identify possible scenarios and cases. The CER lead to clear decisions as to whether to adopt and use SFG intervention. In symbolic notation, the Cost- effectiveness measure can be expressed as:

$$Cost - Effectiveness_{BUPE} = \frac{(\text{cost} / pupil)}{(Effect\ size)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where cost is the SFG allocated to the treatment schools, effect size is the impact or the gain in units per school relative to the control school.

As noted above, cost-effectiveness is ideally an efficiency measure. The CER is an efficiency ratio for comparing two systems based on a specific cost-effectiveness measure (cost per graduate/pupil). The decision rule is that if efficiency ratio = 1, then pre and post SFG intervention are equally efficient If efficiency ratio >1, then UPE intervention is less efficient If efficiency ratio <1, then the SFG intervention is more efficient. The inverse of the CER say 9.51 (=79.8/8.39) and 7.90 (=65.2/8.25) is the increase in enrolment in treatment relative to the control schools during the FY2016/17 and FY2017/18, respectively.

**Table 18: Cost Effectiveness Ratios (CER) on Enrolment, Attendance and Performance in Tests**

| | FY2016/17 | FY2017/18 |
|---|---|---|
| Cost per student in US$ | 8.39 | 8.25 |
| Effect size on enrolment | 79.8 | 65.2 |
| CER | 0.11 | 0.13 |
| Effect size on attendance | 179.5 | 150.2 |
| CER | 0.05 | 0.05 |

| | | |
|---|---|---|
| Effect size on performance in Num. | -0.39 | 0.094 |
| CER | (21.52) | 87.75 |
| Effect size on performance in Lit. | -0.632 | 2.46 |
| CER | (13.28) | 3.35 |

In terms of enrolment and attendance, since the CER<1, then the SFG intervention is more efficient in both the FY2016/17 and FY2017/18. Results on performance in numeracy and literacy reveal that SFG intervention is more efficient in FY2016/17 than FY2017/18.

### 6.8. Heterogeneities and Spill overs

This section examines the consequences of socioeconomic differences on educational outcomes in the context of Uganda. It is often common phenomenon that a combination of school and community socio-economic segregation creates challenges to children access to education and ultimately learning. For instance, the location of a school (rural versus urban) is understood as the clustering dimension of socio-economic segregation. The family economic status determines the child's wellbeing in school because it is likely that parents with economic ability can afford to provide mid-day meals to their children while at school. The effects of concentrated poverty are perceived through the actions of certain social mediators. The provision of mid-day meals to a pupil is particularly one of key factors in predicting educational outcomes. The analysis controlled for possible effect of providing mid-day meals and area of residence on access and education outcomes. Schools in rural areas naturally experience increasing demand for education services amidst scarce resources, which explains positive and significant increase in enrolment in rural more than urban schools. Thus, a strong school-family bond is a way of bridging this difference. Because of the large school sizes, particularly in rural areas and poverty in the neighbourhoods, face a challenge of providing a meal to a learner while at school which explains this negative correlation between mid-day meals and school enrolment. Concentrated poverty and school location affect educational outcomes, but this effect is not deterministic. In fact, some families show successful coping strategies, while others do not. Although further research is needed to explain these differences, this research suggests that the school environment plays an important role in counterbalancing the negative effects of socio-economic imbalances on educational outcomes.

## 7. Discussion

This section reviews the concerns related to the possible heterogeneities, including segregated areas, family socio-economic dimension reflected in the potential of parents to provide mid-day meals, and availability of support from NGOs on school physical infrastructure. The section also discusses SFG treatment and provides local contextualization of the findings. The section ends with key lessons arising from the study that may inform the design of monitoring and evaluation plans for future-related programmes.

### 7.1. Validity and Replication

The study was conducted using a clear methodology and timelines, focusing on generating credible evidence to explain the relevance and distributional impact of SFG intervention on access, learning and learning outcomes. The randomization design implemented and coupled with mobilization of stakeholders at national, local government and schools levels led to 100% compliance at both district and schools level. There were noticeable differential attritions at the pupil level, and the necessary diagnostic checks revealed

that pupil attrition was indifferent across the treatment and control schools, as well as across gender (Annex 11). The sensitivity of results was tested using bootstrapped standard errors. Throughout the study, there were no noticeable disruption and compensatory effects. Necessary data quality checks were implemented throughout the study, particularly during primary data collection. There is also clear alignment between qualitative and quantitative information. The external validity concerns were considered and addressed by ensuring that all the districts and schools were eligible to participate in the RCT, and that there were indifferences in key output and outcome indicators at the baseline. All these measures and diagnostic concerns provided a robust basis for measuring treatment effect of the SFG intervention.

We believe the findings from this study can be highly transferable to other areas in Uganda. For instance, in the part that uses secondary data (Annual School Census), schools from other districts or local governments, the districts can be analysed. From the part that uses primary data, we would select another sub-set of needy schools to be representative of districts that receive SFG. An important aspect is that the treatments would follow the same institutional structures as other schools that receive SFG. In fact, the selection process is also largely similar. We also believe that some of our study approaches and findings would be transferrable beyond Uganda. For example, the need for infrastructure is shared by many school systems in other countries. Various interventions related to school facilities are implemented in many developing countries to enhance access and improve student learning. This study provides additional insights regarding these types of interventions.

Moreover, given that the interventions within UPE were selected by the implementing agency, which provides a strong basis, the implementing agency would continue to be fully engaged in the process. The continuous engagement with government officials would ensure that they keep abreast with the impact evaluation; this increases the possibility that the research findings are taken into account when the government decides to modify the program. Our qualitative study carefully documented the process that was involved in selecting schools for the study, which helped us to provide insights on the extent to which the study represents the sub-national and national populations. The sub-sections that follow provide a discussion of the key findings, drawing experiences from international and local contexts.

## 7.2. Treatment effects on Access and Attendance

The relationship between school infrastructure and enrolment is of widely pronounced significance. There is evidence that availability and quality of school facilities affect student achievement through many factors. The quality of school facilities is a factor in student and teacher attendance, teacher retention and recruitment, child and teacher health, and the quality of curriculum. The results on SFG attribution to access are analysed in three dimensions: in terms of pupil-class ratio – classroom intensity, enrolment and attendance as reported by the school registers[13]. Results from Propensity Score Matching reveal evidence on the impact of school facilities on pupil-classroom ratio. Results from Kernel and Stratification estimation techniques reveal positively significant impact of school facilities on access by 6-7 pupils. In fact, in the local context, especially in rural areas, learners, parents and even the communities around the school are often attracted to the new infrastructure, thus increasing enrolment.

[13] School registers are derived from pupil head count exercise conducted regularly to guide and inform the allocation of resources to schools, i.e. UPE capitation and scholastic materials. It is usually a national exercise conducted joint by MoES, District officials, Office of the President and Ministry of Finance, Planning and Economic Development.

Assessment of enrolment patterns across the various grades in a school that received the SFG support shows significant but declining increases in enrolments as the grades advance. Whereas there are increases in enrolments registered for the lower grades from P1 to P5 in all schools assessed, some schools did not recorded any enrolments for the higher grades, Primary 6 and 7. While placing focus on student infrastructure in the lower grades may be viewed as a ploy by school managers to lure parents to enrol their children in their schools in the early stages of the cycle, educationists commend this approach because it is essential for the cognitive development of a child (Trawick-Smith and Smith, 2014). Therefore, school infrastructure is critical to early childhood development because it facilitates a child's prospects for intellectual and cognitive development. The parents and district education officials often argue for the increase in the SFG grant to enable the establishment of school infrastructure that is adequate to serve pupils at all grades of the primary education cycle.

Education researchers stress the importance of engaging key stakeholders, particularly parents, to ensure that the impact of any efforts towards a child's better learning achievement is sustained (Becker and Luthar, 2002). They further argue that whereas government programmes directly support public schools, it is inevitable to detach the parent from the responsibility of catering for a child's social-emotional needs. In performing their role to socio-emotionally provide for their school-going children, parents in Uganda's low-income communities are faced with a challenge of sponsoring their children's mid-day meals. According to government policy, the cost of feeding pupils in public schools is to be borne by their benefactors. While parents have an option of packing food for the child, schools that have cooking facilities ask that the parent instead remits a small fee to cater for the child's meals prepared by the school. This arrangement is preferred by schools that received the SFG intervention and have used the grant to set up kitchen facilities, among others. Hence, this explains the negative correlation between SFG beneficiary schools that provide midday meals and enrolment.

### 7.3. Treatment Effects on Academic Performance (test scores)

The adequacy of school infrastructure has potential impacts on the performance of all actors within the school setting. Previous studies reveal that school facilities are a precursor to the much needed clean air, comfortable and safe learning environment that have an obvious bearing on students' and teachers' ability to perform (Schneider, 2002). Furthermore, Ugandan schools that register good performance in the national assessment examinations are usually schools equipped with adequate infrastructure to facilitate a conducive learning and teaching environment for students and teachers, respectively. The results of the earlier year (FY2016/17) of intervention show a negative but insignificant effect on achievement partly because of possible disruptions from on-going SFG activities on learning. However, in the later year (FY2017/18) results indicate that schools that received the SFG support registered a significant improvement of a percentage point in numeracy and literacy test scores for their students.

Having placed focus on schools that were in poor functioning states than the rest, the SFG intervention has caused a diminutive effect of the performance gap between the rural and urban public schools. Results reveal significant positive improvements in the performance of urban (than rural) public schools. The improvement in performance is seen across both boys and girls in the SFG beneficiary schools. Therefore, SFG intervention has improved a series of co-factors that are reflected in the improved test scores and the discussed dimensions.

## 7.4. Evidence of SFG effects on access, learning and academic achievement – From Qualitative Perspective

The qualitative study was designed to collect information to complement the quantitative data, and particularly to provide deeper understanding of the conditions of the school facilities in treatment and control schools as well as the effectiveness of SFG on access and attendance. It also aimed to establish the adequacy and quality of school facilities, perceptions on management of the SFG grant and best practices and innovations for sustainability. Information was collected from district education officials, parents and head teachers from the sampled schools. The findings are presented hereunder.

