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Evaluation Design for the Côte d'Ivoire Secondary Education Activity

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LIST OF ACRONYMS

BEPC	*Brevet d'Études du Premier Cycle* (mandatory examination certifying completion of lower secondary education)
BRIGHT	Burkinabé Response to Improve Girl's Chances to Succeed
CBA	Cost-Benefit Analysis
CDP	*Collèges de proximité* (local lower secondary schools)
CIFE	*Comité Interministériel pour la Formation des Enseignants du Premier Cycle du Secondaire* (Interministerial Committee for Lower Secondary School Teacher Training)
CM2	*Cours Moyen 2* (last year of primary school)
CMEF	*Club de Mères d'Elèves Filles* (Club for Mothers of Girls)
COGES	*Comité de Gestion des Établissement Scolaires* (School Management Committee)
DEEG	*Direction de l'Egalité et de l'Equité du Genre (*Directorate of Gender Equality and Equity)
DESPS	*Direction des Etudes, des Strategies, de la Planification et des Statistiques* (Directorate of Studies, Strategies, Planning and Statistics)
DVSP	*Direction de la Veille et du Suivi des Programmes* (Directorate of Program Monitoring and Evaluation)
EMIS	Education Management Information System
ENS	*Ecole Normale Supérieure* (teacher training school)
ERR	Economic rate of return
FGD	Focus group discussion
GSC	*Groupes de Soutien à la Construction* (Construction Support Groups)
GoCI	Government of Côte d'Ivoire
IGEN	*Inspection Générale de l'Education Nationale* (National Education Inspectorate)
IRB	Institutional review board
IMAGINE	IMprove the educAtion of Girls In NigEr
INJS	*Institut National de la Jeunesse et des Sports* (Teacher Training School for Physical Education)
ITS	Interrupted time series
KAP	Knowledge, attitudes, and practices

KII	Key information interview
OLS	Ordinary least squares
MCA-CI	Millennium Challenge Account-Côte d'Ivoire
MCC	Millennium Challenge Corporation
MDD	Minimum detectable differences
MENA	*Ministère de l'Education Nationale et de l'Alphabétisation* (Ministry of National Education and Literacy)
METFPA	*Ministère de l'Enseignement Technique, de la Formation Professionnel et de l'apprentissage* (Ministry of Technical Education, Vocational Training and Apprenticeship)
PASEC	*Programme d'Analyse des Systèmes Educatifs de la CONFEMEN* (Conference of the Ministers of Education of French Speaking Countries [CONFEMEN]'s Educational Systems Analysis Program)
SABER	Systems Approach for Better Education Results
SSA	Sub-Saharan Africa
STEM	Science, Technology, Engineering, and Math
TIMSS	Trends in International Mathematics and Science Study
ToR	Terms of Reference
UNESCO IIEP	United Nations Educational, Scientific and Cultural Organization International Institute for Education Planning
UNICEF	United Nations Children's Fund

I. INTRODUCTION

In recent years, Côte d'Ivoire has achieved several notable advances in increasing access to secondary education. In 2015, the government passed a compulsory education law mandating that all children attend primary and lower secondary school and reduced testing requirements to enter lower secondary school. This led to increases in gross enrollment in lower secondary schools, which climbed from 33 to 58 percent between 2007 and 2014 (*Ministère de l'Enseignement Technique, de la Formation Professionnelle et de l'apprentissage* [METFPA] 2017) and then to 66.6 percent in 2018 (METFPA 2018).[1] The completion rate for lower secondary school also rose during this period, from 36 percent in 2015 to 57 percent in 2019 (*Ministère du Plan et du Développement* 2019). The Government of the Republic of Côte d'Ivoire (GoCI) is also increasing the number of lower secondary schools with the objective of increasing access to education (*Ministère du Plan et du Développement* 2019).

While significant progress has been made, enrollment in lower secondary education is far from universal and important disparities exist, particularly between genders, across urban and rural divides, and among regions. In 2018, the rate of enrollment was 72 percent for boys, compared to 61 percent for girls; also, as of 2014, 94 percent of secondary schools were located in urban areas (UNESCO IIEP - Pôle de Dakar, UNICEF, and Government of Côte d'Ivoire 2016). A deficit of lower secondary teachers (METFPA 2017) confounds the issues of educational access, enrollment, and quality and contributes to relatively poor learning outcomes. This is, in part, because the country has only one training center for secondary teachers, the *École Normale Supérieure* (ENS). Overall, learning outcomes for the majority of lower secondary students in Côte d'Ivoire are below international standards. In 2014, 52 percent of Ivorian students in grade 6 were below the "sufficient competency" threshold in the *Programme d'Analyse des Systèmes Educatifs de la CONFEMEN* (PASEC)[2] late primary reading assessment and 73 percent were below the corresponding threshold in the math assessment (PASEC 2015).

The Millennium Challenge Corporation (MCC) and GoCI are addressing these education shortfalls through a $525 million Compact, which was signed in November 2017 and entered into force in August 2019. The Côte d'Ivoire Compact aims to increase economic growth and reduce poverty by diversifying the Ivorian economy (MCC 2017). As part of its compact with GoCI, the MCC is funding the $155 million Skills for Employability and Productivity (Skills) Project to support GoCI's efforts in the education sector. The project includes the Secondary Education Activity, which is intended to improve education access and quality at the lower secondary level. The Activity includes four subactivities: (1) the construction of and support of new lower secondary schools in rural areas in the Gbêkê and San Pedro regions (Equitable Access subactivity), (2) the expansion of pre-service Teacher Training opportunities and the improvement of Teacher Training quality (Teacher Training subactivity), (3) gender policy and institutional strengthening (Gender Policy subactivity), and (4) the improvement of management systems for decision making (Management Systems subactivity).

[1] Insofar as possible, this section presents data from 2018 or 2019 (i.e., immediately prior to or contemporaneous with the entering into force of Côte d'Ivoire Compact in August 2019) to highlight pre-Compact levels of key outcomes and characterize the baseline situation of the country's education sector.

[2] PASEC's surveys are administered in 25 countries, most of which are in Francophone Africa. Specifically, PASEC's members include Benin, Burkina Faso, Burundi, Cambodia, Cameroon, Canada (New Brunswick), Central African Republic, Chad, Comoros, Congo-Brazzaville, Cote d'Ivoire, Djibouti, DR Congo, Gabon, Guinea, Laos, Lebanon, Madagascar, Mali, Mauritius, Mauritania, Niger, Senegal, Togo, and Vietnam. The international assessment findings presented in PASEC (2015) focus on ten countries in Francophone Africa, including Cote d'Ivoire.

MCC has contracted with Mathematica to conduct an independent evaluation of the Côte d'Ivoire Secondary Education Activity. The evaluation design will use a mixed-methods approach comprised of a performance evaluation to assess the effects of all four subactivities, as well as an impact evaluation of the Teacher Training subactivity.

This report describes the proposed methodology for assessing the impact and contributions of the Côte d'Ivoire Secondary Education Activity. Chapter II presents a summary of the activity interventions as well as an overview of the activity logic and a review of existing international literature on the impacts of similar interventions. Chapter III presents a detailed description of the evaluation design, providing a discussion of the evaluation questions, methods, and data sources for the study's primary outcomes. Chapter IV presents our evaluation administration and management plan, including obtaining institutional review board (IRB) clearance, how data will be protected and reported, and the roles and responsibilities of the evaluation team members.

II. SECONDARY EDUCATION ACTIVITY

In this chapter, we provide a description of the Secondary Education Activity and its four subactivities. We outline the activity logic behind the interventions, provide a review of existing literature on similar interventions, and highlight how our evaluation of these interventions will inform related policy discussions.

A. Project description

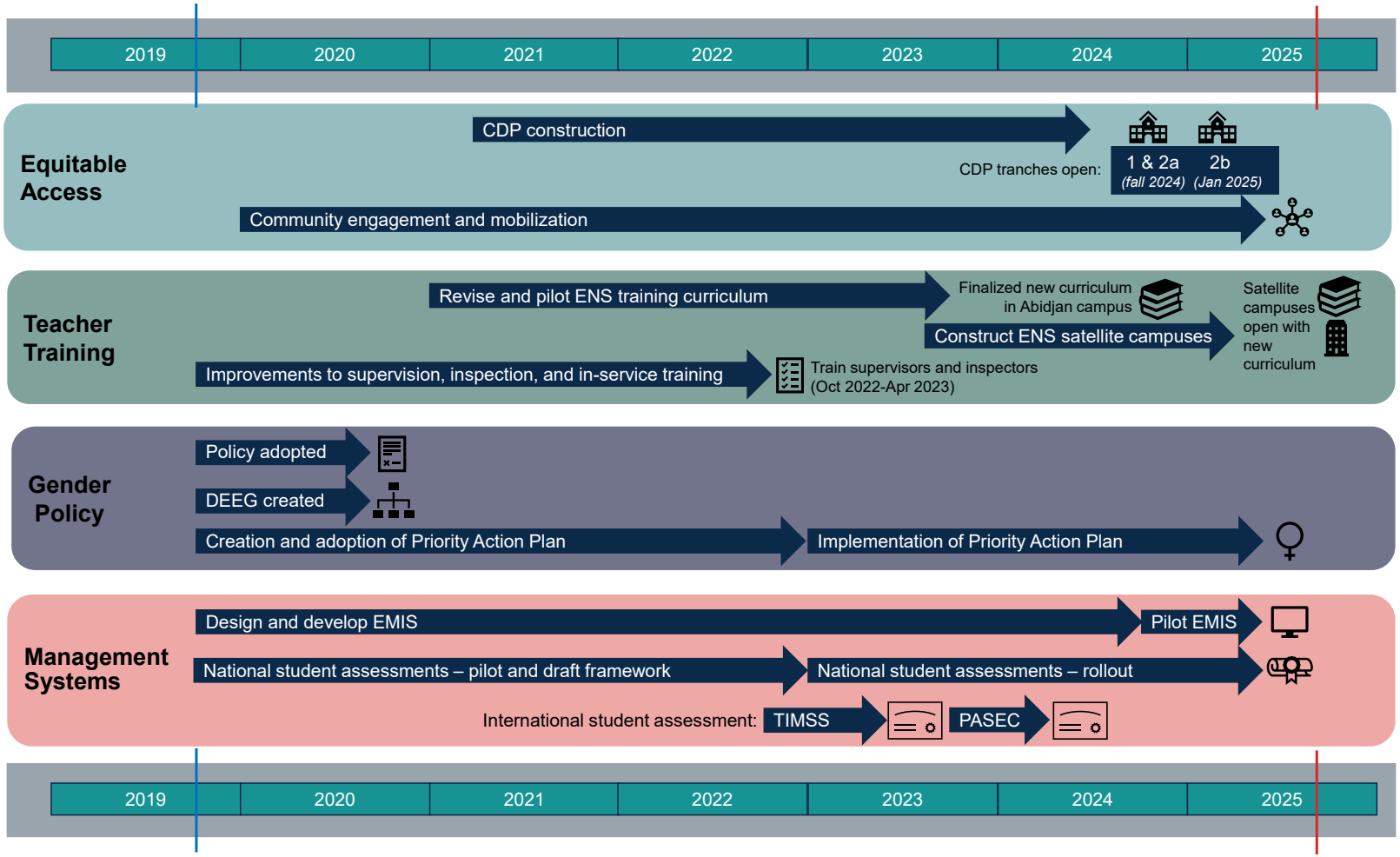
The objective of the Secondary Education Activity is to increase the number of years of education received and improve the acquisition of quality, in-demand basic skills, including reading, math, and soft skills, for lower secondary students. It aims to do so through four subactivities:

1. **New Secondary Schools for Equitable Access (Equitable Access) subactivity.** The Equitable Access subactivity seeks to construct, equip, and provide support for up to 84 new lower secondary schools known as *collèges de proximité* (CDPs) in rural and peri-urban areas of the Gbêkê and San Pedro regions (Figure II.1). The total number of CDPs to be built is still being finalized, but the Compact agreement established a target of 752 classrooms constructed. Specifically, the new CDPs will be constructed based on standard designs in one of two sizes: (i) the smaller Base 2 variant, which can accommodate up to 320 students across four grade levels and two classrooms per grade; and (ii) the larger Base 4 variant, which can accommodate twice as many students and classrooms.[3] The selection of each school site and size was based on a school site-selection plan, which entailed a systematic assessment of the expected population of eligible students, availability of land and necessary infrastructure (such as electricity and running water), and the suitability of the local terrain. This is complemented by a community engagement strategy that aimed to engage the community in the school site selection as well as encourage enrollment in the newly constructed schools, particularly among girls.

Figure II.1. Map of Côte d'Ivoire indicating Gbêkê (north) and San Pedro (south) regions

[3] Due to budget and time constraints, various alternatives to the number of target CDPs have been discussed. The goal is to achieve 752 classrooms with a larger number of Base 4 CDPs than originally planned.

Figure II.2. Implementation timeline



Note: The blue arrows indicate when each activity began and the estimated duration. Icons indicate each activity's estimated completion date. CDP = collège de proximité; DEEG = Direction de l'Egalité et de l'Equité du Genre; EMIS = education management information system; ENS = École Normale Supérieure ; PASEC = *Programme d'Analyse des Systèmes Educatifs de la CONFEMEN*; TIMSS = Trends in International Mathematics and Science Study.

As shown in Figure II.2, community mobilization began in early 2020 in the communities in Gbêkê and San Pedro that will receive the first tranche of 20 CDPs. Construction of the 20 CDPs in these communities is expected to be completed in spring 2024, with the first cohort of students enrolling in the 2024-2025 academic year and completing lower secondary education at the end of the 2027–2028 academic year. The second tranche, consisting of 10 schools, is anticipated to open in fall 2024 or January 2025. More details about the implementation schedule can be found in Figure A.1 in Appendix A.

2. **Improving and Expanding Teacher Training (Teacher Training) subactivity.** The Teacher Training subactivity aims to expand the capacity of the education sector in Côte d'Ivoire to provide high-quality, pre-service secondary-school teacher training to better meet nationwide demand for teachers. It will also improve the education sector's ability to provide supervision for secondary school teachers. Specifically, MCC funding will support (i) the construction and equipping of two new satellite teacher training campuses (one each in Gbêkê and San Pedro) of the ENS to complement its main campus in Abidjan; (ii) the review and redesign of the pre-service teacher training curriculum to be implemented at all three ENS campuses along with associated investments in management, training of staff, and equipment; and (iii) provision of technical assistance to the Ministry of Higher Education (known as MESRS, following its official name in French, *Ministère de l'Enseignement Supérieur et de la Recherche Scientifique*) to design and field-test a new teacher-supervision program to enhance the supervision of teachers nationally, both during and after their pre-service training.

   Construction of the two ENS satellite campuses in Gbêkê and San Pedro as part of the Teacher Training subactivity is expected to commence in 2023, with the campuses slated to begin operating in the 2025–2026 academic year (Figure II.2). Development of the revised teacher training curriculum began in January 2021; it was adopted by national stakeholders in January 2022 and was piloted at the ENS Abidjan campus during the 2022–2023 academic year. Revisions to the curriculum based on the pilot are anticipated during the 2023–2024 academic year, with the finalized version of the curriculum ready for the 2024–2025 academic year at the ENS Abidjan campus. The ENS satellite campuses will use the new curriculum when they become operational. Thus, the first cohort of teachers trained for a full two years using the finalized version of this new curriculum at the Abidjan campuses is the cohort that enters at the beginning of the 2024–2025 academic year and is expected to graduate at the end of the 2025–2026 academic year. For the satellite campuses, it is the cohort that enters at the beginning of the 2025–2026 academic year and is expected to graduate at the end of the 2026–2027 academic year. Teacher supervisors and inspectors are expected to be trained on improvements to the teacher supervision and inspection program between October 2022 and April 2023.

3. **Gender in Education Policy and Institutional Strengthening (Gender Policy) subactivity.** The Gender Policy subactivity seeks to enhance economic opportunities for women in Côte d'Ivoire by reducing gender disparities in access to education. Specifically, MCC funding will support (i) the development of a national Gender Policy (along with a five-year implementation plan) for the education sector to be adopted by the Ministry of National Education (known as MENA); (ii) the development, creation, operationalization, and administration of a gender action unit within the MENA; and (iii) implementation in line with priority actions identified in the Gender Policy to address barriers that constrain girls' access to education.[4]

[4] The responsibility for national education policy in Côte d'Ivoire previously rested with the Ministry of Technical Education, Vocational Training and Apprenticeship (known as METFPA, following its official name in French

As shown in Figure II.2, the gender action unit within the MENA (known as DEEG, following its official name in French, *Direction de l'Egalité et de l'Equité du Genre*) was established by official decree in December 2018 in the leadup to the launch of the Gender Policy subactivity. The national Gender Policy was drafted and validated in March 2020, with a five-year implementation plan developed shortly thereafter. A priority action plan targeting the application of the national Gender Policy to the Gbêkê and San Pedro regions is currently in development.

