

# EX-POST PERFORMANCE EVALUATION OF MCC'S EDUCATION ACTIVITIES IN GHANA

## Final Evaluation Report

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ADVANCING DEVELOPMENT EFFECTIVENESS

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# **Ex-Post Performance Evaluation of MCC's Education Activities in Ghana**

## **Final Evaluation Report**

**October 2017**



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# ACRONYMS

BPA	Blanket Purchase Agreement
CSC	Community Score Card
DEO	District Education Officer
ECOSOC	UN Economic and Social Council
EMIS	Education Management Information System
EQ	Evaluation Question
ERR	Economic Rate of Return
FGD	Focus Group Discussion
GES	Ghana Education Service
GoG	Government of Ghana
GPRS	Ghana Poverty Reduction Strategy
JHS	Junior High School
KG	Kindergarten
KII	Key Informant Interview
MCA	Millennium Challenge Account
MCC	Millennium Challenge Corporation
MiDA	Millennium Development Authority
MOE	Ministry of Education
NER	Net Enrollment Rate
NORC	National Opinion Research Centre
O&M	Operations and Maintenance
PI	Principal Investigator
PTA	Parent–Teacher Association
SMC	School Management Committee
SI	Social Impact, Inc.

# Executive Summary

## Overview of the Compact

The first compact of the Millennium Challenge Corporation (MCC) with the Government of Ghana (GoG), covering the years from 2006 to 2012, intended to reduce poverty through economic growth. As part of the compact, three large projects focused on agriculture, transportation, and rural development in 30 districts across the Northern Agricultural Zone, the Afram Basin Zone, and the Southern Horticultural Zone. These three projects included a series of 12 activities as well as several sub-activities. One of these sub-activities involved the construction and rehabilitation of school infrastructure. The theory of change / program logic behind the education sub-activity specified that the improved school infrastructure would result in improved access and a better learning environment, which would lead to increased enrollment, reduced dropout, increased attendance, and higher completion rates which, in turn, would improve graduates' future earning potential and increase welfare overall. The Millennium Development Authority (MiDA), a statutory institution, was responsible for oversight and management of the compact's implementation.

The education sub-activity was implemented in two phases between 2007 and 2012. In Phase 1, MiDA drew from the list of schools identified by districts as having both the greatest need for rehabilitation and the fewest resources to rehabilitate their schools. In Phase 2, after the completion of a needs and environmental assessment, MiDA selected the schools that would receive new classroom blocks. At the close of the compact, MiDA had rehabilitated and/or constructed classroom blocks spread across 218 schools in the three zones.

## Evaluation Design

The objectives of this ex-post performance evaluation target how the education sub-activity was implemented, if and how it has been sustained, and its perceived outcomes. To meet these objectives, MCC and Social Impact, Inc. (SI), outlined four evaluation questions:

1. What are the current conditions of MCC investments made for the education sub-activity? How do the conditions of MCC investments compare to non-MCC-supported sites?
2. How did the implementation process and/or post-completion maintenance contribute to current conditions of MCC investments?
3. What other factors explain both perceived school-level outcomes and the current conditions of schools?
4. What are the perceived outcomes of the investments in school infrastructure?

To answer the evaluation questions, SI supplemented existing data with two distinct but related data collection activities: first, a school conditions survey to answer Evaluation Question 1, and second, cross-case studies to answer Evaluation Questions 2, 3, and 4.



The school conditions survey was a systematic examination of current school infrastructure conditions against international standards,<sup>1</sup> GoG building guidelines, and the MiDA maintenance manual. This survey was completed in 221 MCC schools<sup>2</sup> and 192 non-MCC schools where enumerators scored different aspects of school infrastructure, including the condition of school grounds, classroom blocks, equipment and furniture, and toilet facilities and polytanks. Ratings of conditions were made on a three-point scale—poor, average, and good—and each rating was accompanied by a photograph of the object being rated. Using the ratings from the school conditions survey, SI calculated an aggregate school conditions score for each school in the study.

Following the school conditions survey and preliminary analyses of the data gathered, SI conducted nine district-level, in-depth case studies with cross-case analysis<sup>3</sup> to answer evaluation questions about the processes that may have led to the current conditions of school infrastructure, and perceptions of key stakeholders on the relationship between the investments made and school-level outcomes such as enrollment, attendance, completion, and learning. Key informant interviews (KIIs), focus group discussions (FGDs), and community score cards (CSCs) were conducted with parents, students, teachers, school leaders or headmasters, district education officers, individuals responsible for operations and management, construction consultants and implementers, MiDA and MCC staff, and a representative from the Ministry of Education.

## Findings and Conclusions

### Evaluation Question 1

*What are the current conditions of MCC investments made for the Compact 1 education sub-activity? How do the conditions of MCC investments compare to non-MCC supported sites?*

Findings from the quantitative and qualitative data show that MCC schools are in better condition than non-MCC schools across all three zones. In MCC schools across all zones, classroom blocks, furniture and equipment, and toilet and water facilities were in better condition than those in non-MCC schools while school grounds were comparable in the two groups. Correlation analysis further showed that the size of the school, whether there was sufficient space for students, and whether the school had received MCC funding were significantly positively correlated with its aggregate school conditions score. There is also substantial variation in the condition of MCC schools both across and within zones. ANOVA analysis showed that Southern and Afram zone MCC schools had aggregate school conditions scores that were significantly higher than Northern zone MCC schools. Also, within all three zones, t-test analysis showed that high-scoring MCC schools were in significantly better condition than low-scoring MCC schools. This high variability indicates that aspects of implementation (i.e., construction and rehabilitation)

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1 Global Facility for Disaster Reduction and Recovery (GFDRR), *Guidance Notes on Safer School Construction* (New York: Inter-Agency Network for Education in Emergencies, and Washington, DC: GFDRR/World Bank, 2009), <http://www.wcdrr.org/wcdrr-data/uploads/885/Guidance%20notes%20on%20safer%20school%20construction.pdf>.

2 During data collection, the team found 221 MCC schools instead of the 218 schools that were documented.

3 SI recommended case studies of both MCC and non-MCC schools to be able to gather information about why the schools are in the condition they are. This information permitted comparison of maintenance practices and decision-making processes more broadly in Ghana, regardless of schools' aggregate conditions score.

as well as maintenance and maintenance funding are not uniform across schools in the different zones as well as across schools within the same zone.

## **Evaluation Question 2**

*How did the implementation process and/or post-completion maintenance contribute to current conditions of MCC investments?*

All respondents, particularly those from low-scoring MCC schools, highlighted poor planning and design at the implementation stage as a factor contributing to current school condition. There were instances where toilets were built in locations inaccessible to younger students, and where unassembled furniture was provided to schools- furniture of an unfamiliar design that could not be assembled by the school staff. Respondents across all groups and zones also mentioned contractors' poor workmanship as a factor affecting overall infrastructure quality. Particularly in the Northern and Afram zones, respondents spoke about contractors subcontracting aspects of construction work to others, in violation of their contract and negatively affecting the quality of construction. Some contractors also used inadequate and poor-quality materials in construction to cut costs, also adversely affecting the quality of the school buildings. As the implementing consultant, Lamda was in charge of supervision and oversight of local contractors, with additional spot checks by MiDA project managers. For both Lamda and MiDA, while they had guidance on pre-qualification and oversight of contractors through MiDA's Technical Specifications Manual, in practice this was not fully followed. Verifying the quality and reputation of contractors used in the implementation process and monitoring them thoroughly is key to ensure work of consistently good quality. To achieve this, two steps are required: First, ensure that the current contracting mechanism sufficiently vets all contractors before listing them as prequalified; and, second, ensure that once selected, the prequalified contractors perform the work and don't subcontract it out to non-approved or non-vetted entities.

Maintenance practices in Ghana also had a major effect on the conditions of MCC investments. Respondents across zones and types of schools described similar barriers to regular maintenance, including lack of funding, community lack of commitment or responsiveness, and lack of skills or expertise to undertake the work. However, those from low-scoring MCC schools appeared to describe a slightly greater number of maintenance issues than high-scoring MCC schools or non-MCC schools.

## **Evaluation Question 3**

*What other factors explain both perceived school-level outcomes and the current conditions of schools?*

In addition to poor maintenance practices, other factors such as misuse of school facilities by community members (i.e. using grounds as sports field), harsh weather (i.e. storms), and environment (i.e. lack of water during dry season) adversely affected school conditions. School facilities are easily accessible to the wider community, and security is insufficient to protect the premises from misuse and damage. Teachers, parents, and school management committee members all stressed the effect of unregulated use on school infrastructure condition. Respondents at low-scoring MCC schools also highlighted heavy rains, storms, wind, and fire as

factors affecting school infrastructure; these seemed more prevalent in the Afram and Northern zones than in the Southern Zone. At the same time, Parent–Teacher Associations (PTAs) and School Management Committees (SMCs) in high-scoring MCC and non-MCC schools were more proactive in addressing these factors than PTAs and SMCs at low-scoring MCC schools. Although the solutions proposed by respondents across schools were similar, respondents from low-scoring MCC schools proposed solutions for the government to implement, while those from high-scoring MCC schools and non-MCC schools spoke about what the community had done, including the formation of community watchdog groups.

Poverty, parental attitude to education, and availability of teacher housing were highlighted as key external factors affecting perceived school-level outcomes. Teenage pregnancy and menstruation were also cited as key factors affecting girls' education in all three zones. In the Northern Zone, in particular, cases of girls moving to commercial hubs in the country to become porters was also a major factor driving dropout.

#### **Evaluation Question 4**

*What are the perceived outcomes of the investments in school infrastructure?*

Respondents across MCC and non-MCC schools in all three zones felt that investment in infrastructure had a positive effect on enrollment, attendance, completion, and learning. They felt that renovated buildings, adequate furniture, and additional space created by new classroom blocks improved the learning environment, attracted students, teachers, and parents, and positively affected students' enrollment and attendance. The addition of polytanks and toilets close to the school also allowed students to spend more time there, as the placement eliminated children's need to travel far to use the toilet or fetch water. Most respondents across MCC and non-MCC schools also thought that the quality of teaching and learning at their school had improved over the preceding three years. A higher percentage of respondents at high-scoring MCC schools felt this way than respondents at low-scoring MCC schools. Although it cannot be concluded that the positive perception was due to the infrastructure improvement, respondents from MCC and non-MCC schools highlighted it as a contributing factor.

Enrollment has increased at most study schools, regardless of the MCC intervention. Although many respondents spoke about improved school infrastructure as a factor contributing to increased enrollment, some explained that new students were often those from neighboring schools that were in poorer condition. Consequently, although respondents felt that the improved school conditions attracted more children to enroll in their schools, it is unclear whether the improvements had any effect on bringing out-of-school children to school.

#### **Economic Rate of Return**

MCC originally calculated the Economic Rate of Return (ERR) to be 11.4 percent based on a set of key assumptions, key benefit streams, and key costs. The findings of this evaluation, however, have implications for assumptions of the original ERR:

- The lack of preventive maintenance at the schools will result in schools occasionally incurring fixed infrastructure costs (e.g., replacing a roof, polytank, furniture) not included in the original ERR.
- Along with routine wear and tear, school facilities are adversely affected by external factors such as community misuse of facilities, break-ins, and theft. Even if routine maintenance were conducted, the cost will likely be higher than assumed.
- Poor quality of construction will result in a shorter life of school infrastructure, affecting the number of years that students will enjoy the benefits of the school infrastructure improvements, in turn affecting the projected benefit stream.

Sensitivity analyses conducted with adjusted assumptions show that the current ERR is likely to be between 9.1 and 11 percent. Although this range will change based on the assumptions, the analysis suggests that the actual ERR is lower than the original ERR calculated by MCC. The assumptions used to make these calculations are described in more detail in the main report.

## **Policy Implications**

Key policy implications from these findings are:

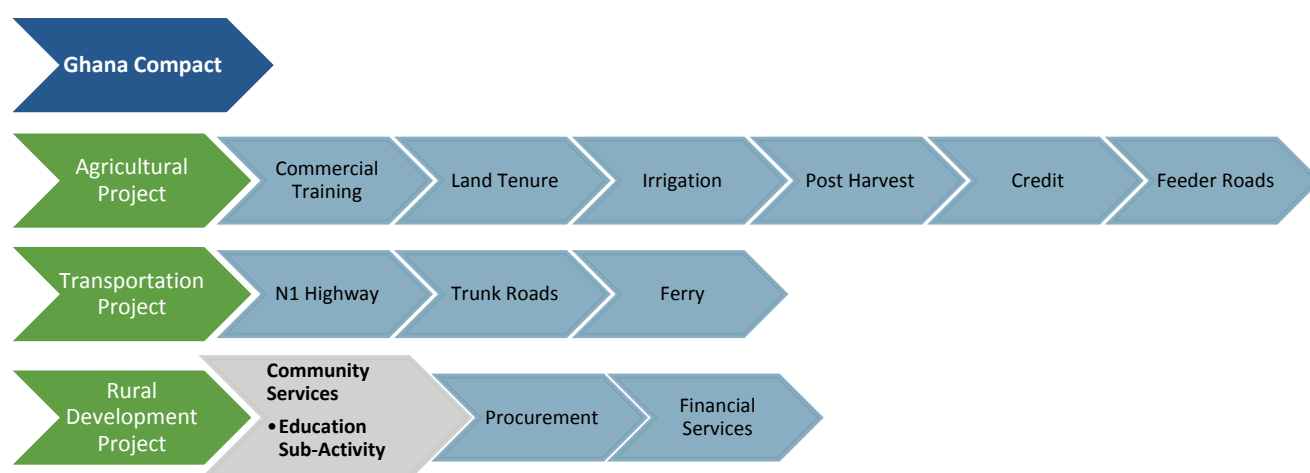
- A long-term maintenance strategy should be a central part of the design of any school infrastructure investment in Ghana.
- Experimentation around maintenance interventions is crucial to an understanding of what works and to progress in this area.
- Increased and effective monitoring during implementation is required to ensure building quality.

# Overview of the Compact

## The Compact

The first MCC compact with the GoG was signed in August 2006, and implementation of the compact projects began in February 2007 and ended in February 2012. The current evaluation of the compact's education sub-activity began in June 2015 with data collection taking place in 2016, four years after its completion in 2012. Through the compact, MCC granted Ghana US\$547 million to carry out a country-owned program focusing on improving agricultural development over five years.<sup>4</sup>

**Figure 1. Components of the Compact**



MiDA was responsible for oversight and management of compact implementation. MCC's compact with the GoG<sup>5</sup> was intended to reduce poverty through economic growth by achieving two primary objectives:

- Increase production and productivity of high-value food and cash crops in the intervention zones in Ghana.
- Enhance the competitiveness of high-value food and cash crops in the local and international markets.

## The Education Sub-Activity

The education sub-activity was one of three sub-activities that fell under the community services activity of the Rural Development Project. Overall, the community services activity was designed to improve social infrastructure such as education facilities, water, and electrification. It aimed to

<sup>4</sup> Millennium Challenge Account Ghana, *Compact Completion Report* (Washington, DC: Millennium Development Authority, 2013), [http://www.mida.gov.gh/pages/view/MCA\\_Completion\\_Report.pdf/3/news](http://www.mida.gov.gh/pages/view/MCA_Completion_Report.pdf/3/news).

<sup>5</sup> Economic and Social Council (ECOSOC) Annual Ministerial Review, "Ghana Poverty Reduction Strategy (GPRS I), 2007" in *Development Strategies That Work* [database], <http://webapps01.un.org/nvp/indpolicy.action?id=130>.

“enhance the sustainability of the Agricultural Project by providing the necessary infrastructure to improve [the] health of communities, to enhance skill development through the access to education, and to facilitate small scale post-harvest processing of agricultural products.”

The education sub-activity, split into two phases (with Phase 1 beginning in 2007 and Phase 2 in 2009), focused on rehabilitation or new construction of classroom blocks, construction of restroom facilities, installation of polytanks for rainwater catchment, and the furnishing of the newly constructed and rehabilitated spaces.

### **Program Logic of the Education Sub-Activity**

A theory of change for the sub-activity was not explicitly stated in the many documents reviewed by SI. In a review of relevant documents,<sup>6</sup> SI found that MCC and MiDA were operating on the hypothesis that an investment in education infrastructure would result in improved access to schools and better learning environments, which would lead in turn to increased enrollment, reduced dropout, increased attendance, and higher completion rates.

These intermediate outcomes could then be linked to the overarching programmatic objective of an increase in long-term earnings by increasing the education level of community members. This underlying theory was most explicitly explored in the cost-benefit analysis where employment was linked with years of education—that is, completion of kindergarten (KG), primary school, junior high school (JHS), and secondary school. Although the linkage between education and economic growth was implied, the cost-benefit analysis did not specifically explore the linkage between education and an increase in agricultural productivity.

### **Implementation of the Education Sub-Activity**

Phase 1 of the education sub-activity began between 2007 and 2008 and focused on the rehabilitation of schools identified by the community service activity under Ghana I Compact using the district medium-term development plans. According to the evaluation design report compiled by the National Opinion Research Centre (NORC),<sup>7</sup> the community service activity team under the Ghana I Compact drew from the list of schools identified by the district as having both the greatest need for rehabilitation and the fewest resources to accomplish this rehabilitation. Rehabilitation included replacing roofs, doors, and windows; repairing cracks; reinstalling window and door locks; and providing classrooms with new chalkboards and furniture.

Phase 2 of the sub-activity began in 2009 upon completion of a needs and environmental assessment that enumerated 881 schools as potential candidates to receive new class blocks.

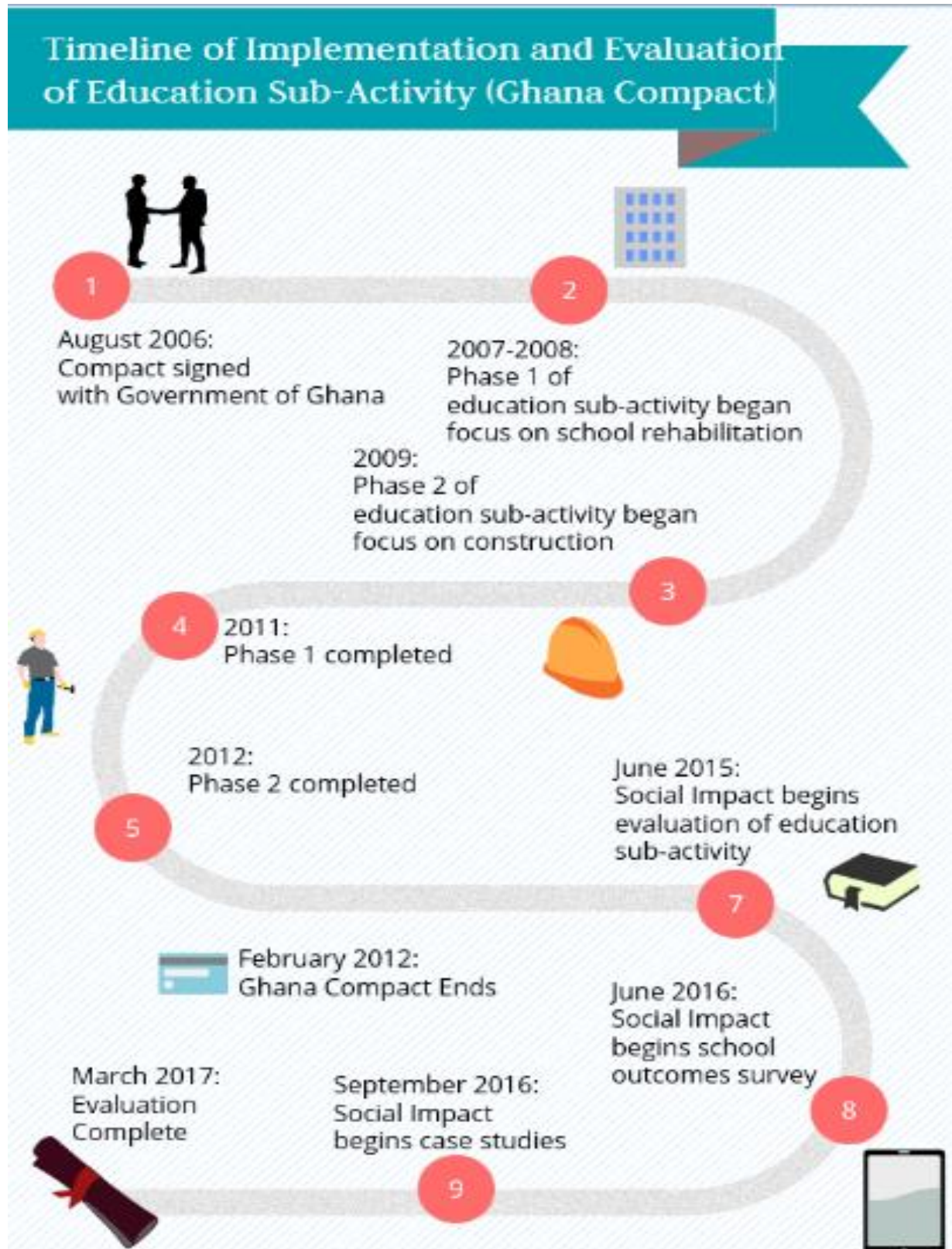
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<sup>6</sup> Millennium Challenge Corporation, *Ghana's Rural Development Project, Community Services: Education, Economic Rate of Return (ERR) Analysis* (Washington, DC: Millennium Challenge Corporation, 2013), <https://www.mcc.gov/where-we-work/err/ghana-compact>; National Opinion Research Centre (NORC), *MCC Ghana Impact Evaluation Services Evaluation Design Report—Update* (Chicago: NORC, 2013); Millennium Challenge Account Ghana, *Compact Completion Report*; and MASDAR, “Phase 2 Final Descriptive and Analytic Report” (n.p., n.d.). MASDAR is the local consulting firm that collected and analyzed monitoring data for the community services activity under Ghana Compact I.

<sup>7</sup> NORC, *MCC Ghana Impact Evaluation Services Evaluation Design Report*.