### 7.4.1. Prevailing conditions of school facilities in treatment and control schools

The introduction of SFG focused on construction of new school facilities such as classrooms, toilets, and teacher houses with the aim of improving the school infrastructure in the supported schools. The schools supported were expected to achieve the classroom pupil ratio of atmost 1:55 and gain improved learning outcomes. With the increasing number of pupils that enrol in UPE schools, parents, district education and school management officials argue that the grant is not adequate to address the infrastructural challenges that have left most schools overcrowded with very few classroom space despite the increasing numbers of pupils. Having selected the sampled schools from among the neediest schools, the respondents said that new infrastructure attracts enrolment of more children from their former schools, a matter that consequently leads to overcrowding because the capacity of the new infrastructure is suppressed. Prior to setting up new infrastructure, parents and officials at district and school level revealed that the condition of school infrastructure was in deplorable state. Pupils would either hold classes under trees or use the collapsing infrastructure present at the time in shifts with some pupils attending class in the morning, while others attended in the afternoon. To the parents, this inconvenienced the pupils' recreational and learning schedules. To the teachers, teaching in shifts meant an increase in their workload, which resulted in low productivity and learning achievement.

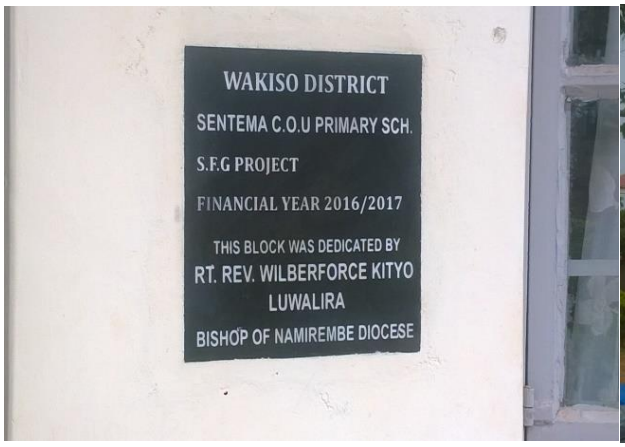
**Classroom constructed at Bishop Hanington P/S in Mayuge District under phase I schools**

*… the enrolment of pupils has increased, retention of learners has also increased at the school since pupils can stay long in schools. Even the beauty of structures attracts more pupils within the community…* **District Education Official, Kitgum district**

*… pupils now believe in the school because they have where to study from not under the tress; teachers can easily find them in classrooms…* **Head teacher, SFG beneficiary school in Namisindwa district**

**Classroom constructed at Otara P/S under phase I schools**

Whereas parents, district education officials and school management officials commend the construction of school infrastructure because it has given a new look to the hitherto neediest schools, there is outcry that the new classroom blocks are not equipped with the necessary furniture like chairs or desks. From views of parents and district education officials, it is noted that there is laxity to ensure maintenance of the infrastructure because there are no budgetary arrangements to cater for the maintenance costs. While school management feels the district officials ought to support the SFG beneficiary schools in the repair and maintenance of the constructed infrastructure, district officials challenge schools to coordinate with parents and ensure that the condition of the constructed infrastructure is maintained.



**Classroom constructed at Sentema C.O.U in Wakiso District under phase I schools**

While it is noteworthy that there is new infrastructure in SFG beneficiary schools, key informants interviewed mentioned that classroom furniture (desks) was still insufficient and cases of pupils sitting on the floor were common, especially those in lower classes. Broken desks could also not be repaired due to lack of funds.

Head teachers in the control sampled schools indicated that teachers' houses were too old to be inhabited. For instance, there were many teachers' houses with damaged doors and windows and in Northern Uganda, most teacher houses in non-SFG schools were grass thatched.

> *SFG can be made more effective in terms of availing more funds to build teachers houses and other classroom blocks.* **Head teacher, SFG Beneficiary school in Busia district**

### 7.4.2. Effectiveness of SFG on access and attendance

Officials at school and district level had similar opinion about the school facilities grant. They stated the grant was primarily intended to construct classroom blocks in the school. For most head teachers in the schools visited, the grant was used to construct classrooms for the lower grades of P.1 to P.3 arguing that children at lower grades need more attention and are sensitive to the environment in which they learn. This assertion is in tandem with results from quantitative analysis that showed significant increase in attendance for children in the lower grades in schools that received the SFG and used it to construct classrooms. District education officials further argued that the focus on the neediest schools also accounted for improved access because the schools were now located in the remote areas close to families that would otherwise have been distant from schools with the necessary infrastructure.

> *…….pupils have been attracted to attend school because of the new permanent classroom block since most of them were studying under trees and experiencing a number of hardships like rain and sunshine.* **Head teacher, SFG beneficiary school in Namisindwa district**
>
> *……...parents have been motivated to bring their children for registration; enrolment has increased from around 200 pupils to 381.* **A district education official, Ntoroko district**

Head teachers and district education officials mentioned that the SFG grant has not been able to address all the infrastructural needs of the beneficiary schools to have adequate classrooms that would achieve the recommended class size of 55 students per stream. However, schools that benefit from the SFG grant have had their class sizes increased to 100 pupils and beyond. In most districts, an enrolment has greatly increased yielding pressure on the few scholastic materials availed by the school for every stream. Head teachers and the district education officials opined that the construction of infrastructure is one of the many solutions to improving a child's learning environment. There is need for budgetary provisions to cater for the complimentary school needs such as desks, textbooks, chalk and well-trained and motivated teachers. Currently, officials interviewed argue that the increased enrolments noted in SFG beneficiary schools are influenced by infrastructure and not the quality of teaching offered by the school. Therefore, there is concern that whereas SFG schools continue to attract impressive infrastructure, the quality of teaching and learning offered continue to dwindle.

### 7.4.3. General perception regarding the adequacy and quality of school facilities

Overall, respondents from the control schools felt that primary school facilities were in a deplorable state requiring more attention by both central and local governments. The SFG support was described as largely inadequate yet there were limited alternative sources of funding for the school infrastructure. District officials felt that schools needed to adopt a renovation/maintenance culture.

### 7.4.4. General perceptions on the management, decision and use of SFG funds at the district and school levels

Whereas parents, teachers and district officials know that the school facilities grant is intended to improve infrastructure in the neediest schools, the same stakeholders raised concerns on the selection criteria for the beneficiary schools decrying impropriety in the process. For example, when the team visited Nakinyama UMEA - Primary School in Nakasongola District, the Deputy Head Teacher (DHT) lamented, “Even when we know the level of need of this school, it has never received any thing”. Because most respondents were not told about how schools are selected to benefit from SFG, they knew less about components of SFG and its intentions. Some head teachers believe that SFG beneficiaries are based on political influence.

Most schools raised negative perspectives about contractors hired to construct the SFG facilities. For example, Bembe Primary School complained about the quality of SFG buildings. They think central government should help to select engineers but not local government. They thought that SFG funds are sometimes diverted into other things by some district officials, for example, buying DEO a vehicle.

According to respondents from the Central region, SFG did not take into account setting up a rehabilitation plan for the school where facilities were constructed. Pointing out an example of Kasozi primary school in Nakasongola District, only one block of classrooms and toilets were constructed before 2006 and are now all dilapidated. Doors and windows have no shutters, walls are in a sorry state and latrine stances are not enough compared to the enrolment.

On the other hand, some schools appreciated the work done at the school, emphasising that classrooms constructed saved the face of the school. The existence of nice looking classrooms has attracted more pupils to join and reduced dropouts. Various head teachers understand and believe that if SFG provides teacher’s houses, this could curb the vice of teacher absenteeism. Teachers’ quarters could reduce teachers’ expenses on rent and transport. In addition, facilities help to keep the school secure since teachers stay at school and protect it.

### 7.4.5. Best Practices and Innovations for Sustainability

- A fund to ensure routine repair and maintenance of the infrastructure constructed with the grant ought to be formed by the school with the help of district officials.
- School management committees should be empowered to solicit support from parents and other stakeholders so that they need not look up to government for infrastructural needs of schools they are responsible for.
- The implementation of grants such as the school facilities grant ought to be done on the basis of extensive research of the schools in need. The selection process should be done at the level closest to the schools as possible so that the village committees and members of school boards are involved.
- The infrastructure constructed should be used to foster public-private partnerships by the schools to

ensure that the infrastructure is equipped with learning aids. The partnership could also lead to the construction of facilities that the fund could otherwise not afford.

# 8. Specific findings for policy and practice

## 8.1. Introduction

The study documents the quantitative and qualitative results on the impact of SFG intervention on access and learning outcomes in primary schools in Uganda. The report also articulates the knowledge gap, evaluation context, theory of change and testable hypotheses under specific assumptions. Distributional impact results are presented on access, attendance and test scores. The results have implications on the way teaching and learning is handled particularly in terms of providing safe and secure environment for learning. Below, we provide some key implications for policy action at the national, local (LGs) and school levels.