4. **Management System for Decision Making (Management Systems) subactivity.** The Management Systems subactivity seeks to improve the gathering, management, analysis, and use of information to promote data-informed decision making in the Ivorian education sector. Specifically, MCC funding will support (i) investments in hardware, software, and technical assistance at the MENA to develop and pilot an integrated education management information system (EMIS) in the regions of Gbêkê and San Pedro, including integration of all CDPs constructed as part of the Equitable Access subactivity; (ii) development and operationalization of a multi-year plan to expand international and national student assessments, including participation in international testing programs; and (iii) technical assistance to MENA to build capacity on using the information generated from the integrated EMIS and student assessments to make data-driven decisions.

   The committee that will oversee the implementation of the integrated EMIS—including beyond the period supported by MCC as part of the Management Systems subactivity—was established by official decree in January 2020 (Figure II.2). Its first meeting (involving both the technical and pilot subcommittees) occurred in October 2020. In 2021, a consultant began the process of (i) systematically diagnosing the information gaps and needs that the integrated EMIS will fill and (ii) proposing and developing the specific architecture required for the system. Another consultant has been engaged to develop the EMIS beginning in September 2023. The system is anticipated to be operation by fall 2024, and will likely integrate other actions being put in place for data collection in schools before its launch, such as the ongoing development of a tool for collecting data from the teacher supervision protocols. Pilot tests of the system will first focus on the Gbêkê and San Pedro regions. A pilot of expanded national-level student assessment was completed in May 2022 and students in Gbêkê and San Pedro in 5eme and 3eme sat for exams in mathematics and French during the 2022–2023 academic year. The GoCI also participated in the 2023 Trends in International Mathematics and Science Study (TIMSS) and will participate in the *Programme d'Analyse des Systèmes Educatifs de la CONFEMEN* (PASEC) at the lower secondary school level in 2024 in order to track student progress against relevant international benchmarks. These recent activities also broadly align with the objectives of the *Comité Interministériel pour la Formation des Enseignants du Premier Cycle du Secondaire* (CIFE), an inter-ministerial body set up to utilize data for decision making with respect to teacher training, recruitment, and deployment.

B. Activity logic

There is an increasing realization that the benefits of investments in education (such as higher wages) in Sub-Saharan Africa (SSA) may be primarily realized when students go on to complete higher levels of

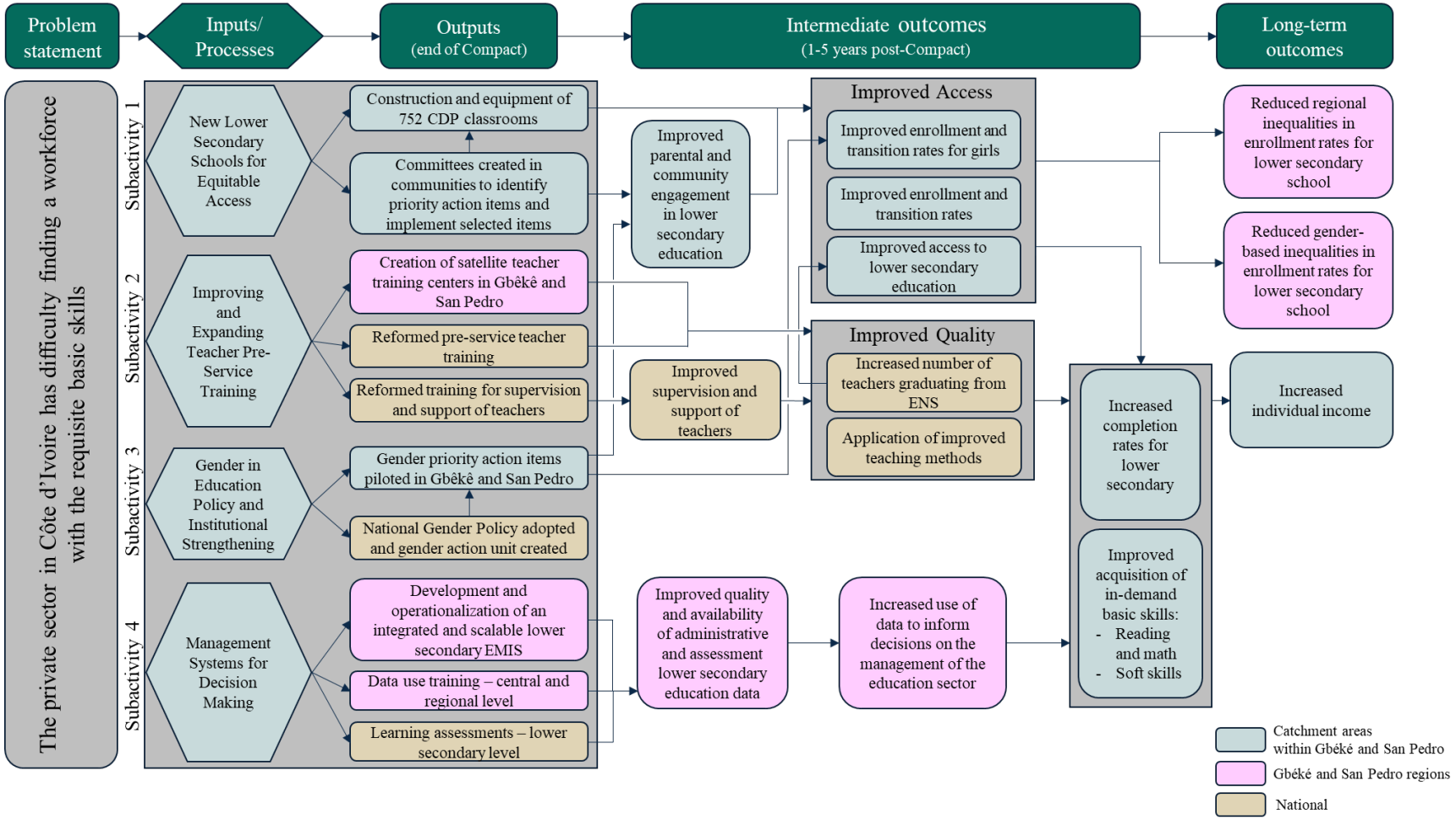
Ministère de l'Enseignement Technique, de la Formation Professionnelle et de l'apprentissage). An update to the organizational structure in April 2021 led to the creation of the Ministry of National Education (known as MENA, following its official name in French *Ministère de l'Education Nationale et de l'Alphabétisation*) and the Ministry of Technical Education, Vocational Training and Apprenticeship (known as METFPA, following its official name in French *Ministère de l'Enseignement Technique, de la Formation Professionnelle et de l'Apprentissage*). MENA is more directly involved with the Secondary Education Activity.

education (Keswell and Poswell 2005; Kuepié and Nordman 2015). This can exacerbate preexisting patterns of inequality if there are gender, regional, or other disparities in access to secondary or post-secondary education. This challenge is especially acute for Côte d'Ivoire, as returns to secondary education in Côte d'Ivoire are higher compared to the average country in a sample of 139 economies as well as to countries at similar income levels (Montenegro and Patrinos 2014).[5] If access to secondary education in Côte d'Ivoire is not enhanced for girls or rural students, gender or rural–urban income/wage gaps can be expected to widen in the future. In addition, the wide presence of formal, on-the-job training offered to workers by firms in SSA also suggests that there is a mismatch between the skills that are gained through formal education and those that are necessary to succeed in the workplace. This practice is also particularly pervasive in Côte d'Ivoire. Formal training, for example, is offered by around 60 percent of export-oriented Ivorian firms, a higher share than in Burkina Faso (50 percent), Senegal (44 percent) and Nigeria (33 percent) (World Bank 2016).[6]

The activity logic for the Secondary Education Activity illustrates the hypothesized causal pathways—from program inputs to immediate, medium-term, and long-term outcomes—through which MCC expects the Activity to address these challenges in Côte d'Ivoire and contribute to the overarching aim of reducing poverty through economic growth (Figure II.3). Each of the links in the activity logic represents an assumption about how activities will affect the Compact's beneficiaries and key stakeholders, including students, teachers, school administrators, and policymakers in relevant ministries and centers.

[5] For additional details and further discussion of the context-specific constraints to economic growth in Côte d'Ivoire, refer to MCC's Constraints Analysis (MCC 2015).
[6] We consider firms in the World Bank (2016) data for which direct exports are 10 percent or more of sales as "export-oriented."

Figure II.3. Secondary Education Activity logic



Note: Adapted from the logic model (MCC 2023) according on our current understanding of the subactivities based on document review and meetings with MCC, MCA-CI, and other stakeholders. Minor adjustments were made to the language and connections between outputs and outcomes.

CDP = *collège de proximité*; EMIS = education management information system; ENS = *École Normale Supérieure*; MCC = Millennium Challenge Corporation; MCA-CI = Millennium Challenge Account-Côte d'Ivoire.

The Equitable Access subactivity adopts a multi-pronged approach to address two distinct sets of impediments to access to education in Gbêkê and San Pedro. Specifically, investments in school construction help lower supply-side barriers related to the availability of crucial education infrastructure, while community mobilization addresses demand-side factors that result in underutilization of existing educational resources (namely, absence of parental and community engagement in children's secondary education). If successful, this combination of interventions should result in reduced regional and gender inequalities in enrollment rates and greater years of schooling, which, in the long term, should result in better lifetime incomes for targeted students. A key assumption underpinning the sustained success of the Equitable Access subactivity—particularly beyond the life of the MCC-funded Compact—is that GoCI will support acquiring necessary land, teachers and administrators, and ongoing operational expenses for CDPs. Our literature review (Section II.C) demonstrates that while there is a dearth of evidence on the validity of these assumptions for secondary-school construction, related evidence from rigorous evaluations of primary-school construction suggests that hypothesized causal pathways are reasonable; however, it is unclear that construction of schools at the lower secondary level is sufficient to overcoming barriers faced by eligible youth. In addition, it is unclear if the community engagement of the sort that is expected to occur during the Compact (namely, outreach and communication to sensitize communities around education, involving community members in school-based management) will have an effect on student outcomes beyond the effect of the newly functioning CDPs. Our literature review, for instance, shows that programs that improve community awareness about education can improve education outcomes, but that they may not provide additional benefit when coupled with another education intervention. Similarly, efforts to increase the involvement of community members in school-based management should result in each CDP having a functioning school management committee (COGES for its name in French: *Comité de Gestion des Établissement Scolaires*) that includes representatives from the community as members. However, the evidence on whether such school-based management activities impact educational outcomes is inconclusive. That said, evidence does indicate that school-based management communities are less effective in areas with lower local capacity, suggesting that it will be essential to ensure that committee members are well-equipped to manage the new schools and that the committees continue to be functional post-Compact.

The Teacher Training subactivity seeks to expand the capacity and improve the quality of the education sector by providing pre-service training for more lower secondary school teachers. It aims to do so through investments in (1) constructing two satellite ENS campuses, (2) improving the quality of the pre-service training by revising the existing teacher training curriculum (including the development of a program targeted at training bivalent teachers that anchors the role of such teachers within the Ivorian education sector while also highlighting the challenges associated with each of five bivalent teaching "blocks"), and (3) strengthening the MENA's capacity to supervise secondary school teachers (through investments in developing and field-testing a new teacher supervision program). These interventions combined should begin increasing the flow of better trained teachers into the education system, helping increase access to education and meet the growing demand for education (which depends, in part, on the ability to effectively train, supervise, and deploy new teachers). Over the same period, as new cohorts of teachers trained with the revamped curriculum are deployed to lower secondary schools across the country and the quality of supervision improves, the quality of instructional practices will begin to improve. In the long term, more and higher-quality teachers are expected to contribute to gains in lower secondary school completion rates and to offer youth better opportunities to acquire basic skills that better align with market needs. Although teacher pre-service and in-service professional development interventions can be effective at improving teacher practices (which can improve students' education outcomes), a growing body of research demonstrates that effectiveness depends on the specific

characteristics of the intervention and the context and quality of implementation, and the magnitude of the effects can vary widely. In addition, a key premise of the logic model is that the shortage of teachers is principally explained by a limited capacity to train teachers. However, if other factors (such as the attractiveness of the teaching profession relative to other types of employment) are important drivers of this observed trend, investments in enhancing training capacity may have limited impact.

The Gender Policy subactivity seeks to reduce gender disparities in the Ivorian education system, which should improve the economic opportunities for women in Côte d'Ivoire and contribute to the Compact's overall aim of reducing poverty. The subactivity seeks to achieve two main outputs over the Compact's five-year period: (i) develop and adopt the national Gender Policy for the education sector by MENA and develop, create, and put into operation a new gender action unit within MENA to implement the Gender Policy; and (ii) develop and pilot priority actions in the Gender Policy to reduce impediments to girls' access to education. This should lead to improved lower-secondary enrollment and transition rates for girls, contributing to achieving the Activity's long-term aim of reducing overall and gender-based inequalities in lower secondary school enrollment rates in Gbêkê and San Pedro. This is consistent with growing acknowledgment in the literature that institutional change is necessary to address distortions and inefficiencies in education systems in low- and middle-income countries. In addition, the Gender Policy subactivity should also complement the Equitable Access subactivity's community mobilization efforts, which, among other things, aim to promote girls' education among parents in targeted communities.

The Management Systems subactivity seeks to improve the gathering, management, analysis, and use of information to promote data-informed decision making in the Ivorian education sector. The main outputs to achieve during the Compact are developing and putting into operation an integrated and scalable lower secondary EMIS; improving MENA's central and regional staff's capacity and processes to use EMIS data; and developing a multiyear plan for implementing national and international student assessments. The integrated EMIS should improve the quality and availability of student assessment data and of administrative data for managing human resources and other assets—which, in turn, should increase capacity for data-informed decisions in the education sector and contribute to improving student performance in ways that mitigate gender and regional disparities. Combined with the other subactivities, these improvements are expected to lead to increased completion rates, improved acquisition of in-demand skills, and earnings. Implicit in the logic model is the assumption that non-availability of suitable educational data and the capacity to use those data are key barriers limiting data-driven decision making in the Ivorian education sector. If other factors are key drivers, such as a culture of data usage at all levels within the system, an EMIS and technical assistance to improve the capacity to use data may be insufficient to induce the necessary behavior change; improving accountability and incentivizing individuals across the system to use the data may also be required. There may be additional drivers that need to be addressed to induce the desired change.

Overall, the activity logic suggests that MCC's investments in the interventions comprising the Secondary Education Activity will increase educational attainment, completion of lower secondary school and learning (particularly in reading, math, and soft skills) for lower secondary students (MCC 2017a). If low levels of school attainment or the absence of these skills are binding constraints for employability, the improvements, in turn, will increase labor-force productivity and earnings and help mitigate regional inequalities. Efforts to ensure that access to lower secondary education and acquisition of employable skills is especially strengthened among girls will also help reduce gender disparities in educational

outcomes.[7] Interventions that target complementary factors—such as parental or community-level perception about the value of lower secondary education, high-quality teachers, and enhanced data to facilitate informed decision making—all contribute to increased student enrollment and more effective transitions into the labor force upon graduation.

C. Literature review

The Secondary Education Activity—which seeks to increase access to lower secondary education (particularly for girls), as well as to improve the quality of lower secondary education by enhancing the quantity and quality of teachers, improving policy related to the education of girls, and enabling data-driven education-sector decision making—has the potential to address these challenges. By helping a greater number of students obtain high-quality and relevant skills, the Secondary Education Activity can improve long-term earnings and employment outcomes in Côte d'Ivoire. In this section, we organize our review of the literature to assess the assumptions that underpin the activity logic by the key components for the subactivities: (i) school construction, (ii) community engagement, (iii) teacher training and pedagogical reform, (iv) institutional change to address gender disparities in education, and (v) data for education decision making.

1. School construction

The available evidence on the impacts of investments in school infrastructure and equipment is scarce, particularly regarding construction of new secondary schools. For instance, Glewwe et al. (2014) review nearly 80 studies published between 1990 and 2010 and find only three that focus on the effects of building new schools, while a systematic review of the literature by Snilstveit et al. (2016) identifies only two such studies. A more recent working paper by Martinez (2022) considers the impacts of changes in school-aged children's distance to the nearest secondary school on educational and labor-market outcomes. Similarly, recent assessments of major schooling reforms carried out in Senegal beginning in the early 2000s—which included the construction of a large number of lower-secondary schools—have looked at impacts on a range of educational and non-educational outcomes, including completion (Momo et al. 2021) and political participation (Larreguy and Xiu 2023). This limited available evidence suggests that such investments can increase enrollment, daily attendance, years in school, as well as wages and wellbeing. However, much of this evidence is drawn from evaluations of primary school construction, and the extent to which these findings apply to the lower secondary level remains unclear as youth in the relevant age range face different barriers to schooling than younger children. For instance, in their recent literature review, Null et al. (2017) found only one rigorous study on the impact of secondary school construction. In that paper, Andrabi et al. (2013) showed that construction of government-run girls' secondary schools in Pakistan more than doubled the number of women with secondary or higher education in the median village affected by the program.