Figure 2. Timeline of Implementation and Evaluation



According to the community services selection criteria document issued by MiDA,<sup>8</sup> substandard facilities were given priority in the following order: schools that held classes under trees, schools whose classrooms were in unsafe structures (e.g., structures made of mud, open sheds), schools whose structures had not been completed, schools using rented accommodation, and schools in unclad pavilions.

According to MiDA's technical specifications manual<sup>9</sup>, eight main criteria determined which sites would be selected for rehabilitation: location, size, topography, shape, proximities, infrastructure, relocation, and title/ownership.

Using these criteria, MiDA, in consultation with the project management group Lamda, identified the schools where new classroom blocks would be constructed. At the close of the compact, MiDA had overseen the rehabilitation and/or construction of classroom blocks spread across 218 schools.

## Program Participants

Focused solely on school rehabilitation, the education sub-activity did not include direct services to participants and thus had no program participants per se. However, the entire compact specifically targeted rural farmers and their families. Direct beneficiaries of the sub-activity included students, parents, teachers, and school leaders.

**Table 1. Intervention Schools by Zone<sup>10</sup>**

	Phase 1 (2007–2011)	Phase 2 (2009–2012)	Total
Northern Agricultural Zone	35	37	72
Afram Basin Zone	15	81	96
Southern Horticultural Zone	15	43	58
TOTAL	65	161	226

The program was ultimately implemented in 30 districts across the Northern Agricultural Zone (Northern region), the Afram Basin Zone (Ashanti and Eastern regions), and the Southern Horticultural Zone (Central, Greater Accra, Eastern and Volta regions). These sites were chosen because they had a high percentage of farmers as well as a high percentage of income entering the community as a result of farming.

<sup>8</sup> Millennium Challenge Account Ghana, *Community Services Activity (Project Selection Criteria)* (n.p.: Millennium Development Authority, 2009).

<sup>9</sup> Millennium Development Authority (MiDA), *Draft Operations Manual for MiDA Community Services* (Washington, DC: Millennium Development Authority, 2006), vol. 4 (Technical Specifications: Education).

<sup>10</sup> Some schools participated in both Phase 1 and Phase 2, which is why the total number of schools presented in the table (226) is higher than the actual number of schools MCC planned to renovate/construct (218).

# Literature Review

This literature review focused on the relationship between school infrastructure and learning outcomes of students and included a mix of academic and government sponsored research. Most studies in the literature reviewed showed a positive relationship between improved school infrastructure and improved learning outcomes, school attendance and retention. For example, a 2010 literature review conducted by the 21<sup>st</sup> century school fund summarized 20 studies in developed countries (mainly the US) about the effect of school facilities on students and teachers since 2000. It found that most studies showed a small but steadily positive relationship between the quality of public school facilities and a range of academic and community outcomes including student academic performance, attendance, and dropout rates, as well as teacher retention rates.<sup>11</sup>

However, several studies also noted that infrastructure improvements alone were not sufficient to have an impact on learning outcomes and should be coupled with other educational interventions such as textbook and teaching material supplies. For example, a 2004 World Bank impact evaluation on basic education in Ghana found that while improving the quality and quantity of education infrastructure (i.e. classrooms) is an important strategy, it is not by itself adequate to ensure better learning outcomes. It showed a strong link between improved or new infrastructure and student enrollment, attributing a third of the increase in school enrollments between 1988 and 2003 to the changes in infrastructure quantity and quality. However, it also found that other interventions, such as supplying textbooks, were more effective in improving learning outcomes, such as test scores<sup>12</sup>.

The geographic distribution of studies was uneven, with the most rigorous having been conducted in the United States and other developed countries rather than in developing countries (with the exception of Latin America), which constitutes a gap in the literature.

The full list of included studies with their findings can be found in Annex 1. Annotated Bibliography of Selected Sources Consulted.

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<sup>11</sup> 21<sup>st</sup> Century School Fund, *Research on the Impact of School Facilities on Students and Teachers: A Summary of Studies Published Since 2000*, 2010

<http://www.21csf.org/csfhome/Documents/ResearchImpactSchoolFacilitiesFeb2010.pdf>

<sup>12</sup> World Bank Operations Evaluation Department, *Books, Buildings, and Learning Outcomes: An Impact Evaluation of World Bank Support to Basic Education in Ghana*, 2004, Washington, DC:

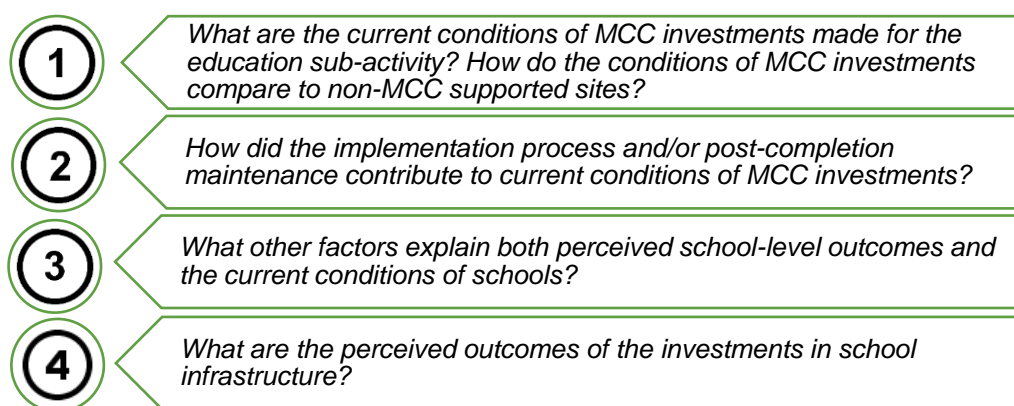
<https://openknowledge.worldbank.org/bitstream/handle/10986/14901/302220PAPER0Books0buildings.pdf?sequence=1&isAllowed=y>

# Evaluation Design

## Evaluation Questions

The objectives of this ex-post performance evaluation target how the education sub-activity was implemented, if and how it has been sustained, and the perceived outcomes from it. To meet these objectives, MCC and SI outlined four evaluation questions<sup>13</sup>.

**Figure 3. Evaluation Questions**



## Policy Relevance

The life of the investment is of central importance to MCC's cost-benefit analysis. The two primary factors that influence the life of the investment are the quality of the original work and the degree to which the investments were maintained over time. How the implementation process unfolded and whether the schools were maintained have important policy implications not only for MCC, but also for their local affiliate MiDA, other international donors, and the GoG. Understanding this process will allow each stakeholder to learn about the issues that affect implementation and maintenance and will enable them to address these issues in future programming.

## Methodology

To answer the evaluation questions, SI supplemented existing data with two distinct but related data collection activities: a school conditions survey, to answer evaluation Question 1, and cross-case studies to answer evaluation Questions 2, 3, and 4. A summary of the methodology is presented below, with additional details in Annex 2. Sampling and Design: Additional Details.

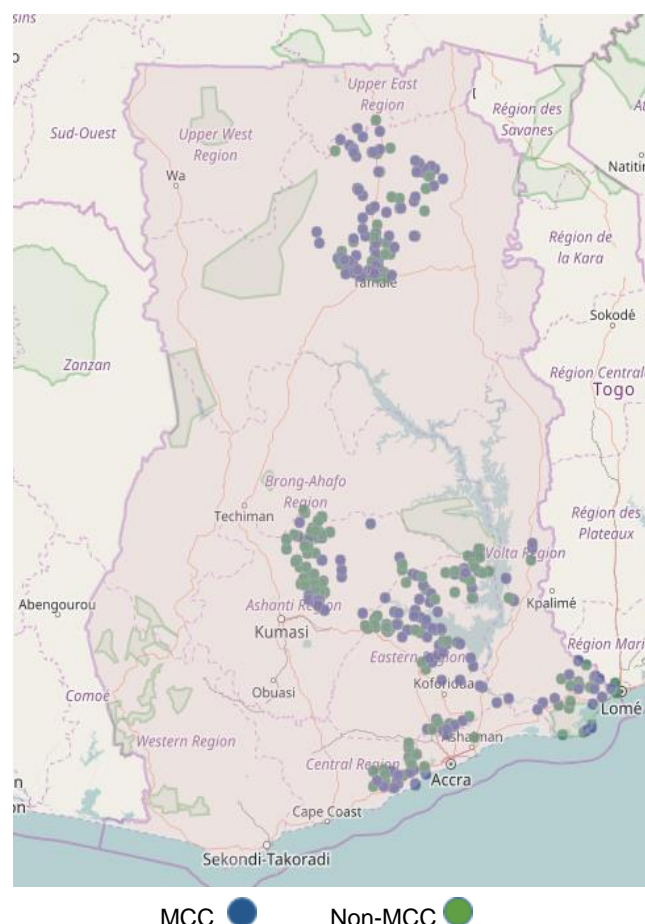
<sup>13</sup> Note that the evaluation questions presented here have been rearranged and renumbered from those outlined in the evaluation design report so as to support and simplify the discussion on methodology, analysis, and findings.



## School Conditions Survey

A school conditions survey was completed in 221 MCC and 192 non-MCC schools to systematically examine school infrastructure conditions against international standards<sup>14</sup>, GoG building guidelines, and the MiDA maintenance manual<sup>15</sup>. The survey had a section on basic school information (including the school's Education Management Information System (EMIS) number; location, with geocoordinates; approximate number of students served; and investments or upgrades made, and by whom, during the previous five years) followed by a checklist for enumerators to score different aspects of school infrastructure (i.e., school grounds, classroom block conditions, equipment and furniture, and toilet facilities and polytanks), each with multiple subcomponents. The condition of each of these was rated as poor, average, or good and documented with a photograph of the object rated. Although a school conditions survey is subjective in nature, the photographs provided a visual record of conditions and allowed the SI team to test for enumerator bias.

**Figure 4. MCC and Non MCC schools**



**Table 2. School Conditions Survey Sample by Zone**

Zone	MCC		Non-MCC		Total	
	Original Sample	Actual	Original Sample	Actual	Original Sample	Actual
Afram	93	93	167	96	260	189
Northern	69	72	56	35	125	107
Southern	56	56	114	61	170	117
Total	218	221	337	192	555	413

Source: School Conditions Survey 2016

During the analysis stage, ratings for each subcomponent were standardized to a four-point scale ranging from poor to good condition to account for features that could have been missing and therefore were not ratable (e.g., roof, door, windows). Scores for the four components were then averaged, weighted equally, to create an aggregate school conditions score for each school. This score allowed the evaluation team to rank and compare schools' conditions and enabled the team

<sup>14</sup> Op. cit. GFDRR, *Guidance Notes*.

<sup>15</sup> Op. cit. MiDA, *Community Services Infrastructural Maintenance Manual*

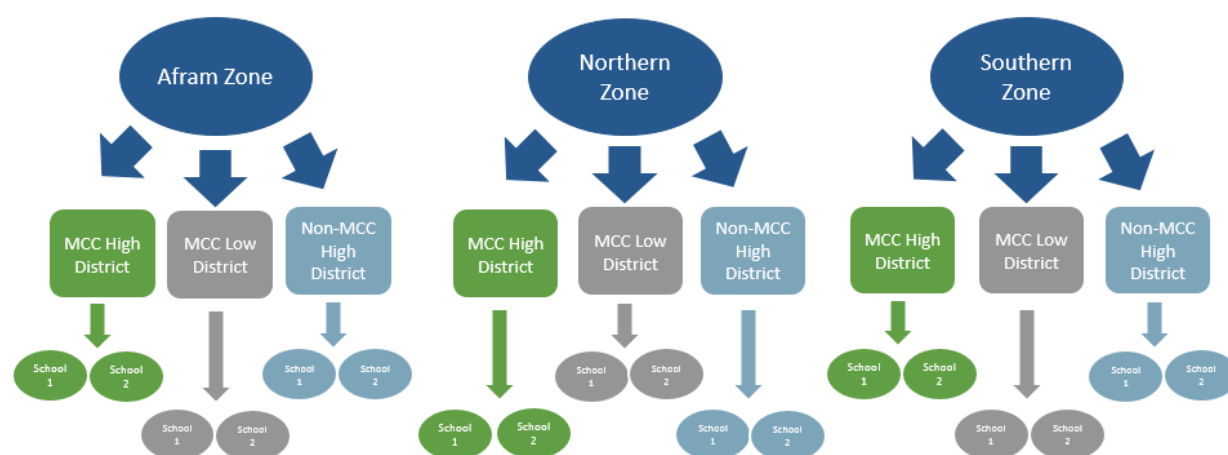
to observe variations across districts, zones, and intervention status and to identify factors requiring further investigation during qualitative field research.

## Case Studies

Following the school conditions survey and the preliminary analyses of the data gathered, SI conducted nine district-level, in-depth case studies with cross-case analysis<sup>16</sup> to answer evaluation questions about the processes that may have led to current school infrastructure conditions and the perceptions of key stakeholders on the relationship between the investments made and school-level outcomes such as enrollment, attendance, persistence, and learning.

The evaluation team used a stratified purposive sampling approach to select the best and worst cases for examination (districts with clusters of schools with good or poor conditions),<sup>17</sup> with the expectation that these cases represented the extremes in the processes that would allow the team to identify patterns of behavior and describe the context/environment in which these behaviors occur. There were three case studies in each of the three zones where MCC provided support (i.e., Afram, Northern, and Southern). Two case studies focused on MCC schools and a third on non-MCC schools, for a point of comparison. In all, SI selected 18 schools (six high-scoring MCC schools, six low-scoring MCC schools, and six high-scoring non-MCC schools), across nine districts in the three zones.

**Figure 5. Case Study School Selection Process**



During case study data collection, the team interviewed four categories of people at each school: individuals familiar with the implementation process; individuals familiar with maintenance; those who could speak to the area's social, political, economic, and environmental climate; and those who could address the relationship between school conditions and school-level outcomes. SI

<sup>16</sup> SI recommended case studies of both MCC and non-MCC schools so as to gather information about why the schools were in the condition they were in and to permit comparison of maintenance practices and decision-making processes more broadly in Ghana, regardless of aggregate conditions scores.

<sup>17</sup> For more on the case study approach for evaluation, see United States General Accounting Office (GAO) Program Evaluation and Methodology Division, *Case Study Evaluations* (Washington, DC: GAO, 1990), [http://www.gao.gov/special.pubs/10\\_1\\_9.pdf](http://www.gao.gov/special.pubs/10_1_9.pdf). For more on case selection, see Linda G. Morra and Amy Friendlander *Case Study Evaluations* (n.p.: World Bank Operations Evaluation Department, n.d.), [https://ieg.worldbankgroup.org/Data/reports/oed\\_wp1.pdf](https://ieg.worldbankgroup.org/Data/reports/oed_wp1.pdf).



worked with the data collection partner and a local education expert to determine the ideal respondents in each category. Final respondents included parents, students, teachers, school leaders or headmasters and individuals responsible for operations and management at the school level; district education officers, construction consultants and implementers at the district level; and representatives from the Ministry of Education, MiDA, Lamda and MCC at the national level. KIs, FGDs, and CSCs were used to guide the interviews. Annex 5. Case Study Respondent Group Selection, includes the full list of respondents along with details on selection and interview methods.

## **Time Frame**

MiDA implemented the education sub-activity between 2006 and 2012. SI completed the initial evaluability assessment in 2015 and the evaluation design phase in 2016. Data collection was carried out later that year—for the school conditions survey over five weeks in June and July and for the case studies over six weeks in September and October.

## **Challenges and Limitations**

Limited information about the schools in the sample: The evaluation team was provided with the list of schools that were originally considered by MiDA for the education sub-activity. This list included schools that received funding (MCC schools) along with those that did not (non-MCC schools). Although information was complete for the MCC schools, community and school names were missing for many of the listed non-MCC schools. As a result, the team could not visit the full sample of non-MCC schools, and those visited during data collection may not have been representative.

Subjective nature of the school conditions survey: Although the inherent subjectivity of observations was mitigated by the inclusion of photographs of items assessed and by extensive enumerator training on assessment criteria, conditions assessments are ultimately subjective and may have varied from one enumerator to the next.

School conditions aggregate score: The process of aggregating the school conditions score, although helpful for deriving meaning from the data collected, entails a loss of specificity. Reducing the number of schools studied to 18 from the more than 500 listed also essentializes some of the findings.

Recall bias: Because data collection occurred four years after the intervention ended, respondents relied on recall when talking about project implementation and the changes since then. As a result, their statements may have reflected recall bias. SI tried to mitigate the risk of this by speaking to multiple respondents who could describe the implementation process and then triangulating the various responses.

Interviewing contractors: SI faced multiple challenges in obtaining names and accurate contact details for the contractors who built the MCC schools. Although the evaluation team tried to obtain this information from the MiDA team that had implemented the project, the contact details provided were not current and many contractors could not be reached. Among those reached, the majority refused to participate in interviews.

# Findings and Conclusions

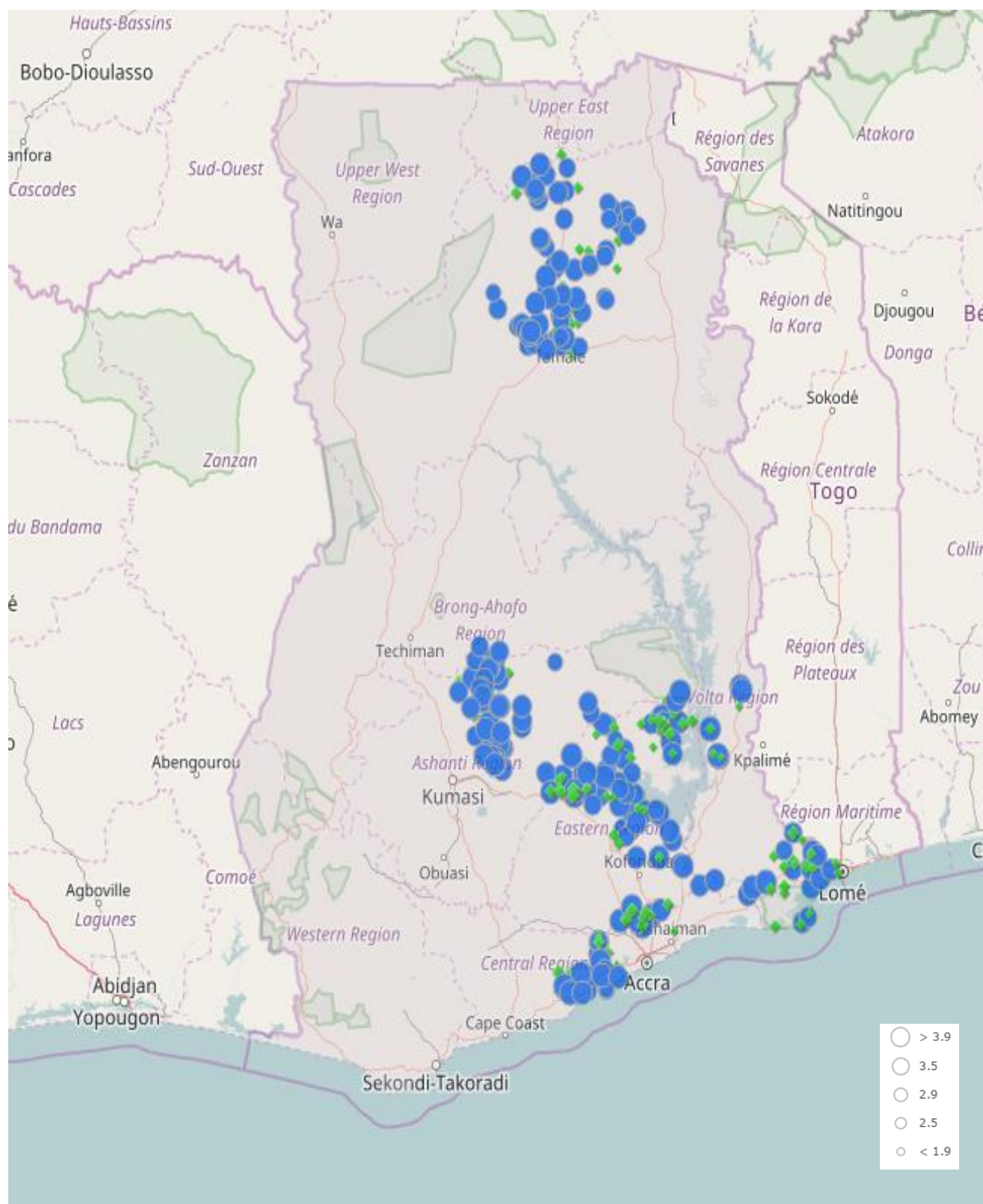
Using both quantitative and qualitative data, SI conducted cross case analysis to answer the four evaluation questions, while noting the differences between zones (Afram, Northern, Southern) and type of school (low-scoring MCC, high-scoring MCC, high-scoring non-MCC). The key findings are summarized below in Table 3 and discussed in more detail in the following section.