## 8.2. Key Issues and Implication for Policy Action

From the study, some of the key issues emerge that inform future policy direction; draw the attention of technocrats and policy makers on the relevance of available adequate and quality physical school infrastructure. Below are the highlights of some of these issues.

i. Adequate and quality school infrastructure remain a key component of UPE programme because it promotes access to education. However, what needs to be considered is the question of an adequate amount of schools and the best appropriate and effective model. Investment in infrastructure is quite heavy and may take time to yield outcomes. Increasing the participation of parents and communities to support school construction is crucial because it can increase their voice on accountability through social audits.
ii. SFG is conditional or restrictive in nature since it is usually spent on constructing new infrastructure. The decision makers at the local government find difficulties in making appropriate decisions, particularly in allocating funds for rehabilitation of school structures. Indeed, it was found to be the case in some instances where renovation would be cost effective than building a new facility;
iii. Large class sizes remain a common challenge in UPE schools, and this somewhat affects not only access but also retention of children.
iv. Parents still find it difficult to provide mid-day meals to their learners at school.
v. There are noticeable differences in the effectiveness of SMC on the availability, quality and maintenance of school facilities. Good results are noted in schools with active SMC members, especially the chairperson;

## 8.3. Lessons learnt from Implementation of the Evaluation

The lessons were learnt at the stakeholders, intervention and implementation levels. We provide a brief of each of them below.

i. **Stakeholder engagement at various levels is very important:** Involvement of stakeholders at various levels was found crucial both in buy-in and effective implementation of the evaluation. Given that the evaluation was premised on existing government system and structures, lobbying for ownership and support of the evaluation was fully embraced by the evaluation team. The stakeholders at the national level, i.e., MoES and OPM, provided technical guidance and strategic direction of the

evaluation, while stakeholders at the local government and school levels supported the day-to-day activities of the project, particularly in randomization and follow-up activities.

ii. **Regular monitoring:** The evaluation would not have been possible without putting in place the effective monitoring systems. The DEOs and the head teachers of the concerned schools were regularly monitored through phone contacts. The DEOs were regularly engaged to follow-up on construction activities in treatment schools but also monitor the activities of the control schools. The evaluation team often conducted spot checks and regularly reviewed school reports that were submitted to the DEOs. This helped minimize non-compliance of schools but also minimized contamination and spill overs.

iii. **SFG was supply driven and the implementation guidelines restrictive:** It was found that SFG flows are supply driven and the information on its flow and use is limited to the district officials. The final uses/beneficiaries of SFG such as SMC, head teachers and parents have limited information and decision making on SFG issues. This could be taken as a challenge but also is a lesson learnt. Due to limited access to information on SFG, the SMC had limited understanding about the management of funds. Even though the evaluation team sensitized some of the school level beneficiaries on this important fund, vital information on the flows and allocation to schools was still lacking.

iv. **Politicization of the SFG intervention:** It was found out that the decision to choose the beneficiary schools and allocate the SFG monies is vested on the technocrats at the district and with approval of the district council. In some instances, the district councils compete for the few available resources to benefit their respective area schools. To minimize the political influence, the evaluation team engaged the MoES and OPM who provided guidance and direction on how the evaluation would be handled, particularly with regard to randomization and the follow-up activities.

### 8.3. Policy recommendations

Arising from the above key findings, the study derives some key recommendations categorized according to the audience.

**Issue 1:** The study reveals that school facilities, such as classrooms, teacher houses and sanitation facilities, matter to access and learning, and its outcomes are significant in both rural and urban schools. Furthermore, qualitative results reveal that in schools where there is good sanitation and hygiene facilities, learning takes place because girls, boys and teachers feel safe and secure to stay in school the whole day.

**Recommendation 1:** The government should provide SFG funds in relation to current pupil ratio and the population of the district to cater for the increasing enrolment.

**Recommendation 2:** It should be a matter of policy that every school in Uganda has clean water, sanitation and hygiene facilities to facilitate a conducive learning environment for the pupils, more particularly the girl child.

**Issue 2:** There was significant impact of SFG on pupil attendance. Qualitative investigations reveal that pupil class attendance is high, particularly where class teachers stay within school compound. Staff houses would address the vice of teacher absenteeism; the process evaluation report (2016) attributed this

detrimental practice to the long distances that teachers have to travel between their places of residence and the schools.

**Recommendation 3:** Since infrastructure seems to boost the attitude and retention possibilities for teachers, government should consider as a matter of policy and priority construction of staff houses and if possible renovate the existing dilapidated ones. While this may not be the ultimate solution to teacher attitude, retention possibilities and absenteeism, it forms a basis for the remedy.

**Issue 3:** The crowding in schools remains a common phenomenon and limits the learning placement opportunities for potential learners. This is partly due to limited funding available to meet the infrastructure needs of all the needy schools. Ultimately, the few schools that benefit often tend to attract exponential increases in enrolment.

**Recommendation 4:** In circumstances of inadequate facilities amidst increasing enrolment, double shift system (day and afternoon lessons) should be considered so that we can keep the classroom sizes relatively low and ultimately improve the learning environment.

**Issue 4:** The findings reveal that the involvement of the community and parents in the SFG allocation decisions and school facilities construction activities is rather limited, yet they are among the key stakeholders in managing and protecting the school. It is also evident that SFG does not provide for rehabilitation of the dilapidated school building; it focuses on constructing new ones. Thus, in circumstances of limited funding, there are more old and/or dilapidated structures than the newly constructed ones.

**Recommendation 5:** There is need to actively involve the community and parents for the follow-up intervention roll-out by means of social audits. This would help to involve all the key stakeholders in the SFG programme and assess not only the economic benefit but also social effects of this programme. Communities should be encouraged and recognized to contribute towards schools construction, particularly renovation of old school structures.

**Recommendation 6:** Redirecting SFG towards only new structures limits the decision-making on SFG allocation at the district level, yet it would rather seem cost-effective to renovate the existing structures than constructing new ones. Thus, the SFG guidelines should be reviewed to give local governments and schools the flexibility to allocate the funds to construct new structures and renovate the existing ones.

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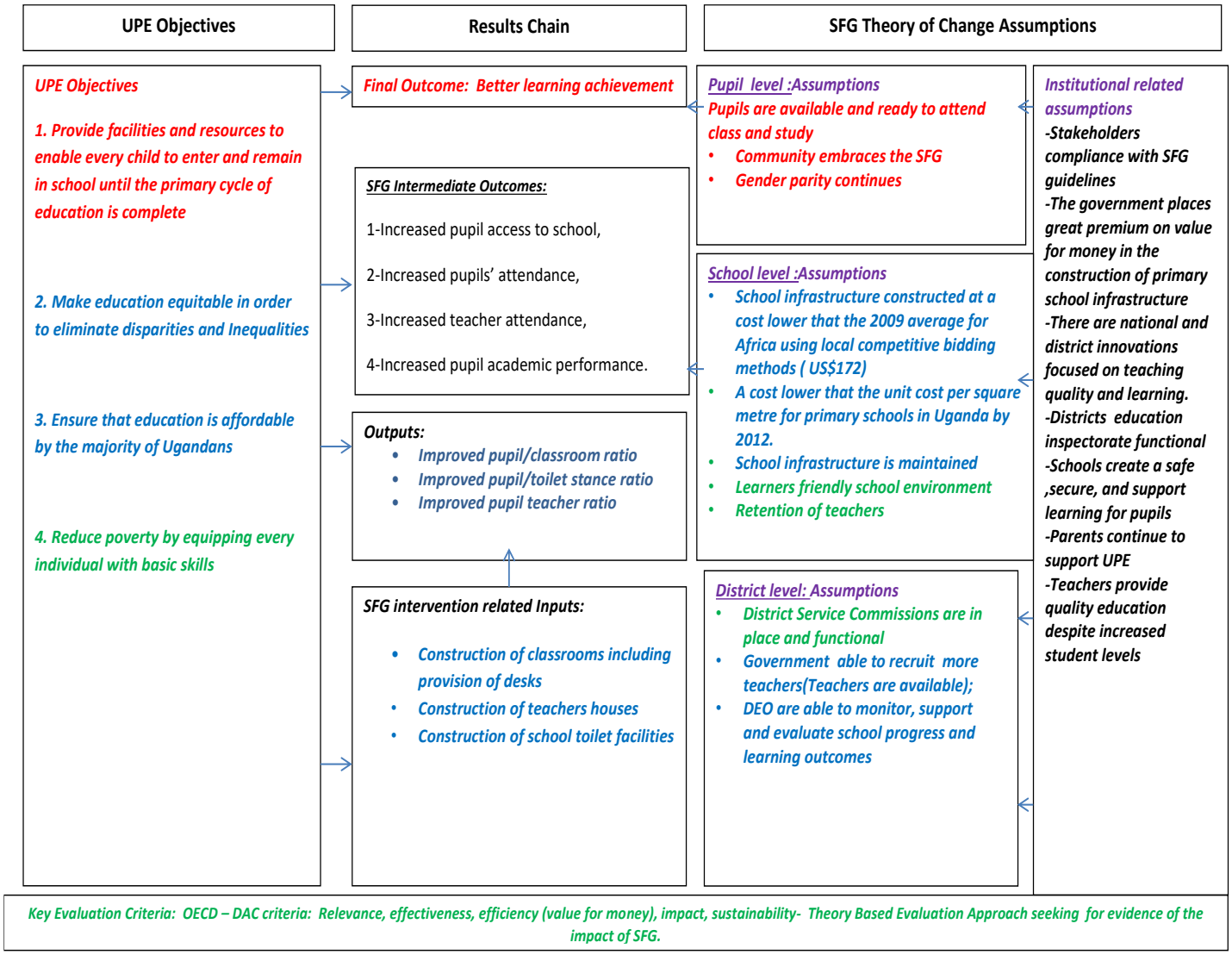
ANNEXES:

## Annex 1: Theory of Change Framework




## Annex 2: Notes on tools and data collection

### Steps for Primary Data Collection

Tools for primary data entailed several steps that included a) tools development, b) piloting of tools, c) adjusting the tools based on pilot experiences and d) administering tools to respective respondents. Prior to conducting baseline survey, the research team visited the District Education Officers to get insights on SFG and collected necessary information (such as schools included in the district plan for SFG) that informed endline data collection.

### Tools Development

In accordance with the scope of work, the team built a strategy for data collection and developed checklists/guides that were used to collect data.

### Piloting of tools

The developed data collection tools were pre-tested to assess the adequacy and responsiveness of the data collection process to support the attainment of relevant findings, conclusions and generate effective

recommendations for the SFG program evaluation.

**Stakeholder Consultations**
The Consultant held consultations with stakeholders (e.g. OPM, MoES, MoFPED, school management, pupils, parents as well as LG officials and other stakeholders at various levels. At higher local government (HLG) level, consultations were carried out with the Chief Administrative Officer, the DEOs, DIS, RDCs and local chiefs as well as foundation bodies to obtain their views on the performance of the UPE program. Interface with these officials, to a great extent enabled the team appreciate progress attained against planned milestones. The research team also established implementation challenges that were experienced in implementing SFG as well as any lessons learned and best practices for possible replication.