To the best of our knowledge, all other rigorous studies of new infrastructure focus on primary schools. For instance, BRIGHT,[8] a program funded by MCC, built new primary schools and implemented several complementary interventions, such as school canteens and providing school supplies, to increase girls' educational attainment in rural villages in Burkina Faso. A quasi-experimental evaluation of the program found positive impacts on both access to education (namely, school enrollment and completion) and

[7] Given that gender is part of the logic as well as the evaluation design of the Secondary Education Activity (further described in Section III), the evaluation's Gender Type was determined to be Type 1 (see Appendix C for additional information).

[8] BRIGHT's official name is Burkinabé Response to Improve Girl's Chances to Succeed.

learning outcomes (test scores 3, 7, and 10 years after the program's start date). In addition, BRIGHT's 7- and 10-year impacts on enrollment and test scores were larger for girls than boys. Although the impacts were sustained in the long term, they declined over time (Davis et al. 2016). Similarly, the rigorous evaluation of the Partnership for Advancing Community-Based Education in Afghanistan (also known as PACE-A), which built new primary schools in villages without schools, found large increases in enrollment and test scores, particularly for girls, after one year of schooling (Burde and Linden 2013).

A related series of studies explore the impacts of investments in the quality of school infrastructure. For example, a recent randomized trial of IMAGINE,[9] another project funded by MCC, found that constructing new durable schools and providing complementary interventions (such as training modules for teachers and a mobilization campaign in support of girls' education in Niger) primarily in communities that already had schools that were of poor quality and not durable, had small impacts on enrollment and no impacts on attendance or test scores one year after the schools were built. However, three years after the schools were built, the intervention had larger, positive impacts on school enrollment, absenteeism, and math test scores (Bagby et al. 2016).

Taken together, this limited indirect evidence suggests that school construction can increase access to education. It also suggests that new infrastructure can raise test scores. However, it is worth noting that follow-on effects on learning outcomes are not guaranteed. In a literature review focusing specifically on the African context, for instance, Bold et al. (2017) argue that teacher quality—namely, basic pedagogical training, minimum subject knowledge in language and mathematics, and absenteeism—account for a "large share of the dramatic loss in human capital" observed among primary school students. Investments in new school infrastructure may fail to deliver improved learning outcomes if this constraint continues to bind.

2. Community engagement

Interventions aimed at engaging the community in the education systems have diverse designs, including two that are being used in the Equitable Access subactivity: (1) outreach and communication to sensitize communities around education and (2) involving community members in school-based decision-making (such as the school construction process and post-construction school management). Evaluations of programs aimed at improving community awareness about education suggest that such programs can improve education outcomes, but that they may not provide additional benefit when coupled with another education intervention. A systematic review of the evidence from low- and middle-income countries by Snilstveit et al. (2016) found that increases in enrollment were driven by 2 of the 10 studies included. In addition, separate studies of community engagement combined with reading programs in Uganda, Kenya, Guatemala, and Rwanda found no additive impacts of the community engagement component (Oketch et al. 2012; Lugo-Gil et al. 2021; Friedlander and Goldenberg 2016).

Rigorous evidence on the impacts of involving community members in the government school construction process in low- and middle-income countries is limited. In addition, much of the literature on community-based school construction—whereby community stakeholders contribute to school construction by, for example, directly selecting school sites, raising construction funds, providing construction labor, or serving on planning and construction oversight committees—has focused on the challenges related to structural risks and vulnerabilities of the constructed schools themselves and not on subsequent effects on educational outcomes. For example, Paci-Green et al. (2020) drew on insights from interviews with practitioners with expertise in community-based school construction to conclude that

[9] IMAGINE's official name is IMprove the educAtion of Girls In NigEr.

while community-based school construction can support local livelihoods and build capacity, improper application of certain construction materials and methods has the potential to lower the resilience of constructed structures.

In contrast, the literature on involving communities in post-construction school-based management of government schools is broader. These studies have reported mixed results, but they do suggest that such programs may be less effective in areas with lower capacity levels. In their systematic review, Snilstveit et al. (2016) found that there was no evidence of improvements in education outcomes from 12 programs that included decentralization of school management combined with capacity building. In addition, they suggest that differences in results across study may be due to differences in programs, their implementation, and the local context. Some studies have shown that poorer communities benefit less from such programs than wealthier communities (Galiani and Perez-Truglia 2013; Gertler et al. 2012; Galiani et al. 2008). Snilstveit et al. (2016) also suggest that focusing on intermediate outcomes is key for community engagement interventions to produce desired impacts on students' outcomes. For example, parents and school committees must first understand their roles and responsibilities and know the status of education in their localities before they can participate in effective collective actions to improve education outcomes. A large randomized controlled trial in Indonesia examined effects of community-based interventions on intermediate outcomes and found that the interventions that effectively improved students' learning outcomes increased community-level inputs, collaboration between the school committee and the village council, and cooperation with the village council (Pradhan et al. 2014).

3. Teacher training and pedagogical reform

As noted above, a growing body of research demonstrates that professional development interventions for teachers can be effective at improving students' learning outcomes. Evans and Popova (2015) examined six reviews of the impacts of teacher training interventions on learning outcomes in low- and middle-income countries at both the primary and secondary levels (Conn 2017; Glewwe et al. 2014; Kremer et al. 2013; Krishnaratne et al. 2013; McEwan 2015; Ganimian and Murnane 2016). They concluded that long-term teacher training and accountability interventions can be effective at improving student learning in the short term—9 to 13 months on average. However, the authors also highlighted substantial impact heterogeneity within these intervention categories and cautioned that the effectiveness of pedagogical professional development depends on the specific characteristics of the intervention and the context and quality of implementation. For example, teacher training interventions that focus on a specific subject areas and skillsets or those that tailored training to the skill levels of teachers are more effective than general instruction or generic training (Muralidharan and Sundararaman 2010; Ganimian and Murnane 2016; Popova et al. 2021). The authors also note that more frequent or longer-term visits from pedagogical advisors and mentors, availability of in-school teacher support, provision of instructional materials, and a focus on skill development (rather than classroom management) also tend to produce more sizeable effects on student learning.

The evidence also shows that impacts from teacher training on students' learning outcomes can take time to emerge. Interim results from an MCC-funded evaluation of the Improving General Education Quality Project in Georgia demonstrated improvements in teachers' knowledge of student-centered instructional strategies after one year of training. However, that study did not detect changes in classroom practices. The findings are in line with the projects' activity logic, as improvements in classroom practices and students' learning outcomes take longer to emerge (Nichols-Barrer et al. 2019).

4. Institutional change to address gender disparities in education

The importance of institutional change to address distortions and inefficiencies in education systems is widely recognized. Glewwe and Kremer (2006) describe several institutional issues that plague education systems in low- and middle-income countries, including a systemic orientation towards the education of elites (such as mismatch between the mandated curriculum and the needs of the typical student) that entrenches educational disparities. Several studies highlight the adverse effects of such elite orientation. Glewwe et al. (2009), for instance, show that increased access to textbooks in Kenya only raised test scores among high-achieving students as the language of instruction (English) was not understood proficiently by most students. In principle, gender disparities in education stem from a similar elite orientation of the education system. In practice, however, there is a dearth of research about effective institutional change interventions to reduce gender-related barriers to education in low- and middle-income countries (Chuang et al. 2019; Unterhalter et al. 2014). Indeed, there are theoretical frameworks to address barriers to girls' education; they include policy- and system-level barriers, such as inadequate legal frameworks that exclude pregnant girls and outdated curricula that reinforce gender stereotypes, in addition to community-, school-, and household-level barriers (UNICEF 2002; Unterhalter et al. 2014). This evaluation will contribute to expanding the knowledge base about the effectiveness of institutional reforms to address gender disparities in low-income countries.

5. Data for education decision making

There is growing consensus that evidence-based decision making can contribute to improving education systems. For example, 130 countries have rolled out the Systems Approach for Better Education Results (SABER) initiative, which emphasizes the role of student learning assessments and data-informed actions to improve education outcomes (Marcus et al. 2018). In addition to widespread adoption of SABER tools, empirical evidence indicates that students in countries with national exit exams, as well as countries that participate in international assessments (such as the Program for International Student Assessment and TIMSS), can perform significantly better than students in countries that do not implement systematic assessments (Hanushek and Woessmann 2010). However, outcomes vary depending on what countries choose to do with test results. Hanushek and Raymond (2006) capitalized on the staggered adoption of accountability and testing programs across the United States to examine the effects of different programs on student performance. They found that expected growth on student achievement was larger in states that implemented accountability systems, compared to states that did not. Moreover, they observed achievement gains only in states that linked school performance to consequences in the form of rewards or sanctions, but not in states that only made testing results public through school report cards. The latter did not perform significantly differently from states that implemented no accountability programs (Hanushek and Raymond 2006).

In addition, the evidence on whether teachers, school administrators, and policymakers effectively use student outcome data to guide their decision making is mixed. Recent evidence on the impact of citizen-led assessments of children's basic reading and math skills suggests that such efforts do not translate to improved student learning, even when they highlight gaps and shortcomings in the education system to stakeholders (Plaut and Eberhardt 2015). Resources and capacity constraints (particularly at the school level) hinder the ability to respond to such assessments with meaningful reforms. The literature also shows that student assessments and information systems alone are rarely enough to improve policy feedback loops. Improvement is more likely if these factors are accompanied by incentives or training for stakeholders (such as school administrators and teachers) to use information for decision making, adjust pedagogical styles, or identify struggling students (Liuzzi et al. 2019; Piper and Corda 2010; Results for

Development Institute 2015; Szekely 2011). Similarly, training for local, regional, and national education authorities to develop data-use protocols that characterize data-driven organizations (such as clearly articulated communication channels and feedback mechanisms) is often insufficiently supported (Braun and Kanjee 2006), even though some evidence suggests that the availability of assessment data can help improve resource allocation at higher administrative levels (Ravela et al. 2008; Clarke 2012). Absent a clear understanding among educators and policymakers of how data can be effectively deployed to improve student learning and enhance the performance of the education sector, investments in data generation and management capacity are unlikely to yield sustained benefits.

D. Policy relevance of the evaluation

Our review of the literature highlights that the evaluation of the Secondary Education Activity under the Skills for Employability and Productivity Project in Côte d'Ivoire can fill key gaps in the understanding of how and why specific education interventions increase access, improve learning, and enhance management of the education sector. This potential is especially high for the Equitable Access, Gender Policy, and Management Systems subactivities, given the dearth of the evidence on the impacts of secondary school construction, gender-related institutional change, and data-driven decision making in the education sector, respectively, on educational outcomes. Indeed, given the fact that low educational attainment significantly constrains economic growth in many low- and middle-income countries, a deeper understanding of whether and how large-scale investments in secondary-education infrastructure translate to increased access and improved learning is critical. Similarly, there is a growing recognition that systemic policy change may be needed to address worsening gender inequalities in educational and labor-market outcomes globally, yet the mechanisms through which such efforts mitigate inequities and sustain access to education change remain largely unclear. How key stakeholders in the education sector—including teachers, school administrators, and national and regional policymakers—can be better equipped to generate and use data to drive decision making in the education sector also remains unclear. In addition, although the literature on teacher training and pedagogical reform generally points to impacts on student performance, the magnitudes of these effects depend crucially upon context-specific characteristics and fidelity of implementation. The evaluation has the potential to shed light on the relative importance of these contextual drivers.

A rigorous counterfactual based evaluation of the Teacher Training subactivity, and performance evaluations of all four subactivities, have the potential to inform policymaking in Côte d'Ivoire and beyond in two main ways. First, the evaluations will allow MCC and GoCI to understand the relative effectiveness of policy tools that promise to deliver equitable educational outcomes. For instance, should the series of interventions delivered as part of the Secondary Education Activity prove effective, GoCI may choose to scale up similar solutions in regions beyond Gbêkê and San Pedro in an effort to further close the national urban–rural gap in access to secondary education. Second, the evaluations will highlight the relative importance of various contextual drivers. The global evidence base on the effects of educational interventions is characterized by heterogeneity. Building a better understanding of not just whether but also how, why, and to what extent certain interventions deliver expected results is critical to informing scale-up of effective solutions going forward. In the context of Côte d'Ivoire, for instance, this may enable GoCI to make *ex-ante* assessments about where future investments in interventions modelled after the Secondary Education Activity will be effective on their own, and where contextual barriers (such as remoteness or income levels) may require investments in complementary efforts to sustain success.

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III. EVALUATION DESIGN

In this chapter, we describe our proposed mixed-methods design for the evaluation for the Côte d'Ivoire Secondary Education Activity, which includes a performance evaluation of all four subactivities and an impact evaluation of the Teacher Training subactivity. We provide a brief overview of the proposed evaluation design and list the research questions that the evaluation addresses. We then describe the impact evaluation of the Teacher Training subactivity, the performance evaluation of all four subactivities, and how the evaluation will contribute to MCC's *ex post* cost-benefit analysis (CBA) in more detail—including the study samples involved, sample sizes, data sources, and analytical approach. Finally, we discuss data quality and the limitations and potential challenges of the evaluation, and we conclude with the timeline and reporting schedule.

A. Research questions and overview of the evaluation

The research questions that we will study through the performance and impact evaluations are related to understanding (i) outcomes of the Equitable Access subactivity; (ii) impacts of the Teacher Training subactivity on students and teachers, including the disaggregated effect on female students and teachers; and (iii) how the different subactivities cause changes in the experiences and behaviors of students, teachers, administrators, and community members, as well as in the education system in Côte d'Ivoire.

In Table III.1, we list the research questions for the study. The table also links the evaluation questions to the subactivity or subactivities covered, the type of study (performance evaluation, impact evaluation, or cost-benefit analysis), and the evaluation methodology that will be used to answer the research question.

Table III.1. Research questions and evaluation design

#	Research question	Subactivity	Evaluation design	
Research Question 1: To what extent was the project implemented according to plan (in terms of quantity and quality of outputs)?				
1.1	To what extent was each subactivity implemented according to plan (in terms of quantity and quality of outputs)?	All	Performance evaluation	Qualitative research
1.2	What were the major challenges of implementing each subactivity? How effective were the steps taken to address these challenges?	All	Performance evaluation	Qualitative research
1.3	How was each subactivity integrated with other subactivities to achieve the common outcomes?	All	Performance evaluation	Qualitative research
1.4	What evidence is there that each subactivity's outputs and its outcomes will be maintained and further scaled post-Compact?	All	Performance evaluation	Qualitative research
Research Question 2: Did the project achieve its stated objective in the timeframe and magnitude expected? Why or why not?				
2.1	To what extent did the subactivity increase enrollment, attendance, promotion, transition, and completion, and reduce dropout rates in lower secondary schools in target communities in Gbêkê and San Pedro? What is the disaggregated effect of the subactivity on these outcomes for girls?	Equitable Access	Performance evaluation	Descriptive trends analysis; qualitative research

#	Research question	Subactivity	Evaluation design	
2.2	To what extent did the Activity improve reading, math, and soft skills among lower secondary students in targeted communities in Gbêkê and San Pedro? What is the disaggregated effect of the Activity on these outcomes for girls?	All	Performance evaluation	Pre-post design; qualitative research
2.3	To what extent did the subactivity improve community members' perceptions about the lower secondary education provided in target communities in Gbêkê and San Pedro?	Equitable Access	Performance evaluation	Qualitative research
2.4	To what extent did the Teacher Training subactivity increase the number of teachers graduating from the ENS? By gender?	Teacher Training	Impact evaluation	Interrupted time series
2.5	To what extent did the Teacher Training subactivity meet the demand for secondary school teachers nationwide? By gender?	Teacher Training	Performance evaluation	Descriptive trends analysis
2.6	To what extent did the Teacher Training subactivity improve the quality of the pre-service training? Did the subactivity increase the KAPs of teachers who graduate from the training centers? By gender?	Teacher Training	Performance evaluation	Teacher tracer study
2.7	To what extent did the subactivity improve the quality of the in-service training and supervision?	Teacher Training	Performance evaluation	Qualitative research
2.8	To what extent did the Teacher Training subactivity improve student educational attainment?	Teacher Training	Impact evaluation	Interrupted time series
2.9	To what extent did the Gender Policy subactivity priority actions contribute to increasing girls' access to quality secondary education relative to boys' access in Gbêkê and San Pedro?	Gender Policy	Performance evaluation	Descriptive trends analysis
2.10	What were the changes in the school environment, especially changes in perceptions associated with girls' and boys' education at the lower secondary level, due to the rollout of Gender Priority Action Plan in Gbêkê and San Pedro?	Gender Policy	Performance evaluation	Contribution analysis
2.11	Do stakeholders observe increased integration of gender considerations in the development and implementation of education and training policies and practices at the national level?	Gender Policy	Performance evaluation	Contribution analysis
2.12	How do the Management Systems subactivity components contribute to improved student assessment, policy changes to foster more accountable data and policy feedback systems, and a more performance-driven secondary education system?	Management Systems	Performance evaluation	Contribution analysis; political economy analysis
2.13	How has institutional capacity for data-driven decision making been strengthened?	Management Systems	Performance evaluation	Contribution analysis; political economy analysis
2.14	What is the availability and quality of the data in the EMIS?	Management Systems	Performance evaluation	Data quality analysis

ENS = École Normale Supérieure ; KAPs = knowledge, attitudes, and practices ; MENA = Ministère de l'Education Nationale et de l'Alphabétisation ; EMIS = education management information system.