**Table 3. Summary of Key Findings**

Evaluation Question	Key Findings
EQ1: Current conditions of MCC investments.	<ul style="list-style-type: none"> <li>MCC schools are in significantly better condition than non-MCC schools (p-value&lt;.001). The average overall school conditions score, on a scale of 1-4 with 4 being good condition, was 3.24 for MCC schools compared to 2.78 for non-MCC schools.</li> <li>There is variability in the condition of MCC schools across zones. Southern and Afram zone MCC schools have significantly higher school conditions scores than Northern zone MCC schools (p-value&lt;.001). Southern zone (3.37) Afram zone (3.28) Northern zone (3.09).</li> <li>There is also variability in the condition of MCC schools within zones. High-scoring MCC schools have significantly higher school conditions scores than low-scoring MCC schools within each zone (p-value&lt;.001). Southern zone (3.56 vs 3.13) Afram zone (3.50 vs 3.05) and Northern zone (3.35 vs 2.87).</li> </ul>
EQ2: Effect of implementation and maintenance on current condition of school infrastructure.	<ul style="list-style-type: none"> <li>Poor planning and design at the implementation stage contributed to current school conditions across all zones and schools.</li> <li>In the Northern and Afram zones, contractors sometimes subcontracted the work to others, in violation of their contract. This negatively affected the quality of construction.</li> <li>There is no practice of routine or preventive maintenance across all zones and schools.</li> <li>Lack of maintenance funding and community buy-in are key barriers to maintenance.</li> <li>Low-scoring MCC schools had more maintenance issues than high-scoring ones.</li> </ul>
EQ3: Other factors affecting school conditions and learning outcomes.	<ul style="list-style-type: none"> <li>Misuse of school facilities by community members (across all zones and schools), harsh weather (primarily in Afram and Northern zones, but all school types), and environment (primarily in low scoring MCC schools) adversely affected school conditions.</li> <li>PTAs and SMCs in high scoring MCC and non-MCC schools were more proactive in addressing these factors than those at low-scoring MCC schools.</li> <li>Poverty (primarily in Northern and Afram zones), parental attitude to education (all zones), and availability of teacher housing (all zones) are key factors affecting perceived school-level outcomes.</li> </ul>
EQ4: Perceived outcomes of investment in school infrastructure.	<ul style="list-style-type: none"> <li>Perception across all zones in all study schools was that improvements in infrastructure positively affected enrollment, attendance, completion and learning.</li> <li>Most respondents across MCC and non-MCC schools thought that the quality of teaching and learning at their school had improved over the preceding three years.</li> <li>A higher percentage of respondents at high-scoring MCC schools felt this way than respondents at low-scoring MCC schools.</li> <li>Enrollment has increased at most study schools, regardless of the MCC intervention.</li> </ul>

Source: School Conditions Survey 2016, Qualitative transcripts

**Figure 6. MCC and non-MCC Schools, by School Conditions Score**



Source: School Conditions Survey 2016

MCC ● Non-MCC ◆

## Evaluation Question 1

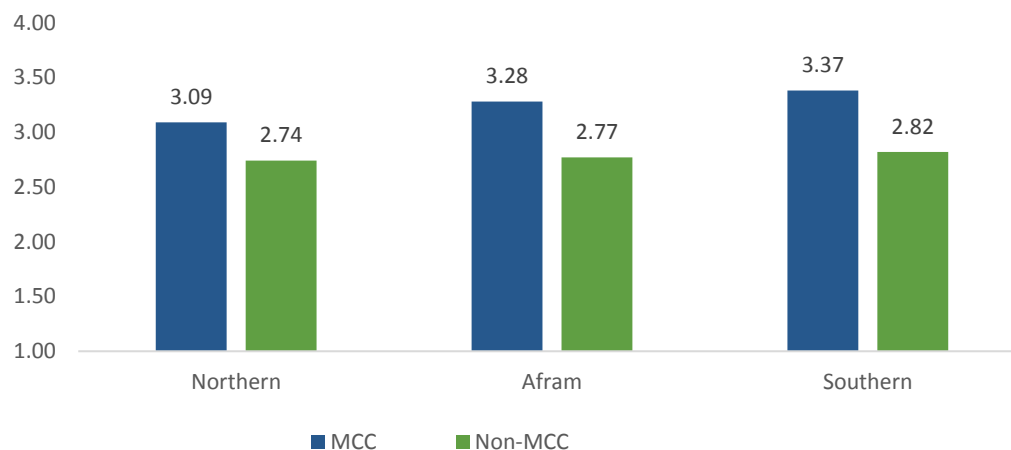
What are the current conditions of MCC investments made for the Compact 1 education sub-activity? How do the conditions of MCC investments compare to non-MCC-supported sites?

***MCC schools are in better condition than non-MCC schools across all zones. There is significant variation in the condition of MCC schools across and within zones.***

### ***MCC schools are in better condition than non-MCC schools across all zones***

The results of the school conditions survey clearly show that across zones, MCC schools' infrastructure is currently in better condition than that of non-MCC schools. In all three zones, aggregate scores were notably higher for MCC schools than for non-MCC schools (Figure 7).

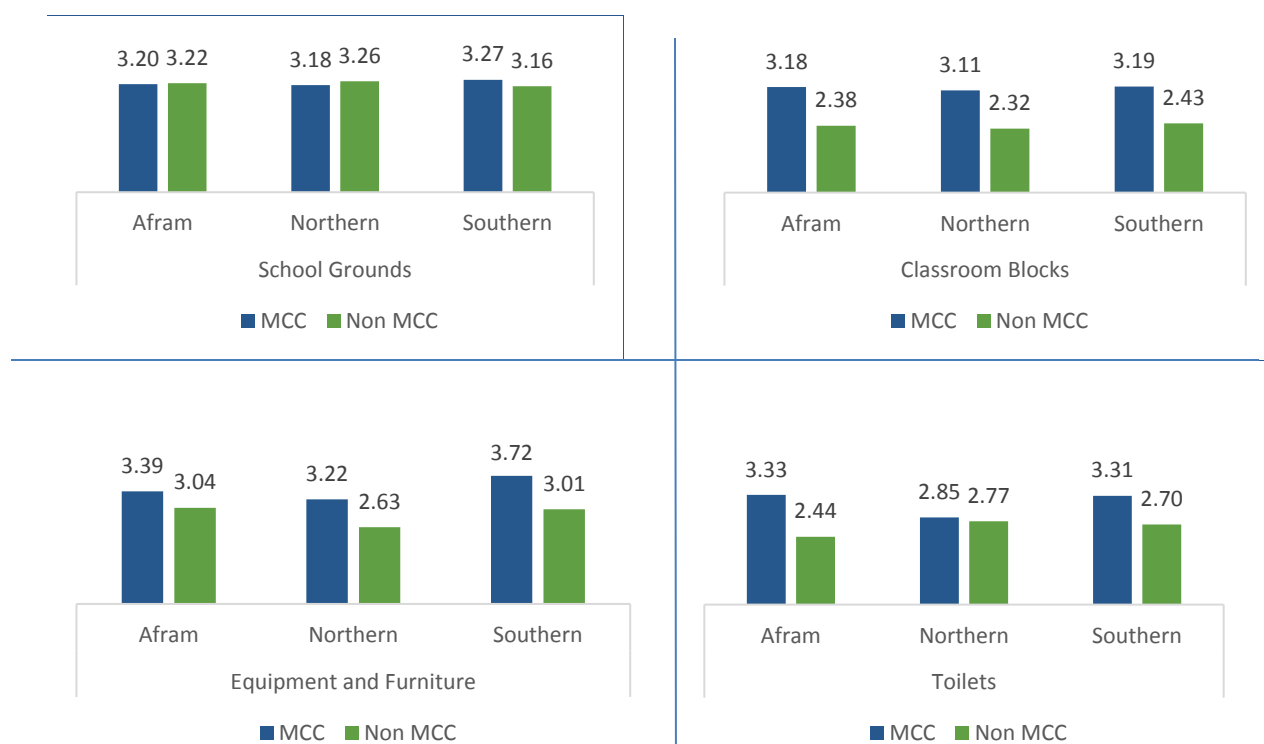
**Figure 7. Aggregate School Scores by Zone and Funding Status**



Source: School Conditions Survey 2016

The biggest difference in aggregate scores between MCC and non-MCC schools occurred in the Southern Zone, the smallest difference in the Northern Zone. The Southern Zone also had the highest scores for both MCC and non-MCC schools while the Northern Zone had the lowest scores for both. In the Afram Zone, both MCC and non-MCC schools were in the middle compared to other zones. The overall average score across all zones was 3.24 for MCC schools and 2.78 for non-MCC schools; the difference between them was statistically significant, with  $p\text{-value} < .001$ . To see whether there was any difference between MCC sponsored rehabilitation work and other donors' interventions, the team also ran a t-test comparison between regularly rehabilitated MCC schools and non-MCC schools which received rehabilitation or new construction since 2012. The average for MCC schools was the same 3.24 and interestingly, the average for rehabilitated non-MCC schools was 2.77, nearly identical to the overall non-MCC average, and the difference between them was statistically significant with  $p\text{-value} < .001$ .

**Figure 8. Components of School Scores by Zone and Funding Status**



Source: School Conditions Survey 2016

Looking at the school conditions scores by their component parts, (Figure 8) we see a similar pattern of MCC schools scoring higher than non-MCC schools, with minor variations. MCC schools scored higher than non-MCC schools in all zones for classroom block, equipment and furniture, and toilet components. School grounds was the only component where non-MCC schools scored near equal to or higher than MCC schools in the Afram and Northern zones, while MCC schools still scored higher in the Southern Zone. The biggest difference in scores between MCC and non-MCC schools was in the condition of classroom blocks, with MCC schools scoring 0.78 points higher on average across zones. When looking at the average component scores for all MCC and non-MCC schools, we see that component scores for MCC schools were higher, with statistical significance, than for non-MCC schools for all but school grounds. (Table 4)

**Table 4. Component Significance Levels**

	School Grounds	Classroom Blocks	Equipment and Furniture	Toilets
MCC schools	3.21	3.16	3.42	3.17
Non-MCC schools	3.21	2.38	2.96	2.58
Difference	.00	.78***	.46***	.59***
p-value	.48	0.00	0.00	0.00

Source: School Conditions Survey 2016

Significance Levels: \*p<.05, \*\*p<.01, \*\*\*p<.001

These findings from the school conditions survey were corroborated by the qualitative findings from the CSCs, which were gathered during the case study interviews from students, parents, and teachers. Respondents were asked whether, in their opinion, the condition of classroom buildings, toilets, and furniture and supplies had gotten better, stayed the same, or gotten worse over the preceding three years. Overall, a greater percentage of respondents in MCC schools claimed that classroom building, furniture and equipment conditions had improved over this period compared to respondents in non-MCC schools. (Table 5) However, a larger percentage of respondents from non-MCC schools claimed that toilets had improved. It is worth noting that for both MCC and non-MCC schools, a higher percentage of respondents claimed that conditions of classroom buildings and furniture and supplies had deteriorated.

**Table 5. Community Score Card Responses**

% of Respondents by Zone and School Type	Condition of Classroom Buildings			Condition of Latrines			Condition of Furniture and Supplies		
	Worse	Same	Better	Worse	Same	Better	Worse	Same	Better
MCC Afram	57%	4%	38%	76%	16%	8%	84%	7%	10%
MCC Northern	53%	13%	35%	38%	8%	54%	39%	16%	45%
MCC Southern	6%	3%	91%	9%	35%	57%	2%	48%	50%
Non-MCC Afram	75%	9%	15%	81%	14%	5%	57%	22%	20%
Non-MCC Northern	56%	34%	10%	1%	0%	99%	56%	35%	9%
Non-MCC Southern	4%	46%	50%	83%	3%	14%	90%	0%	10%

Source: Community Score Cards 2016

To investigate whether MCC funding had any statistically significant relationship with the current conditions of schools, the team conducted correlation analysis that measured the strength of the relationship between the aggregate school conditions score and factors such as school size, MCC funding, and maintenance activity. This analysis showed that the size of the school, whether there was sufficient space for students, and whether the school had received MCC funding were significantly positively correlated with the aggregate school conditions score. Interestingly, other donor activity that had occurred since 2012 had no correlation with higher school conditions scores, with a rho (coefficient of correlation) of 0 and p-value of 0.97 ( $p > .1$ ). One possibility for the disparity between correlations of funding by MCC and other donors with school conditions is the type of activities funded. Although MCC funding went toward classroom block rehabilitation, new furniture, and upgrades to toilets and polytanks, funding from other donors, including the GoG, NGOs, and communities, sometimes went toward sanitation, health, building materials, solar lamps, sports equipment, and the like. One head teacher from a high-scoring non-MCC school explained how the school used its government-provided capitation grant:



*Normally we...use capitation for sporting activities. Hardly do we use capitation for maintenance works. Sometimes when the capitation comes and it is enough, we allot some portion for a little maintenance.*

*~Head teacher, high-scoring non-MCC school, Southern Zone*

Overall, across all zones, MCC schools and their school conditions components were in notably better condition than non-MCC schools and their school conditions components. In fact, with only one exception, the highest-scoring non-MCC schools in each zone scored lower than the lowest-scoring MCC schools in the same zone. This clear difference in the condition of MCC and non-MCC schools—combined with the strong correlation of MCC funding with better school conditions and the lack of correlation of other donor funding with improved school conditions—leads to the conclusion that MCC funding contributes in an important way to school conditions, regardless of zone.

***There is substantial variation in the conditions of MCC schools both across and within zones***

Breaking the data out geographically allowed us to see striking variations in conditions among MCC schools in Afram, Northern, and Southern zones. The highest aggregate scoring zone for MCC schools was the Southern Zone, with an average score of 3.37, while the lowest-scoring zone was the Northern Zone, at 3.09. This trend extended to the component level, where—among MCC schools across all four categories—those in either the Southern Zone or the Afram Zone scored highest and those in the Northern Zone scored lowest (Table 6).

**Table 6. Average Component Scores for MCC Schools across Zones**

Component	Northern Zone MCC School Score	Afram Zone MCC School Score	Southern Zone MCC School Score
School grounds	3.18	3.20	3.27
Classroom blocks	3.11	3.18	3.19
Equipment and furniture	3.22	3.39	3.72
Toilets	2.85	3.33	3.31
Aggregate School Index	3.09	3.28	3.37

Source: School Conditions Survey 2016

As shown in Table 7 below, comparing the component scores of MCC schools in the Afram, Southern, and Northern zones, we see statistically significant disparities in the condition of the schools overall, as well as specifically related to equipment/furniture and toilets. For equipment and furniture, the Southern zone MCC schools scored significantly higher than both the Northern and Afram zone MCC schools while the Afram and Northern zone MCC schools were not significantly different from each other. For toilets, both Afram and Southern zone MCC schools scores significantly higher than the Northern zone MCC schools, but there was no significant difference between the Afram and Southern zones. Looking at the aggregate school condition index, both Southern and Afram zone MCC schools scored significantly higher than the Northern zone MCC schools, which is in keeping with the trends in the sub-components.

**Table 7. ANOVA Analysis of Component Scores for MCC Schools across Zones**

Index	Comparisons	Difference	P-Value
MCC School Grounds Index	Afram vs Northern	.02	0.96
	Southern vs Northern	.09	0.51
	Southern vs Afram	.07	0.63
MCC Classroom Blocks Index	Afram vs Northern	.07	0.31
	Southern vs Northern	.08	0.31
	Southern vs Afram	.01	0.98
MCC Equipment and Furniture Index	Afram vs Northern	.17	0.10
	Southern vs Northern	.50***	0.00
	Southern vs Afram	.33***	0.00
MCC Toilets Index	Afram vs Northern	.48***	0.00
	Southern vs Northern	.45***	0.00
	Southern vs Afram	-.02	0.97
MCC Aggregate School Index	Afram vs Northern	.19***	0.00
	Southern vs Northern	.28***	0.00
	Southern vs Afram	.09	0.10

Source: School Conditions Survey 2016

Significance Levels: \*p&lt;.05, \*\*p&lt;.01, \*\*\*p&lt;.001

While the figures above show the high variability of MCC school conditions across zones, high variability also existed between school conditions scores in MCC schools within each of the zones. To test whether there was a significant difference between high-scoring MCC schools (defined as MCC schools that scored above the zone mean) and low-scoring MCC schools (defined as MCC schools that scored below the zone mean), the team conducted t-test analysis at the zonal level. The results showed that in all three zones, the high scoring MCC schools had significantly higher school conditions scores than the low scoring MCC schools, all with a significance level of p<.001 (Table 8).

**Table 8: T-Test Analysis on High vs Low Scoring MCC School Aggregate Scores within Zones**

	Northern Zone	Afram Zone	Southern Zone
High Scoring MCC	3.35	3.50	3.56
Low Scoring MCC	2.87	3.05	3.13
Difference	.48***	.45***	.43***
p-value	0.00	0.00	0.00

Source: School Conditions Survey 2016

Significance Levels: \*p&lt;.05, \*\*p&lt;.01, \*\*\*p&lt;.001

The high variability that exists among MCC schools' conditions scores both across and within zones points to inconsistencies over the life of the investment. If we saw differences in MCC scores only across zones, we might be able to point to different levels of local government support or funding, or other local contributing factors, as a cause of the high variability between high- and low-scoring MCC schools. However, because we also see significant differences between high- and low-scoring MCC schools within zones, the possibility is reduced that only local contextual factors are driving the differences. The variation of MCC school scores both across and within zones, coupled with the correlation between regular maintenance and better school conditions scores ( $\rho = .09$ ,  $p < .1$ ), lead to the conclusion that some aspect of the MCC investment is not uniformly implemented and managed throughout Ghana. To investigate this, we compiled a tally sheet of all qualitative data for both high- and low-scoring MCC schools as well as high-scoring Non-MCC schools related to respondents' maintenance experience (Table 9).

**Table 9. Maintenance Tally Sheet**

	Lack of Maintenance Training	Lack of Maintenance Funding	Lack of Community Support for Maintenance	Lack of Skills and Expertise to Conduct Maintenance
<b>HIGH-SCORING MCC SCHOOLS</b>				
Northern	0	3	0	1
Afram	2	6	1	1
Southern	1	5	1	0
<b>TOTAL</b>	<b>3</b>	<b>14</b>	<b>2</b>	<b>2</b>
<b>LOW-SCORING MCC SCHOOLS</b>				
Northern	2	8	1	2
Afram	1	9	6	1
Southern	2	5	0	0
<b>TOTAL</b>	<b>5</b>	<b>22</b>	<b>7</b>	<b>3</b>
<b>HIGH-SCORING NON-MCC SCHOOLS</b>				
Northern	1	7	3	0
Afram	0	5	5	0
Southern	1	6	2	0
<b>TOTAL</b>	<b>2</b>	<b>18</b>	<b>10</b>	<b>0</b>

Source: Qualitative KIIs and FGDs

The tally sheet included responses from KIIs and FGDs with district education officers, local contractors, community leaders, head teachers, SMCs, male and female students, parents, and teachers. Overall, more respondents at low-scoring MCC schools, compared to those at high-scoring MCC schools, noted a lack of maintenance training, funding, community support, and skills. Among these issues, the one most frequently mentioned by respondents in both high- and low-scoring MCC schools across all zones was a lack of funding for maintenance. Within all three zones, the low-scoring MCC schools mentioned lack of funding with the same or greater frequency than their counterpart high-scoring MCC schools, suggesting that within zones, funding is not distributed evenly to all schools.

## Evaluation Question 2

*How might have the implementation process and/or maintenance post-completion contribute to current conditions of MCC investments?*

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***Issues with planning, design, and construction of school infrastructure contributed to the poor condition of some MCC schools.***

***Quality of contractors was mixed across all types of MCC schools.***

***Lack of funding for maintenance and low levels of community buy-in also adversely affected the condition of these schools.***

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### Implementation

Respondents of all types across all zones and score levels mentioned challenges related to implementation, particularly in connection to the work of contractors, which subsequently affected infrastructure quality and longevity. Respondents from low-scoring MCC schools mentioned these issues more often than at those from high-scoring MCC schools or non-MCC schools.

#### ***Poor planning and design occurred in some low scoring MCC schools***

Although one MiDA respondent felt that project designs were good, some respondents from low-scoring MCC schools mentioned challenges related to the planning and design phases of implementation. For instance, a few respondents from low-scoring MCC schools mentioned complex infrastructure designs that made it difficult for the school to maintain, such as for roofing sheets or latrines. At some schools where the furniture provided by the contractors came unassembled and was of an unfamiliar design that made it difficult to set up, headmasters rejected it. As a result, desk components remained unused in these schools. However, a Lamda representative described the chosen design as “easily . . . done, you don’t need any expert.”

In one instance, people were afraid to use the latrine because it had a roof and people felt that if the building collapsed, “we will fall inside it.” Students were intimidated by the latrines and so instead would “go to the bush.” There were also a couple of instances where latrines were built in inaccessible locations, such as far into the bush, difficult for students to access, particularly kindergartners. A district education officer from a low-scoring MCC school in the Northern Zone mentioned that community members often did not know what a contractor was building until after construction had started—sometimes not until the structure had been completed—and it was only then that they realized that they did not need what had been provided. (This is interesting, given that MCC schools in the Northern Zone scored the lowest of any region on the school conditions survey for toilets, the component that brought the lowest scores across components and regions, with a 2.85.) For instance, in a couple of cases, schools were provided with flushing toilets that ended up not being used because the school did not consistently have water. Once a contractor had begun construction however, plans could not be changed because the contractor would not get paid.

A district-level respondent from a non-MCC school mentioned poor planning, citing construction done next to a waterway that would flood, and result in high water in the school. The same respondent described having been provided with a ceiling fan—for a school that did not have electricity.

***Quality of contractors and their construction work were mixed across all types of MCC schools***

Respondents across all groups and zones mentioned contractors' poor workmanship as a factor affecting overall infrastructure quality.

One MiDA representative described specific construction issues related to the quality of materials utilized. A different MiDA respondent noted inconsistent work despite MiDA and Lamda efforts to provide adequate supervision and oversight to ensure good construction.

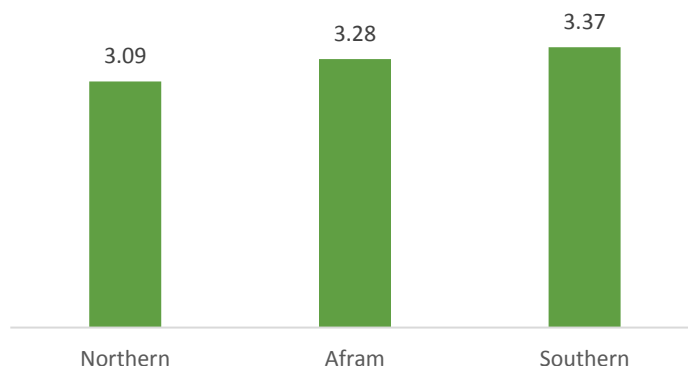
District-level respondents from low-scoring MCC schools also brought up poor work by contractors. One person from a low-scoring MCC school in the Northern Zone deplored “shady work done by contractors”—specifically, that they might use half the cement required, resulting in cracking over time. While acknowledging that some contractors were “very lazy” and had to be pushed, one local contractor in the same region blamed the cracking on the ground—clay would become waterlogged and thus susceptible to cracking and was expensive to build on.