**Interview Guides (IGs)**
Interview guides were developed based on the pre-determined issues and concerns that require consultations with the UPE stakeholders and beneficiaries at various levels of government at national and local levels. These guided the preparation of both focus group discussions and individual key informant interviews.

***Notes on Test Item Measurements***
**Literacy and Numeracy Test Development**
Development of the literacy and numeracy tests began with the construction of a *test framework*, then *item writing* and concluded with *setting of threshold scores* that helped in the determination of mastery or proficiency.

**Test Framework**
Test specification, also known as a test framework, was derived from the Uganda primary school curriculum and adopted from the NAPE's test compositions. As a content validation process, the test framework was designed by practicing primary school teachers with experience in NAPE and PLE item writing, curriculum experts from the National Curriculum Development Centre (NCDC) and assessment experts from UNEB. The test framework is multi-grade since it encompasses competences from P1 to P5 First Term for the purpose of tracking progress from the baseline at P3 up to the endline when the learners reach P5.

**Item Writing**
Literacy and Numeracy items design was conducted by practicing primary school teachers who participated in the design of the test framework and they were guided by curriculum and assessment experts from NCDC and UNEB. Items were constructed together with corresponding item score spaces synchronized with the test frameworks, curriculum and approved official reference texts. Two competence-based written tests in literacy and numeracy in English were generated together with draft score guides detailing expected responses and associated score allocation.

**Setting Score Cut-offs**
The criterion-referenced[14] technique called the Angoff Method[15] was used to determine the cut-off threshold. It produces an average estimate of minimum competence of a pupil who can competently perform the duties for which the knowledge tested is needed using several Subject Matter Experts. In the Angoff procedure, we asked each judge (subject matter expert) to state the probability that the 'minimally acceptable pupil' would answer each item correctly. In effect, the judges thought of a number of minimally acceptable persons, instead of only one such pupil, and estimated the proportion of minimally acceptable persons who would answer each item correctly. The sum of these probabilities or proportions represents the minimally

[14] Kaftandjieva, F. (2010). Methods for setting cut scores in criterion-referenced achievement tests. *A Comparative Analysis of Six Recent Methods with an Application to Tests of Reading in EFL. EALTA publication*.
[15] Angoff, W. H. (1971). *Educational measurement*. R. L. Thorndike (Ed.).

acceptable score for Literacy and Numeracy. The modified Angoff approach lowered the average estimate by one standard error of measurement after consideration of likely statistical and human factors. Seven judges were engaged for each subject area after the test scoring process.

**Test Administration**

Researchers were graduates and secondary school teachers with experience in research-related data collection. The researchers had a three-day training in Kampala following a pre-prepared field administration manual. In addition, Research Assistants (RAs) who are familiar with infant classes were selected through the district education offices. The RAs had a one-day training by the Researchers at the districts and their focus was to administer the Literacy and Numeracy test to P3 pupils at the baseline and P5 at the endline. The written *paper-pencil* tests were administered to selected pupils under standard conditions that included spacing, duration and instructions in respective local languages to ensure reliable and valid test scores.

**Test Scoring**

Practicing primary school teachers of literacy and numeracy, and graduates of good mathematics and English language background were identified for the task of test scoring. They underwent a two-day training on how to award scores based on age-appropriate competences exhibited by pupils of P3 and P5. To appreciate the test item demands and as preparation for discussions of the draft score guides, each trainee scorer was required to respond to the test items. Draft score guides were enriched through the guidance of item writers and UNEB assessment expert, and operational guides were adopted.

A conveyor-belt-system (CBS) was used. It meant that 6 scorers constituted a team which was led by a senior teacher. A pupil's script was partitioned into 5 clusters of items and each scorer in a team consistently scored her assigned cluster of items, which ensured reliability of score award. The sixth person in the team served as a moderator for the purpose of quality assurance as guided by the adopted score guide as standard.

## Annex 3: List of Sampled schools and respondents by district and region

| Region | District Visited | No. of needy schools Visited | No. of pupils tested in Literacy and Numeracy | | Other Categories Interviewed |
|---|---|---|---|---|---|
| | | Baseline/ Endline | BASELINE | ENDLINE (%) | |
| Eastern | BUKEDEA | 16 | 302 | 98% | CAO,DEO,DIS |
| | BUDAKA | 16 | 334 | 94% | CAO, DEO |
| | MANAFWA/ NAMISINDWA | 14 | 273 | 86% | CAO, DEO |
| | BUSIA | 16 | 317 | 96% | CAO, DEO ,SEO |
| | MAYUGE | 14 | 276 | 99% | DEO |
| Central | NAKASONGOLA | 16 | 313 | 100% | CAO,DEO,DIS |
| | WAKISO | 14 | 282 | 98% | DEO,DIS |
| | KAYUNGA | 16 | 317 | 99% | CAO, DEO |
| | KIBOGA | 15 | 305 | 100% | CAO,DEO,DIS |
| | MITYANA | 14 | 280 | 101% | CAO,DEO,RDC |
| Western | KISORO | 16 | 321 | 93% | CAO,ASS.CAO |
| | RUBIRIZI | 16 | 320 | 100% | CAO, All district HoDs |
| | IBANDA | 16 | 302 | 98% | CAO, DEO, DIS |
| | NTOROKO | 15 | 284 | 88% | CAO,DIS,DEO |
| | KASESE | 13 | 268 | 97% | DEO, DIS |
| Northern | PADER | 14 | 275 | 97% | CAO, DEO, Chair LCV |
| | LIRA | 16 | 318 | 98% | CAO,DEO |
| | APAC | 14 | 285 | 99% | CAO,DEO, DIS |

| | | | | | |
|---|---|---|---|---|---|
| | KITGUM | 15 | 309 | 99% | CAO,DEO,DIS |
| | ARUA | 16 | 331 | 90% | CAO, DEO , DIS, SEO |
| | **Total** | **302** | **6,012** | 97% | |

Source: Baseline Survey (2016) & Endline Survey (2018)

## Annex 4: Summary of the variables by category

| Variable category | Variables | PSM | RPID | Data source |
|---|---|---|---|---|
| *Final Outcomes - Test scores* | Numeracy in English | ✓ | ✓ | Survey data |
| | Literacy in English | ✓ | ✓ | Survey data |
| *Intermediate outcomes* | Pupil attendance | ✓ | | Survey data |
| | Teacher attendance | ✓ | | Survey data |
| | Enrolment (by gender, rural-urban) | ✓ | ✓ | Survey data |
| *Input indicators* | Receipt of a grant | | ✓ | Survey data |
| | SFG per pupil per year | | ✓ | Survey data |
| | School ownership | ✓ | ✓ | EMIS |
| | PTA funds per pupil per term | ✓ | ✓ | Survey data |
| | School ownership | ✓ | ✓ | EMIS |
| | School type (public – private) | ✓ | ✓ | EMIS |
| | School location (rural-urban) | ✓ | ✓ | Survey data |
| | School founding body | ✓ | ✓ | EMIS |
| | School grade | ✓ | ✓ | EMIS |
| | Boarding type (day-boarding) | ✓ | ✓ | EMIS |
| | Distance of water source from school | ✓ | ✓ | EMIS |
| | PTR | ✓ | ✓ | EMIS |
| | Pupil gender | ✓ | ✓ | Survey data |
| | Pupil age | ✓ | ✓ | Survey data |
| | Parents education level; | ✓ | ✓ | Survey data |
| | Asset index – measure of welfare | ✓ | ✓ | Survey data |
| | Distance of home from school | ✓ | ✓ | Survey data |

## Annex 5. Pre-analysis plan for the endline

***Data collection:***

***Primary data*:** As a follow-up from the baseline and midline studies, numeracy and literacy tests was administered to 20 pupils of grade 5 in each of the 301 schools from 21 districts in the country. In addition to administering tests, the evaluation team conducted pupil, teacher and school surveys in July – September 2018. The test items were developed by Uganda National Examination Board (UNEB), and were similar to those in National Assessment of Progress in Education (NAPE).

***Secondary data***: Data was collected and analysed annual school census data from 2006 to 2017. The team matched the schools that received SFG with those that did not receive the grants to estimate the impact of SFG beginning from 2007. Data was collected from MoES, Office of the Prime Minister, Ministry of Finance as well as from Districts Local Governments. **Annex 4** provides a summary of the key indicators to be used in the two kinds of estimation techniques; (i) Propensity Score Matching (PSM) & Randomized Phase in Design (RPID)

***Data Analysis***

***Primary data****:* Ideally, data was collected and analysed using standard tools used for randomized control trial. The analysis was complimented with difference-in-difference (DID) method, and further employed various robust checks (e.g. addressing whether there were different trends in outcomes of interest in

program and comparison schools prior to implementation of the program, and use of National Assessment of Primary Education data to assess the extent of impact of the SFG program.

The dependent variables were changes in student test scores, pupil and teacher attendance. In addition to whether the pupil is in the treatment or control group, the explanatory variables included gender, age, and socio-economic status of the child. In our regression analysis, the evaluation also controlled for whether the school has received funds from NGOs for school facilities construction. The regression analysis also controlled for school level variables such as school location (rural-urban), and whether a school provides meals or not. The study also looked at the relationships between funds for construction of classrooms, sanitation facilities, teacher housing, or some combination of these and our outcomes of interest. These provided some insights on what kind of school facilities grants are more effective.

Impact of interventions may be heterogeneous on girls, marginalized ethic groups, and academically weaker students. To capture heterogeneity, just like the baseline, during the endline evaluation data collection exercise, the evaluation team collected observable characteristics of treated and non-treated individuals and school-specific characteristics, which were taken into account to estimate impact of treatments on different sub-groups.

***Secondary data:*** The research team analysed the existing data in EMIS to establish the impact of SFG using Propensity Score Matching (PSM). The lists of schools that had received SFG was generated.