Research questions 1.1 through 1.4 are related to the fidelity of implementation of each of the four subactivities, the integration between subactivities, and the sustainability and scalability post-Compact of all four subactivities. We will answer these four research questions through a performance evaluation, relying on a desk review of design and implementation documents, key informant interviews (KIIs) and focus group discussions (FGDs), and analysis of administrative data. Interviewees will include stakeholders at the national, regional, and local levels—including teachers, students, and regional and national level ENS and MENA staff. Note that different components of each of the four subactivities can be designed and implemented at different times. This can make it challenging to compare implementation to design in a consistent way across the Secondary Education Activity. Our performance evaluation will address this issue by documenting subactivity-specific implementation milestones, comparing subactivity-level implementation progress with what was designed (i.e., the final design for each subactivity, whenever it was decided), and attempting to understand challenges faced as well as responses to those challenges.

Research questions 2.1 through 2.3 aim to understand effects of the Equitable Access subactivity. Research question 2.1 addresses estimating the change in student educational outcomes (enrollment, attendance, promotion, transition, and dropout) by sex and overall following the construction of CDPs. To answer this research question, we plan to use administrative student-level data to descriptively track trends in these outcomes for the cohort of students that completed *Cours Moyen 2* (CM2), the last year of the primary education cycle, in the academic year prior to the CDP opening for each CDP. This will shed light on changes in outcomes among the cohort of students that stand to benefit most directly from CDP construction. For research question 2.2, which covers effects of the project on learning outcomes (namely, reading, math, and soft skills), we propose a quantitative outcomes analysis using a pre-post design. We plan to use data from skills assessments administered to a subsample of enrolled students as part of primary data collection at baseline and endline to track the extent to which the various subactivities supported by the project are associated with changes in reading, math, and soft skills. To answer research question 2.3 about perceived effects on community perceptions and improvements in school-level outcomes, we will analyze data from in-depth qualitative interviews and FGDs with school administrators, teachers, and parents.

Research questions 2.4 through 2.8 aim to determine if the Teacher Training subactivity met the demand for secondary school teachers nationwide and increased student educational attainment, namely, increased the number of teachers graduating from the ENS and met the demand for secondary school teachers nationwide (research questions 2.4 and 2.5); improved the quality of pre-service teacher training and teacher KAPs (research question 2.6); improved the quality of in-service training and supervision (research question 2.7); and increased student educational attainment (lower-secondary enrollment and graduation; research question 2.8). We will conduct an interrupted time series (ITS) impact evaluation using administrative data to answer research questions 2.4 (change in the number of teachers graduating from the ENS) and 2.8 (student attainment). To answer research question 2.5 about teacher demand, we instead propose a descriptive trends analysis using administrative data because the key assumption required for an ITS is not met for this outcome. We will address the quality of the pre-service training and teacher knowledge, attitudes, and practices (KAPs) (research question 2.6), using a teacher tracer study. We will answer research question 2.7 about the quality of the in-service training through qualitative interviews with teachers and inspectors. This study will draw on survey data to ascertain the quality of the pre-service training and changes in teachers' KAPs by following a longitudinal sample of teachers graduating from the three ENS campuses. When answering all four of these research questions, we will conduct subgroup analysis by gender to assess the differential impacts on male and female teachers and

supplement our findings by drawing on qualitative data from our KIIs and FGDs. Whenever possible, we will also consider subgroup analysis based on other relevant disaggregation levels (for example, by the "disciplinary block" that bivalent teachers are trained to specialize in) to shed further light on differences in effectiveness of the subactivity.

Research questions 2.9 through 2.11 aim to understand if the Gender Policy subactivity improved girls' access to education, the quality of the school environment, and governance of gender in the education sector. To determine if the subactivity increased girls' access to quality education in Gbêkê and San Pedro (research question 2.9), we will use a descriptive analysis that draws on the national administrative student data from the Directorate of Studies, Strategies, Planning and Statistics (known as DESPS, following its official French name, *Direction des Etudes, des Stratégies, de la Planification et des Statistiques*) requested for the evaluation of the Equitable Access subactivity to show student education attainment (such as enrollment, achievement, dropout, and progression) over time by gender. We will rely on descriptive analysis rather than an ITS approach to shed light on the impacts of this subactivity because the other subactivities will also influence these outcomes, thereby limiting our ability to attribute changes in observed outcomes to only the Gender Policy subactivity. Our qualitative research will help disentangle the role of the Gender Policy subactivity in influencing these outcomes relative to other subactivities. To answer research questions 2.10 and 2.11 regarding changes in the school environment, perceptions and realities associated with girls' and boys' education, and the governance of gender in the education sector in Côte d'Ivoire, we will conduct FGDs with school-age youth and parents and KIIs with stakeholders and implementers and analyze the data using a contribution analysis.[10] We will also draw on survey data from the Equitable Access pre-post performance evaluation to supplement our findings for all three research questions.

Finally, research questions 2.12 through 2.14 aim to understand the effects of the Management Systems subactivity. Research questions 2.12 and 2.13 focus on how the subactivity contributes to improved data and feedback for a more performance-driven education systems, and how institutional capacity for data-driven decision making has been strengthened. To answer these research questions, the performance evaluation will rely on a contribution and political economy analysis of qualitative data collected through KIIs and a descriptive quantitative analysis of administrative data. Finally, to assess implementation outcomes and answer research question 2.14 about the quality of data in the new system, we will analyze administrative data from the EMIS once it is functional.

B. Impact evaluation of the Teacher Training subactivity

In this section, we discuss our approach for the impact evaluation of the Teacher Training subactivity. We begin with an overview of our analytical approach. We conclude with the data sources. To complement the impact evaluation, we will conduct a performance evaluation comprised of a descriptive trends analysis using teacher tracer survey data and administrative data and qualitative research (see Chapter III Section D for details). Findings of the effects on student educational attainment (namely, lower-secondary

[10] Contribution analysis is a methodology used to assess the contribution of policies, programs or interventions have made towards observed changes in one or more outcomes (Mayne 2001). It is particularly useful in situations where the use of field experiments to evaluate causal impacts is not feasible or practical.

enrollment and graduation) from this impact evaluation of Teacher Training can be used to inform subsequent ex-post CBA analyses (described in further detail in Chapter III Section E).[11]

1. Analytical approach

We will use the ITS evaluation methodology to estimate the impact of the Teacher Training subactivity on (i) the number of teachers trained, and (ii) student educational attainment (such as enrollment, achievement, dropout, and progression) of lower secondary students. The ITS approach is a variant of pre–post testing that relies on the availability of multiple pre- and post-implementation outcome measurements over time. Unlike conventional pre–post testing, this enables pre-implementation trends to be accounted for rigorously in ITS analyses. It also highlights whether any observed post-implementation impacts sustain over multiple periods, which partly addresses concerns relating to effects being driven purely by chance. Nevertheless, a key assumption associated with pre–post testing (namely, that any observed impacts are driven only by the intervention being studied and not by any other contemporaneous change) is also relevant for the ITS approach.

We propose ITS analysis to evaluate the impact of the Teacher Training subactivity on the outcomes mentioned above because we believe observed changes in these outcomes will be driven only by this subactivity. Specifically, to conduct an impact evaluation using ITS analysis, we must be confident that the trend we observe in the pre-intervention period would have continued in the post-intervention period in the absence of the Teacher Training subactivity—which would enable us to credibly attribute observed changes in outcomes to the subactivity. We believe it is reasonable to conclude this for teacher graduation as the interventions carried out under the other subactivities are unlikely to affect teacher-level outcomes. We also do not expect contemporaneous external factors (namely, policies and/or interventions unrelated to those comprising the Teacher Training subactivity) will play a large role in shifting these trends.

However, changes in demand for teachers (research question 10), as reflected by the number of teachers employed in secondary schools, will be driven by the Teacher Training subactivity as well as other subactivities, and external factors (for example, teaching positions only available in non-desirable locations, relative differences in pay between teaching and non-teaching positions). While the Teacher Training subactivity is the primary factor driving changes in the supply of teachers over time, the other subactivities will likely influence the demand for teachers (for example, through changes in policies regarding the number of students per classroom and the construction of additional lower secondary schools). Because we cannot attribute changes in this outcome to the Teacher Training subactivity alone, we instead propose a descriptive trends analysis as part of the performance evaluation discussed in Section D to assess effects on this outcome.

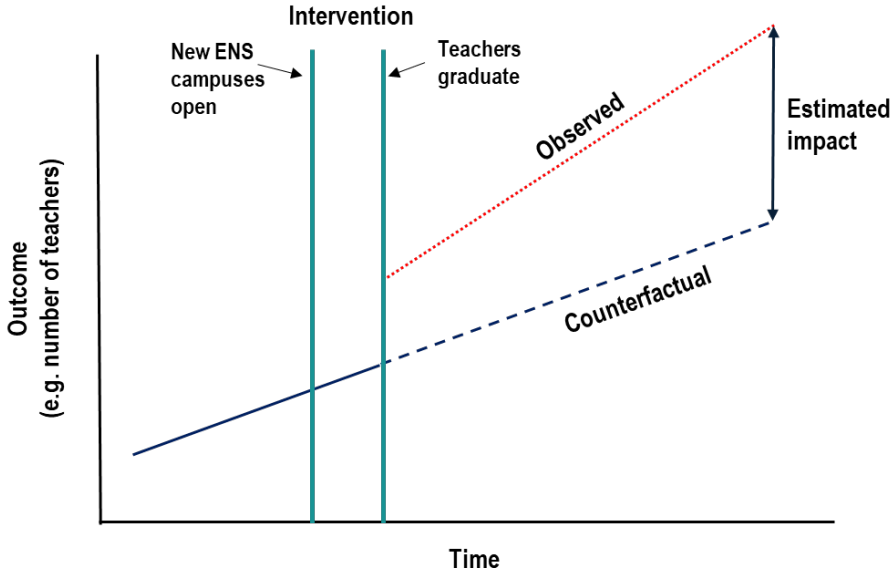
We will analyze the impact of the Teacher Training subactivity on student educational attainment at the national level, as teachers trained at the ENS in Abidjan and new satellite campuses in Gbêkê and San Pedro will be deployed to lower secondary schools throughout Côte d'Ivoire, not only in those two regions. However, in Gbêkê and San Pedro, the impacts we observe will be a result of both the Equitable Access and potentially the Teacher Training subactivities, depending on how teachers are deployed. This is because the construction of new CDPs, according to the activity logic, will also alter trends in student enrollment and graduation relative to the pre-intervention period. Therefore, we will conduct our analysis

[11] While the CBA for the Teacher Training subactivity incorporates student test scores, we cannot measure impacts on that outcome in a rigorous manner. We will therefore use impact estimates on student educational attainment (namely, lower-secondary enrollment and graduation) to inform the ex post CBA.

for these student outcomes both including and excluding students from Gbêkê and San Pedro to better understand the impact of the Teacher Training subactivity in isolation.

Using historical data starting in 2008 (or another year, depending on availability), we will account for the trends in these outcomes observed before implementation to estimate the difference between the outcome levels that are predicted to have occurred without the intervention (based on the pre-implementation period trend—the counterfactual) and the actual outcome levels observed in the post-implementation period. In Figure III.1, we illustrate the ITS design using the number of teachers trained as an example.

Figure III.1. Interrupted time-series design



ENS = *École Normale Supérieure* (teacher training school).

To conduct the ITS analysis, we will use the OLS regression model in Equation III.1, below:

$$y_t = \beta_0 + \beta_1 * Year_t + \beta_2 * Post_t + \beta_3 * (Year_t * Post_t) + \varepsilon_t \quad \text{(III.1)}$$

where y_t is the value of an outcome of interest in year t; $Year_t$ is a running variable indicating the difference in number of years between year t and the year in which the first cohort of newly trained teachers graduates (pre-graduation years are negative numbers); $Post_t$ is a binary variable that equals 1 for all years t greater than or equal to graduation year; and ϵ_t is a normally distributed error term. Our coefficient of interests are β_2 (which indicates the change in the level of the outcome that occurs immediately following the graduation of the newly trained teachers) and β_3 (which represents the difference between pre- and post-graduation trends in the outcome of interest over time).[12] Depending on

[12] The ITS design is an appropriate choice for the evaluation of the Teacher Training subactivity for two main reasons. First, the subactivity is expected to have a national impact (for example, teachers trained under the new pre-service teacher training curriculum will be employed by schools across the country). Because all regions of the country will be affected by the subactivity contemporaneously, it is not possible to use quasi-experimental approaches that require that certain regions be unaffected in order to serve as a comparison group (such as difference-in-differences). Second, the ITS design is well suited for evaluations of the impacts of programs that have

data availability, we will assess the robustness of the results obtained from estimating Equation III.1 by using varying lag structures to account for autocorrelation (correlation between past and present values of an outcome variable). In addition, we will also conduct analyses by subgroup to estimate the differential impact on different subgroups, such as female and male teachers and students as well as bivalent teachers specializing in different types of subjects.

To complement the analyses of lower secondary teachers, we will also describe the number of teachers placed in upper secondary and primary teaching positions over time. Such analyses will provide an understanding of whether the composition of teachers nationwide changes as a result of increasing the number of lower secondary teachers that are trained. Additional analyses will also be performed as a part of the performance evaluation described in section D.

2. Data sources and reporting

The ITS evaluation will rely on national administrative data on student educational attainment (namely, lower-secondary enrollment and graduation) from the DESPS of MENA and administrative teacher-level data from the ENS on teacher enrollment and graduation from the training program and CODIPOST[13] data on teacher employment historically[14] through 2029. We will analyze the population of teachers and students in the data. The administrative student data from the DESPS will be the same data requested for the Equitable Access performance evaluation, but here we will analyze data from all regions of the country to assess the impact of the Teacher Training subactivity on national student educational attainment. We will use teacher enrollment and graduation data from the ENS to assess the impact of the subactivity on the number of teachers trained and use teacher employment data from CODIPOST to determine if the demand for secondary school teachers is met nationwide.

In Table III.2, we present an illustrative list of outcomes/indicators that each data source would yield. We will provide the final list of the specific variables that we will collect as more details of program implementation become available.

Table III.2. Data sources and key outcomes/indicators for the Teacher Training impact evaluation

Data type	Source	Outcomes/indicators
Administrative	DESPS student-level data	Student enrollment, promotion, transition, and dropout
	ENS teacher-level data	Teacher enrollment and graduation from ENS
	CODIPOST teacher-level data	Number of teachers employed Number of unfilled posts

Note: CODIPOST is the human resources management system for teachers.

DESPS = *Direction des Etudes, des Stratégies, de la Planification et des Statistiques* (Directorate of Studies, Strategies, Planning and Statistics); ENS = *École Normale Supérieure* (teacher training school).

discrete start dates, as is the case with the Teacher Training subactivity. The opening of the new ENS campuses, for example, represents a discrete event whose start date can be clearly identified and used to divide available data into pre- and post-intervention time series to facilitate statistical analyses.

[13] CODIPOST is the human resources management system for teachers.

[14] We will request historical data for as many years as are available. MCA-CI has indicated that data are likely available dating back until 2010, and possibly 2008.

Beginning in the fall of 2023, we will require national historical data (beginning in 2008 or the earliest year available) through 2023 from all three data sources to analyze for the baseline report.[15] Thereafter, we will require access to the administrative data annually at the start of each school year through 2029.

C. Performance evaluation of subactivities 1-4

In this section, we describe the design, data sources, and analytic approach for the mixed-methods performance evaluation for all four subactivities of the Secondary Education Activity. We present our approach for the performance evaluation for the overarching research questions that cut across subactivities, followed by the approach we will take for each subactivity. For each subactivity, we discuss the quantitative and qualitative data sources[16] we will draw on for the evaluation, our proposed quantitative analytical approach, and the qualitative sample and data collection timeline. We conclude this section by summarizing the qualitative data sample sizes and timeline for all components of the performance evaluation (because we combine qualitative data collection efforts across the subactivities) and presenting the analytical approach for qualitative analyses, which is the same across all subactivities.

1. Overarching performance evaluation

There are several overarching research questions (questions 1.1–1.4) for the performance evaluation of all four subactivities, as described earlier. In Table III.3, we present an overview of the qualitative data sources to answer those questions and the outcomes, indicators, or themes resulting from each data source. We will conduct KIIs with school directors, ENS staff, inspectors, MCA-CI and local MCC staff, implementers, other donors in the secondary education sector, and national and regional MENA officials. These interviews will enable us to assess outcomes across all four subactivities, as well as the fidelity of implementation and sustainability post-Compact. We will invite the most appropriate individuals from each organization for an interview at baseline (2023), midline (2025, just as implementation is wrapping up), and/or endline (2027, 2029, or 2030).