A few respondents from low-scoring MCC schools, primarily from the Afram and Northern zones, mentioned furniture, roofing, and latrines as being poorly constructed. A respondent from a high-scoring MCC school from the Northern Zone mentioned that a poorly laid foundation permitted erosion, which was damaging to the buildings.

A different respondent from a high-scoring MCC school in the Afram Zone mentioned that contractors did not bring the correct materials and did not assemble them—for example, roofing and furniture. The school staff did not know how to do this work. The same respondent also mentioned lack of follow-up as a challenge, where contractors came and did construction but never returned to see whether there had been any issues about the work. However, a Lamda representative felt that the designs should have been easy for anyone to put together. It was a challenge for the contractors, he noted, to go around to all the schools to assemble the materials, so an attempt was made to “create a communication” with teachers to provide support.

Although respondents across regions mentioned similar issues in the implementation process, described above, issues were brought up more often about the Northern and Afram zones. This aligns with school conditions survey findings of lower aggregate condition scores for the Northern and Afram zones' MCC schools than for MCC schools in the Southern Zone (Figure 9). This could be due to the same contractors being procured in those regions.

**Figure 9. Aggregate Condition Score for MCC Schools**



Source: School Conditions Survey 2016

***Verifying the quality and reputation of contractors used for implementation is key to ensuring consistently high-quality work.***

Both high-scoring and low-scoring MCC schools raised the quality of contractors and their work as a concern. The problem is rooted in how contractors are selected. A Lamda representative described the procurement process as “not too competitive”; contractors are prequalified based on their technical qualifications and then the firm with the lowest price wins the award.

Although this selection format is typical and in theory should ensure that only quality contractors are hired, several respondents mentioned a high prevalence of subcontracting, even though the practice is prohibited under the terms of contractors’ agreements. A MiDA representative spoke of having struggled with contractors, noting that some were “just the normal Ghanaian—they will get the job and pass it on to somebody else to do, so . . . that the consistency is not there.” This representative felt that Lamda’s contract was “too flexible” and mentioned the challenge of tracking such contractual violations. Other respondents mentioned steps taken to prevent subcontracting and to make sure that the work was done by the right people.

While MiDA has a Technical Specifications Manual for Education that sets out how the pre-qualification of contractors should occur and prohibits sub-contracting, the implementation of those regulations was a challenge. Verifying the quality and reputation of contractors used in the implementation process and monitoring them thoroughly is key to ensure work of consistently good quality. To achieve this, two steps are required: First, ensure that the current contracting mechanism sufficiently vets all contractors before listing them as prequalified; and, second, ensure that once selected, the prequalified contractors perform the work and don’t subcontract it out to non-approved or non-vetted entities.

***Regular and frequent oversight of contractors is key to identification of underperformers and corrective action***

Several groups of respondents, including high- and low-scoring MCC schools in the Afram and Northern zones, mentioned scenarios that could have been avoided or corrected if regular and



frequent oversight had taken place—contractors not using quality cement, not assembling furniture, not installing blackboards, or not returning for final handover and inspection. Although the primary responsibility for conducting check-ins with local contractors was with Lamda, MiDA also had oversight responsibility and conducted occasional site visits for quality control.

A MiDA representative mentioned “high supervision” but noted that contractors took advantage of the situation when “supervision wasn’t as close as possible” and that Lamda supervision was not close. A district-level respondent also described a lack of contractor supervision that may have resulted in lower-quality work.

Although poor work can go unnoticed during construction, a MiDA respondent pointed out a time that payment was suspended because of shoddy workmanship. With sufficient oversight, poor work can be identified and corrective actions taken.

## **Maintenance**

Respondents across regions and types of schools described similar barriers to regular maintenance, including communities’ lack of funding, commitment, responsiveness, skills, and expertise. However, those from low-scoring MCC schools appeared to mention a slightly greater number of maintenance issues than respondents from high-scoring MCC and non-MCC schools.

### ***Lack of maintenance funding negatively affects routine maintenance***

The main official mechanisms for funding school maintenance are capitation grants and the common fund. MiDA described capitation grants, which are provided through the district assembly, as designed to be used for routine maintenance. They then described the common fund as intended to cover larger maintenance issues that are “tricky.” A MiDA representative said that almost all districts will attest to setting aside five percent of their common fund for maintenance but that sometimes that is “woefully inadequate.”

In addition to the capitation grant and the common fund, respondents often described PTA fees and parent donations as being used for maintenance. Teachers may also use their own money to repair items that are broken if they are unable to obtain funding from any other source or if there is not enough time for an appeal to the district assembly.

The most pervasive barrier to regular maintenance recounted in the interviews was a lack of funding for maintenance. To investigate this and other challenges, SI compiled a tally sheet of qualitative data collected concerning respondent maintenance experiences (Table 9). The tally sheet included responses from KIIs and FGDs with district education officers, local contractors, community leaders, head teachers, school maintenance committees, male and female students, parents, and teachers. Across all school types, lack of maintenance funding was found to be the biggest challenge to successful maintenance, with 14 respondent groups from high-scoring MCC schools, 22 from low-scoring MCC schools, and 18 from high-scoring non-MCC schools reporting it to the researchers.

District and school-level respondents mentioned issues of receiving funds for maintenance in a timely manner. For instance, a district education officer from a low-scoring MCC school in the

Northern Zone noted that the issue was that the government promised to use a capitation grant for maintenance but then was not responsive to maintenance needs, so that schools received neither money nor maintenance support. Multiple respondents from low-scoring MCC schools mentioned such situations as not receiving money or support to fix boreholes or leaking roofs or doors.

It was learned in a KII with a district education office engineer that district assemblies tended to prioritize requests for funds for major, rather than minor, repairs. Consequently, school buildings and equipment would deteriorate significantly before a school could obtain funds for repairs or replacements.

At the MCC schools, the contractors working for Lamda were supposed to maintain new or newly renovated school facilities for six months. After that, according to a KII with a project supervisor, individuals from the Ministry of Education (presumably the district education officers and headmasters) were to take on responsibility for maintenance.

Capitation grants are often insufficient to cover emergencies such as flooding or fire. When a fire damages furniture and supplies, schools may have to make a special request for refurbishment. A respondent from a high-scoring MCC school mentioned the lack of funding for emergencies, such as the collapse of a building due to rain. Some respondents from non-MCC schools mentioned capitation grants as too small and the cost of maintenance too high.

Parents' or teachers' money may support maintenance, but cannot be relied upon in impoverished regions—quite apart from the fact that they believe the government should be providing funds for maintenance. Parents from a low-scoring MCC school in the Afram Zone mentioned that the school no longer receives chalk or books; parents have to buy them. Purchases are funded by PTA fees and contributions. There is some disagreement about who is responsible for such expenses; a Lamda representative noted that it was in fact up to parents to cover such costs.

The inadequacy of government maintenance funding and reliance on funds from parents and teachers to cover basic maintenance and materials raises the issue of poverty and communities' ability to provide supplemental funds. If government funding is insufficient and communities cannot afford to provide what is needed, maintenance is neglected and the infrastructure deteriorates. Such a situation disproportionately affects poor communities and will negatively affect the longevity of the MCC investment.

### ***Lack of community buy-in negatively affects maintenance***

A Ghana Education Service (GES) respondent noted that maintenance is important to infrastructure longevity and that it is dependent on stakeholders, the district assembly, the community, and school authorities. These “immediate users” must take action to keep the facility in shape. The challenge occurs when they lack resources to remediate problems and when they sit aloof.

A MiDA respondent agreed that schools' condition “all depends on the maintenance culture of the people.” In some cases, a community might have a “communal spirit” and ensure the school infrastructure is properly cared for; in other cases, community involvement is inadequate.

*The central government can't do everything and the district assembly can't do everything. So it is the responsibility of the parents, the PTA, to accept a minimum levy for every parent to pay. For me, that is the only way schools can be maintained. Even private schools are levying parents for maintenance.*

*~Lamda respondent*

Issues may arise if school staff—in the belief that the government should fix maintenance problems—do not take the initiative to fix even simple problems such as loose screws and either wait for the district assembly to make the repair or let it go. Respondents from the district education offices of low-scoring MCC schools in the Afram and Southern zones opined that it was up to the chief, headmaster, and district assembly to maintain the building.

Respondents from low-scoring MCC schools and from non-MCC schools discussed challenges relating to unresponsive or nonfunctioning community leaders. One individual from a low-scoring MCC school in the Afram Zone described the district assembly as “not financially sound.” Another individual from the same school described the PTA and SMC as “not functioning.” A respondent from a non-MCC school in the same region said that opinion leaders were not interested in the school and that the chiefs “didn’t really care.”

Another challenge is lack of follow-up or maintenance training for school staff following renovation or new construction. Although MiDA created a maintenance manual and originally planned to hold maintenance trainings for schools, most school level respondents said they did not receive either. Schools may not be well equipped to handle maintenance, and the project donor may leave the area without following up on how its investment will be maintained. Multiple school-level respondents across score levels mentioned infrastructure that had not been renovated or maintained since its construction—for example, the doors of a high-scoring MCC school in the Northern Zone, a polytank from a high-scoring MCC school in the Afram Zone, and broken windows, leaking roofs, ruined cupboards, and damaged polytanks in low-scoring MCC schools in the Afram Zone. A local contractor mentioned being obligated for six months of maintenance, which he had provided, and noted that after that period the Ministry of Education was meant to take over maintenance.

Those at the school level, such as students, teachers, and parents, are usually the first to respond to maintenance needs, so when buy-in is low, a backlog of tasks can quickly accumulate. Lack of ownership can manifest in unwillingness not only to provide money for maintenance but also to invest time in providing services such as cleaning up school grounds or performing basic repairs.

Where community buy-in is high, parents and community members donated their time and skills to help extend the life of the school. When buy-in is low, on the other hand, issues compound over time and can end by being beyond the skills of the community to address even if the will to do so is there.

### Evaluation Question 3

*How might other factors explain both perceived school-level outcomes and the current conditions of schools?*

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*In addition to poor maintenance practices, other factors such as misuse of school facilities by community members and harsh weather and environment adversely affected school conditions.*

*Poverty, poor parental attitude to education, and lack of teacher accommodation affected perceived school-level outcomes.*

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#### **External factors significantly affected infrastructure conditions of all study schools across the three zones**

Respondents from all study schools in all three zones cited similar issues affecting schools' infrastructure conditions. The most common issue highlighted was intrusion after hours or during holidays by community members, significantly damaging school property. Intrusions were facilitated by lack of security (e.g., fences, locks, or a security guard who could thwart intruders). Respondents also cited harsh weather and environment, student overcrowding, and misuse of school facilities as contributing factors.

**Community use of facilities:** School facilities are easily accessible to the wider community and security is insufficient to protect them from misuse and damage. Teachers, parents, and SMC members all stressed the effect of unregulated use on school infrastructure conditions.

*At times the poor nature of the buildings, maybe at times the doors and windows are not good so they are not properly locked, whereby we may not be here on weekends or holidays. Anyone from the town comes in to use the place. Maybe if they are in the room they may misuse the furniture.*

*~Head teacher, high scoring MCC school, Southern Zone*

In the Afram Zone, respondents described both cases of purposeful theft or destruction and instances where community members had destroyed or damaged school property while using school grounds for sports or school facilities and furniture for church services or funerals. Similar incidents were described by respondents from the Southern and Northern zones, who also spoke about community members breaking into schools and using school toilet facilities.

**Harsh weather and environment:** Respondents across all zones often cited weather and environmental conditions, including heavy rain, storms, wind, fire, and lack of water during the dry season as factors affecting school infrastructure; those at low-scoring MCC schools and non-MCC schools cited weather as a factor more often than those at high-scoring MCC schools. Those from the Afram and Northern zones were more likely to reference damage to infrastructure due to weather.

One contractor involved in building schools in the Northern Zone noted that a school's local topography greatly affected its infrastructure conditions. District education officers in the Southern

and Afram zones echoed this thought, adding that fire is an issue, especially if the school grounds are not weeded frequently.

Many school-level respondents from the Afram and Northern zones mentioned rain and wind as affecting infrastructure. In one example from the Northern Zone, wind blew off the latrine roof. Multiple respondents from that zone also mentioned the challenge of accessing water during the dry season.

**Animals and insects:** Damage to infrastructure by animals, exacerbated by easily opened doors and lack of locks, was often cited by school-level respondents from low-scoring MCC schools and non-MCC schools. Respondents from the Northern and Afram zones also seemed to bring these issues up slightly more often than those from the Southern Zone.

Respondents mentioned insects and animals such as ants, rats, bats, termites, mosquitoes, bees, and snakes as posing an issue and potentially affecting infrastructure. Respondents from low-scoring MCC schools recounted issues with snakes, termites, bats, and rats. Multiple respondents noted that inadequately locked doors permitted goats to get into buildings and defecate in classrooms. Students had to dismantle desks after snakes got in, a process that damaged the furniture. Respondents described termites eating school doors and textbooks.

***PTAs and school management committees in high-scoring MCC and non-MCC schools were more proactive in addressing problem factors than respondents from low-scoring MCC schools***

Respondents across schools cited similar broad factors affecting schools' infrastructure conditions and proposed similar solutions. Students, teachers, and the District Education Office representative from the Southern Zone discussed the importance of improving school security by adding metal bars to windows, hiring security guards, and adding streetlights. In the Northern Zone, too, respondents emphasized the need for a security guard and felt that metal bars over doors and windows, plus padlocks, could deter community members from breaking into schools.

The steps that communities had taken to address their issues varied however. Where respondents from low-scoring MCC schools proposed solutions for the government to implement, those from high-scoring MCC and non-MCC schools spoke about what their own communities had done. In non-MCC schools in the Northern Zone, respondents mentioned that the PTA was going to form a community watchdog group to prevent people from breaking into the school and that they were looking into purchasing metal bars for the school windows. Respondents noted that their community had already added metal bars to the dining hall of one school. In high-scoring MCC schools, respondents discussed how the PTA had raised funds from members to renovate school windows and doors and to hire a security guard for the school. In contrast, some respondents from low-scoring MCC schools said that they were unable to employ a security guard and that their windows did not deter intruders.

*During vacation, there is no one to watch the school. People come from the community and destroy things like the water tank. After they came and carried the whole tank away, the tap fell down and was destroyed. They expect me to replace it.*

*~Head teacher, low-scoring MCC school, Afram Zone*

**Poverty, parental attitude to education, and availability of teacher accommodations were highlighted as key external factors affecting perceived school-level outcomes**

Respondents felt that a variety of factors contributed to school-level outcomes including individual challenges and motivations, family-level factors, school-level factors, and community and gender differences. Students are motivated to attend school and do well in order to educate themselves and become successful members of society. They are discouraged from coming to school if they fear punishment (particularly in the form of caning) or if they feel that the time they spend at school is not worthwhile because the teaching is of poor quality or because they can make money elsewhere.

**Poverty:** Although economic growth in Ghana has been steady since 2005, the rate has differed across zones. The Northern, Upper East, and Upper West zones continue to experience the country's highest levels of poverty. In 2013, 50.4 percent of residents in the Northern Zone lived below the poverty line, compared to 14.8 percent in Ashanti and 5.6 percent in Greater Accra.<sup>18</sup>

Many respondents highlighted financial constraints as a key contributing factor to school-level outcomes. Parents' inability to pay fees or pay for school supplies (e.g., uniforms, textbooks) was often listed as a major factor affecting education. Respondents felt that if students did not have adequate supplies, they tended to skip school or drop out. Students may also be embarrassed and stay away from school if their clothes are ripped or torn. If parents do not have the money to pay PTA fees, their child may be dismissed from school.

*The children are suffering in so many ways. The parents have to provide for them but because they don't have money, it becomes a problem. The people here are peasant farmers who do not have money.*

*~Head teacher, low-scoring MCC school, Afram Zone*

District education officers, students, and teachers from high-scoring MCC schools in the Afram Zone also mentioned parents pulling children out of school to help with farming and the harvesting of cassava or groundnuts. This can significantly affect attendance, as students may miss a few days—or a whole season. In the Afram Zone, respondents mentioned that students sometimes move with their families to the north for a season and miss school while they are away, causing enrollment fluctuations. Many students are absent for the third term, which is harvest season. They may also miss first term in order to help harvest groundnuts or maize. In addition to farming,

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<sup>18</sup> Edgar Cooke, Sarah Hague, and Andy McKay, *The Ghana Poverty and Inequality Report: Using the 6th Ghana Living Standards Survey* (n.p.: University of Sussex, Unicef, and ASHESHI, 2016), [https://www.unicef.org/ghana/Ghana\\_Poverty\\_and\\_Inequality\\_Analysis\\_FINAL\\_Match\\_2016\(1\).pdf](https://www.unicef.org/ghana/Ghana_Poverty_and_Inequality_Analysis_FINAL_Match_2016(1).pdf).



some students (mostly girls) have to stay home to help care for the family or to work as maids to bring the family extra income. These girls may be living in poverty without adequate food or support, prohibiting them from attending school regularly. Boys may go to work or leave school to find a vocation.

In the Northern Zone, respondents felt that a big issue for girls was “kayaye”—that is, they travel to another zone to work as “head porters,” carrying luggage and parcels on their heads around urban areas. Kayaye did not appear to be as common in the Afram or Southern zones. In a study of 400 of these porter girls living in Accra, it was found that the vast majority were from the Northern Zone and 50 percent of them had no education<sup>19</sup>. In fact, kayaye has been identified as an occupational niche for girls from the northern part of Ghana<sup>20</sup>. Respondents from the Northern Zone also mentioned girls being adopted or taken on as foster children and moving away.

More respondents in the Afram and Northern zones mentioned financial constraints as a barrier than in the Southern Zone. A head teacher from the Southern Zone mentioned that parents there do not have much of a financial burden since they need to pay only PTA dues—no additional school fees and no textbook expenses, because the latter are covered by the government. According to data from the Ghana Living Standard Survey in 2012<sup>21</sup>, the mean annual per capita income was approximately USD 697 in the Northern Region, which was significantly below the national average of USD 1224. Overall, income levels were much lower in the Northern zone than in the Afram or Southern zones.

**Parental and community attitudes to education:** Across zones, many respondents felt that school-level outcomes were tied to parents’ attitude towards education. This is confirmed by the literature in Ghana, which describes that mothers’ involvement in their children’s schools is positively and significantly related to students’ learning outcomes<sup>22</sup>. Overwhelmingly, respondents spoke of communities and parents having a positive view toward education and its contribution to improving lives.

*Looking at the current condition of those of us who did not go to school, we are really suffering, and because of what I am going through, I won’t allow my child to go through this same hardship. So I am willing to do anything possible for my child to be educated.*

*~Parent, low-scoring MCC school, Afram Zone*

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<sup>19</sup> Ziblim Shamsu-Deen, “Migration and Health Nexus: A Case of Female Porters (Kayayei) in Accra, Ghana,” *Research on Humanities and Social Science* 3, no. 3 (2013), <http://www.iiste.org/Journals/index.php/RHSS/article/view/4936/5019>.

<sup>20</sup> Seema Agarwal et al, “Bearing the Weight: The Kayayoo, Ghana’s Working Girl Child,” *International Social Work* 40, no. 3 (1997): 245–263, <http://journals.sagepub.com/doi/pdf/10.1177/002087289704000302>.

<sup>21</sup> Ghana Statistical Service, *Ghana Living Standards Survey Round 6 (GLSS 6)* (n.p., 2014), <http://www.ilo.org/surveydata/index.php/catalog/466>.

<sup>22</sup> Kingsley Nyarko, “Parental School Involvement: The Case of Ghana,” *Journal of Emerging Trends in Educational Research and Policy Studies* 2, no. 5 (2011): 378–381, <http://www.jeteraps.scholarlinkresearch.com/articles/Parental%20School%20Involvement.pdf>.

SMC members mentioned that parents were motivated to bring their child to school because a child's success brought "honor to the community" and helped them become role models for other children.

*We have come to realize the benefits of going to school. Secondly, we want to develop this community, and we know we can do that only if the children go to school and become prominent people in the community. Only then will they grow the community.*

*~SMC member, high-scoring MCC school, Northern Zone*

A GES respondent felt that the community attitude toward education was vital to successful school outcomes and stressed that for infrastructure interventions to improve school outcomes, the community must first value education.

**Availability of teacher housing:** District education officers across all zones and types of schools mentioned the importance of having adequate housing for teachers so as to ensure regular teacher attendance, because it directly affects a school's standard of teaching and learning. Without teacher housing, it may be difficult to attract staff. Alternatively, long commutes may impede regular teacher attendance.

Lack of housing was frequently mentioned as a barrier to effective teaching and learning. One respondent pointed out that it could be particularly hard to find housing for women and that this difficulty meant fewer female teachers, with fewer female role models for students as a result. Respondents from a school in the Northern Zone remarked that teachers' attendance improved after teachers' quarters were built at their school. In Ghana, more than 80 percent of teachers prefer to work in urban areas; one of the key issues driving this preference is a concern about the quality of accommodations.<sup>23</sup> Lack of housing, thus, may result in a teacher shortage at some schools.

**Girls' education:** Within the Afram and Northern zones, incongruous statements were made about teenage pregnancy. Although teachers and community members mentioned that their community did not have problems with teenage pregnancy, students often cited it as a reason that female students dropped out. Some respondents pointed out that some girls got pregnant but then stayed in school. A respondent from the Afram Zone said that although teenage pregnancy had once been a problem, it has since declined. In the Southern Zone, respondents of all types mentioned teenage pregnancy as a factor affecting girls' education outcomes. Data from the Ghana Demographic and Health Survey<sup>24</sup> in 2014 shows that 14 percent of women aged

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<sup>23</sup> Kwame Akyeampong and David Stephens, "Exploring the Backgrounds and Shaping of Beginning Student Teachers in Ghana: Toward Greater Contextualisation of Teacher Education," *International Journal of Educational Development* 22, no. 3–4 (2002): 262–274, [https://www.researchgate.net/publication/222220456\\_Exploring\\_the\\_backgrounds\\_and\\_shaping\\_of\\_beginning\\_student\\_teachers\\_in\\_Ghana\\_Toward\\_greater\\_contextualisation\\_of\\_teacher\\_education](https://www.researchgate.net/publication/222220456_Exploring_the_backgrounds_and_shaping_of_beginning_student_teachers_in_Ghana_Toward_greater_contextualisation_of_teacher_education).