## Annex 6: Sample Size Calculation and Minimum Detectable Effect Calculator

**Sample size and minimum detectable effect calculator ©**

**7.2.1 Two-level cluster randomised trials with individuals level outcomes (continuous outcome)**

*(refer to p.26 in the manual)*

3ie International Initiative for Impact Evaluation

**Table 1.1: Number of clusters in each treatment group determination**

**Instructions** Specify the parameters in yellow to determine J

| Parameter | Value | Definition | Source of parameter - comments |
|---|---|---|---|
| $\alpha$ | 0.05 | Significance level | |
| $\beta$ | 0.8 | Desired power of the test | |
| Tail | 2 | One-tailed or two-tailed test | |
| $t_1$ | 1.96 | T-value corresponding to the desired significance level of the test | |
| $t_2$ | 0.84 | T-value corresponding to the desired power of the design | |
| $n$ min | 6000 | The minimum sample size decided beforehand to determine t values | |
| $\sigma_y$ | 20.1 | The pooled total standard deviation of the estimated effect on the outcome variable | |
| $\rho$ | 0.46 | Intra cluster correlation coefficient | |
| $P$ | 0.5 | Proportion of individuals assigned to the treatment group | |
| $n$ | 15 | Number of individuals per cluster | |
| $J$ | 149 | Number of clusters in each treatment group | |
| $\delta$ | 6.5 | Minimum detectable effect | |

**Table 1.2: Minimum detectable effect determination**

**Instructions** Specify the parameters in yellow to determine the number of clusters in each treatment group

| Parameter | Value | Definition | Source of parameter - comments |
|---|---|---|---|
| $\alpha$ | 0.05 | Significance level | |
| $\beta$ | 0.8 | Desired power of the test | |
| Tail | 2 | One-tailed or two-tailed test | |
| $t_1$ | 1.96 | T-value corresponding to the desired significance level of the test | |
| $t_2$ | 0.84 | T-value corresponding to the desired power of the design | |
| $\sigma_y$ | 20.1 | The pooled total standard deviation of the estimated effect on the outcome variable | |
| $\rho$ | 0.46 | Intra cluster correlation coefficient | |
| $P$ | 0.5 | Proportion of individuals assigned to the treatment group | |
| $n$ | 15 | Number of individuals per cluster | |
| $J$ | 150 | Number of clusters in each treatment group | |
| $\delta$ | 6.479 | Minimum detectable effect | |

This worksheet is designed to be used alongside the manual, *Power calculation for causal inference in social science: sample size and minimum detectable effect determination*

## Descriptive statistics

### Annex 7: Enrolment by gender and by grade, PTR, PCR, School location

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| enrboyp1 | 301 | 68.5 | 38.3 | 8 | 212 |
| enrgirlp1 | 300 | 67.2 | 38.9 | 5 | 256 |
| enrboyp2 | 301 | 48.1 | 31.0 | 4 | 194 |
| enrgirlp2 | 300 | 48.3 | 29.1 | 2 | 165 |
| enrboyp3 | 301 | 45.6 | 31.5 | 5 | 209 |
| enrgirlp3 | 300 | 49.5 | 31.0 | 3 | 192 |
| enrboyp4 | 301 | 46.7 | 34.0 | 2 | 194 |
| enrgirlp4 | 300 | 47.6 | 33.8 | 2 | 233 |
| enrboyp5 | 297 | 40.2 | 29.1 | 3 | 202 |
| enrgirlp5 | 296 | 42.1 | 39.4 | 1 | 364 |
| enrboyp6 | 293 | 31.7 | 23.1 | 0 | 197 |
| enrgirlp6 | 293 | 32.9 | 24.1 | 0 | 238 |
| enrboyp7 | 281 | 20.6 | 13.5 | 0 | 80 |
| enrgirlp7 | 280 | 20.5 | 14.8 | 0 | 134 |
| enrol123g | 301 | 164.4 | 93.0 | 0 | 527 |
| enroll123b | 301 | 162.2 | 93.6 | 24 | 529 |
| enrolg1_7 | 301 | 304.3 | 181.2 | 0 | 1265 |
| enrolb1_7 | 301 | 298.7 | 179.7 | 39 | 1106 |
| enroltot1_7 | 301 | 603.1 | 353.8 | 80 | 2371 |
| Enrolment p1 | 300 | 135.4 | 75.2 | 17 | 413 |
| Enrolment p2 | 300 | 96.1 | 58.4 | 13 | 359 |
| Enrolment p3 | 300 | 94.5 | 59.5 | 10 | 376 |
| Enrolment p4 | 300 | 93.9 | 66.2 | 5 | 397 |
| Enrolment p5 | 296 | 82.0 | 63.2 | 5 | 740 |
| Enrolment p6 | 292 | 64.6 | 45.9 | 0 | 435 |
| Enrolment p7 | 280 | 41.1 | 26.6 | 0 | 202 |
| Pupil Class Room ratio (PCR) | 236 | 154.6 | 176.7 | 9 | 767 |
| Pupil Teacher Ratio (PTR) | 297 | 58.4 | 40.5 | 11 | 809 |
| School location (rural/urban) | 301 | 0.9 | 0.2 | 0 | 1 |
| School giving meals (Yes=1) | 301 | 0.3 | 0.5 | 0 | 1 |

### Annex 8: Descriptive statistics for the Propensity Score Matching (PSM)

| Variable | No. of observation | Mean score | Std. dev. | Min. | Max. |
|---|---|---|---|---|---|
| **Treated (=No)** | 2,625 | 0.128 | 0.335 | 0 | 1 |
| PCR | 2,558 | 82.128 | 70.457 | 1.949 | 314 |
| PTR | 2,625 | 58.290 | 51.700 | 6.2 | 550 |
| Proportion of female pupils | 2,625 | 0.501 | 0.4812 | 0 | 1 |
| Teacher to house ratio | 1,251 | 6.647 | 4.7471 | 0.55 | 37 |
| Proportion of repeaters to total | 2,000 | 0.486 | 0.115 | 0 | 1 |
| | | | | | |
| **Treated (=Yes)** | | | | | |
| PCR | 325 | 83.975 | 55.305 | 13.297 | 522.75 |
| PTR | 338 | 59.908 | 37.321 | 8.375 | 570 |
| Proportion of female pupils | 338 | 0.501 | 0.0365 | 0.3905 | 0.677 |
| Teacher to house ratio | 166 | 7.290 | 5.659 | 1 | 37 |
| Proportion of repeaters to total | 267 | 0.0922 | 0 | | 1 |

## B) Results

### Annex 9: Impact Evaluation Results by grade (Dependent variable – Enrolment)

| | Grade 4 | Grade 4+ | Grade 5 | Grade 5+ | Grade 6 | Grade 6+ | Grade 7 | Grade 7+ | enrolb1_7 | enrolg1_7 |
|---|---|---|---|---|---|---|---|---|---|---|
| Treated 1 - 2016/17 (0/1) | 3.816 [10.02] | 2.977 [10.059] | 4.05 [9.623] | 3.757 [9.666] | 7.085 [7.145] | 7.381 [7.183] | -1.574 [4.286] | -0.9168 [4.292] | 1.308 27.263 | 6.943 [27.280] |
| Treated 2 - 2017/18 (0/1) | 0.748 [8.800] | 1.115 [8.809] | 3.221 [8.491] | 3.299 [8.505] | 1.977 [6.244] | 2.026 [6.261] | -3.432 [3.666] | -3.486 [3.664] | 8.551 [23.805] | 9.737 [23.819] |
| Time (0/1) | 0.935 [7.923] | 0.981 [8.670] | 3.783 [7.605] | -0.025 [8.326] | 1.893 [5.560] | 0.483 [6.090] | -4.686 [3.274] | -4.974 [3.577] | 3.897 [23.500] | 4.007 [23.515] |
| Treated 1 * time | -0.717 [14.163] | -1.002 [14.180] | 7.276 [13.565] | 7.321 [13.587] | -6.33 [9.978] | -6.510 [10.005] | 2.42 [5.939] | 2.231 [5.936] | 27.327 [38.435] | 52.490 [38.458] |
| Treated 2 * time | 2.798 [12.456] | 1.947 [12.524] | -4.095 [11.962] | -4.126 [12.031] | -0.592 [8.768] | -0.959 [8.829] | 4.436 [5.157] | 3.972 [5.172] | 23.917 [33.816] | 41.302 [33.837] |
| Rural (=1) | | 1.544 [11.130] | | 1.856 [10.618] | 1.856 [10.618] | -4.263 [7.746] | | -7.778* [4.525] | -3.654 [29.817] | 16.683 [29.836] |
| Pupil meals (Yes=1) | | -8.701 [5.875] | | -2.097 [5.624] | | 0.272 [4.110] | | 2.613 [2.397] | -18.968 [15.883] | -31.00* [15.892] |
| NGO-fund (Yes=1) | | 4.170 [7.777] | | 9.831 [7.434] | | 3.502 [5.428] | | -0.030 [3.184] | 3.059 [21.056] | 4.069 [21.069] |
| Control means | 92.04*** [5.612] | 92.87*** [11.874] | 78.10*** [5.387] | 76.94*** [11.338] | 62.26*** [3.953] | 66.11*** [8.278] | 43.93*** [2.337] | 50.39*** [4.866] | 296.25*** [31.926] | 279.65*** [31.946] |
| | | | | | | | | | | |
| N | 600 | 600 | 592 | 592 | 584 | 584 | 560 | 560 | 602 | 602 |
| $R^2$ | 0.001 | 0.0051 | 0.004 | 0.0077 | 0.002 | 0.003 | 0.004 | 0.012 | 0.008 | 0.024 |