Table III.3. Data sources and key themes for the overarching performance evaluation

Data type	Source	Themes
Primary (qualitative)	School director interviews (open-ended questions as part of primary quantitative director survey)	• How changes to teacher training curriculum, supervision, and in-service training have influenced teacher KAPs and application of improved teaching methods • How data is used to inform school management, needs, and performance (in particular, budgeting, assessment, and accountability) • How school environment has changed as a result of the Gender Policy priority action items • Facilitators of and barriers to change
	MCA-CI and local MCC staff KIIs	• Perceptions of how the subactivities have been implemented • Strengths and weaknesses of the design, implementation, and performance of the subactivities

[15] In 2022 we requested and received the DESPS student-level data for school years 2018/19 through 2021/2022. Therefore in the fall of 2023 we will request DESPS student-level data for the 2022/23 school year.
[16] In addition to the quantitative data sources discussed here, we will draw on the youth, parent, and teacher survey data and administrative data collected for the pre-post and impact evaluations discussed previously. Appendix B Tables B.1 and B.2 provide a summary of all quantitative and qualitative data sources for the evaluation.

Data type	Source	Themes
		• Implementation challenges • Sustainability of the interventions • Facilitators of and barriers to change • Examples of systems or processes that have changed; how and why they have changed
	MENA staff KIIs	• Perceptions of how the subactivities have been implemented • Strengths and weaknesses of the subactivities • Implementation challenges • Sustainability of the interventions • Facilitators of and barriers to change • Examples of systems or processes that have changed; how and why they have changed • Implementation of the Gender Policy priority action items in Gbêkê and San Pedro • Changes to governance of gender in the education sector • Implementation of the EMIS and student assessments • Perceptions of quality of the EMIS and data • How data are being used to inform decisions on the management of the education sector, including funding
	Staff at implementing partners KIIs	• Perceptions of implementation, successes and challenges • Sustainability of the interventions • Facilitators of and barriers to change • Examples of systems or processes that have changed; how and why they have changed
	Other donors in the sector	• Awareness and perceptions of the subactivities, including perceived sustainability • Key donor activities in the secondary education sector and synergies with the subactivities
	Document review	• Implementation plans • Implementer quarterly and annual reports • Research studies conducted by implementers • Policy documents • Teacher supervision reports

EMIS = education management information system; KAPs = knowledge, attitudes, and practices; KII = key informant interview; MCA-CI = Millennium Challenge Account-Côte d'Ivoire; MCC = Millennium Challenge Corporation; MENA = *Ministère de l'Éducation Nationale et de l'Alphabétisation* (Ministry of National Education).

2. Equitable Access subactivity

The Government of Côte d'Ivoire selected locations where CDPs will be constructed based on an analysis of socioeconomic and demographic data from clusters of villages (*bassins*). These village clusters—typically consisting of all villages located within a 5-kilometer distance of a "host" village—were created to ensure that CDPs are placed in areas with sufficiently large numbers of eligible school-age youth that could enroll in the newly opened school. Village clusters were selected to receive CDPs based on a process of both identifying if the village cluster meets basic infrastructure requirements as well as through a community engagement process (MCA-CI 2020, 2021).

Our proposed performance evaluation of the Equitable Access subactivity employs a descriptive trends analysis in combination with a pre-post design to track changes in outcomes in selected village clusters that receive a newly constructed CDP. Subgroup analyses for girls and boys separately will reveal differences in outcome trends by gender. We will also draw on qualitative data collected for the performance evaluation to understand findings from the evaluation. Our findings of the effects on lower secondary school completion from this evaluation have the potential to inform subsequent *ex post* cost–benefit analyses (CBA; as described in further detail in Section III.E).

Data sources and reporting

As noted above, village clusters were selected for CDP construction partly based on an assessment of cluster-level infrastructure. This assessment includes verifying that selected village clusters contain functioning primary schools. The presence of these primary schools helps ensure there is a population of eligible school-age youth that have completed the primary education cycle and could enroll in the newly opened secondary schools. The primary schools in the village clusters thus serve as "feeder" schools for newly constructed CDPs. Students that completed CM2 (the last year of the primary cycle) at these feeder schools in the academic year prior to CDP construction (and are thus eligible to enroll in newly constructed CDPs to begin the lower-secondary cycle) represent the cohort that most directly stands to benefit from school construction. Accordingly, the Equitable Access evaluation will rely primarily on student-level data obtained from administrative sources for the "CM2 cohort" in each village cluster. We will supplement these administrative data with three rounds of targeted primary data collection with a subsample of students in each village cluster's CM2 cohort to conduct student skills assessments.

We will also collect additional survey and qualitative data to answer research questions related to implementation and the attitudes, perceptions, and experiences of students, teachers, and community members. In Table III.4, we present an overview of the data sources for the performance evaluation of the Equitable Access subactivity that are additional to those presented in Table III.3, including an illustrative list of outcomes/indicators that each data source would yield. We will determine the specific variables that we will collect as more details of program implementation become available. We discuss each data source in detail in the following sections.

Table III.4. Data sources and key outcomes/indicators/themes for the Equitable Access performance evaluation

Data type	Source	Outcomes/indicators/themes

Administrative	MENA/EMIS data	• Enrollment, attendance, promotion, and transition among the cohort of students that completed primary school (those that complete CM2) in selected village clusters in the academic year prior to CDP construction:
		  • Enrollment: Share of each village cluster's cohort of graduates from primary school that is enrolled (including students repeating a year) in the respective village cluster's CDP
		  • Attendance: Proportion of days in the school year that the average student in each village cluster's primary school graduating cohort is not absent from school
		  • Promotion: Share of each village cluster's primary school graduating cohort that was promoted to the next year of the lower-secondary education cycle in the previous school year
		  • Transition: Share of each village cluster's primary school graduating cohort that successfully enrolled in the first year of the lower-secondary education cycle (that is, the primary-to-secondary transition rate)
		  • Completion: Share of each village cluster's primary school graduating cohort that completed the final year of the lower-secondary education cycle by successfully passing the BEPC on schedule (that is, four school years after starting the lower-secondary cycle).
		• Student grade and exam scores (annual and end-of-cycle)

	Population and Housing Census	• Household- and community-level socioeconomic and demographic indicators
Primary (quantitative)	Student skills assessments	• Numeracy and literacy • Soft skills (such as critical thinking, self-esteem, self-control, perseverance, and social skills)
	Director surveys	• Quality and use of infrastructure and equipment • Availability and skills of teachers
	Teacher surveys	• Teacher skills and support received • Quality and use of infrastructure and equipment
	Infrastructure assessments	• Availability and quality of infrastructure and equipment
Primary (qualitative)	Students/school-aged youth FGDs	• How students have improved their reading, math, and soft skills • How students' interest in STEM fields has changed (particularly for girls) • Why students decide to remain in school or dropout • What the biggest changes in the quality of schooling are, and why

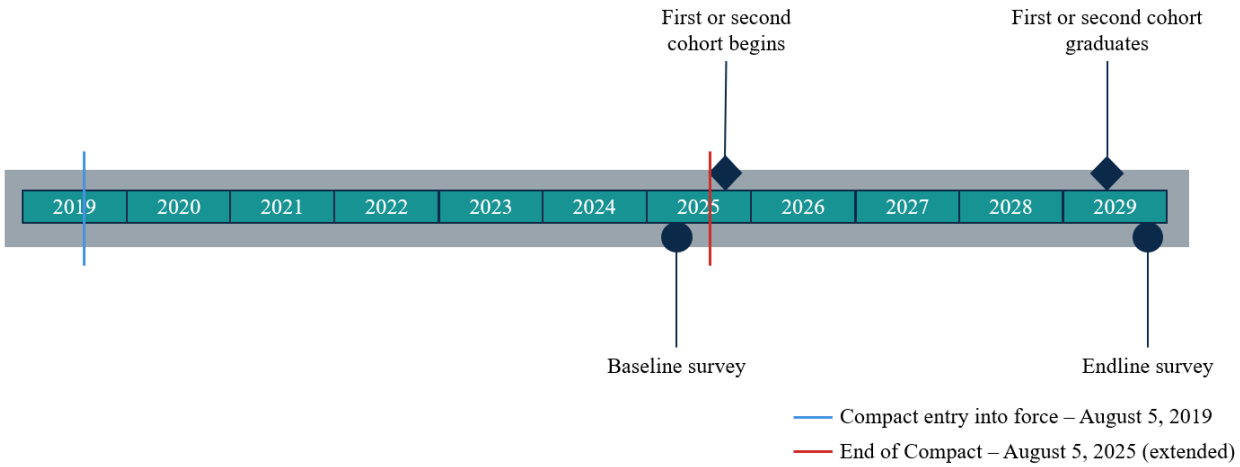
Data type	Source	Outcomes/indicators/themes
	Parent, COGES, and CMEF FGDs	• Barriers to and facilitators of access to secondary education • Attitudes and perceptions about lower secondary education and quality • Attitudes about students, and girls in particular, attending lower secondary school • Existence of school cooperatives, clubs and associations, and the extent to which students participate in activities they offer • Parental/community involvement in school activities (including activities that facilitate teachers' integration into communities and community members' contributions to school operations, e.g., canteens) • Parental perspectives on changes in student behavior, goals, and ambitions • Parental expectations of a student's future • Parental knowledge of a student's school performance (grades, assessment results)
	Teacher interviews (open-ended questions as part of primary quantitative teacher survey)	• Why a teacher decides to retain their post or switch posts • How the subactivity has influenced community members' perceptions about lower secondary education • Teacher's perceptions of the continued support they received in-service • Role teachers play in monitoring and supervising student initiatives launched by school cooperatives, clubs and associations
	School director interviews (open-ended questions as part of primary quantitative school director survey)	• How changes to teacher training curriculum, supervision, and in-service training have influenced teachers' integration into communities (e.g., communication with community leaders) and their relationship to school operations (e.g., participation in COGES) • How data is used to inform school management, needs, and performance (in particular, budgeting, assessment, and accountability) • Role school directors play in student life (including accessibility to students and contributions to school activities) • Effects of expanded support for teacher supervision (including school visits by inspectors, and availability of structured teacher- and school-level support) • Facilitators of and barriers to change

MENA = Ministère de l'Education Nationale et de l'Alphabétisation; EMIS = education management information system; CMEF = *Club de Mères d'Elèves Filles* (Club for Mothers of Girls); COGES = *Comité de Gestion des Établissement Scolaires* (School Management Committee); FGD = focus group discussion; GSC = *Groupes de Soutien à la Construction* (Construction Support Groups); KAPs = knowledge, attitudes, and practices; STEM = science, technology, engineering, and math.

In Figure III.2, we summarize the timeline for primary data collection. As shown in this figure, primary data collection will closely track the roll-out of CDPs across Gbêkê and San Pedro. Baseline primary data collection will occur with a subsample of the CM2 cohort in each village cluster in spring 2025, prior to enrollment of this cohort at the new CDPs in fall 2025. This will shed light on pre-intervention youth- and community-level characteristics. For new CDPs that open in fall 2024 or January 2025 as currently

anticipated, the evaluation will follow the second cohort of students who are eligible to enroll at the new CDPs. If there are delays and some or all of the CDPs do not open until fall 2025, then the evaluation would follow the first cohort of CM2 students who are eligible to enroll in these CDPs. Given that we do not have a comparison group and are conducting a purely descriptive study, we see little downside to following the second cohort of students to enroll rather than the first, or a combination thereof. Endline data collection with the same subsample of each village cluster's CM2 cohort will occur four school years later, in 2029, to estimate final trends.

Figure III.2. Equitable Access evaluation: Survey data collection timeline



We will require access to administrative data for the baseline and endline reports, and we will request access to the data annually during the fourth quarter of each year from 2023 through 2029 to correspond with the end of the preceding academic year. In 2021, we already requested these data as well as 2014 and 2021 census data. We will use these data to inform all relevant analyses pertaining to our assessment of the Equitable Access subactivity if these data are made available to us.

Quantitative analytical approach

Our performance evaluation of the Equitable Access subactivity will rely on three main quantitative data sources:

- **Administrative MENA and census data.** We will work with the MENA to obtain access to longitudinal, individual-level administrative records of lower secondary students in selected village clusters in Gbêkê and San Pedro to track trends related to attendance, enrollment, promotion, and completion for the cohort of students that completed CM2 in the academic year prior to CDP construction in selected village clusters. Specifically, in our analyses, we will use information on (i) the enrollment, attendance, promotion, transition, and completion status of each student in this cohort; (ii) end-of-schoolyear grades (as reported on report cards provided on a trimester basis); and (iii) national exit exam scores for the *Brevet d'Études du Premier Cycle* (BEPC), the mandatory examination that certifies completion of lower secondary education in Côte d'Ivoire.

  In addition, insofar as possible, we intend to use administrative data to shed light on context-specific factors associated with observed changes in outcomes. To do so, we will require access to data on (i)

longitudinal, individual-level administrative records of primary students in the two target regions, starting with the year 2008 through to the most recently available year; and (ii) community-level statistics from the 2014 and 2021 rounds of the *Recensement Général de la Population et de l'Habitat* covering all villages in Gbêkê and San Pedro.

- **Cross-sectional youth learning assessment.** In addition to the main outcome measures, the evaluation will also aim to assess changes in learning. Because we do not anticipate universal completion of lower secondary education by the CM2 cohort that we will track in each cluster, we cannot rely exclusively on the scores obtained during end-of-cycle tests—namely, the BEPC—to assess changes in learning. In addition, it may not be possible to obtain end-of-school-year grades for all students in the CM2 cohort. For this reason, during baseline and endline rounds of data collection, we will assess numeracy and literacy skills as well as soft skills among a randomly selected subsample of each CM2 cohort. Specifically, we anticipate sampling up to 40 youth (20 boys and 20 girls) in each CM2 cohort in village clusters receiving a CDP.[17] In so doing, we will be able to measure learning outcomes for sample youth, some of whom may subsequently drop out of school and not complete lower secondary education.

  To assess numeracy and literacy, we will draw on domestic and international standardized assessments, which we will work with the MENA to adapt and ensure that they contain content that is culturally appropriate and are not burdensome. In particular, we plan to rely on protocols associated with prior assessments of lower-secondary-age students that have been conducted in Côte d'Ivoire as well as planned assessments that will be conducted nationally in the future.[18] As needed, we will also adapt questions used in existing quarterly tests (*compositions trimestrielles*) to assess numeracy and literacy. We will adjust the difficulty level of these to correspond to the knowledge that targeted youth are expected to achieve, given their age or grade level. We will also consult with stakeholders during the assessment creation process to ensure pertinence and relevance.

  We will similarly adapt internationally validated soft skills assessments to gather information on key soft skills that are tied to the activity logic (as identified through consultation with key stakeholders), including critical thinking, self-esteem, self-control, perseverance and social skills, at baseline and endline. We will also consult with stakeholders after the implementation of the project has begun to determine if the soft skills assessment should be altered for endline data collection.

- **Director/teacher surveys and infrastructure assessments.** We will survey school directors and teachers and conduct an infrastructure assessment to evaluate school-level outcomes, including the availability of teachers and their skills and support received (particularly those trained under the revised teacher training curriculum) and the quality of infrastructure and equipment at the new CDPs. We will survey the directors of all the newly constructed CDPs at endline after the schools in each tranche have been operating for four or five years and the first or second cohort of students will have graduated. At endline, we will also survey five teachers at each CDP, one teacher from each bivalent block, and complete an infrastructure checklist at the same time we survey school directors. The timing of these will correspond to those of the youth/student skills assessments surveys.

[17] Recent assessments suggest that the average classroom size in public lower secondary schools ranges from 70 to 76 students (Oxford Business Group 2022).

[18] In 2017, for instance, the *Direction de la Veille et du Suivi des Programmes* (DVSP) at the MENA conducted reading comprehension assessments in 60 CDPs in the northern part of the country. In 2021, DVSP conducted language and mathematics assessments of students (including lower-secondary school students) affected by school closures due to COVID-19 during the 2019-20 academic year. The GoCI also participated in the 2023 Trends in International Mathematics and Science Study (TIMSS) and will participate in the PASEC in 2024..

Using these data, we propose carrying out a descriptive trends analysis to track outcomes for the cohort of students that completed CM2 (the last year of the primary cycle) at primary schools located in selected village clusters in 2025 (one to two academic years prior to the new CDPs opening) to assess the extent to which the intervention is associated with changes in enrollment, attendance, promotion, transition, and completion.[19] Specifically, in each village cluster, we will use first student-level administrative data to identify all students who have completed CM2 at primary schools located in the respective village cluster. This will result in one "CM2 cohort" in each village cluster. We will then use administrative data to track each CM2 cohort in each year of the secondary education cycle to conduct descriptive analyses of trends in enrollment, attendance, promotion, transition, and completion. Our analytical approach will thus track outcomes over the full lower-secondary cycle to assess how outcomes evolve following school construction and to compare outcomes for different subgroups (such as female and male youth). We will combine the results of these analyses with insights from qualitative key informant interviews carried out as part of our overarching performance evaluation of all subactivities (described in detail in Section III.D) to shed light on the extent to which any observed trends are related to CDP construction.