<sup>24</sup> Ghana Statistical Service (GSS), Ghana Health Service (GHS), and ICF International, *Ghana Demographic and Health Survey 2014* (Rockville, Maryland: GSS, GHS, and ICF International, 2015), <http://dhsprogram.com/pubs/pdf/FR307/FR307.pdf>.

15 to 19 have begun childbearing—a slight increase from 13 percent in 2008. At 17 percent, this rate is higher in rural areas than in urban areas (12 percent).

A national-level respondent pointed out that girls may not be able to attend school when they are menstruating if their school lacks adequate facilities or water. A district education officer in the Afram Zone also brought up the issue of menstruation, for teachers as well as students. Some female teachers have issues living in teacher compounds, with the consequence of fewer female teachers and thus fewer female role models for girls, which in turn can affect girls' education outcomes.

*If girls see that a woman can do something with her life when she is highly educated, it would encourage them to take their studies seriously. It will also reduce teenage pregnancy because the girls would like to be like her.*

*~SMC member, high-scoring MCC school, Northern Zone*

According to EMIS data for 2014–2015,<sup>25</sup> only 41 percent of teachers in public primary schools and 28.4 percent of teachers in junior high schools are female. There is thus a gender gap among teachers in these schools.

**Other factors:** Respondents spoke about other factors that positively influenced students' school performance. School feeding programs spurred students to attend school. Some teachers incentivized students with snacks and tea to do good work or attend school regularly. Students mentioned this as a motivation for working hard and doing well. As a disincentive, students often brought up their fear of getting caned; caning was cited as a reason for missing class or dropping out. Children may be caned for being late, for not doing their homework, or for not showing up with school supplies. Although some parents thought their community did not cane too much, other parents and many students felt that caning was a huge problem. Some students described having such great fear of getting caned that it would cause them to leave school entirely.

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<sup>25</sup> Ministry of Education and Education Management Information System, *Basic National Profile—2014/2015 School Year Data* (n.p., n.d.), <http://www.moe.gov.gh/emis/EMIS%20BASIC%20EDUCATION%20DATA/Basic/2014-2015/Basic%20National%20Profile.pdf>.

## Evaluation Question 4

*What are the perceived outcomes of investments in school infrastructure?*

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***Respondents across all MCC and non-MCC schools in the three zones felt that investment in infrastructure had a positive effect on enrollment, attendance, completion and learning.***

***Most respondents thought the quality of teaching and learning had improved in MCC and non-MCC schools over the last three years.***

***Enrollment increased in most study schools, regardless of the MCC intervention.***

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***Respondents across all MCC and non-MCC schools in all three zones felt that investment in infrastructure had a positive effect on enrollment, attendance, completion, and learning***

Existing research has found a positive relationship between improved school infrastructure and improved learning outcomes, school attendance, and retention<sup>26</sup>, although the effect was shown to be small and several studies noted that infrastructure improvements alone were not sufficient to have an impact and should be coupled with other educational interventions such as provision of textbooks and teaching materials.<sup>27</sup>

Perceptions on the ground were that infrastructural improvements led to positive educational outcomes. Respondents mentioned similar factors that were improved through infrastructure investment and that subsequently affected school-level outcomes. Factors generally fell into the category of aesthetic (e.g., a school that is “beautiful” or “nice looking”) or practical (e.g., a school with toilets on site, more classroom space for students). This finding was uniform across all types of MCC schools in all geographies.

Many respondents felt that renovated buildings, adequate furniture, and additional space created by new classroom blocks attracted students, teachers, and parents and positively affected students’ enrollment and attendance. Additionally, respondents felt that buildings that were aesthetically pleasing and comfortable made for a better learning environment and helped students “feel good going to school” and concentrate better. Many respondents noted that parents considered infrastructure when enrolling their children in school; that a building’s appearance played a “crucial role”; and that better infrastructure was important to attract and retain good-quality teachers.

*When a school is tiled, the feelings you have toward it are positive—you won’t dirty your clothes, you will be excited to come, and parents are encouraged. If the infrastructure is not nice and you have nails ripping off your clothes, the children will not be happy.*

*~Community member, Afram Zone*

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<sup>26</sup> Glewwe, Paul W. Et al. *School Resources and Educational Outcomes in Developing Countries: A Review of the Literature from 1990 to 2010*

<sup>27</sup> 21st Century School Fund. *Research on the Impact of School Facilities on Students and Teachers: A Summary of Studies Published Since 2000.*

Respondents across groups mentioned adverse weather as a factor affecting school-level outcomes. Before the MCC intervention, students had to leave school when it was raining because of poorly constructed roofs. After renovations, students could stay at school and continue learning, rain or shine. Parents who were previously concerned about their child's safety in poorly constructed school buildings felt more confident about sending their child to newly constructed or renovated schools.

The addition of polytanks and toilets close to the school allowed students to spend more time in school since they no longer had to travel far to use the toilet or fetch water.

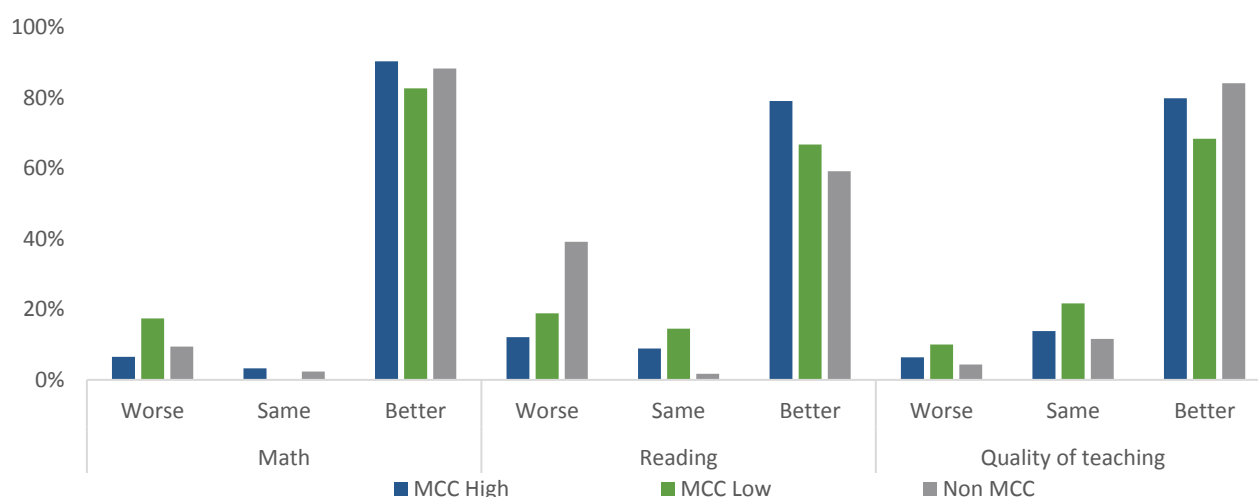
*The availability of [toilets] also brings [students], so non-availability [of toilets] will scare them. You know that when your [child] goes to school there is no way the child will be going around to houses begging for water or going into the bush to ease herself, endangering her life, no. Because we have the toilet facilities, there would be no need for that.*

*~Head teacher, Northern Zone*

Respondents across groups felt that enrollment and attendance increased after renovations were completed. However, an initial increase after renovation of a low-scoring MCC school in the Southern Zone was followed by a reduction in enrollment when a school in the next village built a new school.

***The majority of respondents across MCC and non-MCC schools thought that the quality of teaching and learning at their school had improved in the last three years***

**Figure 10. Parents, Students and Teachers' Opinion on Changes to Learning Outcomes and Quality of Teaching over the Preceding Three Years**



Source: Community Score Cards with Parents, Teachers, and Students

When parents, students, and teachers were asked to speak about changes in teaching quality and students' learning outcomes at their school over the preceding three years, the majority of respondents across both MCC and non-MCC schools spoke of improvements. On average, more respondents at high-scoring MCC schools spoke about improvements, with 90 percent reporting

improvements in math skills, 79 percent reporting improvement in reading skills, and 80 percent reporting improvements in the quality of teaching (Figure 10). For low-scoring MCC schools, there were similar findings but lower perceptions of improvement in math (83 percent), in reading (67 percent), and in the quality of teaching (68 percent). Even non-MCC schools felt there had been improvement—on par with the MCC high-scoring schools, except for reading, which had the lowest perceived improvement (59 percent). Although it cannot be concluded that the positive perception was due to the infrastructure improvement, respondents from MCC and non-MCC schools highlighted it as a contributing factor.

At the beginning of the intervention, when MiDA reviewed schools in Ghana that needed the MCC intervention, all schools that were shortlisted had poor infrastructure. However, since then, many of the schools that did not receive the MCC intervention—the non-MCC schools—have received funding from other donors and the GoG to improve school infrastructure conditions. A total of 40.3 percent of head teachers in non-MCC schools reported school rehabilitation or new construction during the period since the intervention, while 55 percent reported having received new furniture and 23.6 percent reported having received toilet infrastructure updates since 2012. These non-MCC schools' infrastructure improvements may have been a factor contributing to respondents' positive perception of those schools' change in learning outcomes and teaching quality.

### ***Enrollment increased in most study schools, regardless of the MCC intervention***

When headmasters were asked about the school population and whether it had increased, decreased, or stayed the same since 2012, the vast majority, including 82 percent of MCC schools and 80 percent of non-MCC schools, stated that it had increased. This follows the general enrollment trend in Ghana, which has seen sustained growth over the last decade. According to EMIS data in Ghana, net enrollment rate (NER) in the country increased from 81.7 percent in 2012 to 91 percent in 2015.<sup>28</sup> In the Northern Zone, the increase has been from 83.5 percent to 88.6 percent. Comparatively, in Afram Zone, which includes Ashanti and Eastern regions, the change has been from 84.3 percent to 92.3 percent in Ashanti and from 78.3 percent to 83.9 percent in the Eastern region<sup>29</sup>.

Although many respondents spoke about improved school infrastructure as one of the factors contributing to increased enrollment, some highlighted that the new students were often those from neighboring schools that were in worse condition. As a result, although respondents felt that improved school conditions had attracted more children to enroll, it is unclear whether the improvements had had any effect on bringing out-of-school children to school.

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<sup>28</sup> Ministry of Education and Education Management Information System, *Basic National Profile*.

<sup>29</sup> Ibid.



## Economic Rate of Return Analysis

### Original ERR Calculation

MCC originally calculated the ERR to be 11.4 percent based on a set of key assumptions, key benefit streams, and key costs.

The ERR calculation assumed that dropout rates at both primary and secondary levels would decrease due to the MCC intervention and that more students would stay in school and complete secondary school. It assumed that the project schools would provide benefits to students and the community in terms of improved access to education over 20 years. Key assumptions also included maintenance costs at 5 percent of the fixed costs of building the schools.

MCC used data from the Ghana Living Standards Survey (GLSS) in 2007<sup>30</sup> to calculate the benefit streams. Contributing data documented: population education levels; enrollment rate; school completion rate for primary, secondary, tertiary, and vocational education; employment rates; and average salaries at varying education levels. Using GLSS data, MCC projected the benefit stream from the increased income of students graduating from the MCC schools. The underlying theory of change was that students in MCC schools would have more years of education, which would lead to an increased income level in the future. Since MCC renovated only kindergarten, primary, and junior high schools, the first students graduating from the MCC schools were in 2015 (three years after the renovations and constructions), and the income benefits were calculated from 2015 through 2042. Key costs included the fixed costs of building the schools and the variable costs of school maintenance and operations. Costs were projected through 2042.

Unfortunately, precise enrollment data for the schools was not available at the school level for the period of the study and therefore the difference in enrollment increases between MCC and non-MCC schools is not known, making recalculation of the benefit difficult to estimate. Positively, cost data may be more reliably estimated (see below).

### Sensitivity Analysis

Although the evaluation produced findings relevant to some of the key assumptions of the cost-benefit model, the qualitative findings do not suffice to completely recalculate the ERR. However, the evaluation team used the findings to conduct sensitivity analyses assessing the potential impact on the ERR of the changes to these assumptions. The implications on the assumptions made in the original ERR calculation are as follows:

- Schools lack a culture of routine or preventive maintenance. As a result, they occasionally incur fixed infrastructure costs (e.g., replacing a roof, a polytank, furniture, doors, and windows). These costs were not included in the key cost projections in the original ERR.
- In addition to routine wear and tear, school facilities are adversely affected by external factors (e.g., communities' misuse of facilities, break-ins, theft). Based on this reality, even if routine maintenance were conducted, the original assumption of maintenance costs of 5 percent may be too low.

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<sup>30</sup> Ghana Statistical Service, *Ghana Living Standards Survey*.

- Because of poor construction coupled with widespread lack of maintenance, MCC schools are deteriorating faster than anticipated. The original assumption was that MCC schools would last for 20 years. Data collection for this evaluation took place in Year 9 of that span. Although data shows MCC schools in better condition than non-MCC schools (3.24 vs 2.78 average conditions scores across all zones), the relatively minor difference in condition between the two groups implies that the life of the investment is likely to be less than 20 years. Concomitantly, the benefit streams projected for the original ERR calculation will also be reduced.

This report's qualitative findings do not provide precise estimates for these assumptions. However, based on the trends discussed above, SI ran several scenario analyses to test different assumptions' effect on the ERR. In each scenario, base assumptions around enrollment rate, completion rate, employment rate, and wage rate were held constant. This is because some assumptions of the original ERR calculation could not be verified with GLSS 2007 data and could not be updated with GLSS 2012 data<sup>31</sup>. In order to keep the new ERR calculations comparable to the original calculation, SI has held these base assumptions constant.

## **Scenario 1**

### *Additional "Fixed Infrastructure Cost" Incorporated into Cost Projections (All Other Base Assumptions Hold)*

Holding all other base assumptions constant, we assumed that a small portion of MCC schools (20 percent) will incur a fixed infrastructure cost (10 percent of fixed cost) every year starting from 2017, 10 years after the start of the compact. Note that the variable cost is held constant at 5 percent, since there is a cost of operations at the school regardless of its maintenance culture. This reduces the ERR from 11.4 percent to 11 percent.

Fixed infrastructure costs could range widely depending on the infrastructure being replaced, and it is likely that a higher percentage of MCC schools would incur such costs in the compact's later years. Therefore, the effect on the ERR calculated under the Scenario 1 assumptions could be an underestimation.

## **Scenario 2**

### *Maintenance Cost Increased (All Other Base Assumptions Hold)*

Holding all other base assumptions constant and increasing maintenance costs to between 7.5 and 9 percent of fixed costs reduces the ERR from 11.4 percent to between 10.7 and 10.3 percent respectively. The plausible range of maintenance costs, as MCC noted in the original ERR calculation, is between 1 and 9 percent of fixed costs. Based on this report's findings, the actual cost is likely to be toward the higher end of the range.

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<sup>31</sup> Ghana Statistical Service, *Ghana Living Standards Survey*.

### **Scenario 3**

*Depreciation Rate Is Higher and Life of Investment Drops from 20 to 15 Years  
(All Other Base Assumptions Hold)*

Holding all other base assumptions constant, we reduced the assumed life of investment from 20 to 15 years. In the original ERR, the benefit stream was projected with the assumption that students would gain more years of education from MCC schools and that their income would consequently prove higher than that of students in non-MCC schools. However, if the life of the investment is 15 years, MCC schools will be in the same state as non-MCC schools in Year 16 and students graduating from both schools should have the same number of years of education. Therefore, from Year 16 onward, the income streams of those graduating from MCC schools will be the same as those graduating from non-MCC schools. This reduces the ERR from 11.4 percent to 10 percent.

A limitation of this assumption is that it posits an immediate change in conditions and benefits between Years 15 and 16, whereas the actual decrease in benefit streams is likely to be gradual and spread out over several years.

### **Scenario 4**

*Combination of the Previous Three Scenarios  
(All Other Base Assumptions Hold)*

Here we assume that 20 percent of MCC schools will incur a fixed infrastructure cost (10 percent of fixed cost), that maintenance cost will be 7.5 percent of fixed cost, that the life of the investment is 15 years, and that all other assumptions are unchanged. In this scenario, the ERR drops from 11.4 percent to 9.1 percent. Findings from this report suggest that a combination of these assumptions are likely to occur simultaneously, implying that the actual ERR is likely to be between 9.1 percent and 11 percent. Although changing assumptions will change the range, our analysis suggests that the actual ERR is lower than MCC's original ERR.

## Policy Implications

### ***A long-term maintenance strategy should be a central part of the design of any school infrastructure investment in Ghana***

As the findings from this study show, lack of preventive or routine maintenance has a significant effect on the infrastructure condition of schools, permitting many to fall into disrepair and reducing buildings' lifespan and the potential economic and social gains that the schools could have brought to their communities. Buildings that go unmaintained for too long fall into such disrepair that new construction is required, with major cost implications for the GoG.

Incorporating a phased maintenance strategy into the design of an infrastructure project can be a more cost effective approach to optimizing gains from schools over the long term. Given the limitations around maintenance that have been identified in this report, two key policy challenges exist:

1. Creating an effective funding mechanism for routine maintenance, and
2. Creating a maintenance culture and community ownership around each school.

Currently, PTAs raise funds for minor school repairs. In high-poverty communities, such funding falls short and needed repairs are often neglected. Although districts become involved for major infrastructure activities, there is a funding gap for routine maintenance. To ensure routine maintenance at every school, this policy challenge needs to be addressed.

In the vast majority of schools that were part of the study, head teachers noted that repairs and maintenance were conducted “when the need arose” and not routinely. Most head teachers also said they did not have a maintenance manual or guide describing how to care for the school building. Creating a culture of preventive or routine maintenance along with increased community ownership can significantly extend the life of school buildings.

### ***Experimentation around maintenance interventions is crucial to an understanding of what works and to progress in this area***

There is a major gap in the literature on which policy interventions work to address the two policy challenges outlined above. To make progress on this front, governments, donors, and researchers need to collaborate and experiment on policies and interventions in order to identify the most cost-effective and impactful solutions.

### ***Increased and effective monitoring during implementation is required to ensure building quality***

Subcontracting by local contractors—persistent despite contractual specifications against it—was identified as a major challenge during implementation of the MCC intervention. Many respondents felt that this directly affected the quality of the school being built. To tackle this issue, the GoG and donors investing in school infrastructure need to review the monitoring system for construction to increase its effectiveness.

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# ANNEXES

## Annex 1. Annotated Bibliography of Selected Sources Consulted

The following list of studies included in this literature review have been organized chronologically.

**Cuesta, Ana, Paul Glewwe, and Brooke Krause. “School Infrastructure and Educational Outcomes: A Literature Review, with Special Reference to Latin America.” *Economía* 17, no. 1 (2016): 95–130.**

This paper examined 39 studies published from 1990 to 2012 assessing the extent to which specific types of school infrastructure had a causal impact on student learning and enrollment. “Infrastructure” refers to classroom-level infrastructure (physical rooms) and other classroom characteristics (natural light, temperature, acoustics), and school-level infrastructure, including utilities (availability of electricity and water, the condition of building) and other features (existence of library, computer lab, science labs). It excluded textbooks, other pedagogical materials, and technology such as computers and tablets.

The study found that the evidence base is not particularly strong. Focusing on the 19 high-quality studies from developing Latin American countries, it found some limited evidence that having roofs, walls, and floors in good condition improves student learning, but that no other classroom-level variables have clear effects. For school-level infrastructure, there was some evidence that the existence of libraries and the creation of new schools leads to improved learning and enrollment; that toilets improve student learning; and that laboratories and drinking water facilities increase enrollment.

The main conclusion is that the evidence base is weak; more high-quality research is needed on the impact of infrastructure on learning outcomes in developing countries.

**Senadza, Bernardin. “Education Inequality in Ghana: Gender and Spatial Dimensions.” *Journal of Economic Studies* 39, no. 6 (2012): 724–739. doi.org/10.1108/01443581211274647**

This paper used the education Gini coefficient, computed on the basis of individuals’ years of schooling, to assess education inequality in Ghana. It found that there is gender and spatial inequality in education there. Relevant to our evaluation, it found this effect to be particularly strong in the northern regions, with lower educational attainment as well as higher education Gini coefficients than in the rest of the country. The paper found women to be more disadvantaged and identified a positive correlation between poverty incidence and educational inequality. Although more econometric research is needed to infer causality, the authors suggest that gender needs to be considered specifically in examining educational programming of all types.

**Glewwe, Paul W., Eric A. Hanushek, Sarah D. Humpage, and Renato Ravina. *School Resources and Educational Outcomes in Developing Countries: A Review of the Literature from 1990 to 2010*, National Bureau of Economic Research Working Paper No. 17554. Cambridge, MA: National Bureau of Economic Research, 2011. <http://www.nber.org/papers/w17554>.**

This rigorous review of the education and economic literature focused specifically on developing countries. The authors' specific findings on infrastructure were that there were positive effects for general indices of school infrastructure and for blackboards and other visual aids. They also found that high-quality walls, roofs, and floors appear to lead to better outcomes: five of their six estimates were positive, and two of the five were significantly positive. There was one negative estimate, but it was not significant.

**Cuyvers, Katrien, Gio De Weerd, Sanne Dupont, Sophie Mols, and Chantal Nuytten. *Well-Being at School: Does Infrastructure Matter?* CELE Exchange, Centre for Effective Learning Environments, No. 2011/10. Paris: OECD Publishing, 2011. DOI: 10.1787/20727925.**

This study used a sample of 2,032 students aged 14 and 15 from 14 Flemish secondary schools, seven with good infrastructure and seven with poor infrastructure. The research found empirical evidence to support the importance of infrastructure on the well-being of students in the Belgian region of Flanders. The authors noted satisfaction levels contrasting starkly between students attending schools with good infrastructure and those in schools with poor infrastructure. Differences remain significant regardless of student characteristics (e.g., gender, grade, type of education) and school characteristics (e.g., urbanization and educational networks). Female students were found to be more sensitive to school infrastructure than their male colleagues; ninth grade students more sensitive than those in tenth grade; and general education students less sensitive than others. One specific finding was that vocational education students were much more sensitive to well-integrated information communication technology than other students.