### Annex 10a: Impact Evaluation Results by grade (Dependent variable – Pupil Attendance)

| DV – pupil class attendance | Grade 4 (1) | Grade 4+ (2) | Grade 5 (3) | Grade 5+ (4) | Grade 6 (5) | Grade6+ (6) | Grade 7 (7) | Grade 7+ (8) |
|---|---|---|---|---|---|---|---|---|
| Treated 1 - 2016/17 (0/1) | 0.596 [4.808] | 0.767 [4.821] | -4.686 [4.151] | -4.548 [4.157] | -0.4211 [3.472] | -0.431 [3.484] | -1.344 [3.936] | -1.485 [3.953] |
| Treated 2 - 2017/18 (0/1) | 4.218 [4.222] | 4.263 [4.222] | 1.492 [3.662] | 1.399 [3.658] | 2.897 [3.034] | 2.731 [3.037] | 3.515 [3.367] | 3.453 [3.374] |
| Time (0/1) | 12.240*** [3.865] | 15.299*** [4.217] | 12.825*** [3.336] | 15.564*** [3.636] | 8.150*** [2.753] | 8.777*** [3.002] | 8.295*** [3.065] | 9.073*** [3.351] |
| Treated 1 * time | -2.384 [6.831] | -2.461 [6.830] | -2.322 [5.883] | -2.165 [5.875] | -2.746 [4.890] | -2.576 [4.894] | -0.860 [5.501] | -0.735 [5.513] |
| Treated 2 * time | -2.925 [6.017] | -3.143 [6.040] | -7.077 [5.195] | -6.698 [5.208] | -5.164 [4.294] | -4.639 [4.314] | -2.178 [4.781] | -1.829 [4.807] |
| Rural (=1) | | -2.753 [5.336] | | 3.579 [4.569] | | 3.005 [3.759] | | 3.254 [4.170] |
| Pupil meals (Yes=1) | | -0.028 [2.841] | | 0.764 [2.441] | | 2.249 [2.015] | | -0.647 [2.233] |
| NGO-fund (Yes=1) | | -7.159* [3.785] | | -7.040** [3.247] | | -2.722 [2.687] | | -2.282 [2.999] |
| Control means | 73.739*** [2.693] | 76.284*** [5.694] | 75.895*** [2.324] | 72.401*** [4.880] | 77.557*** [1.921] | 74.199*** [4.018] | 79.258*** [2.146] | 76.075*** [4.485] |
| | | | | | | | | |
| N | 591 | 591 | 583 | 583 | 573 | 573 | 548 | 548 |
| $R^2$ | 0.030 | 0.036 | 0.041 | 0.050 | 0.020 | 0.025 | 0.026 | 0.028 |

## Annex 10b: Impact Evaluation Results by grade (Dependent variable – Pupil Attendance)

| DV – pupil class attendance | Grade 1-7T (1) | Grade 1-7T+ (2) | Grade 1-7girl (3) | Grade 1-7 girl+ (4) |
|---|---|---|---|---|
| Treated 1 - 2016/17 (0/1) | -2.728 [3.211] | -2.749 [3.221] | -2.157 [3.281] | -1.977 [3.292] |
| Treated 2 - 2017/18 (0/1) | 1.838 [2.811] | 1.858 [2.812] | 1.315 [2.882] | 1.308 [2.883] |
| Time (0/1) | 4.012 [2.539] | 5.98** [2.777] | 4.121 [2.595] | 5.73** [2.838] |
| Treated 1 * time | 16.22*** [4.539] | 16.22*** [4.541] | 15.61*** [4.638] | 15.58*** [4.641] |
| Treated 2 * time | 13.25** [3.979] | 13.19*** [3.996] | 14.45*** [4.079] | 14.39*** [4.099] |
| Rural (=1) | | -0.146 [3.523] | | -1.776 [3.643] |
| Pupil meals (Yes=1) | | -0.361 [1.876] | | 0.802 [1.923] |
| NGO-fund (Yes=1) | | -4.510* [2.488] | | -4.146 [2.545] |
| Control means | 74.98*** [1.798] | 75.209** [3.772] | 75.21*** [1.838] | 76.64*** [3.886] |
| N | 602 | 602 | 600 | 600 |
| $R^2$ | 0.120 | 0.125 | 0.121 | 0.126 |

## Annex 11: Balance tests on pupils who attrited and/or replaced

| Attritors | Pooled | Rural | Urban | Males | Female |
|---|---|---|---|---|---|
| Treated | 0.018 [0.125] | 0.136 [0.127] | 0.178* [0.069] | 0.202 [0.017] | 0.017 [0.018] |
| Constant | 0.610*** [0.009] | 0.613*** [0.009] | 0.505*** [0.052] | 0.634*** [0.129] | 0.587*** [0.128] |
| R-Squared | 0.0004 | 0.0002 | 0.0327 | 0.004 | 0.003 |
| N | 5,981 | 5,782 | 199 | 2,901 | 3,080 |
| **New entrants** | | | | | |
| Treated | 0.124 [0.127] | 0.008 [0.013] | 0.077 [0.054] | | |
| Constant | 0.603*** [0.009] | 0.609 [0.009] | 0.493*** [0.040] | | |
| R-Squared | 0.002 | 0.001 | 0.006 | | |
| N | 5,834 | 5,468 | 336 | | |

## Annex 12: Impact Evaluation Results on PCR and PTR

| Dependent Variable – PCR and PTR | PCR (1) | PCR+ | PTR (2) | PTR+ |
|---|---|---|---|---|
| Treated 1 - 2016/17 (0/1) | 31.78 [27.40] | 25.080 [27.173] | 1.924 [6.145] | -0.109 [6.074] |
| Treated 2 - 2017/18 (0/1) | 9.855 [23.865] | 13.009 [23.624] | 2.741 [5.393] | 3.525 [5.320] |
| Time (0/1) | 34.84 [24.035] | 18.494 [26.560] | -1.52 [4.849] | 2.359 [5.227] |
| Treated 1 * time | 69.043 [42.238] | 67.838 [41.795] | 8.776 [8.660] | 8.927 [8.537] |
| Treated 2 * time | 24.231 [37.187] | 29.141 [36.852] | 13.12* [7.582] | 12.39* [7.511] |

| | | | | |
|---|---|---|---|---|
| School location (rural=1) | | 67.811** [32.177] | | 12.46* [6.655] |
| School providing meals (yes=1) | | -39.85** [17.271] | | -14.18*** [3.539] |
| School receiving support from NGO (Yes=1) | | 42.287* [24.702] | | -2.638 [4.644] |
| Control means | 120.40*** [15.01] | 68.18** [33.828] | 54.86*** [3.466] | 46.88*** [7.114] |
| | | | | |
| N | 236 | 471 | 297 | 593 |
| Adj. $R^2$ | 0.050 | 0.03895 | 0.019 | 0.0267 |

## Annex 13: Survey Instruments

# School Questionnaire

| | | | | | | |
|---|---|---|---|---|---|---|
| School Name | | | | | | |
| District | | | | | | |
| Primary respondent's name | | | | | | |
| Primary respondent's gender | (1) MALE (2) FEMALE | | | | | |
| Primary respondent position | (1) HEAD TEACHER<br>(2) DEPUTY HEAD TEACHER<br>(3) SENIOR TEACHER | | | | | |
| Primary respondent phone number | | | | | | |
| Interview date | Date | | Month | | Year | |
| Interview time (24hour clock) | Hour | | Minutes | | | |
| GPS reading | | | | | | |

## SECTION A: SCHOOL INFORMATION

| | | | |
|---|---|---|---|
| A1 | Type of school | 1. Rural 2. Urban | |
| A2 | What type of organization founded the school? | 1. Church/mosque founded<br>2. Community founded<br>3. Government founded<br>4. Other (Specify) | |
| A3 | What is the gender orientation of this school? | 1. Boys' school<br>2. Girls school<br>3. Both boys and girls school | |
| A4 | Who owns the land used by the school? | 1. Government<br>2. Community<br>3. Church<br>4. An individual | |
| A5 | What is the distance (in km.) from the school to the nearest town? | | |
| A6 | How many other government schools are there within a radius of 5 km? | | |
| A7 | Is this school a day or boarding school | 1. Day<br>2. Boarding<br>3. Both | [ ] |
| A8 | Which grades are taught at this school? | Multiple Responses | P1<br>P2<br>P3<br>P4<br>P5<br>P6<br>P7 |
| A9 | Does the school provide mid-day meals for learners? | 1.Yes 2.No | |
| A10 | If yes in A9, who provides the meals | 1. School<br>2. Parents<br>3. Government<br>4. NGO | |

| B: PUPILS' ENROLLMENT AND CLASS SIZE | | | | | |
|---|---|---|---|---|---|
| | **Class** | **Gender** | **Enrolment** | **No. of streams** | **Class attendance as of to- day** |
| | P.1 | Boys | | | |
| | | Girls | | | |
| | P.2 | Boys | | | |
| | | Girls | | | |
| | P.3 | Boys | | | |
| | | Girls | | | |
| | P.4 | Boys | | | |
| | | Girls | | | |
| | P.5 | Boys | | | |
| | | Girls | | | |
| | P.6 | Boys | | | |
| | | Girls | | | |
| | P.7 | Boys | | | |
| | | Girls | | | |

| **C** | **COMPLETION** | ***By*** | **P1** | **P2** | **P3** | **P4** | P.5 | **P6** | **P7** |
|---|---|---|---|---|---|---|---|---|---|
| C1 | Number of students who sat for PLE Examination 2013 | Girls | | | | | | | |
| | | Boys | | | | | | | |
| | Number of students who sat for PLE Examination 2014 | Girls | | | | | | | |
| | | Boys | | | | | | | |
| | Number of students who sat for PLE Examination 2015 | Girls | | | | | | | |
| | | Boys | | | | | | | |
| C2 | Number of students who passed PLE Examination 2013 | Girls | | | | | | | |
| | | Boys | | | | | | | |
| | Number of students who passed PLE Examination 2014 | Girls | | | | | | | |
| | | Boys | | | | | | | |
| | Number of students who passed PLE Examination 2015 | Girls | | | | | | | |
| | | Boys | | | | | | | |
| C3 | Number of children who repeated in 2013 | Girls | | | | | | | |
| | | Boys | | | | | | | |
| | Number of children who repeated in 2014 | Girls | | | | | | | |
| | | Boys | | | | | | | |
| | Number of children who repeated in 2015 | Girls | | | | | | | |
| | | Boys | | | | | | | |