We will complement the descriptive trends analysis with a pre-post design to assess changes in numeracy, literacy, and soft skills. Specifically, we will estimate if these outcomes have changed over time using the ordinary least squares (OLS) regression model in Equation III.2:

$$y_{ivrct} = \beta_1 P_t^{EL} + \mathrm{X}_{iv}'\delta + \gamma_r + \gamma_c + \epsilon_{ivrt} \quad \text{(III. 2)}$$

where y_{ivrct} represents a literacy, numeracy, or soft-skills outcome of interest for student i in village cluster v (located in region r and part of tranche c) at time t; P_t^{EL} denotes a binary variable that equals 1 if data for the relevant observation were collected at endline following the construction of the CDP; X_{iv} is a matrix of student- and cluster-level controls; γ_r is a region fixed-effect, which controls for time-invariant region-specific confounders; γ_c is a tranche fixed-effect, which accounts for time-invariant tranche-specific unobservables; and ϵ_{ivrt} is a cluster-specific error term.[20] Our coefficient of interest is β_1, which indicates the change in literacy, numeracy, or soft-skills at endline (following CDP construction) relative to the baseline level (before CDP construction).

To compare differences between males and females, we will use the OLS regression model in Equation III.3, which adds subgroup terms to Equation III.1:

[19] Initial implementation plans suggested that selection of selected village clusters would be based on a strict population-based threshold. This would have enabled the use of a regression discontinuity (RD) design to evaluate the impacts of the Equitable Access subactivity. However, stakeholder consultations to validate and finalize the initial set of village clusters selected using this approach appear to have resulted in considerable overlap in the estimated populations of CM2 students in selected and unselected village clusters, ruling out the possibility of using an RD approach. In addition, we also assessed the feasibility of a matched-comparison group design using available data (by comparing 11 different community-level variables), and found that large differences between selected and unselected village clusters in key characteristics (such as the population of lower-secondary school age youth, number of villages, and the number of primary schools and associated school-management committees and teachers) greatly limited the set of unselected village clusters that could serve as appropriate matches for selected ones. While it is feasible that there are village clusters with similarities in other important characteristics such that reasonable comparisons could be found, we do not have access to the Census data that could be used to assess a wider range of characteristics.

[20] The use of fixed-effects involves including a set of binary indicators for all but one of the discrete values of a particular variable (e.g., including binary indicators for the second and third tranches in the regression while omitting that for the first tranche).

$$y_{ivrct} = \beta_1 P_t^{EL} + \beta_2 (Subgroup_i) + \beta_3 (P_t^{EL} \times Subgroup_i) + \mathrm{X}'_{iv}\delta + \gamma_r + \gamma_c + \epsilon_{ivrt} \quad \text{(III. 3)}$$

where $Subgroup_i$ is a binary variable that equals 1 if youth i is a member of a subgroup of interest and all other parameters are defined as above. Our coefficient of interest, β_3, estimates differences in outcomes between members and non-members of subgroups of interest at endline relative to at baseline.

We will also use the director, teacher, and infrastructure survey data from all newly constructed schools to describe school-level outcomes in newly constructed CDPs. We will present summary statistics on school-level outcomes for the entire sample, as well as subgroups of interest such as region and type of CDP (Base 2 or Base 4) when possible, based on sample sizes.

Qualitative data

We will collect qualitative data at endline from each of the two regions receiving the Equitable Access subactivity. We will conduct focus groups with youth, parents, and members of COGES and *Club de Mères d'Elèves Filles* (CMEF; Club of Mothers of Girls) in 2029 in approximately 20 percent (that is, six) of the village clusters receiving CDPs in tranches 1 and 2. We will select these clusters to ensure they are distinct geographically (for example, a mix of clusters in both Gbêkê and San Pedro) as well as on the basis of population (for example, clusters with both above- and below-median total population, as calculated using census data). We will add open-ended questions to the school director surveys for all the newly constructed CDPs at endline (see Figure III.2 for timing). We propose to purposefully sample the six village clusters where FGDs will be held to ensure representation of village clusters of different sizes and both Base 2 and Base 4 schools. To minimize the costs of finding youth samples, we will invite a sample of youth selected to participate in student skills assessments for the Equitable Access pre-post evaluation of learning outcomes to participate in the focus groups, including those who have dropped out. We will invite the parents of selected youth to participate in the parent focus groups, all COGES members to participate in the COGES focus groups, and all CMEF members to participate in the CMEF focus groups. We will hold gender disaggregated FGDs for enrolled and out-of-school youth and parents to facilitate an environment where participants feel safe expressing themselves.

3. Teacher Training subactivity

The performance evaluation of the Teacher Training subactivity will complement the ITS impact evaluation and will incorporate survey data as well as qualitative research. In Table III.5, we present an overview of the data sources for the performance evaluation of the Teacher Training subactivity that are additional to those presented in Table III.3. We discuss each data source in detail in the following sections.

Table III.5. Data sources and key outcomes/indicators/themes for the Teacher Training performance evaluation

Data type	Source	Outcomes/indicators/themes
Primary (quantitative)	Teacher tracer survey (national - teachers trained in the new pre-service curriculum at the Abidjan and satellite campuses)	• KAPs regarding pedagogical innovations • Satisfaction with training • Employment status and type of job (including reasons for pursuing current employment) • Whether additional training was received and why • Reasons for not completing ENS training (if relevant)
	Classroom observation (Gbêkê and San Pedro - teachers in lower secondary schools)	• Hours of instruction • Time on task • Use of pedagogical innovations as well as materials and equipment from teacher training subactivity • Student time, for girls and boys, spent studying
Quantitative administrative	ENS teacher-level data (national - teacher pre-service training)	• Teacher enrollment and graduation from ENS
	CODIPOST teacher-level data (national - all teachers)	• Number of teachers employed • Location of employment • Number of years in post
Primary (qualitative)	Teacher FGDs (national - teachers trained in the new pre-service curriculum at the Abidjan and satellite campuses)	• How well the pre-service training has prepared teachers to begin teaching • How the pre-service training has influenced teaching plans (for example, what subjects they plan to teach, where they want to teach) • How the pre-service training has influenced perceptions relating to teaching • Availability and use of STEM classroom materials and equipment during teaching • What factors influenced female teacher's interest in bivalent teaching and/or in teaching STEM fields • What are the specific challenges facing bivalent (dual subject) teachers
	Teacher KIIs (national)	• How well the pre-service training prepared teachers to begin teaching • Teacher's perceptions of the in-service supervision, inspection, and training (and changes to these systems for those who graduated from the ENS prior to 2023) • Why a teacher decides to retain their post or switch posts
	Teacher interviews (open- ended questions as part of the teacher tracer survey)	• How well the pre-service training prepared teachers to teach • How the in-service training and supervision program supports ongoing training for teachers • Why teachers decide to retain their post or switch posts • Teachers' interest in continuing to serve as bivalent teachers • How teachers have applied the teaching methods they learned; what facilitated or hindered application • How (through examples) teachers assist students to learn and use soft skills

	ENS and INJS staff KIIs	• Perceptions of how the Teacher Training subactivity was implemented • Influence of the training program on female teachers' interest in teaching STEM fields • Strengths and weakness of the Teacher Training subactivity • Perceptions of the new satellite campuses • Perceptions of the quality of pre-service teacher training • Perceptions of the newly developed teacher training curriculum • Perceptions of how the subactivity influenced teacher KAPs
	CIFE KIIs	• Perceptions of implementation, successes and challenges • Sustainability of the interventions • Facilitators of and barriers to change • Examples of systems or processes that have changed; how and why they have changed
	IGEN, supervisor and DRENA KIIs (national)	• How the supervision/inspection program has changed because of the subactivity • Perceptions of how the subactivity influenced teacher KAPs

Note: CODIPOST is the human resources management system for teachers.

CIFE = *Comité Interministériel pour la Formation des Enseignants du Premier Cycle du Secondaire* (Interministerial Committee for Lower Secondary School Teacher Training); DRENA = *Direction Régionale de l'Education Nationale et de l'Alphabétisation*; ENS = *École Normale Supérieure* (teacher training school); FGD = focus group discussion; IGEN = *Inspection Générale de l'Education Nationale*; INJS = *Institut National de la Jeunesse et des Sports*; KAPs = knowledge, attitudes, and practices; KII = key informant interview; STEM = science, technology, engineering, and math.

Teacher tracer survey

We will conduct a teacher tracer survey to track a cohort of newly trained lower secondary school teachers from each of the ENS campuses (the main Abidjan campus and the two new satellite campuses in Gbêkê and San Pedro), starting shortly after they start their training at the ENS until several years of teaching after graduation. We will use a descriptive trends analysis to analyze the data from these surveys to describe changes to teachers' KAPs and teaching plans (what subject and where they intend to teach) over time. We will present findings separately for different subgroups of interests—for example male and female teachers or teachers who graduated from the Abidjan campuses and teachers who graduated from the new satellite campuses.

Survey sample. The teacher tracer survey will follow the third cohort[21] from the Abidjan campus to benefit from the newly revised training curriculum—the cohort entering in the fall of 2024. From the two satellite campuses, we will follow the second cohort to enroll after the new campuses open. The new campuses are scheduled to open in 2025, thus we intend to follow the cohort entering in the fall in 2026. We propose following the third cohort of teachers from the Abidjan campus since they are the first cohort to benefit from the piloted and revised version of the new curriculum and the second cohort from the new satellite campuses due to the risk of implementation delays and the possibility that the first cohort could

[21] The first cohort to benefit from the new curriculum began at the ENS Abidjan in fall 2022, thus the cohort we will follow will be the third cohort trained with the new curriculum at the ENS Abidjan. However, during the 2022-2023 academic year, the new curriculum was being piloted and there will be ongoing revisions to the new curriculum and supervision/inspection tools during the 2023-2024 academic year as they are refined and finalized based on the pilot. Thus, the third cohort enrolling at the ENS Abidjan will be the first cohort to benefit from the finalized version of the new curriculum.

vary significantly from future cohorts due to adjustments that will be made in the first year the campuses are open.

We will survey all teachers enrolled in the evaluation cohorts at all three ENS campuses, an expected total enrollment of 800 teachers-in-training. We will conduct baseline surveys of teachers shortly after enrollment at the ENS (2024 and 2026 for the Abidjan and satellite cohorts, respectively). We will conduct midline surveys when each cohort graduates from the ENS (2026 and 2028 for the Abidjan and satellite cohorts, respectively), an additional midline survey in 2028 when the Abidjan cohort is two years post-graduation, and endline surveys in 2030, enabling us to measure how teachers' KAPs and interest in teaching math and science change over time. We provide an overview of the data collection timeline below in Figure III.3. At baseline, we will obtain contact information for teachers in the sample to facilitate tracking them over time. In addition, administrative data from the ENS and CODIPOST will assist us in tracking teachers after graduation from the ENS regardless of where they are deployed, minimizing attrition.

Our proposed sample size of 800 teachers for this descriptive analysis is driven by minimum detectable differences (MDDs), which are defined as the smallest differences that can be statistically distinguished from 0. As noted in Table III.5, the key focus for the teacher tracer survey is on teachers' KAPs regarding pedagogical innovations. However, in the absence of information about the underlying standard deviation that is required to conduct MDD calculations for differences in KAPs, we use information on teacher employment to select a sample size that will enable formal statistical tests of differences in outcomes between key groups of newly trained teachers as well as over time to rigorously highlight the effects of the Teacher Training subactivity. Specifically, we will compare outcomes (i) over time (for example, baseline and endline), (ii) between men and women at a particular point in time (for example, gender differences at endline), (iii) between men and women over time (for example, gender differences between baseline and endline), (iv) between teachers trained at the Abidjan ENS campus and those trained at the satellite campuses at a particular point in time, (v) between teachers trained at different campuses over time, and (vi) between bivalent teachers specializing in different types of subjects. The proposed sample of 800 teachers is based on power calculations aimed to detect a pre-post difference of 5 percentage points and subgroup difference of 9–10 percentage points in employment outcomes (representing a 6–13 percent difference in the rate of employment relative to the assumed employment rate of 80 percent).[22] Although prior evidence on the effect of teacher training on teacher-level employment outcomes is limited, for reference, these figures broadly correspond to baseline rates of teacher attrition in the sub-Saharan African context (Macdonald 1999).

Data collection. The teacher tracer study will include multiple rounds of survey data collection for teachers from each ENS center, as illustrated in Figure III.3. We will conduct a baseline survey shortly after each cohort begins training at the ENS—in 2024 for the Abidjan cohort and in 2026 for the satellite cohorts. We will conduct our baseline surveys in person. These baseline data will enable us to measure

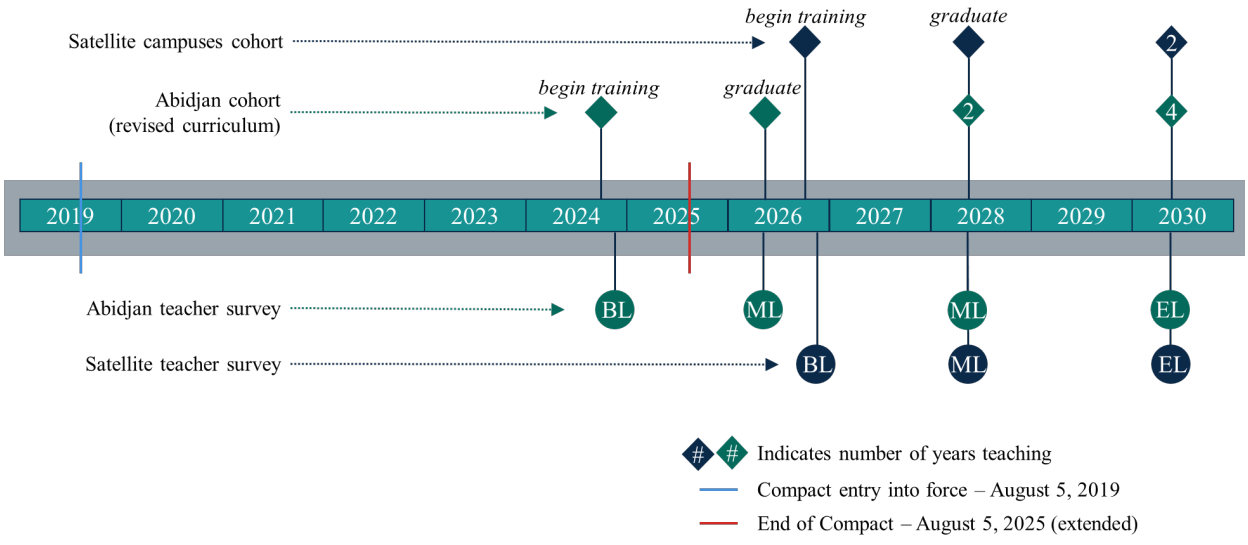
[22] We assume the employment rate to be approximately 80 percent based on UNESCO (2020) data on the percentage of trained teachers employed in secondary education. These data report the employment rate for secondary teachers in Côte d'Ivoire as 100 percent. However, this rate is inconsistent with levels of employment reported for other countries in West Africa, which span a value closer to the 80 percent range. This includes Senegal (72 percent), Ghana (76 percent), Gambia (92 percent), and Burkina Faso (60 percent). We do not have information on how many ENS-trained teachers in a graduating cohort go on to be employed. Therefore, for the purposes of our power calculations, we assume an employment rate of 80 percent.

teachers' expectations for the pre-service training as well as teacher KAP and teaching plans (what subject and where they intend to teach) prior to receiving their training at the ENS.

Follow-up data post-graduation will enable us to measure the same outcomes and see if there were changes between starting the training, graduation, and time employed as a teacher. We will determine the outcomes that will be collected as more details of program implementation become available, and through consultation with evaluation stakeholders. However, teachers' interest in teaching math and science and learning of teaching practices are of key importance. We will conduct our first midline follow-up survey when each cohort graduates from the ENS (which is two years after enrolling)—in 2026 for the Abidjan cohort and in 2028 for the satellite cohorts. We will also conduct an additional midline follow-up survey for the Abidjan cohort in 2028, corresponding to the two-year mark post-graduation for this cohort. Finally, we will conduct endline follow-up surveys in 2030, which will enable us to observe the Abidjan cohort after four years of teaching and the satellite cohorts after two years of teaching.

We will conduct the midline follow-up survey in person when each cohort graduates. Subsequent follow-up surveys will be conducted via phone as teachers will be deployed through Côte d'Ivoire and it would be impractical to visit all of them for in-person interviews. Each additional year of follow-up data collection will enable us to assess longer-term outcomes, including how well teachers retain the pre-service training over time, how their KAPs evolve as they gain more experience, and understand teachers' decisions to retain or change their post.