**21st Century School Fund. *Research on the Impact of School Facilities on Students and Teachers: A Summary of Studies Published Since 2000*. Washington, DC: 21<sup>st</sup> Century School Fund, 2010. <http://www.21csf.org/csf-home/Documents/ResearchImpactSchoolFacilitiesFeb2010.pdf>.**

This study summarizes 20 studies in developed countries (mainly the United States) that focus on the effect of school facilities on students and teachers after 2000. A well-organized chart on page two has information about citations, main results, independent variables and their data sources, dependent variables, and sample size. Most studies included show a small but steadily positive relationship between the quality of public school facilities and a range of academic and community outcomes (e.g., student academic performance, student attendance and dropout rates, teacher retention rate).

**Akyeampong, Kwame, Jerome Djangmah, Abena Oduro, Alhassan Seidu, and Frances Hunt. "Access to Basic Education in Ghana: The Evidence and the Issues." Falmer, Brighton, U.K., and Wennaba, Ghana: Consortium for Educational Access, Transitions and Equity (CREATE), 2007 [http://sro.sussex.ac.uk/1872/1/Ghana\\_CAR.pdf](http://sro.sussex.ac.uk/1872/1/Ghana_CAR.pdf).**

This report reviews the history of access to basic education in Ghana, including trends in primary enrollment over an extended period; basic education policies and practices for insight into the effect they have had on access to basic education; and the conditions and factors that underpin access as both a process and outcome. There is good background on the gendered nature of access to education and limited analysis of infrastructure.

**Kadingdi, Stanislaus. "Policy Initiatives for Change and Innovation in Basic Education Programmes in Ghana." *Educate* 4, no. 2 (2006): 3–18.  
<http://www.educatejournal.org/index.php/educate/article/view/35>.**

This study is a historical review of the Ghana education system from the period before independence through the 1990s educational reforms that led to the institution of universal primary education. Although the study looks at the factors that will ultimately lead to improved education outcomes on many levels, it does not address infrastructure as a major driver or detractor from these outcomes. Rather, it focuses on teacher training, the availability of supporting materials (e.g., textbooks, chalk), and the ability of teachers to actually teach. It provides a good overview of the history of donor involvement prior to the MCC Compact investment.

**World Bank Operations Evaluation Department. *Books, Buildings, and Learning Outcomes: An Impact Evaluation of World Bank Support to Basic Education in Ghana*. Washington, DC, 2004:  
<https://openknowledge.worldbank.org/bitstream/handle/10986/14901/302220PAPER0Books0buildings.pdf?sequence=1&isAllowed=y>.**

This study found that improving the quality and quantity of education infrastructure (i.e., classrooms) is an important strategy but not by itself adequate. The authors' conclusion is that these types of interventions need to be paired with other initiatives to ensure equitable access to quality basic education. Findings included the fact that improving school quality has been accompanied by increased enrollments, which were rapidly growing at the time of the study (10 percent over 15 years). The data review showed that by 2000, more than 90 percent of Ghanaians aged 15 and above had attended school, compared to 75 percent 20 years earlier. Dropout rates had fallen, and completion rates were rising. For example, by 2003, 92 percent of those entering Grade 1 were completing junior secondary school (Grade 9). Statistical analysis of survey results shows the importance of school infrastructure on enrollment. Building a school, thereby reducing children's travel time, has a major impact on enrollment.

The research focused more on the system of education and the outcomes it was producing than on the physical infrastructure. World Bank investments in textbooks and curricula and the outcomes from those investments were the focus.

**Schneider, Mark. *Do School Facilities Affect Academic Outcomes?* Washington, DC: National Clearinghouse for Educational Facilities, 2002.**  
<http://www.ncef.org/pubs/outcomes.pdf>.

This literature review focused on school facilities, primarily in the United States and the developed world. The main conclusion is that school facilities affect learning. Spatial configurations, noise, heat, cold, light, and air quality have a bearing on students' and teachers' ability to perform. There is a consensus about the positive effects of small school size, and the effects seem to be the strongest with students from lower socioeconomic groups. However, the debate on class size is unresolved.

**Chapman, David, Elizabeth Barcikowski, Michael Sowah, Emma Gyamera, and George Woode. "Do Communities know Best?: Testing a Premise of Educational Decentralization: Community Members' Perceptions of their Local Schools in Ghana." *International Journal of Educational Development* 22, no. 2 (2002): 181–189.**  
<https://eric.ed.gov/?id=EJ675333>.

This study explored the extent to which community members in rural Ghana demonstrated a clear understanding of what school practices were indicative of an effective school and what community members could do to most effectively support schools and educational outcomes. Although the study itself focused on the impact of decentralization, findings also showed that only as community members develop a fuller understanding of school practices indicative of an effective school and the actions they can take to support the educational process can decentralization be achieved. This finding has interesting implications for parent perceptions of both decentralization, and, more broadly, the effects of investments like infrastructure on educational outcomes.

**Fisher, Kenn. *Building Better Outcomes: The Impact of Infrastructure on Student Outcomes and Behavior*. Canberra, Australia: Australian Department of Employment, Education, Training and Youth Affairs, 2001.** <http://files.eric.ed.gov/fulltext/ED455672.pdf>.

Another literature review of school and infrastructure studies, this study concluded that student academic achievement improves with improved building condition. The author found that individual factors, such as lighting levels, air quality and temperature, and acoustics, influence student behavior and outcomes, although quantitative evidence on some of these factors was limited as the studies were not rigorously conducted. The review focused on literature from the 1990s, mostly from the U.S. context.

**PricewaterhouseCoopers. *Building Performance: An Empirical Assessment of the Relationship between Schools Capital Investment and Pupil Performance*. London: Department for Education and Skills, 2001.** <http://files.eric.ed.gov/fulltext/ED461980.pdf>.

This literature review found that although most *quantitative* studies show that capital spending heightens academic performance, the relationship appears weak. However, *qualitative* studies and a literature review reveal a stronger link between capital spending and student achievement. The strongest relationship between capital investment and academic performance appears to be in specific school design features and school facility quality. The authors interviewed stakeholders from 27 schools in the U.K. and found that capital expenditure in schools was strongly linked to

pupil achievement. At the same time, they conducted a statistical analysis of information on capital investment and pupil performance in 1,916 English schools; this found a weaker positive relationship.



## Annex 2. Sampling and Design: Additional Details

### School Conditions Survey

The school conditions survey was a systematic examination of the current conditions of school infrastructure against international standards,<sup>32</sup> GoG building guidelines, and the MiDA maintenance manual. The survey had one section of basic school information (including the school's EMIS number, GIS information, approximate number of students, and investments or upgrades and their implementers over the last five years), followed by a checklist for enumerators to use to score different aspects of school infrastructure: school grounds; classroom block conditions; equipment and furniture; and toilet facilities and polytanks. Conditions were ranked as poor, average, or good, and each ranking was followed with a photograph of the object ranked. Although the school conditions survey is subjective, photographs provide hard evidence of conditions and permitted the SI team to test for enumerator bias.

### Sampling Frame

At the beginning of the evaluation, MiDA provided SI with a list of schools that had been considered for MCC's education sub-activity. Although there was complete information for the schools that received the MCC intervention, names were missing for many of the schools that had not been selected. Thus, the evaluation team was left to sample from a list of 555 schools (218 MCC schools and 337 non-MCC schools).

During data collection, the team attempted to reach all these schools and was successful in reaching 221 MCC schools<sup>33</sup> and 192 non-MCC schools. During data collection, many non-MCC schools in the original list were identified as duplicates.

### Data Collection

SI collaborated with a local data collection firm, TNS Ghana, to conduct the school conditions survey. Data were collected electronically using Survey CTO. Members of the evaluation team travelled to Ghana to train the enumerators on the survey as well as on electronic data collection. During the training, reference pictures were used to standardize the rating system and ensure all enumerators followed an objective standard of rating. Pictures of school infrastructure components in different conditions (good, average, poor) were used during the training and enumerators as a group discussed and identified which rating was suitable for which picture. This process was repeated for every component that was rated in the survey. This training was followed by two days of piloting, where the survey was finalized and all enumerators' understanding tested before the start of data collection.

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<sup>32</sup> Global Facility for Disaster Reduction and Recovery, *Guidance Notes on Safer School Construction*.

<sup>33</sup> During data collection, the team found three additional schools that had received MCC funding, increasing the sample of MCC schools from 218 to 221.

In each school, enumerators first confirmed the name of the school and engaged with a representative at the school (usually the headmaster or the assistant headmaster) who could give basic school information. For the MCC schools, enumerators then confirmed the number of school blocks that had been rehabilitated or constructed by MCC and completed the checklist separately for each MCC-funded block. For non-MCC schools, enumerators counted the total number of blocks at the school and randomly selected one block (if the total number of blocks was fewer than or equal to three) or two blocks (if the total number of blocks was more than three). Enumerators then completed the checklist separately for each selected block. A stringent data quality assurance process was followed.

### **Data Quality Assurance**

Checks were incorporated at multiple levels to ensure data quality. Field supervisors from the data collection firm accompanied 15 percent of enumerator visits while the field manager paid unannounced visits to selected locations to observe enumerators during the survey. Issues identified during these checks were shared with the rest of the team to ensure that they were not repeated. SI also hired an independent local consultant who provided on-the-ground quality assurance and oversight through spot checks to ensure that the survey protocols were followed.

Data was collected electronically using Survey CTO and this allowed the SI team to monitor data collection on a daily basis. Twenty-six enumerators from the different zones were led by five supervisors, and each supervisor was responsible for uploading the data for all enumerators in his or her team at the end of the day.

The data collection firm's quality control team checked 20 percent of data submissions each day (selected through cluster randomization at the district level) to monitor ratings and their corresponding photographs for consistency. Any issues identified were discussed with the team. At the end of data collection, SI checked a random sample of each enumerator's ratings along with the photographs of the objects rated to test for enumerator-specific errors. SI also looked into all ratings with a "Don't know" response and provided a rating based on the photograph, where possible. This reduced the number of missing values in the dataset.

### **Analysis**

The school conditions survey rated four components of school infrastructure—school grounds, classroom block, equipment and furniture, and toilet facilities—each with multiple subcomponents (Annex Figure 1).

**Annex Figure 1. Subcomponents of the School Conditions Survey**

School Grounds	Classroom Block	Equipment and Furniture	Toilet Facilities
<ul style="list-style-type: none"> <li>• Soil condition</li> <li>• Presence of grass/weeds</li> <li>• Clean grounds</li> <li>• Trash bins</li> <li>• Trees maintained</li> <li>• No stagnant water</li> </ul>	<ul style="list-style-type: none"> <li>• Building foundation</li> <li>• Floors</li> <li>• Windows</li> <li>• Doors</li> <li>• Roof</li> <li>• Ceiling</li> <li>• Wood structure holding roof</li> <li>• Paint (interior and exterior)</li> <li>• Rain gutters</li> <li>• Safety</li> <li>• Room space</li> <li>• Structural condition</li> </ul>	<ul style="list-style-type: none"> <li>• Electricity</li> <li>• Desks</li> <li>• Blackboards</li> <li>• Chalk</li> </ul>	<ul style="list-style-type: none"> <li>• Separate toilet for boys and girls</li> <li>• Separate waiting area for boys and girls</li> <li>• Toilet functioning</li> <li>• Toilet accessibility</li> <li>• Toilet cleanliness</li> <li>• Toilet doors</li> <li>• Water storage tanks (polytanks)</li> <li>• Area to wash hands</li> </ul>

In order to compare the conditions of studied schools, SI created an aggregate school conditions score based on the subcomponents' ratings. This was done in four steps:

**Step 1:** For schools where multiple blocks were assessed, an average rating was created for each assessed subcomponent in the school.

**Step 2:** All the ratings were then converted to a uniform four-point system:

- 1: Poor condition
- 2: Below average condition
- 3: Average condition
- 4: Good condition

**Step 3:** Component index scores were created using the average of all subcomponent ratings for each component.

**Step 4:** An aggregate school conditions score was created using the average of the four components' index scores. All four components were given equal weight in the aggregate score.

The aggregate school conditions score allowed the evaluation team to rank and compare the condition of schools; to observe variability in school conditions across districts, zones, and intervention status; and to identify factors that needed further investigation during the qualitative field research.

## Case Studies

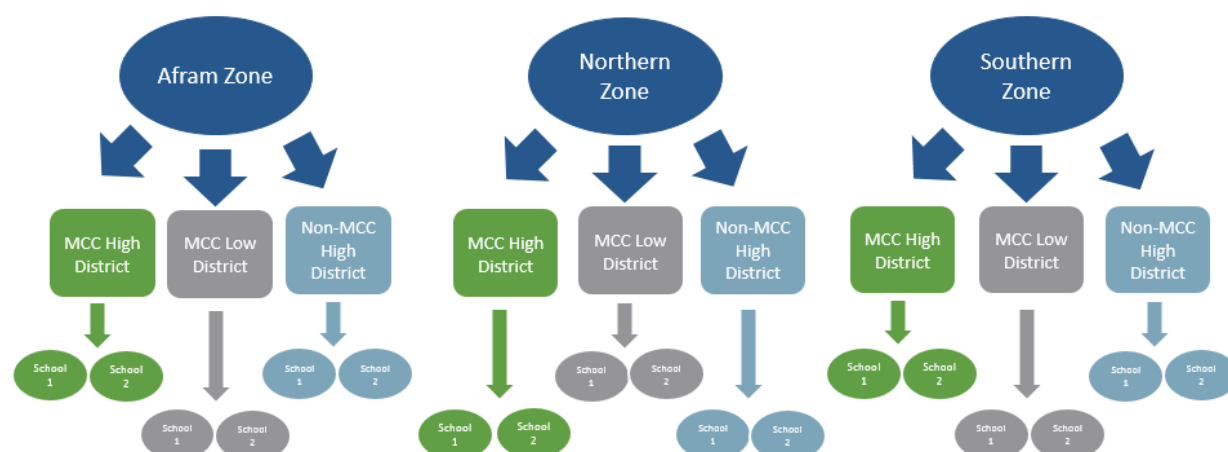
Following the school conditions survey and preliminary analyses of the data gathered, SI conducted nine district-level, in-depth case studies with cross-case analysis<sup>34</sup> to answer evaluation questions about the processes that may have led to the current conditions of school infrastructure, and perceptions of key stakeholders on the relationship between the investments made and school-level outcomes such as enrollment, attendance, persistence, and learning. The objectives of the case studies were threefold. First, the case studies would reconstruct the narratives around program implementation to help understand what role the implementation

<sup>34</sup> SI recommended that case studies be undertaken of both MCC and non-MCC schools so as to gather information about why the schools are in the condition they are and to allow for comparison of maintenance practices and decision making processes more broadly in Ghana, regardless of schools' aggregate conditions scores.

process played in MCC schools' conditions. Second, the case studies would map the process of maintenance for MCC schools and non-MCC schools as well as other push and pull factors that may have influenced conditions, including the schools' political, environmental, social, and financial environments. Finally, the team would use the case studies as an opportunity to explore teacher, parent, and student perceptions of the relationship between learning environment and learning outcomes and the contributions that MCC investments made to that environment.

## Case Study Site Selection

**Annex Figure 2. Case Study School Selection Process**



The evaluation team used a stratified purposive approach to select the best and worst cases for examination (districts with clusters of good schools or schools with poor conditions),<sup>35</sup> with the expectation that they represented the extremes in the processes that would allow the team to identify patterns of behavior and describe the context/environment in which those behaviors occur. In total, there were three case studies in each of the three zones where MCC provided support—Afram, Northern, and Southern. Two cases focused on MCC-schools and the third focused on non-MCC schools for a point of comparison. Overall, the team selected sites using a phased approach:

**Phase 1:** The district average aggregate school conditions score (referred to as the “score” from here on) was calculated separately for MCC and non-MCC schools. This allowed the team to see the average score for the MCC and non-MCC schools in each district.

**Phase 2:** Using the district average score, the team selected the highest-scoring MCC district, the lowest-scoring MCC district, and the highest-scoring non-MCC district in each zone that had more than two study schools.

**Phase 3:** After the districts had been selected, the team chose two schools in each category (high-scoring MCC schools, low-scoring MCC schools, and high-scoring non-MCC schools) in

<sup>35</sup> For more on the case study approach for evaluation see the *GAO Guidelines for Case Study Evaluations* (1990) [http://www.gao.gov/special.pubs/10\\_1\\_9.pdf](http://www.gao.gov/special.pubs/10_1_9.pdf), and for more on case selection, see Linda G. Morra and Amy Friendlander's *World Bank Guide on Case Study Evaluations* at [https://ieg.worldbankgroup.org/Data/reports/oed\\_wp1.pdf](https://ieg.worldbankgroup.org/Data/reports/oed_wp1.pdf).

each zone. Schools were picked based on their score and how it matched the category under which they were selected. For example, for the high-scoring MCC districts, the two highest-scoring schools within those districts were chosen. Similarly, for the low-scoring MCC districts, the two lowest-scoring schools within the districts were selected.

This process led to the selection of 18 schools (six high-scoring MCC schools, six low-scoring MCC schools, and six high-scoring non-MCC schools), across nine districts in three zones.

### **Respondent Group**

At each selected school, the evaluation team interviewed four categories of people during case study data collection: individuals familiar with the implementation process; those familiar with maintenance, those who could speak to social, political, economic and environmental climate of the area, and finally, those who could speak on the relationship between school conditions and school-level outcomes. SI worked with the data collection partner and a local education expert to determine the ideal respondents in each of these four categories. Final respondents included parents, students, teachers, school leaders or headmasters, district education officers, individuals responsible for operations and management, construction consultants and implementers, MiDA and MCC staff, and representative from the Ministry of Education. The full list of respondents along with selection methodology is outlined in Annex 5. Case Study Respondent Group Selection.

### **Data Collection Approach**

Varied data collection methods were used for the case studies including KIs, FGDs, and CSCs. KIs allowed individuals to speak with an interviewer one-on-one in a “safe” environment conducive to discussing sensitive issues. FGDs and CSCs, communal discussions, were used to query groups of respondents and develop a consensus around issues. Interview methods for each respondent are below (Annex 3. Data Collection Instruments). SI then triangulated findings across all data sources.

The case study interviews were conducted by two teams. Team 1 was led by the principal investigator of the study and Team 2 by the local education expert. Both teams were supported by note-takers and interpreters, who assisted team leads during interviews. All interviews were recorded, translated, and transcribed by the data collection firm and coded by Social Impact for analysis.

## Annex 3. Data Collection Instruments

SCHOOL CONDITIONS SURVEY			
<b>Section 1: Pre-Interview Coding</b>			
A1. <b>Record:</b> Zone			
A2. <b>Record:</b> District			
A3. <b>Record:</b> Community			
A4. <b>Record:</b> School Name			
A5. <b>Record:</b> School Status		<input type="checkbox"/> MCC Funded <input type="checkbox"/> Non-MCC Funded	
A6. <b>Record:</b> Enumerator name			
A7. <b>Record:</b> Date of Survey			
A8. <b>Record:</b> GPS Coordinates			
<b>Section 2: Head Teacher's Consent</b>			
<i>Instruction: If head teacher is not available, ask to speak with his deputy or the next in charge.</i>			
<p>My name is [NAME OF ENUMERATOR] and I am here to request your participation in a research study on the Millennium Challenge Corporation's infrastructure project in Ghana. This project was implemented by the Millennium Development Authority and included rehabilitation and construction of school infrastructure. The study is being conducted in Ghana by Social Impact, in collaboration with TNS. The project and study have received approval from the Ministry of Education. This study will help us better understand the factors that affect school infrastructure projects in Ghana.</p> <p>We would like your permission to take a look at this school's infrastructure facility, take some photographs of the facilities and conduct a brief survey with you or your representative about the infrastructure projects that have been completed here. This will take approximately 30 minutes. There is no direct benefit to you from participation, but the learning from the study will help MCC improve their projects in Ghana. There is no known risk associated with participation in the study. All data collected here will be protected to the maximum extent permitted by the laws of the US and Ghana. It will be kept confidential and will not be linked directly to the school in the final analysis. Millennium Challenge Corporation and the evaluator(s) will have access to all data collected here, including the photographs, and this will only be used for statistical purposes.</p> <p>Participation in this study is entirely voluntary.</p> <p>Are you willing to participate in this study?</p> <p> <input type="checkbox"/> Yes, I consent to participate → <b>Skip to Section 3</b>  <input type="checkbox"/> No, I don't consent to participate → <b>Skip to 2.2</b> </p>			
<input type="checkbox"/> No interview—No one at school <input type="checkbox"/> No interview—No responsible person at school <input type="checkbox"/> No interview—Staff request reschedule <input type="checkbox"/> No interview—Other reason (specify)		<input type="checkbox"/> Refusal—Staff not able to interview (no time, other activity ongoing at school) <input type="checkbox"/> Refusal—Staff say reschedule is not possible <input type="checkbox"/> Refusal—Direct refusal (unwilling) <input type="checkbox"/> Refusal—Direct refusal (not trust the survey) <input type="checkbox"/> Refusal—Other (specify)	
		If 2.1="No"	
<b>END SURVEY IF RESPONDENT DOES NOT CONSENT</b>			
<b>Section 3: School Information</b>			
3.0 What is the full name of this school?			
3.1 Do you know the EMIS ID number for this school?			
<input type="checkbox"/> Yes <input type="checkbox"/> No			
3.1.1 If yes, please specify.		If 3.1="Yes"	
3.2 How many separate buildings (blocks) are there in this school?			
3.3 How many learning spaces are there in this school?			
3.4 Which grades/levels are there in this school?			
<input type="checkbox"/> KG 1 <input type="checkbox"/> KG 2	<input type="checkbox"/> Class 2 <input type="checkbox"/> Class 3	<input type="checkbox"/> Class 6 <input type="checkbox"/> JHS 1	<input type="checkbox"/> SHS 1 <input type="checkbox"/> SHS 2