## SECTION D: SCHOOL FACILITIES

Stock of available facilities

| | **Type of facility built between 1998 to 2015** | **Number of premises** |
|---|---|---|
| D1 | Permanent classrooms (built from brick/cement) | |
| D2 | Classrooms: mud and wattle | |
| D3 | Staff rooms | |
| D4 | Houses for staff | |
| D5 | Book Store | |
| D6 | Library | |
| D7 | Ventilated Improved Pit (VIP) latrines for girls only | |
| D8 | Ventilated Improved Pit (VIP) latrines for boys only | |
| D9 | Regular pit latrines for girls only | |
| D10 | Regular pit latrines for boys only | |

| | | | |
|---|---|---|---|
| D11 | Does the school have access to a functional Water source? | 1.Yes 2.No | |
| D12 | What is the distance to the nearest water source? In KMs | | |
| D13 | Does this school have water source for hand washing near the toilet? | 1.Yes 2.No | |
| D14 | In your opinion do pupils generally use hand washing facility after visiting the toilet facility | 1.Yes 2.No | |
| D15 | Are there separate latrines for girls and boys? | 1.Yes 2.No | |
| D16 | How many latrines stances are there for girls and boys | **Enter number for each sex** | Boys [ ] Girls [ ] |
| D17 | Do teachers and students share latrines? | 1.Yes 2.No | [ ] |
| D18 | Does the school have a changing room for girls during menstruation period? | 1.Yes 2.No | [ ] |

## SECTION E: Availability of OTHER school facilities

| | **Type of facility** | **Yes =1 No=2** |
|---|---|---|
| E1 | Football pitch | |
| E2 | School fence | |
| E3 | Water harvesting tank | |
| E4 | Borehole/spring well/shallow well | |
| E5 | Kitchen | |

## SECTION F. TEACHERS' RECRUITMENT

[1] How many teachers does this school need to address all the pupils' teaching needs?
[2] How many teachers are there in total (including the Head Teacher) at this school?
[3] How many teachers are from within this sub county?
[4] How many teachers are from outside this sub county?
[5] How many teachers are present to-day as per the attendance register?

| **Grade** | **N0. Of teachers M = male F = Female** | | **P.1** | | **P.2** | | **P.3** | | **P.4** | | **P.5** | | **P.6** | | **P.7** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **M** | **F** | **M** | **F** | **M** | **F** | **M** | **F** | **M** | **F** | **M** | **F** | **M** | **F** | **M** | **F** |
| Degree Holder | | | | | | | | | | | | | | | | |
| Diploma Holder | | | | | | | | | | | | | | | | |
| Grade III | | | | | | | | | | | | | | | | |
| Grade II | | | | | | | | | | | | | | | | |

## SECTION G: SCHOOL INPUTS

| Educational input | [1] How many ___ does this school have today? |
|---|---|
| A. Textbooks per grade (P1-P7) | |
| B. Desks | |
| C. Chairs | |
| D. Blackboards | |
| E. Boxes of chalk | |
| F. Class registers | |

## SECTION H: PUPIL CHARACTERISTICS

| | Question | Codes/Instructions |
|---|---|---|
| H1 | What is the most common reason that pupils repeated a class? | 1. Not Ready To sit for PLE Exams<br>2. Did Not Attend Enough Days Of School Last Year<br>3. Parents Concerned About Performance<br>4. Teachers Concerned About Performance<br>5. Change from another school<br>6. N/A: No Repetition<br>7. Other<br>(Specify)…….. |
| H2 | What is the most common reason that pupils **dropped out** of school? | 1. Parents cannot afford scholastic materials<br>2. Child has to work<br>3. Parents not interested in pupils studies<br>4. Poor Performance Of Pupil<br>5. Parents No Longer Resident<br>6. Pregnancy<br>7. Transferred to other school<br>8. Other<br>(specify)……. |
| H3 | What is the most common occupation of parents who have children in this school? | 1. Farming<br>2. Trading<br>3. Civil service<br>4. Any other specify …….. |

## SECTION I: SCHOOL PERFORMANCE

*The following questions refer to Primary Leaving Examination (PLE) results in 2013, 2014, and 2015*
*Complete columns labeled "Total" only if information by gender is not available.*

| | 2013 | | | 2014 | | | 2015 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| [1] N0. Pupils registered for the PLE in __? | | | | | | | | | |
| N0. of pupils actually sat the PLE in __ ? | | | | | | | | | |
| Division I mark? | | | | | | | | | |
| Division II mark? | | | | | | | | | |
| Division III mark? | | | | | | | | | |
| Division IV mark? | | | | | | | | | |
| Division U mark? | | | | | | | | | |
| Division X mark? | | | | | | | | | |

## SECTION J: SCHOOL GOVERNANCE-PTA

| | Question | Codes/Instructions |
|---|---|---|
| J1 | Does this school have a functional PTA? | **Yes =1 No=2** |
| J2 | Does the PTA keep minutes of its meetings? | **Yes =1 No=2** |
| J3 | How many times has the PTA met this year (2016)? | |
| J4 | Does the PTA have an Executive Committee? | **Yes =1 No=2** |
| J5 | What is the purpose of the PTA to this school? | 1. Review of pupils' performance |

| | | |
|---|---|---|
| | | 2. Strategizing on how to improve school performance<br>3. Raising funds for school infrastructure construction<br>4. Other (specify) |

## SECTION K: SCHOOL GOVERNANCE-SMC

| | Question | Codes/Instructions |
|---|---|---|
| K1 | Does this school have a functional SMC? | **Yes =1 No=2** |
| K2 | Does the SMC keep minutes of its meetings? | **Yes =1 No=2** |
| K3 | How many times has the SMC met this year (2016)? | |
| K4 | Does the SMC have an Executive Committee? | **Yes =1 No=2** |
| K5 | What is the purpose of the SMC to this school? | 1. Review of pupils' performance<br>2. Strategizing on how to improve school performance<br>3. Raising funds for school infrastructure construction<br>4. Other (specify) |

## SECTION L: SCHOOL GOVERNANCE- INDICATORS

| **Question** | **Answer Codes/Instructions** |
|---|---|
| L1. Does this school have a work plan that covers the NEXT TERM? | YES 2.NO |
| L2. Does this work plan assign people to **monitor** each activity? | YES 2. NO |
| L3. Does this school keep a **teacher attendance register**? (With arrival times, etc.) | Yes, up to date<br>Yes, but not up to date<br>No register found |

L.4 Which of the following types of information is displayed publicly in the school?

| Type of information | Displayed? YES NO | Where displayed? 1. HEADTEACHER'S OFFICE 2. CORRIDOR/ENTRYWAY 3. STAFF ROOM 4. EXTERIOR OF SCHOOL 5. NEARBY NON-SCHOOL BUILDING (EX: CHURCH) 6. OTHER (SPECIFY) |
|---|---|---|
| A. UPE release | | |
| B. List of teachers | | |
| C. Teacher attendance poster | | |
| C. School work plan | | |
| D. PLE results | | |
| E. SMC membership | | |
| F. PTA (executive) membership | | |
| G. Exams timetable | | |

## SECTION M: BUDGET PROCESS

| | |
|---|---|
| M1. Which of the following are consulted about the school budget? (enter all that apply) | SMC<br>STAFF<br>HEADTEACHER<br>4.PTA |
| M2. Who makes the final decision about the school budget? | 1. SMC<br>2. STAFF |

| | |
|---|---|
| | 3. HEADTEACHER<br>4. PTA |
| M3. How frequently does the school make a budget? | 1. EVERY TERM<br>2. EVERY YEAR<br>3. TWICE YEARLY<br>4. OTHERS<br>(SPECIFY) |

## SECTION N: REVENUE SOURCES

N1. How many grants does the school receive?.....

N2. Types of grants received by the school

1. UPE capitation grant
2. School Facility Grant
3. Other specify……..

## SECTION P: SCHOOL FACILITY GRANTS AND RELATED FUNDS

| | |
|---|---|
| 1. Has the school benefited from SFG grant? | 1. Yes<br>2. No |
| 2, If yes, when did the school benefit from such grant? | _____ year<br>_____ year<br>_____ year |
| 3. What did the grant cover? | Classroom construction 1. Yes 2. No<br>Teacher houses 1. Yes 2. No<br>Latrine facilities 1. Yes 2. No<br>4.administration block 1. Yes 2. no<br>5. Water facility 1. Yes 2. no<br>**Note**: If yes specify number for each category |
| 5. Has school ever received funds for classroom, teacher housing or sanitation facilities from non-SFG sources? | 1. Yes 2. No |
| 6, If yes, when did the school receive such non-SFG grants? | _____ year<br>_____ year<br>_____ year |
| 7. What did the non-SFG grant cover? | Classroom construction 1. Yes 2. No<br>Teacher houses 1. Yes 2. No<br>Latrine facilities 1. Yes 2. No |
| 8. Who provided those grants? | 1. NGOs<br>2. Development partner<br>3. Parents<br>Any other specify…….. |
| 9 . What facilities are lacking in this school? (captured in the next table) | Classrooms 1. Yes 2. No<br>Teacher houses 1. Yes 2. No<br>Latrine facilities 1. Yes 2. No<br>Any other specify…… |

## SECTION F: AVAILABILITY AND QUALITY OF SCHOOL FACILITY

**[405] To what extent is each of the following a problem in this school?**

| Q | Question | Put a no. | Response |
|---|---|---|---|
| 405a | Large class sizes | | 1-Not a problem<br>2-To a small extent<br>3-To a great extent |
| 405b | Number of class rooms | | |
| 405c | Sanitary facilities | | |
| 405c | Availability of water | | |
| 405d | Poor pupil health | | |

| | | | |
|---|---|---|---|
| 405e | Teacher absence | | |
| 405f | Teacher lateness | | |
| 405g | Motivation of teachers | | |
| 405h | School library | | |
| 405i | Teacher houses | | |

Questionnaire ID

## Pupil Questionnaire

### INTRODUCTION QUESTION

Let a child be free-Ask questions that make the conversation flow for the child not to feel interviewed but discussed with. Ask the question about class, family and how they find school

### SECTION A: BASIC INFORMATION

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| School Name | | | | | | | |
| District | | | | | | | |
| Pupil's name | | | | Gender | [1] Male [2]. Female | | |
| Interview date | Date | | Month | | Year | | |
| Interview time (24hour clock) | Hour | | Minutes | | | | |
| GPS reading | | | | | | | |