Figure III.3. Teacher Training performance evaluation: Tracer survey timeline



BL = baseline; ML = midline; EL = endline.

Classroom observation

We will complement the teacher tracer survey with direct classroom observation to assess teaching practices. Specifically, for a repeated cross-section of teachers in Gbêkê and San Pedro, we will collect data on hours of instruction, time spent on task, and use of specific pedagogical innovations featured in the new teacher training curriculum as well as other support provided to schools, such as equipment.

In particular, in each round of data collection we will sample all 95 lower-secondary schools in Gbêkê and San Pedro, which includes all newly constructed CDPs through the Equitable Access subactivity, and all previously existing lower-secondary schools.[23] Within each school, we will select five teachers per school, resulting in a final sample of approximately 475 teachers. The proposed sample of teachers for classroom observation will result in our ability to detect an overall cross-sectional difference of approximately 6.1 percentage points and a cross-sectional subgroup difference of just under 9 percentage points in the share of available classroom hours spent on instruction between teachers trained under the old and new curricula (representing a 8–12 percent difference in the proportion of classroom hours spent by teachers on instruction relative to the assumed level of 75 percent) according to our power calculations.[24] In selecting the sample of teachers for participation in direct classroom observation, we will ensure sufficient representation of teachers trained under the new teacher training curriculum as well as at the newly constructed satellite ENS campuses.

In addition to shedding light on teaching practices and behaviors, triangulation using insights from direct classroom observation will also help improve the validity and reliability of self-reported data on pedagogical practices collected through the teacher tracer survey. For this reason, we will align the timing of direct classroom observation with that of the teacher survey at midline in 2028 and endline in 2030 to facilitate comparability across these two data sources. Specifically, we will conduct classroom observation at the end of the 2027-28 and 2029-30 school years—corresponding to the first midline follow-up survey round for the teacher tracer survey in which both the Abidjan cohort as well as the Satellite campuses cohort will participate and the endline follow-up survey round, respectively—using the same measurement approach in each round.[25]

Administrative data for quantitative outcomes evaluation

The performance evaluation of the Teacher Training subactivity will draw on administrative data to assess whether demand for lower secondary teachers was met nationwide over time. As mentioned previously, we consider this to be a descriptive trends analysis rather than an impact analysis because we do not believe we can reasonably attribute an observed change in this outcome to the Teacher Training subactivity due to the influence of the other subactivities (such as construction of new schools) on this outcome. To evaluate the extent to which the Teacher Training subactivity changed whether the demand

[23] Based on an assessment of administrative data, we understand that there are 65 lower-secondary schools in the two regions currently. In addition to these schools, we also include 30 CDPs that will be constructed under the Equitable Access Subactivity in our initial sampling plan.

[24] We assume that lower secondary teachers spend on average 75 percent (standard deviation 25) of available classroom hours engaged in instruction. We base this assumption on findings from the final evaluation of the *Éxito Escolar* activity within the MCC Guatemala Threshold Program's Guatemala Education Project (Liuzzi et al. 2023), which considered impacts on teachers' use of time, including active and passive instruction. Although this evaluation's regional focus is not perfectly analogous to the Ivorian context, its focus on lower secondary teachers provides useful information on baseline time use patterns for the purposes of carrying out initial power calculations and assessing feasibility of anticipated effect sizes. For the purposes of carrying out power calculations for subgroup analyses, we assume that approximately half of the proposed sample belongs to the relevant subgroup (for example, an equal proportion of men and women).

[25] We anticipate adapting the Stallings classroom observation system for the Ivorien context. The Stallings system consists of an internationally standardized and validated instrument that collects classroom data on four main variables: teachers' use of instructional time; teachers' use of materials; teachers' core pedagogic practices; and teachers' ability to engage students in the learning process. We will also explore the potential of other classroom observation systems, such as the *Teach* Secondary classroom observation tool, which was designed to holistically measures what happens in secondary classrooms based on the *Teach* framework, by measuring time on task and the quality of teaching practices.

for lower secondary school teachers was met over time, we will require administrative data from the ENS and CODIPOST on all lower secondary school teachers trained and deployed throughout Côte d'Ivoire. We will use the same administrative data obtained for the Teacher Training impact evaluation—national historical data (beginning in 2008 or the earliest year available) through 2023 requested in 2023 and annual data requested at the start of each school year through 2029.

Quantitative analytical approach

We will use a descriptive trends analysis for both the teacher tracer study, direct classroom observation, and the administrative teacher data to estimate changes in teachers' outcomes (such as KAPs, employment, and retention) over time and to compare outcomes for different subgroups (such as female and male teachers or teachers trained at the Abidjan campus compared to those trained at the satellite campuses). Through this analysis, we will estimate the average change in outcome values over time, using the ordinary least squares (OLS) regression model in Equation III.4:

(III.4) $$y_{it} = \beta_1 * Post_t + \gamma_i + \varepsilon_{it}$$

Where y_{it} is a binary or continuous outcome of interest for teacher *i* measured at time t; $Post_t$ is a binary variable that equals 1 at endline; γ_i is a teacher fixed-effect, which controls for time-invariant differences between teachers (such as place of birth); and ϵ_t is a normally distributed error term. Our coefficient of interest, β_1, sheds light on the average change in the relevant outcome over the period covered by the evaluation.

To compare differences in trends over time between key subgroups of interest, we will use the OLS regression model in Equation III.5, which adds a subgroup term to Equation III.4:

(III.5) $$y_{it} = \beta_1 * Post_t + \beta_2 * (Post_t * Subgroup_i) + \gamma_i + \varepsilon_{it}$$

where $Subgroup_i$ is a binary variable that equals 1 if teacher i is a member of a subgroup of interest (for example, trained at one of the satellite campuses) and all other parameters are defined as above. Our coefficient of interest, β_2, highlights differences in trends in teacher outcomes between members and non-members of subgroups of interest.

Because of the absence of a counterfactual (since all newly trained teachers in Côte d'Ivoire will be benefiting from the Teacher Training subactivity and we do not have the necessary data on teacher KAPs for an ITS), this methodology will not allow us to attribute changes in outcomes over time to the intervention or make causal claims about the subactivity's impacts. Instead, the descriptive trends analysis will enable us to indicate whether teachers' KAPs changed over time as they completed training, gained experience, and benefited from in-service training and supervision. It will also enable us to detect statistically significant differences in outcomes between subgroups of interest. In addition, we will adapt the methodology to accommodate data-related limitations (for example, the repeated cross-sectional nature of direct classroom observation data will preclude the teacher fixed-effects).

Qualitative data

We will conduct six FGDs with teachers-in-training at the three ENS campuses in spring 2025. In 2025, the second cohort at the Abidjan campus to benefit from the revisions to the curriculum (trained under the pilot curriculum for their first year of training and trained under the finalized curriculum their second year) will have almost completed the two-year training program, while the first cohort at the two new satellite campuses will be halfway through. Teacher FGDs will be followed by KIIs in 2030 with a subset

of these teachers who will be teaching throughout the country for several years and experienced the changes to teacher supervision and in-service training brought by the Teacher Training subactivity. We will carry out corresponding interviews in 2024 and 2025 with ENS staff from all three campuses and INJS staff to assess how the subactivity changes the pre-service training; and with six inspectors from different regions of Côte d'Ivoire to assess how the subactivity changed the in-service training and supervision program. Finally, we will add open-ended questions to the baseline, midline and endline rounds of the teacher tracer survey to assess outcomes of the Teacher Training subactivity.

Sampling for qualitative data collection will aim to obtain insights from diverse perspectives. For example, we will use maximum variation sampling to ensure the inclusion of teachers of both genders who plan to teach various subjects in different regions throughout Côte d'Ivoire in both urban and rural settings.

4. Gender Policy subactivity

The performance evaluation of the Gender Policy subactivity will incorporate primary and secondary quantitative data as well as qualitative research. In Table III.6, we present an overview of the data sources for the performance evaluation of the Gender Policy subactivity that are additional to those presented in Table III.3. We discuss each data source in detail in the following sections.

Table III.6. Data sources and key outcomes/indicators/themes for the Gender Policy performance evaluation

Data type	Source	Outcomes/indicators/themes
Quantitative administrative	DESPS student-level data	• Student enrollment, promotion, transition, and dropout
Primary qualitative	Students/school-aged youth FGDs	• Students' educational plans and reasoning behind the plans • Perceptions of the school environment, particularly as it relates to gender • Attitudes about and experiences of gender equality in the classroom
	Parent, COGES and CMEF FGDs	• Attitudes about students, and girls in particular, attending lower secondary school
	Teacher KIIs (national)	• Attitudes about gender equality in the classroom • How the school environment has changed a result of the Gender Policy priority action items
	Teacher open-ended questions (added to Equitable Access survey)	• How the school environment has changed as a result of the Gender Policy priority action items • Attitudes about gender equality in the classroom
	School director open-ended questions (added to Equitable Access survey)	• How the school environment has changed as a result of the Gender Policy priority action items • Attitudes about gender equality in the classroom
	Teachers who received pre-service training FGDs	• What factors influenced female teachers' interest in teaching STEM fields
	ENS and INJS staff KIIs	• Influence of the training program on female teachers' interest in teaching STEM fields

Data type	Source	Outcomes/indicators/themes
	MENA staff KIIs	• Changes to governance of gender in the education sector • Implementation of the Gender Policy priority action items in Gbêkê and San Pedro
	Document review	• Policy changes and their implementation

CMEF = *Club de Mères d'Elèves Filles* (Club of Mothers of Girls); COGES = *Comité de Gestion des Établissement Scolaires* (School Management Committee); DESPS = *Direction des Etudes, des Stratrégies, de la Planification et des Statistiques* (Directorate of Strategies, Planning and Statistics); ENS = *École Normale Supérieure* (teacher training school); FGD = focus group discussion; INJS = *Institut National de la Jeunesse et des Sports*; KII = key informant interview; MCA-CI = Millennium Challenge Account-Côte d'Ivoire; MCC = Millennium Challenge Corporation; MENA = *Ministère de l'Éducation Nationale et de l'Alphabétisation* (Ministry of National Education); STEM = science, technology, engineering, and math.

Administrative data for descriptive trends analysis

The performance evaluation of the Gender Policy subactivity will draw on administrative data to measure changes in girls' enrollment over time because of the Gender Policy subactivity. To determine if the Gender Policy subactivity may have contributed to an increase in girls' access to education, we will conduct a descriptive analysis using the national administrative student data from the DESPS to observe student education attainment (such as enrollment, achievement, dropout, and progression) over time by gender. We will use the same administrative data requested for the evaluation of the Equitable Access subactivity—historical administrative data for 2008–2023 requested in 2023 and annual data requests at the start of each school year until 2029 for all regions of Côte d'Ivoire.

Quantitative analytical approach

To analyze the administrative data from the DESPS and determine the effect of the Gender Policy subactivity on girls' access to and enrollment in lower secondary education, we will conduct a descriptive trends analysis, following the same analytical approach previously outlined for the tracer study for the Teacher Training subactivity. We will show changes in student education outcomes (such as enrollment, attainment, dropout, and progression) over time by gender. We will pay close attention to examining changes in trends both at the national level, as well as in Gbêkê and San Pedro separately, to investigate if the priority action items that will only be implemented in these two project regions have an effect on the proportion of female students enrolling in schools. The analyses will not be able to disentangle the effects of the Gender Policy subactivity from the Teacher Training or the Equitable Access subactivities. However, we will be able to show how education outcomes change for girls over time.

Qualitative data

The FGDs and interviews conducted for the Equitable Access performance evaluation, the interviews with teachers, ENS, and INJS staff for the Teacher Training evaluation, as well as the stakeholder interviews conducted for the overarching research questions, will also include questions aimed specifically at understanding the implementation and assessing the outcomes of the Gender Policy subactivity. Separate FGDs will be conducted with each relevant group of stakeholders (for example, parents).

5. Management Systems subactivity

In Table III.7, we present an overview of the data sources for the performance evaluation of the Management Systems subactivity that are additional to those presented in Table III.3. We discuss each data source in detail in the following sections.

Table III.7. Data sources and key outcomes/indicators/themes for the Management Systems performance evaluation

Data type	Source	Outcomes/indicators/themes
Quantitative administrative	EMIS data	• Quality of data in the system (such as completeness, accuracy, and usability)
Primary qualitative	School director open-ended questions (added to Equitable Access survey)	• How data are used to inform school management, needs, and performance (in particular, budgeting, assessment, and accountability)

EMIS = education management information system; KII = key informant interview; MCA-CI = Millennium Challenge Account-Côte d'Ivoire; MCC = Millennium Challenge Corporation; MENA = *Ministère de l'Éducation Nationale et de l'Alphabétisation* (Ministry of National Education).

Administrative data for quantitative outcomes evaluation

The performance evaluation of the Management Systems subactivity will draw on administrative data to assess potential impacts on key outcomes of the subactivity as well as the quality of the data in the EMIS. We will require annual data from the EMIS at the beginning of each school year once the system is functional (likely in 2024) until 2029. As the design and specifications of the EMIS system are defined as implementation progresses, we will refine our plans for requesting and analyzing data from the system.

Quantitative analytical approach

We will use the World Bank's SABER tool and/or the Ed-Data Quality Assessment Framework, developed jointly by the United Nations Educational, Scientific and Cultural Organization and the World Bank. Both of these tools provide a framework for assessing data availability, usability, and quality as well as education management policies by evaluating data and management systems relative to evidence-based global standards.

Qualitative data

The school director surveys with open-ended questions conducted for the Equitable Access evaluation, as well as the stakeholder interviews conducted for the overarching research questions, will also include questions aimed specifically at assessing the outcomes of and understanding implementation of the Management Systems subactivity. Incorporating findings from the stakeholder and implementer interviews will enable us to provide a more comprehensive evaluation of the EMIS and management of the education sector in Côte d'Ivoire. We will finalize our plans for the analysis of the EMIS data once implementation is underway and the more details about the design and specifications of the system are known.

6. Qualitative research timeline, study sample, and analytical approach

Timeline and study sample

In Table III.8, we summarize the qualitative data collection effort across all four subactivities, including the sample size and timing for each group of respondents. We will systematically categorize and sort the qualitative information from these interviews to identify patterns and key themes to inform answers to the research questions. This plan is based on our current understanding of intervention activities and will potentially change as intervention implementation plans are finalized. We will discuss these plans with project stakeholders to finalize the set of measures we will gather for the qualitative study.

Table III.8. Qualitative data collection: Sample sizes and timeline

Subactivity	Respondents	Sample size	Timing
All	**MCA-CI and local MCC staff KIIs**	7 interviews (MCC technical leads, MCA-CI subactivity leads, and GSI lead)	Baseline 2023 Midline 2025
All	**MENA staff KIIs**	Approximately 20 interviews (national and regional staff)	Baseline 2023 Midline 2025 Endline 2030
All	**Staff at implementing partners KIIs**	4–8 interviews (including staff from GOPA, C2D, and AETS)	Midline 2025
All	**Other donors in the sector**	2-3 interviews (such as UNICEF, World Bank, and/or AFD)	Endline 2030
All	**Document review**	n.a.	Baseline 2023 Midline 2025 Endline 2030
Equitable Access	**GSC FGDs**	6 focus groups (1 in each of 6 village clusters)	Midline 2025
Equitable Access; Gender Policy	**Students/school-aged youth FGDs**	12 focus groups (1 male and 1 female FGD in each of 6 village clusters)	Endline 2029
Equitable Access; Gender Policy	**Parent, COGES, and CMEF FGDs**	24 focus groups (in each of 6 village clusters: 1 FGD with COGES members, 1 FGD with CMEF members, 1 FGD with male parents, 1 FGD with female parents)	Endline 2029
Equitable Access; Gender Policy	**Teacher interviews (Gbêkê and San Pedro)**	150 interviews (5 teachers per CDP; included as open-ended questions in teacher survey)	Endline 2029
Equitable Access; Gender Policy; Management Systems	**School director interviews**	30 interviews (director of each newly constructed CDP; included as open-ended questions in director survey)	Endline 2029
Teacher Training; Gender Policy	**Teacher FGDs (at ENS campuses)**	6 focus groups	Midline 2025

Subactivity	Respondents	Sample size	Timing
		(1 male and 1 female FGD at each ENS campus)	
Teacher Training; Gender Policy	**Teacher KIIs (national)**	12 teachers who graduated from the three ENS campuses after the new curriculum was implemented (4 from each campus; 6 male and 6 female) 12 teachers who have several years of teaching experience and witnessed the changes to the supervision, inspection, and in-service training	Endline 2030
Teacher Training; Gender Policy	**Teacher interviews (national; open-ended questions in teacher tracer survey)**	800 interviews (included as open-ended questions in teacher tracer survey)	Baseline 2024 and 2025 Endline 2030
Teacher Training; Gender Policy	**ENS staff KIIs**	Approximately 12 interviews (director of each ENS campus and 3 instructors per campus)	Midline 2025 Endline 2030
Teacher Training	**CIFE KIIs**	Approximately 5 interviews	Midline 2025 Endline 2030
Teacher Training	**Inspector KIIs**	12 interviews (6 with inspectors and 6 with supervisors)	Midline 2025 Endline 2030

CDP = *collège de proximité*; CMEF = *Club de Mères d'Elèves Filles* (Club for Mothers of Girls); CIFE = *Comité Interministériel pour la Formation des Enseignants du Premier Cycle du Secondaire* (Interministerial Committee for Lower Secondary School Teacher Training); COGES = *Comité de Gestion des Établissement Scolaires* (School Management Committee); ENS = *École Normale Supérieure*; FGD = focus group discussion; GSC = *Groupes de Soutien à la Construction* (Construction Support Groups; GSI = gender and social inclusion; INJS = *Institut National de la Jeunesse et des Sports*; KII = key informant interview; MCA-CI = Millennium Challenge Account-Côte d'Ivoire; MCC = Millennium Challenge Corporation; MENA = *Ministère de l'Education Nationale et de l'Alphabétisation* (Ministry of National Education); n.a. = not applicable.