<input type="checkbox"/> KG 3	<input type="checkbox"/> Class 4	<input type="checkbox"/> JHS 2	<input type="checkbox"/> SHS 3	
<input type="checkbox"/> Class 1	<input type="checkbox"/> Class 5	<input type="checkbox"/> JHS 3	<input type="checkbox"/> Other	
Specify other.				
3.5 Add your notes here if required.				
<b>Section 4: Enrollment</b>				
4.1.1 What is the current number of students enrolled in this school in kindergarten?				
4.1.2 What is the current number of students enrolled in this school in primary classes?				
4.1.3 What is the current number of students enrolled in this school in JHS?				
4.1.4 What is the current number of students enrolled in this school in SHS?				
4.2 Is there sufficient space for the students who are currently enrolled?				
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
4.3 Does the size of the school currently meet the demands, in terms of space, based on the population size of the surrounding community?				
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
4.4 Has the school population increased, decreased, or stayed the same since 2012?				
<input type="checkbox"/> Increased <input type="checkbox"/> Decreased <input type="checkbox"/> Stayed the same <input type="checkbox"/> Don't know				
<b>Section 5: Donor Activity</b>				
5.1 Has the school received any rehabilitation or new construction since 2012?				
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
5.1.1. If yes, who undertook the improvements?				If 5.1="Yes"
<input type="checkbox"/> Government of Ghana (GES/MOE) <input type="checkbox"/> NGOs <input type="checkbox"/> Donors <input type="checkbox"/> Community (PTA, SMC)		<input type="checkbox"/> School <input type="checkbox"/> Don't know <input type="checkbox"/> Other		
Specify other.				
5.1.1. Specify the name of the organization.				
5.1.2 When were these improvements completed?				
<input type="checkbox"/> 2013 <input type="checkbox"/> 2014 <input type="checkbox"/> 2015 <input type="checkbox"/> 2016		<input type="checkbox"/> Not completed <input type="checkbox"/> Ongoing <input type="checkbox"/> Don't know		
5.1.3. Please give us more details of the improvements.				
5.2. Has the school obtained new furniture, blackboards, or whiteboards since 2012?				
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
5.2.1. Who provided this (new furniture/blackboard/whiteboard)?				If 5.2="Yes"
<input type="checkbox"/> Government of Ghana (GES/MOE) <input type="checkbox"/> NGOs <input type="checkbox"/> Donors		<input type="checkbox"/> Community (PTA, SMC) <input type="checkbox"/> Don't know <input type="checkbox"/> Other		
Specify other.				
5.2.1. Specify the name of the organization.				
5.2.2 When was this provided?		<input type="checkbox"/> 2014	<input type="checkbox"/> 2015	
<input type="checkbox"/> 2013 <input type="checkbox"/> 2016		<input type="checkbox"/> Don't know		
5.3 Have the toilet facilities and polytanks received updates or been newly constructed since 2012?				
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know				
5.3.1 If yes, who provided these facilities?				If 5.3="Yes"
<input type="checkbox"/> Government of Ghana (GES/MOE) <input type="checkbox"/> NGOs <input type="checkbox"/> Donors		<input type="checkbox"/> School <input type="checkbox"/> Don't know <input type="checkbox"/> Other		



<input type="checkbox"/> Community (PTA, SMC)		
Specify other.		
5.3.1. Specify the name of the organization.		
5.3.2 When was this provided?	<input type="checkbox"/> 2013 <input type="checkbox"/> 2014 <input type="checkbox"/> 2016	<input type="checkbox"/> 2015 <input type="checkbox"/> Don't know
5.4 Aside from the district, is there an organization or individual who funds maintenance and upkeep of the school?		
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
5.4.1 If yes, specify the organization or individual.		If 5.4="Yes"
5.5 Aside from the district, who is responsible for maintenance and upkeep of the school?		
<input type="checkbox"/> Head teacher <input type="checkbox"/> PTA/SMC <input type="checkbox"/> Other		
Specify other.		
5.5.1 In the last six months, has somebody conducted maintenance work in the school?		
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
5.5.2 Name the person/organization who conducted maintenance work in the school.		If 5.5.1="Yes"
5.6. Does the district official visit the school regularly for maintenance checks?		
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
5.7 Are school maintenance routines performed?		
<input type="checkbox"/> Regularly <input type="checkbox"/> Infrequently <input type="checkbox"/> Only when requested by school <input type="checkbox"/> Not at all <input type="checkbox"/> Don't know		
5.8 Does the school have a maintenance manual?		
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
5.9 Do school structures sufficiently protect the students from the weather (heavy rains, wind, etc.)?		
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
5.10. Do school structures sufficiently provide for students with disabilities?		
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
<b>Section 6: School Conditions</b>		
<i>Instruction: Inform the head teacher that you would like to look at the school infrastructure now and that you will be taking pictures of the building components. Ask if he/she/somebody who knows about school maintenance can take you around.</i>		
6. How many blocks in this school were constructed or rehabilitated by MCC?		
<b>Block Checklist</b>		
6.1 This block		
<input type="checkbox"/> Received funding from MCC <input type="checkbox"/> Received funding from a different donor <input type="checkbox"/> Received funding from the government <input type="checkbox"/> Received funds from the community		<input type="checkbox"/> Did not receive any additional funds <input type="checkbox"/> Don't know <input type="checkbox"/> Other
Specify other.		
6.2 This block is used for:		
<input type="checkbox"/> Kindergarten <input type="checkbox"/> Primary <input type="checkbox"/> JHS <input type="checkbox"/> SHS		<input type="checkbox"/> Teacher's space <input type="checkbox"/> Not in use <input type="checkbox"/> Other
Specify other.		

6.3 This block was: <input type="checkbox"/> Constructed by MCC <input type="checkbox"/> Rehabilitated by MCC		If A.5="Funded by MCC"
6.4 How many classrooms are there in this block?		
<b>Section A: School Grounds</b>		
1. Are there signs of soil erosion around structure? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the extent of soil erosion around structure. <input type="checkbox"/> Minor soil erosion <input type="checkbox"/> Average soil erosion <input type="checkbox"/> Major soil erosion		
Take a photograph as justification.		
Add any notes you have about the picture.		
2. Tall weeds and grass are not cut. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the extent of tall weeds and grass growth around structure. <input type="checkbox"/> Minor weed and grass growth <input type="checkbox"/> Average weed and grass growth <input type="checkbox"/> Major weed and grass growth		
Take a photograph as justification.		
Add any notes you have about the picture.		
3. There is rubbish on the ground. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the extent of rubbish. <input type="checkbox"/> Very little rubbish on the ground <input type="checkbox"/> Some rubbish on the ground <input type="checkbox"/> A lot of rubbish on the ground		
Take a photograph as justification.		
Add any notes you have about the picture.		
4. Are there appropriate trash bins? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the condition of the trash bins. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
5. Are trees maintained with no low branches that could injure children? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate to what the extent trees are maintained. <input type="checkbox"/> Not maintained well <input type="checkbox"/> Averagely maintained <input type="checkbox"/> Maintained very well		
Take a photograph as justification.		
Add any notes you have about the picture.		
6. There are puddles or stagnant water. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate to what extent there is stagnant water. <input type="checkbox"/> Very little stagnant water around building <input type="checkbox"/> Some stagnant water around building <input type="checkbox"/> Substantial amount of stagnant water around building		

Take a photograph as justification.		
Add any notes you have about the picture.		
7. Is there anything else that you want to rate on the school grounds? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Name the additional feature of the school ground that you would like to rate.		
Rate the feature <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
<b>Section B: Classroom Block Conditions</b>		
1. Exposed or partially exposed building foundations? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the condition of the building foundations. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
2. Deep crack or damaged floors? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the condition of the floors. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
3. Windows/shutters missing or in disrepair? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the condition of the windows/shutters. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification of rating.		
Add any notes you have about the picture.		
3.1 Windows/shutters' locks are missing or in disrepair? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> N/A		
4. Doors missing or in disrepair? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the condition of the doors. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification of rating.		
Add any notes you have about the picture.		
5. Locks on doors are missing or in disrepair. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know <input type="checkbox"/> N/A		

6.1 Is there a roof? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
6.2 Does roof have visible leaks or holes? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the condition of the roof. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
7.1 Is there a ceiling? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
7.2 Does ceiling have visible leaks or holes? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the condition of the ceiling. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
8. Is the wood holding up the roof in poor condition (rotten or broken)? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the condition of the wood holding up the roof. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
9. Peeling or faded paint in the interior of the building. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not painted <input type="checkbox"/> Don't know		
Rate the condition of the paint in the interior of the building. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
10. Peeling or faded paint in the exterior of the building? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not painted <input type="checkbox"/> Don't know		
Rate the condition of the paint in the exterior of the building. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
11. Are rain gutters and downspouts intact and working well? <input type="checkbox"/> Yes <input type="checkbox"/> No		

<input type="checkbox"/> Don't know		
Rate the condition of the rain gutters and downspouts. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition <input type="checkbox"/> N/A		
Take a photograph as justification.		
Add any notes you have about the picture.		
12. Sharp wooden or metal corner or protrusions that could injure someone? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate to what extent it is dangerous. <input type="checkbox"/> Not dangerous <input type="checkbox"/> Somewhat dangerous <input type="checkbox"/> Very dangerous		
Take a photograph as justification.		
Add any notes you have about the picture.		
13. Observe the room size and the number of students in your randomly selected classroom. The room is: <input type="checkbox"/> Overcrowded—The room size is not sufficient for the students in the classroom <input type="checkbox"/> Well spaced—The room size is sufficient for the students in the classroom <input type="checkbox"/> Undercrowded—The room can comfortably fit in more students		
14. Are there any cracks in the structural system that you believe may require further investigation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Rate the condition of the structural system. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
Is there anything else that you want to rate on the school grounds? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Name the additional feature of the classroom block that you would like to rate.		
Rate the feature. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
<b>Section C: Equipment, furniture, and other items inside structure</b>		
1. Is there an electric connection in this block? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
1.1 Is the electric connection working? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
2. Students' desks and benches are present for all students. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
3. There is a blackboard or whiteboard. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Take a photograph of the board.		
Add any notes you have about the picture.		
4. The blackboard or whiteboard is affixed to the wall. <input type="checkbox"/> Yes		

<input type="checkbox"/> No <input type="checkbox"/> Don't know		
5. There is chalk for the blackboard or markers for the whiteboard. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
6. MCC signage is visible. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Take a photograph as justification.		
Add any notes you have about the picture.		
7. Is there anything else that you want to rate on equipment, furniture, and other items inside the structure? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Name the additional feature that you would like to rate.		
Rate the feature. <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
Please add any additional notes you have from your observations of this block.		
The checklist is now complete for this block.		
<b>Section D: Toilet Facilities</b>		
1. There are separate toilets for boys and girls. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Take a photograph as justification.		
Add any notes you have about the picture.		
2. The toilet areas have separate waiting areas for boys and girls. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Take a photograph as justification.		
Add any notes you have about the picture.		
3. Are the toilets functioning/not broken? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
4. Children at the school have regular access to toilets. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
5. There is evidence that the toilets are regularly cleaned. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Take a photograph as justification.		
Add any notes you have about the picture.		
6. The toilets have doors that open and close and can be locked for privacy. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Take a photograph as justification.		
Add any notes you have about the picture.		
7. Polytanks are in place. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Take a photograph as justification.		
Add any notes you have about the picture.		

8. Poly tanks are functioning. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		If 4="Yes"
Take a photograph as justification.		
Add any notes you have about the picture.		
9. There is a designated area for students to wash near the toilets. <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know		
Take a photograph as justification.		
Add any notes you have about the picture.		
10. Is there anything else that you want to rate on toilet facilities for the school? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Name the additional feature that you would like to rate.		
Rate the feature <input type="checkbox"/> Poor condition <input type="checkbox"/> Average condition <input type="checkbox"/> Good condition		
Take a photograph as justification.		
Add any notes you have about the picture.		
GPS coordinates?		
Please add any additional notes you have on the school overall.		

## Focus Group Discussion/Group Interview Guide

### School Management Committee and/or Relevant Community Groups

Today we would like to have a conversation with you regarding the educational needs in your community and as well as the current conditions of school building, their furnishings, materials WASH facilities. Our goal is to get a better understanding of whether or not the needs of your children are being met and how. And, finally, to understand why the school is in the current condition it is.

1. Let's begin by having a general conversation about the role of the school management committee and some of your roles and responsibilities.
2. Now, let's talk about education in your community. Tell me a little bit about perceptions of education and the schools in your community?
  - a. What encourages or discourages families from enrolling their children in school?
  - b. What factors lead to grade repetition and dropping out of school? How are these factors similar or different for boys and girls?
  - c. What do you think could be done to help students perform better?
3. How would you describe the current conditions of (x) school? What do you think are some of the factors that drive the current conditions of schools (including furniture and WASH facilities)? Do you have a system through which conditions are tracked? Or through which complaints can be lodged? If so, can you explain this process?
4. What roles do the MOE and DEO play in the conditions of school infrastructure and equipment? How do you interface with them as a committee?



5. Can you tell me about how school finances work? In particular, how are school budgets set and who is responsible for it?
6. What role, if any, does the school's physical condition play in enhancing or diminishing:
  - d. Enrollment?
  - e. Attendance?
  - f. Completion?
  - g. Learning outcomes?

## **Key Informant Interviews**

### ***KII Questions for MCC and MiDA (Current and Former Representatives)***

1. Please describe how the education sub-activity fit into the larger community services activity. In particular, how did it fit into the overarching Compact and the general theory of change? What were the targeted outcomes?
2. How was the education sub-activity carried out? Please describe the different stages and the key partnerships you had in order to ensure the work was carried out.
3. How was the preliminary list of schools generated? What was the process for working with the MOE for both Phase 1 and Phase 2? And the Community Service Projects Department. Please help me explain the decision-making process.
4. Were there *particular standards* that were used to inform the rehabilitation or new construction that took place during Phase 1? What about Phase 2?
5. Did the education sub-activity meet its objectives? What outcomes did you measure to make sure they did meet objectives?
  - a. If these are different from enrollment, attendance, persistence, and learning outcomes, inquire about those.
  - b. Do you expect that the intervention is still having a positive effect on the school and community? Please explain.
6. For the education sub-activity under Compact I, did you coordinate with other donors to identify appropriate sites for the MCC activities? Have other donors stepped in to also work on rebuilding school infrastructure? If so, can you tell me about that process?
7. Let's discuss some of the successes and challenges you encountered while implementing the education sub-activity. If you had to redesign the education sub-activity, what would you do differently? What would stay the same?
8. What was your experience working with the contractors who constructed and/or rehabilitated schools? What was the process for selection and implementation? What role, if any, did the MOE play in this?
9. Were school staff trained on maintaining the buildings, structures, and furniture provided by MCC? Who was responsible for maintenance? To your knowledge, how does maintenance take place and where do schools gather resources to undertake maintenance?

***KII Questions for the Ministry of Education Representative and District Education Officers***

1. As a ministry or as a district, how do you determine which schools need updates or improvements? What is the process for financing those updates and improvements? What is the process for carrying out those updates?
2. What was the process for working with MCC, MiDA, and Lamda to identify schools that needed to be either rehabilitated or have classrooms and facilities newly constructed?
3. For the education sub-activity under Compact I, did you coordinate with other donors to identify appropriate sites for the MCC activities? Have other donors stepped in to also work on refurbishing or rebuilding school infrastructure? If so, can you tell me about that process?
4. How do you think the conditions of schools, equipment, and facilities influence enrollment, attendance, completion, and school learning?
5. What do you believe were some of the successes and challenges with the education sub-activity of Compact I?
6. What standards do the MOE and district have regarding building structure and development?
7. How is maintenance carried out at the individual schools? Does the MOE have maintenance guidance/requirements? What are the primary procedures for maintaining schools?
8. What is the funding source for school maintenance? What is the process for seeking out that funding? Do you currently have sufficient funding to carry out maintenance? If not, how do you determine how to use the resources you do have and/or seek additional resources?
9. Aside from maintenance, what other factors may influence a school's infrastructure?

***KII Questions for Representative from Lamda and Local Construction Company***

1. How was the preliminary list of schools generated for Phase 1a and 1b? What about Phase 2? Were there particular selection criteria (*refer to the ranking list*)? How did you determine their score and eligibility?
  - a. What role did MCC/MiDA play in this process?
  - b. What role did MOE play in this process?
  - c. The district education officer?
  - d. Your subcontractors?
2. What was the process for working with the MOE for both Phase 1 and Phase 2? And with the Community Service Projects Department? Please help me understand the decision-making process.
3. What standards do the MOE and district have regarding school construction? Is there an approval process that you must follow? If so, please describe that to me?
4. What was your experience working with the contractors who constructed and rehabilitated schools? What was the process for selection and implementation? What role, if any, did the MOE play in this? What role, if any, did MiDA play in this?

5. Were school staff trained on procedures for maintaining the buildings, structures, and furniture provided by MiDA? Who was responsible for maintenance? To your knowledge, how does maintenance take place and where do schools gather resources to undertake maintenance?
6. Is there particular guidance you have on maintaining schools in order to maximize their life?
7. Aside from maintenance, what other factors may influence a school's infrastructure?

***KII Questions for School Leaders***

1. How long have you been a school leader here? Where were you prior to this position? Can you please describe your roles and responsibilities at this school?
2. Today we are here to talk with you a bit about the current conditions of your school in terms of the building's physical structure, furniture, water, and latrine facilities. Can you please describe for me the current conditions of each of these?
  - a. In the case of latrines, are there separate ones for boys and girls? Are there hand-washing facilities? If some students do not use the latrines, why not?
3. Are there currently any components that need upgrading or are in poor condition? If so, can you describe this and then explain some of the factors that you believe have driven the conditions?
4. How many students does this school serve? Is there sufficient space to accommodate the students? Are there sufficient materials for the students?
5. Who is responsible for the maintenance of the school building, the furniture, and the latrines? Please describe this person's role.
6. Can you please describe the process you follow to maintain schools? Is there guidance that you follow? If so, where does the guidance come from? And is your school inspected based on those guidelines?
7. What is the funding source for school maintenance? What is the process for seeking out that funding? Do you currently have sufficient funding to carry out maintenance? If not, how do you determine how to use the resources you do have and/or seek further resources elsewhere?
8. What do you believe are some of the factors that drive the current conditions of your school building, materials, and latrines?

Now I'd like to talk with you a little bit about student outcomes—specifically, about enrollment, attendance, completion

9. Based on your experience in the community, what are some of the factors that prevent or encourage students from enrolling in school?
10. What are some of the factors that prevent or encourage students from attending school on a regular basis?
11. What prevents students from completing school?
12. What are the factors that contribute or detract from students' ability to learn in school?

13. How are your current enrollment rates? Attendance rates? Have you seen either change over time?
14. How are your students currently doing academically? Do you see any trends in their achievement?

***KII Questions for Individual(s) Responsible for School Maintenance***

1. How long have you been responsible for operations and maintenance at this school?
2. What is your process for inspecting the school/furniture/latrines? How often do inspections occur?
3. How often are the classrooms and toilets cleaned? Who does the work?
4. What is your process for maintaining/repairing the school/furniture/latrines/water supply? How often do you undertake these activities?
5. What maintenance activities are undertaken for the school grounds, such as cutting grass and weeds, planting trees, and maintaining sports fields?
6. How adequate is the water supply? Where does the water come from? What issues do you face in ensuring enough water for drinking and cleaning purposes?
7. Are there particular guidelines you follow to inspect schools? To maintain schools?
8. Are you paid for the operations and maintenance work you do?
9. Where does the funding for operations and maintenance come from? Do you have sufficient funding? How is the funding used?
10. How do you prioritize activities?
11. Does anyone assist you in the maintenance process?

**Interviewer Guide for the Community Score Cards: Parents**

**Preparation:** Draw a matrix that looks like this:

	Worse	Same	Better
Conditions of the classroom buildings			
Latrines			
Water supply			
Furniture and supplies at the school			
Enrollment			
Attendance			
Completion			

**Introductions:** First, let's get to know each other. (*Introduce yourself and then have members introduce themselves saying how long they have lived in the community and have been either teaching at the school or a parent of a child at the school*).

**Instructions:** For this discussion, I would like to learn about the quality of education at your school. Some of the things we are going to talk about are the reasons students enroll or not, the things that prevent students from attending school or encourage them to attend, the quality of the building, materials, and latrines, and the teaching and learning that happens at school. For each topic we cover, we will have each individual in the group vote on whether the thing we are discussing has gotten better, worse, or stayed the same **IN THE LAST THREE YEARS**.

Let me give you an example:

"Please raise your hand if you think that farming in this community in the last year has gotten better? Worse? Stayed the same?"

Okay, once we take a vote and we score it, you will have the opportunity to speak with one another about your views. I will ask some questions about the responses people give to help encourage conversation. We don't expect that everyone will agree. And that is okay. The point is to be able to share your perspective and learn about others' perspectives. Shall we get started?

1. Let's get started by talking about the **CONDITIONS OF CLASSROOM BUILDINGS** at this school. How many say that over the last three years the conditions have gotten better? Worse? Stayed the same? (*Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.*)
  - a. For those of you who say that classroom conditions have improved, tell us a little bit about why you think it has improved (probe on the building structure, lighting, roof, space for the children)
  - b. What about those of you who believe conditions have gotten worse? Help us understand.
  - c. How do you think the classroom buildings at your school compare with other schools in the area?
  - d. Do you have suggestions how they might be improved? Do you know anything about the maintenance process?
2. What about the **CONDITIONS OF LATRINES** at this school? How many say that over the last three years the conditions have gotten better? Worse? Stayed the same? (*Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.*)
  - a. For those of you who say that latrine conditions have improved, tell us a little bit about why you think it has improved?

- b. What about those of you who believe conditions have gotten worse? Help us understand.
  - c. How do you think the latrines at your school compare with other schools in the area?
  - d. Do you have suggestions how they might be improved? Do you know anything about the maintenance process?
3. Do you think that over the last three years, the **WATER SUPPLY** at this school has gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that it has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
4. Do you think that over the last three years **SCHOOL SUPPLIES** including desk, chairs, blackboards have gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that the school supplies situation has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
  - c. How do you think the supplies at your school compare with other schools in the area?
5. All of the things we've talked about are related to the physical structure of the school. Do you have any additional suggestions you would make to help improve the structure? Can we make a priority list in order of what you think would be most beneficial to least in terms of improving enrollment? What about attendance? Is that the same? And learning outcomes?
6. Now I want to change gears and talk with you a little bit about children enrolling and attending school as well as completing and moving on to the next grade level. How many say that over the last three years the **SCHOOL ENROLLMENT** has gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that it has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
  - c. How do you think enrollment at your school compare with other schools in the area?
  - d. How did you make the decision on whether to enroll your child or not?