### SECTION B: PUPIL CHARACTERISTICS AND ATTENDACNE AT SCHOOL

| q | Question | Response Options |
|---|---|---|
| 101 | How old are you now? | [__][__] years old |
| 102 | Do you have meals at school? | 1. Yes 2.No |
| 103 | Who provides the meals? | 1] Parents 2] School 3] NGO, 4] Other specify (.....) |
| 104 | Do you do any kind of work outside school during school days? | [1] Yes [2] No |
| 105 | If yes in **104,** how many days in the past week did you spend doing work outside school? | |
| 106 | When you are doing work outside of school, what type of work do you mainly do? | [1]Fetching water/wood/charcoal [2]Cooking [3]Taking care of younger children [4]Digging/manual labor [5]Working in a market [6]Others specify (.....) |
| 107 | In the past week, how many days did you miss coming to school? | [__] days |

### SECTION C: SCHOOL LEARNING ENVIRONMENT

| Q | Question |
|---|---|
| 201 | Do you all of study in classroom? 1 yes 2. no |
| 202 | Do you have where to sit in a classroom? 1 yes 2. no |
| 203 | Do boys and girls share latrines? 1 yes 2. no |
| 204 | Are your teachers always on time in class? 1 yes 2. no |
| 205 | Do your teachers always available at school? 1 yes 2. no |

### SECTION D: SOCIO-ECONOMIC STATUS AT HOME

| No | Question | Answer Category | Answer |
|---|---|---|---|
| B.1 | What is the educational status of your father? | 1.Never enrolled<br>2.Primary dropout<br>3.Primary complete<br>4.JSD/JDC(Grade-8) complete<br>5.SSC/Dakhil(Grade10) Complete<br>6.HSC equivalent<br>7.BA/ equivalent<br>8.MA+ | |
| B.2 | What is the educational status of your mother? | 1. Never enrolled<br>2. Primary dropout<br>3. Primary complete<br>4. JSD/JDC(Grade-8) complete<br>5. SSC/Dakhil (Grade10) Complete<br>6. HSC equivalent<br>7. BA/ equivalent<br>8. MA+ | |
| B.3 | What is the current occupation of your father? | 1. Employee<br>2. Self-Employee or Employer<br>3. Agriculture day laborer.<br>4. Non-Agriculture day laborer.<br>5. Not working. | |
| B.4 | What is the current occupation of your mother? | 1. Employee<br>2. Self-Employee or Employer<br>3. Agriculture day laborer.<br>4. Non-Agriculture day laborer.<br>5. Not working.<br>6.House wife | |
| B.5 | How many members are there in your household excluding yourself? | | |
| B.6 | Which of the following items are there in your house (where you live)? | | |
| | B.6.1 Radio | 1. Yes, 2. No | |
| | B.6.2 TV | 1. Yes, 2. No | |
| | B.6.3 Mobile phone | 1. Yes, 2. No | |
| | B.6.4 DVD/Video player | 1. Yes, 2. No | |
| | B.6.5 Motor cycle/ Car | 1. Yes, 2. No | |
| | B.6.6 Reading-Writing table | 1. Yes, 2. No | |
| | B.6.7 How many separate rooms? | | |
| | B.6.8 Daily newspapers | 1 Yes 2. No | |

**Strongly agree……..**

| | | | |
|---|---|---|---|
| **1. Please select ONE of the statements that you agree with most about school:** | 1. | I enjoy very much coming to school. | O |
| | 2. | I enjoy coming to school, although sometimes I feel bored. | O |
| | 3. | I do not like coming to school very much, but I come to school because I know I must get an education. | O |

| | | | |
|---|---|---|---|
| | 4. | I do not like coming to school very much, but I come to school because my parents want me to become a doctor/engineer/government officer/businessman in the future. | O |

**Thank you for sharing such valuable information with us**

## Teacher Questionnaire

# 100. SOCIOECONOMIC CHARACTERISTICS

| | QUESTION | CODES/INSTRUCTIONS |
|---|---|---|
| 101 | Age (in complete years) | |
| 102 | Gender | MALE 2. FEMALE |
| 103 | Marital status | [1] Single [2] Married [3] Divorced [4] widowed |
| 104 | Highest level of education obtained by a teacher? | 1.No Formal Education 2. Primary 3. O-Level 4. A-Level 5. Tertiary |
| 105 | What type of housing do you live in? | 1. Own House 2. Rented House 3.Accommodation Provided By School<br>4.Accommodation Provided By Community 5. OTHER (SPECIFY) |
| 106 | Approximately **how far** is it from the school to your home? | |

# 200. TRAINING AND DEPLOYMENT

| | | |
|---|---|---|
| 201 | Q201 How many years of training have you had? | |
| 202 | What Highest level of qualification achieved? | 1. GRADUATE TRAINING 2. DIP (GRADE V) 3. GRADE III 4. GRADE II 5. LINCESCED TEACHERS |
| 203 | Have you had any other Training besides teacher training? | 1.YES 2. NO |
| 204 | If yes, which is training? | 1. Management Training<br>2. Business Training<br>3. Others |
| | TEACHING EXPERIENCE | |
| 205 | How long have you been a teacher at this school? | |
| 206 | How long do you plan to remain in teaching? | As long as i am able 2. Until i am eligible for retirement 3. Will probably continue unless something better comes along 4. As soon as i can 5. Undecided at this time |

| | Teacher pay | |
|---|---|---|
| 208 | How is this performance measured? | 1.PLE results<br>2.Teacher preparation (lesson plans)<br>3.Teacher attendance<br>4.Pupils standardized test results<br>5.Time management<br>6.Completion so syllabus<br>7.Others |
| 209 | Who is responsible for appraising your performance? | [1]Head teacher<br>[2] PTA<br>[3] SMC<br>[4]District Education Office<br>[5] Ministry Of Education<br>[6] OTHER (SPECIFY) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 301 | What classes are you currently teaching? | 1. P.1 | 2. P.2 | 3. P.3 | 4. P.4 | 5. P.5 | 6. P.6 | 7. P.7 | |
| | | | | | | | | | |

**400 TEACHER's PRESENCE AT SCHOOL**

| | |
|---|---|
| 401. Are you staying within school | *Yes*<br>*No* |
| Q402 If no, How do you travel to school in most days? | *1. Own car*<br>2. Public means<br>3. Own Motocycle<br>4. Foot<br>5. Own Bicycle |

500 ATTITUDES TOWARDS SFG

| To what extend would you consider the following statements? | Not true | Certainly true | Not applicable |
|---|---|---|---|
| [501] I prefer to teach pupils in a good classroom | 1 | 2 | 3 |
| [502] I prefer to work from a school with good sanitation) | 1 | 2 | 3 |
| [503] I prefer to work from a school that offers accommodation to teachers | 1 | 2 | 3 |

# 600. SFG RELATED CHALLENGES

To what extent is each of the following a problem in this school?

| **Question** | **Response** |
|---|---|
| Q601 Class sizes | [1] Not a problem<br>[2] To a less extent<br>[3] To a great extent |
| Q602 Number of classrooms | |
| Q603 quality of classrooms | |
| Q604 Sanitary Facilities(latrines) | |
| Q609 Teacher absence at school | |
| Q610 Teacher lateness | |
| Q611 Staff housing | |
| Q612 Lack of Kitchen in this school | |
| Q601 Class sizes | |
| Q602 Number of classrooms | |
| Q603 quality of classrooms | |
| Q604 Sanitary Facilities(latrines) | |

**To what extent do you agree with this statement?**

All in all, am satisfied with my job? Strongly disagree Disagree ….

**Thank you very much for your time. Your answers have been very helpful**

# Key informant Qualitative tool – to DHT/SMC/Senior Teacher

## To schools that have received SFG after 2006

**BASIC INFORMATION**

| | |
|---|---|
| School Name | |
| District | |
| Year of the school establishment | |
| Key Informant category | |

1. What is the current condition of the following school facilities?
   (a) Classrooms,
   (b)Teacher houses,
   (c) Latrines
3. What are the facility needs in the school and the approximate cost of each?
4. How do you hope to address these needs?
5. Which facility need should be given the priority and Why?
6. What will be gained by addressing these facility needs?
7. How will the following categories benefit by constructing these facilities?
   (a) School,
   (b) Teachers,
   (c) Students,
   (d) Parents and
   (e) Communities
8. If these facilities cannot be constructed, what other school construction alternatives are there?
9. What sources have you used in the past 5 years to construct the school facilities? (Please indicate the approximate amount and the facilities you constructed with that amount?)
10. How was this school selected for SFG and Why do you think it was selected?
11. How were SFG funds released to your school?
    (a) Quarterly
    (b) Lump sum
    (c) Use of contractor
12. How active are non-government organizations in providing funds for school facilities construction in your school?
    If yes,
        (a) Do you have details on the funds they spent in the school, including the category where funds were utilized?
    If no,
        (a) Why do you think they are not supporting your school?

13. Are there positive/negatives impacts of SFG on access and leaning achievements in this school? Explain?
    (a) Positive

(b) Negative

14. How can SFG be made more effective?

# Key informant Qualitative tool – to DHT/SMC/Senior Teacher

## To schools that haven't received SFG after 2006

**BASIC INFORMATION**

| | |
|---|---|
| School Name | |
| District | |
| Year of the school establishment | |
| Key Informant category | |

1. What is the current condition of the following school facilities?
    (a) Classrooms,
    (b) Teacher houses,
    (c) Latrines
2. What are the facility needs in the school?
3. Which facility need should be given the priority? Why?
4. How do you hope to address these needs?
5. Which are the most needed school facilities and Why?
6. What funding sources are available to construct these facilities?
7. Have you heard about SFG? If yes, how do you think the schools are selected for SFG in practice?
8. Why do you think your school has not received SFG recently?
9. How active are non-government organizations in providing funds for school facilities construction in your school?

    If yes,

        (a) Do you have details on the funds they spent in the school, including the category where funds were utilized in the past 5 years?

    If no,

        (a) Why do you think they are not supporting your school?