7. How many say that over the last three years the **ATTENDANCE** has gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
- a. For those of you who say that it has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
  - c. How do you think attendance at your school compare with other schools in the area?
  - d. What prevents or allows your child to attend school?
8. How many say that over the last three years **SCHOOL COMPLETION** has gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
- a. For those of you who say that it has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
  - c. How do you think complete at your school compare with other schools in the area?
  - d. What prevents or allows your child to complete school?



## Interviewer Guide for the Community Score Cards: Students

**Preparation:** Draw a matrix that looks like this:

	Worse	Same	Better
Conditions of the classroom buildings			
Latrines			
Water supply			
Furniture and supplies at the school			
Attendance			
Completion			
Reading skills			
Math skills			
Quality of teaching			

**Introductions:** First, let's get to know each other. (*Introduce yourself and then have members introduce themselves saying how long they have lived in the community and have been either teaching at the school or a parent of a child at the school.*)

**Instructions:** Now, let me tell you a little bit more about what we are doing here today. We wanted to talk with you about two things: your school and the things that help you learn and do well in school. There aren't any right or wrong answers. We are just trying to learn from you. Some of the things we are going to talk about are the number of students, the things that make you want to attend school, the quality of the building, materials, and latrines, and the teaching and learning that happens at school. For each topic we cover, we will have each individual in the group vote on whether the thing we are discussing has gotten better, worse, or stayed the same **IN THE LAST THREE YEARS.**

Let me give you an example. But for this example, we are going to talk about the Ghana Black Stars and the Black Queens football team.

"Please raise your hand if you think that the Black Stars and Queens in the last year have gotten better? Worse? Stayed the same?"

Now for those of you who said they have gotten better, explain to me how? For example, are they scoring more goals?

Okay, once we take a vote and we score it, you will have the opportunity to speak with one another about your views. I will ask some questions about the responses people give to help

encourage conversation. We don't expect that everyone will agree. And that is okay. The point is to be able to share your perspective and learn about others' perspectives. Shall we get started?

1. Let's get started by talking about the **CONDITIONS OF CLASSROOM BUILDINGS** at this school. How many say that over the last three years, the conditions have gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that classroom buildings' conditions have improved, tell us a little bit about why you think it has improved (probe on the building structure, lighting, roof, space for the children)
  - b. What about those of you who believe conditions have gotten worse? Help us understand.
  - c. How do you think the classroom buildings at your school compare with other schools in the area?
  - d. Do you have suggestions how they might be improved? Do you know anything about the maintenance process?
2. What about the **CONDITIONS OF LATRINES** at this school? How many say that over the last three years, the conditions have gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that latrine conditions have improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe conditions have gotten worse? Help us understand.
  - c. How do you think the latrines at your school compare with other schools in the area?
  - d. Do you have suggestions how they might be improved? Do you know anything about the maintenance process?
3. Do you think that over the last three years, the **WATER SUPPLY** at this school has gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that it has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.

4. Do you think that over the last three years, **SCHOOL SUPPLIES** including desk, chairs, and blackboards have gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that the school supply situation has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
  - c. How do you think the supplies at your school compare with other schools in the area?
5. Now I want to find out more about students choosing to go to school. How many say that over the last three years, the **ATTENDANCE** has gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that it has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
  - c. Do you see a difference in attendance between boys and girls? If so, what do you think are the reasons for the difference?
  - d. How do you think attendance at your school compare with other schools in the area?
  - e. What are the things that make you want to attend school?
  - f. Are there things that make you not want to attend school?
6. How many say that over the last three years, **SCHOOL COMPLETION** has gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that it has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
  - c. Do you see a difference in school completion between boys and girls? If so, what do you think are the reasons for the difference?
  - d. What are some of the reasons that your friends and fellow students complete school?
7. How many say that over the last three years, students at this school are **READING BETTER**? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*

- a. For those of you who say that student reading has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
8. How many say that over the last three years, students at this school are getting **BETTER AT MATH**? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that student math performance has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
9. How many say that over the last three years, the **TEACHERS** have gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that teachers have improved, tell us a little bit about why you think the teachers are better.
  - b. What about those of you who believe they are worse? Help us understand.
  - c. What do you think that teachers could do to be better teachers?

### Interviewer Guide for the Community Score Cards: Teachers

**Preparation:** Draw a matrix that looks like this:

	Worse	Same	Better
Conditions of the classroom buildings			
Latrines			
Water supply			
Furniture and supplies at the school			
Enrollment			
Attendance			
Completion			

**Introductions:** First, let's get to know each other. *(Introduce yourself and then have members introduce themselves saying how long they have lived in the community and have been either teaching at the school or a parent of a child at the school.)*

**Instructions:** For this discussion, I would like to learn about the quality of education at your school. Some of the things we are going to talk about are the reasons students enroll or not, the things that prevent students from attending school or encourage them to attend, the quality of the building, materials, and latrines, and the teaching and learning that happens at school. For each topic we cover, we will have each individual in the group vote on whether the thing we are discussing has gotten better, worse, or stayed the same **IN THE LAST THREE YEARS**.

Let me give you an example:

“Please raise your hand if you think that farming in this community in the last year has gotten better? Worse? Stayed the same?”

Okay, once we take a vote and we score it, you will have the opportunity to speak with one another about your views. I will ask some questions about the responses people give to help encourage conversation. We don’t expect that everyone will agree. And that is okay. The point is to be able to share your perspective and learn about others’ perspectives. Shall we get started?

1. Let’s get started by talking about the **CONDITIONS OF CLASSROOM BUILDINGS** at this school. How many say that over the last three years the conditions have gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that classroom buildings conditions have improved, tell us a little bit about why you think it has improved (probe on the building structure, lighting, roof, space for the children)
  - b. What about those of you who believe conditions have gotten worse? Help us understand.
  - c. How do you think the classroom buildings at your school compare with other schools in the area?
  - d. Do you have suggestions how they might be improved? Do you know anything about the maintenance process?
2. What about the **CONDITIONS OF LATRINES** at this school? How many say that over the last three years the conditions have gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that latrine conditions have improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe conditions have gotten worse? Help us understand.
  - c. How do you think the latrines at your school compare with other schools in the area?

- d. Do you have suggestions how they might be improved? Do you know anything about the maintenance process?
3. Do you think that over the last three years, the **WATER SUPPLY** at this school has gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that it has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
4. Do you think that over the last three years **SCHOOL SUPPLIES** including desk, chairs, and blackboards have gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that the school supplies situation has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
  - c. How do you think the supplies at your school compare with other schools in the area?
5. All of the things we've talked about are related to the physical structure of the school. Do you have any additional suggestions you would make to help improve the structure? Can we make a priority list in order of what you think would be most beneficial to least in terms of improving enrollment? What about attendance? Is that the same? And learning outcomes?
6. Now I want to change gears and talk with you a little bit about children enrolling and attending school as well as completing and moving on to the next grade level. How many say that over the last three years the **SCHOOL ENROLLMENT** has gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that it has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
  - c. How do you think enrollment at your school compare with other schools in the area?
7. How many say that over the last three years the **ATTENDANCE** has gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
  - a. For those of you who say that it has improved, tell us a little bit about why you think it has improved?

- b. What about those of you who believe it has gotten worse? Help us understand.
  - c. How do you think attendance at your school compare with other schools in the area?
8. How many say that over the last three years **SCHOOL COMPLETION** has gotten better? Worse? Stayed the same? *(Facilitator will prompt people to raise their hand to indicate which statement they agree with and then count the number of people who raise their hand to each of these and fill that number into the matrix above.)*
- a. For those of you who say that it has improved, tell us a little bit about why you think it has improved?
  - b. What about those of you who believe it has gotten worse? Help us understand.
  - c. How do you think complete at your school compare with other schools in the area?



## Annex 4. Questionnaire Mapping

### *Mapping the Evaluation Questions to the Data Collection Tools*

Evaluation Question	Data Needs	Methods	Respondent Group	Data Collection Tool Guide
EQ1: What are the current conditions of MCC investments made for the Compact 1 education sub-activity? How do the conditions of MCC investments compare to non-MCC supported sites?	Descriptive data on current conditions with information regarding other investments.  Descriptive information on current conditions of non-MCC supported sites.	School conditions survey, triangulated with qualitative information on school conditions	KII: school leader  FGD: students, teachers, parents/community members, SMCs	School conditions survey  School leader KII #2, 3 Student FGD #1, 2, 3 Teacher FGD #1, 2, 3 Parents/community FGD #1, 2, 3 SMC FGD #3
EQ2: How might have the implementation process and/or maintenance post-completion contribute to current conditions of MCC investments?	In-depth information on how the sub activity was implemented and implementation successes and challenges.  In-depth information on how maintenance is done in Ghana, including understanding roles and responsibilities as well as funding streams.	Qualitative data gathered from FGDs and KIIs about the development and construction of the facility, and about O&M carried out afterward.	KII: Current and former reps of MCC and MiDA, DEO and rep from MOE, rep from Lamda and local construction company, school leader, individual responsible for school maintenance  FGD: students, teachers, parents/community members, SMC	MCC/MiDA <sup>36</sup> KII #2, 3, 4, 6, 7, 8, 9 MOE/DEO <sup>37</sup> KII #1, 2, 3, 6, 7, 8 Lamda/LCC <sup>38</sup> KII #1, 2, 3, 4, 5, 6 School Leader KII #3, 5, 6, 7, 8 O&M head KII #2, 3, 4, 6, 7, 8 Student FGD #1, 2, 3 Teacher FGD #1, 2, 3 Parent/community FGD #1, 2, 3 SMC <sup>39</sup> FGD #4
EQ3: How might other factors explain both perceived school-level outcomes and the current	Qualitative data on political, economic, and social conditions in areas where implementation occurred.	Perceptions data gathered through FGDs and KIIs on alternative reasons impacting school achievement and condition.	KII: Current and former reps of MCC and MiDA, DEO and rep from MOE, rep from Lamda and local construction company, school	MCC/MiDA KII #6, 9 MOE/DEO KII #3, 5, 9 Lamda/LCC KII #7 School leader KII #3, 8 O&M head KII #1, 5

<sup>36</sup> Millennium Challenge Corporation/Millennium Development Authority representatives

<sup>37</sup> Ministry of Education/District Education Officer

<sup>38</sup> Lamda and local construction company representatives

<sup>39</sup> SMC and/or relevant community groups

conditions of schools?	Same information for comparison sites.		leader, individual responsible for school maintenance  FGD: students, teachers, parents/community members, SMC	Student FGD #1, 2, 3 Teacher FGD #1, 2, 3 Parent/community FGD #1, 2, 3 SMC FGD #5
EQ4: What are the perceived outcomes of investments in school infrastructure?	Perceptions of different stakeholders on the value and outcomes of investments.	Perceptions data gathered through KIIs, FGDs, and FGD CSCs on the outcomes of school infrastructure investment.	KII: Current and former reps of MCC and MiDA, DEO, rep from MOE, school leader  FGD: students, teachers, parents/community members, SMC	MCC/MiDA KII #1, 5, 7 MOE/DEO KII #4, 5 School leader KII #4, 9, 10, 11, 12, 13, 14 Student FGD #4, 5, 6, 7 Teacher FGD #4, 5, 6, 7 Parent/community FGD #4, 5, 6, 7 SMC FGD #2, 6

## Annex 5. Case Study Respondent Group Selection

Activities to complete in 18 selected schools' catchment area				Details of selection
Teacher (CSC)	1 group per selected school	Non-random	1 hour	1 group: 5–10 teachers, male and female equally represented if possible. **Teacher CSCs must be completed when class is not in session.
Student (CSC)	2 groups per selected school	Selected by head teacher	1 hour	2 groups: 1 group of 5–10 male students from primary 5–6 and JHS 1–3. 1 group of 5–10 female students from primary 5–6 and JHS 1–3. **Students must be selected by the head teacher. Head teacher's consent is required prior to the interview. Student CSCs must not be done during classes.
Parent (CSC)	1 group per selected school	Selected by head teacher	1 hour	1 group: 5–10 mothers and fathers (equally represented, if possible) of students who study in that school. **Head teacher should choose which parents to invite and inform them in advance so that they are present during our school visit.
School Management Committee (FGD)	1 group per selected school	Purposely selected	1 hour	1 group: 5–10 members of the SMC, male and female equally represented, if possible. **Head teacher should inform them in advance so that they are present during our school visit.
Community group (FGD)	1 group per selected school	Purposely selected by PI on a case-by-case basis	1 hour	1 group: 2–3 people from the community who are well known and respected in the community and are familiar/involved with the school (e.g., chief, elder, imam). **If most of them are already part of the SMC, then this group can be combined with the SMC group for the interview.
School Leaders KII	1 KII for each selected school	Purposely chosen	1 hour	This is a one-on-one interview with the school's head teacher.
Maintenance Representative KII	Up to 1 KII per school	Purposely chosen	1 hour	This is a one-on-one interview with the school maintenance representative. **When setting up the appointment, ask the head teacher who is in charge of overseeing maintenance at the school. If it is the head teacher, then this interview will be conducted with the head teacher. If it is somebody else, he or she will be interviewed separately.
District Level (in 9 selected districts)				
District Education Officer KII	9 KIIs held with 9 DEOs in 9 different districts.	Purposely chosen	1 hour	1 DEO per district.
Local contractor KII	Up to 9 KIIs held with the person in charge of construction	Purposely chosen	1 hour	1 local contractor per district.

	oversight in 9 separate districts			
<b>National Level</b>				
Ministry of Education Rep KII	1 KII	Purposely chosen	1 hour	1 representative from GES/MOE who is familiar with the project or partnered with MiDA on the project.
MiDA Rep KII	3 KIIs	Purposely chosen	1 hour	<ul style="list-style-type: none"> <li>Project consultant</li> <li>Project manager</li> <li>Chief operating officer</li> </ul>
Lamda Rep KII	1 KII	Purposely chosen	1 hour	1 representative from the Lamda office in Accra who was in charge of this project.
MCC Rep KII	Up to 2 KIIs	Purposely chosen	1 hour	To be determined by MCC

### Completed Qualitative Interviews

	Afram			Northern			Southern		
	MCC High	MCC Low	Non-MCC High	MCC High	MCC Low	Non-MCC High	MCC High	MCC Low	Non-MCC High
<b>School Level</b>									
Teacher CSC	2	2	2	2	2	2	2	2	2
Male Student CSC	2	2	2	2	2	2	2	0	0
Female Student CSC	2	2	2	2	2	2	2	0	0
Combined Student CSC	0	0	0	0	0	0	0	2	2
Parent CSC	2	2	2	2	2	2	2	1	1
SMC FGD	2	2	2	2	2	2	1	2	2
Community FGD	0	0	2	0	0	0	2	2	0
School Leader KII	2	2	2	2	2	2	2	2	2
Maintenance Rep KII	0	0	1	0	0	0	0	1	1
<b>District Level</b>									
DEO KII	1	1	1	1	1	1	1	1	1
Local Contractor KII	0	1	0	0	1	0	0	0	0
<b>National Level</b>									
Ministry of Education Rep KII	1								
MiDA Rep KII	2								
Lamda Rep KII	1								
MCC Rep KII	1								

## **Annex 6. Contract Scope of Work**

Annex 6 is submitted as a separate file.

## Annex 7. Comments Matrix

Comment Location	Commenter	Comment	SI Response
Page 2, EQ 1	Sarah Lane	These numbers don't mean anything at this point in the report. Perhaps drop them here	Agreed, removed.
Page 3, EQ 1	Sarah Lane	Do we know why?	The finding that maintenance funding and support differed across zones and school types came from a tally sheet of qualitative responses from district education officers, local contractors, community leaders, head teachers, SMCs, male and female students, parents, and teachers. The responses are included in Table 9 on page 22.
Page 3, EQ 2	Sarah Lane	This is a bit of a roundabout way of saying that oversight was poor. Can you be a bit clearer? I assume also that the two steps cited were not followed?	Have added language to clarify that yes, oversight and pre-qualification practices were not fully followed and that the steps described are what should have happened.
Page 3, EQ 3	Sarah Lane	How is environment different than weather?	Harsh weather included heavy rain, storms, and wind, while environment included things like lack of water during the dry season.
Page 4, EQ 3	Sarah Lane	Very interesting	Thank you
Page 5, ERR	Sarah Lane	Please share your model	The models are explained under EQ4 in more detail. We felt it was too much detail for the executive summary to say more. A note to this effect was added to the Executive Summary.

Page 6, The Compact	Sarah Lane	2016?	This evaluation started in June 2015, but data collection happened in 2016, wording updated in report.
Page 7, Program Logic of the Education Sub Activity	Sarah Lane	Probably should mention the program logic in the Exec Sum	It was discussed in the Exec Summary under the Overview of the Compact, although it was described as the theory of change. Have added phrase program logic there as well.
Page 9, Program Participants	Sarah Lane	Is this relevant?	Not critical information, we have removed.
Page 9, Program Participants	Albert Kofi Nyarko	Changed to regions just for consistency with those in Northern and Afram Basin Zones.	Noted
Page 15, EQ 1	Sarah Lane	Need a little more context about what these numbers mean and what they are measuring.	Have added the scale of the school conditions score for context. More details about the context of the findings are included in the detailed evaluation question sections, however as this is a high level summary table, we felt it best to keep the wording concise.
Page 15, EQ 1	Albert Kofi Nyarko	Any reason for not testing and stating the significance of the variability, though stated in the Executive Summary and Page 17 below? I think a simple ANOVA test on the three zonal mean scores and CV (Coefficient of Variation) of each zone should help find determine the significance of variability across zones and variability within zones respectively. From the output of ANOVA you could also request (if using SPSS) Levene's test for equality of variances of scores, to determine whether or not the difference among the 3 variances of scores is significant.	Agree, the team has done additional ANOVA and t-testing and updated the presentation of the findings.
Page 15, EQ 4	Albert Kofi Nyarko	Prefer you support statement with facts (statistics), and test the null hypothesis of no significance in the increased enrolment figures between the MCC and non-MCC schools.	Reliable enrollment data were not available for this study to allow for such testing. Respondents from the

			qualitative interviews reported increased enrollment at most study schools.
Page 17, Table 4	Sarah Lane	These results don't seem that surprising to me. To me, this just shows that the effects of the areas where we worked have persisted for 4 years. Am I missing some nuance here?	Your interpretation is correct, this shows that as of 2016, MCC renovated schools still had significantly higher conditions scores than non-MCC schools. To see another level of nuance, the team decided to also run a t-test between MCC schools and non-MCC schools which received some level of rehabilitation or construction since 2012 and added those findings above the table.
Page 17, Table 4	Albert Kofi Nyarko	Please define below the table the significance level at which the difference is statistically significant, obvious though, but just for completeness. I know it is at 1% (or 0.01).	Agree, have added significance level definitions below.
Page 19, paragraph 1	Albert Kofi Nyarko	Though obvious the p-value is greater than all three significance levels normally used (0.01, 0.05, 0.10), once you've decided to report in statistical language, complete it by specifying the level of significance you performed the test.	Noted, significance level added.
Page 20, paragraph 1	Sarah Lane	Do we know why?	The reasons for this are discussed at the end of the EQ 1 section when looking at the qualitative maintenance findings (Table 9).
Page 20, paragraph 2	Albert Kofi Nyarko	I think you need go beyond this to statistically justify this conclusion. I suggest you perform ANOVA to test the significance of differences in mean scores across zones at a 5% sig. level, then you can justify this conclusion.	Done. The team has conducted ANOVA testing to compare across zones and included the results in a new table (Table 7) with significance levels.
Page 20, paragraph 2	Albert Kofi Nyarko	I think a simple difference between scores of one top-scoring MCC school and one bottom-scoring MCC school is not enough to statistically justify variability between the two groups of schools within a zone. Why not compute the CVs and compare, or better	Done. The team has conducted t-tests to look at the statistical difference in means between high and low scoring MCC schools in each zone and included



		still perform a t-test for the statistical significance of difference in the mean scores of the two groups?	the findings in a new table (Table 8) with significance levels.
Page 24, paragraph 4	Sarah Lane	What process is this?	Have updated the language to show that MiDA had challenges in implementing steps laid out in their technical manual, and compared it to what should happen in order to ensure consistently high quality construction.
Page 25, paragraph 2	Sarah Lane	This sentence is a bit hard to follow. Can you split it into two?	Have updated the language.
Page 35, paragraph 2	Albert Kofi Nyarko	For evaluation purposes, knowing the enrolment statistics for the specific MCC and non-MCC schools would have been preferred to the generic national and regional statistics.	Agree, however those data were not reliably available at a school level beyond the principal's stating of the general trend.
Page 36, ERR	Sarah Lane	<p>If the CBA used a Mincer as the benefit stream and there is little evidence that the MCCC schools increased enrollment over the non MCC schools, then it would seem like the main benefit would be much smaller than anticipated. Am I interpreting this correctly?</p> <p>The scenarios below only seem to address costs but not the main benefit which is in question</p>	<p>Enrollment was one of the variables that was held steady in our analysis, because the data for MCC vs non-MCC schools was not reliable. Where we did have data that we felt was reliable enough to include was 1. Fixed Infrastructure Costs, 2. Maintenance Costs, 3. Estimates of depreciation of useful life of the school. Overall the data do support that all schools have increased enrollment, but we cannot parse the difference between MCC and non-MCC schools.</p> <p>We are unsure whether a Mincer was used (documentation on how the calculations were made is not available).</p> <p>There is now additional clarification about the inability to parse the benefit</p>

			stream in more depth in the report itself.
Page 39, next steps	Sarah Lane	Is this section necessary?	We only included that as part of the draft report and have removed it for this final version.