Qualitative analytical approach

The qualitative data analysis will explore how the components of the Secondary Education Activity integrate to increase access to and quality of lower secondary education, reduce gender disparities in secondary education, and promote data-informed decision making in the education sector. This qualitative analysis will provide context and meaning to the descriptive quantitative and impact evaluation findings and will help end users understand the roles of the different activities in improving the key outcomes.

We will follow four steps to analyze the qualitative data (Creswell 2009):

1. Raw data management. Raw data management is the process of organizing data into meaningful units of analysis (that is, from audio files to transcripts). During this step, we will review all data and eliminate any data that are incomplete or not useful to our analysis.
2. "Chunking" and initial coding. Often referred to as data reduction, this step will enable us to read through the transcripts several times and obtain a holistic sense of the data. We will develop a detailed initial coding scheme. We will map the coding scheme to the research questions and logic model. We will also develop internal summaries of results, trends, and patterns in the data to accompany the broader coding themes.

3. Detailed coding. This step will involve refining the coding scheme and recoding data as we look at the data in greater depth. We will use NVivo software to review and code the transcripts based on the initial codes developed during the chunking process. Using NVivo to assign codes to the qualitative data will enable us to access data on a particular topic quickly and organize information in different ways to identify themes and compile evidence supporting them. We will expand and refine these codes during the coding exercise and subsequent analysis of the coded transcripts in an iterative process as additional themes emerge. Further, the software enables respondents to be categorized by gender, age, geographic location, or other salient characteristics to permit analysis by group.
4. Data interpretation and writing. The analysis of the coded transcripts will involve triangulating the findings across stakeholders to highlight mechanisms, context, and similarities and differences in perspectives. The baseline and final reports will use the qualitative data to explore the implementation and results of the program activities fully.

To understand how institutions are changing and the extent to which the Secondary Education Activity is sustainable, we will use several analysis techniques as a lens for reviewing the qualitative data related to sustainability. The goal of the analysis will be to understand whether innovations introduced under the program are institutionalized over time and whether they can be taken to scale nationally. This process involves analyzing the facilitators of and barriers to change related to the program. We will aim to establish what, how, and why changes are happening in the education sector as a result of the four subactivities, as well as to identify any key bottlenecks in the system that may prevent the project from reaching its outcomes. We will use the data we collect through interviews with key stakeholders and document review.

D. Informing revised cost-benefit analysis

MCC uses a CBA to estimate the economic rate of return (ERR) associated with its projects. The ERR—the discount rate at which a project's expected benefits equal its costs—summarizes the overall merits and soundness of an investment; a higher ERR indicates that a project's benefits are relatively greater than its costs. This evaluation will provide valuable input to MCC's *ex post* CBAs of the Equitable Access and Teacher Training subactivities.

MCC conducted the initial CBAs used to generate estimated ERRs for the Equitable Access and Teacher Training subactivities in June 2017 (MCC 2019).[26] Both CBA models considered students affected by the respective subactivities as project participants with the potential to become direct beneficiaries. Specifically, potential direct beneficiaries of the Equitable Access subactivity consist of students who complete additional years of schooling, thanks to new CDPs in Gbêkê and San Pedro, and as a result benefit from increased lifetime income, whereas beneficiaries of the Teacher Training subactivity are students who obtain an education from teachers trained at teacher training campuses supported under the Compact and who thus demonstrate improved learning outcomes that yield improved employment outcomes. In both cases, household members of trained students would also be considered potential beneficiaries of the subactivities. The CBA conducted by MCC estimated an overall ERR of 11.5 percent for the Secondary Education Activity and subactivity-specific ERRs of 11.6 percent (with an 80 percent

[26] No ERR was estimated for the Gender Policy and Manage Systems subactivities because "they proved difficult to model given their scope and the data available" (MCC 2019). However, the costs of these subactivities were included in the ERR calculations for the Skills for Employability and Productivity Project, of which the Secondary Education Activity is a component.

confidence interval ranging from 9 to 14 percent) for Equitable Access and 21.2 percent (80 percent confidence interval from 16 to 25 percent) for Teacher Training.

Several assumptions guide the CBA. Key among these is the identification of the benefit streams that are used to determine whether MCC's investments are cost effective. MCC assumes that the Equitable Access subactivity will increase the number of years of schooling attained by students, which will increase their lifetime earnings (MCC 2019). For the Teacher Training subactivity, MCC assumes that Teacher Training will improve student learning outcomes (through increased teacher knowledge of curriculum materials and better pedagogical methods), which will in turn will yield increased future earnings for students.

To effectively monetize these benefits streams, CBA models also rely on assumptions for underlying parameters, drawing on prior evidence from the literature when available to inform parameter values. The key parameters for the CBA for the Equitable Access and Teacher Training subactivities include the estimated effect of the interventions on school enrollment and completion, learning outcomes, labor force participation, and future earnings. The final evaluation report will highlight how estimates from our findings on the change in student educational attainment (namely, lower-secondary enrollment and graduation) from the performance evaluation of the Equitable Access and the impact evaluation of the Teacher Training subactivities compare to parameter estimates within the latest CBA model developed by MCC. In so doing, it will point to how any changes could potentially impact that CBA model's ERR.

However, note that the evaluations of these two subactivities will not estimate longer-term impacts on employment and earnings due to the timing of endline data collection. Additionally, it is also worth highlighting differences between the outcomes considered for the evaluations and those used to quantify the main benefit streams under the CBA. In particular, the current CBA model anticipates that the greatest gains of the Equitable Access subactivity are expected to accrue via increases in gross enrollment rates in targeted communities. Given its focus on the cohort of students that have successfully completed the primary education cycle in schools located in village clusters selected for CDP construction, the planned outcomes analysis of the Equitable Access subactivity will not shed light on the enrollment rate among the general population of youth in those villages clusters who are in the appropriate age range for the lower-secondary cycle. Nevertheless, we anticipate that tracking enrollment rates for this cohort of students will still generate useful insights for informing any subsequent updates to the current CBA model as it will shed light on educational attainment among students expected to benefit most directly from CDP construction.

E. Evaluation timeline, reporting schedule, and dissemination plan

The timing of the evaluation activities that we have proposed is based on our understanding of the rollout of the subactivities and our ability to provide information through the qualitative study that could be used by stakeholders in discussions at the end of the Compact. We provide an overview of the high-level implementation plan and our proposed timing for data collection for the impact evaluation and performance evaluation in Figure III.4. The timing may shift depending upon actual implementation. Document review will occur throughout the course of the evaluation.

Reporting schedule and dissemination plan. Mathematica will present baseline and endline evaluation findings to MCC and to stakeholders in Côte d'Ivoire following the delivery of each report. Mathematica will present baseline findings from the Equitable Access pre-post evaluation and Teacher Training impact evaluation at the end of 2025. This timing will enable us to report findings for all the baseline data

collected, except for the baseline teacher survey data for the cohorts at the new satellite campuses (which will not be collected until the end of 2025). We plan to deliver the baseline report without this cohort included to ensure MCC and MCA-CI receive baseline findings in a timely manner. Mathematica will present final findings from the impact evaluation of the Teacher Training subactivity and the final performance evaluation of all four subactivities at the end of 2030.

We plan to summarize findings in a concise format, which will make the results more readily accessible and usable to stakeholders and program planners throughout the life of the project. We will work with MCC to increase the visibility of the study's findings, particularly among education policymakers and development practitioners. We will also work closely with MCC and stakeholders to identify a variety of forums—including conferences, workshops, and publications—to share the results and encourage implementers and policymakers to integrate the findings into future interventions. For example, in addition to the project's full evaluation report, we will develop issue briefs summarizing and visualizing key findings from the final evaluation report for a broader audience of readers and stakeholders. Potential conferences for presenting evaluation findings will include forums hosted by the Comparative International Education Society, the American Evaluation Association, or the Association for Public Policy Analysis and Management. We will also seek to publish a peer-reviewed article disseminating the study's results in academic or sector-specific journals that are focused on education systems in developing countries.

Figure III.4. Implementation and evaluation timeline

School year (October to June)	19-20		20-21				21-22				22-23				23-24				24-25				25-26				26-27				27-28				28-29				29-30			
Year	**2019**		**2020**				**2021**				**2022**				**2023**				**2024**				**2025**				**2026**				**2027**				**2028**				**2029**				**2030**			
Quarter	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Implementation schedule for key activities																																										
Equitable Access subactivity																																										
Construction of CDPs - Tranche 1 (20 schools; classic construction)																																										
Construction of CDPs - Tranche 2 (10 schools; prefabricated)																																										
Teacher Training subactivity																																										
Revise ENS teacher training curriculum, pilot, & train trainers																																										
Two satellite campuses constructed and opened																																										
Improvements to supervision, inspection, and in-service training																																										
Gender Policy subactivity																																										
Management Systems subactivity																																										
Evaluation schedule																																										
Data collection schedule																																										
Qualitative data collection - equitable access focus groups																					ML																EL						
Qualitative data collection - teacher training focus groups																					ML																						
Qualitative data collection - teacher training interviews																																								EL			
Qualitative data collection - KIIs with other stakeholders																BL					ML																				EL			
Survey data collection - Equitable Access Tranches 1 and 2 (30 schools)																					BL																EL						
Survey data collection - Teacher Training Abidjan																			BL						ML								ML								EL			
Survey data collection - Teacher Training satelite campuses																											BL						ML								EL			
Classroom observation - Teacher Training (CDPs in Gbêkê and San Pedro)																																	ML								EL			
Administrative data requests									X				X				X				X				X				X				X				X				X			
Reporting schedule																																											
Baseline evaluation report																							BL																					
Final evaluation report																																											EL

Compact entry into force August 5, 2019
First cohort of students touched by new CDPs
Third cohort of teachers to be trained using improved ENS curriculum at Abidjan
Second cohort of teacher to be trained at new ENS campuses
End of Compact August 5, 2025 (extended)
First cohort of students graduates
Third cohort of teachers graduates
Second cohort of teachers graduates
BL = baseline; ML = midline; EL = endline

BL = baseline; CDP = *collège de proximité*; ENS = *École Normale Supérieure*; EL = endline; ML = midline.

F. Ensuring data quality

Mathematica, in partnership with MCA-CI and MCC, is committed to ensuring that the administrative data and the primary data collected for the evaluation meet the highest data quality standards so that the results used for advising policy are precise and reliable. There are several steps that we will undertake to ensure that data quality is maintained, including the following:

- **Evaluate quality of administrative data.** We will work with MCC and MCA-CI to provide specific requests for the administrative data required for the evaluation to the appropriate government ministries and departments in Côte d'Ivoire, including the specific variables, time period, and level of disaggregation requested. Once we receive the requested data, we will perform our own data checks to assess the completeness and quality of the data. As needed, we will work with MCC and MCA-CI to request supplemental data if the initial data received does not meet our quality standards. We will also perform data cleaning as needed to correct any irregularities or errors prior to analysis. In the event that the administrative data cannot pass our quality assurance checks, we will exclude it from the evaluation to ensure only high-quality, reliable data is used in our analyses.
- **Work with MCC and MCA-CI to hire the data collection firm.** We will work with MCC and MCA-CI to draft the terms of reference (ToR) for hiring a firm that will collect data during the Compact. We will help MCA-CI review the firm proposals and select the best firm based on the evaluation criteria set by MCA-CI. For data collection that will take place after the Compact has ended, we will competitively procure and hire a data collection firm directly. The procurement process will assess the firm's overall approach to collecting high-quality data, experience in collecting data in a similar context, and the expertise of the team leading the efforts. We will also review costs carefully to ensure they are reasonable and competitive, and we will check references to verify the prior performance of the firms.
- **Develop survey instruments building on best practices and existing tools.** We propose to draw on existing surveys and classroom observation protocols developed for the impact evaluations of MCC's school investments in Burkina Faso, Morocco, Georgia, and Niger. These projects included similar interventions, including infrastructure improvements, community engagement, teacher training, and management training for MENA staff. By adapting the existing surveys and protocols, we can save time and resources, while using instruments that have been proven in the field in similar contexts. We will also incorporate validated instruments used elsewhere where relevant.
- **Pilot the data collection instruments.** We will work with the data collection firm to conduct extensive pilot testing of all data collection instruments in French and appropriate local languages to identify any potential issues with the comprehension, flow, or cultural appropriateness of the instruments. We recommend that the pilot of the student survey take place in at least three villages and that the pilot for the teacher survey take place in at least two locations. The pilot test process includes training enumerators, piloting data collection, documenting any needed instrument changes, and providing cleaned data sets and instruments. All key staff from the data collection firm participate in the pilot.
- **Participate in data collection training.** We will support the data collection firm to ensure that the enumerator training workshop is comprehensive and includes an in-depth explanation of the questions on each instrument, highly detailed protocols, and practice exercises for training assessors and classroom observers. The enumerators will have an opportunity to practice using the instruments in the field during the training process. Training participants will be required to attend all sessions of the

workshop and demonstrate their acquisition of appropriate skills through supervised practices, exercises, or tests.

- **Provide guidance on data collection protocols.** We will provide guidance to MCC and MCA-CI during the Compact so that the data collection firm follows strict data collection protocols articulated in a well-written manual. For post-Compact data collection, we will work directly with the data collection firm to ensure the appropriate data collection protocols are in place. We will further develop detailed manuals for data entry and cleaning to reduce errors stemming from these processes. The manuals will include explanations of all survey questions, data collection protocols and procedures (for example, consent, guidelines for protection of human subjects, how to approach a respondent, building rapport, and follow-up procedures if schools require revisiting), and clear guidance on the administration of the student assessment and classroom observation.
- **Provide data quality assurance.** The data collection firm's ToR will require that data collection supervisors review each instrument and interview transcript immediately following the data collection process. Supervisors will require data collectors to return to respondents if they skipped any questions or if responses are ambiguous. Supervisors will also observe each assessor and observer during his or her first administration of the student assessment or classroom observation. They will retrain field staff or otherwise ameliorate difficulties if systematic problems are found. Mathematica and MCA-CI staff will also conduct quality assurance on the data collection process by observing interviews, assessments, and classroom observations.
- **Test data entry system.** Mathematica has experience using both electronic and paper-based data collection systems. If data collection is conducted on paper, the data collection firm will (i) develop the data entry system and provide a protocol for data entry and cleaning to Mathematica for approval; (ii) test the data entry system by entering pilot data and fix any problems that are identified; and (iii) manage double data entry of all instruments, run frequencies on all variables, and provide this information to Mathematica in electronic form. The data collection firm will send the data electronically to Mathematica for data checks after the first 5 percent of cases are entered. If data is collected electronically, the data collection firm should already possess the necessary hardware capabilities for conducting electronic data collection. The data collection firm will (i) test the electronic data collection system and fix any problems that are identified in the testing process and (ii) transmit the data electronically to Mathematica for review as soon as it has been collected in the field and reviewed by the firm's supervisors. Mathematica will also conduct random audits of a sample of instruments to ensure that the data collected and entered are reliable and accurate.

G. Challenges to the evaluation and mitigation strategies

We anticipate several risks to the evaluation, which we will carefully monitor and manage throughout the study period. Below we list the key challenges to the evaluation and strategies to mitigate those challenges to the extent possible.

- **Low statistical power for estimating changes in learning.** The Equitable Access evaluation may not have sufficient statistical power to detect relatively small changes in learning outcomes. We have discussed this limitation with MCC and confirmed that the primary outcome of interest is student enrollment; this is an outcome for which we propose to use descriptive trend analysis (and not regression analyses) to identify changes.

- **Spillover effects to nearby village clusters without CDPs.** It is possible that students living in unselected village clusters may benefit from the Equitable Access subactivity—in particular, students living in villages that are relatively close to a village cluster that did receive a CDP. This spillover of the Equitable Access intervention to nearby village clusters may result in an under or overestimate of the changes in key outcomes of interest associated with CDP construction if a large number of students in unselected village clusters end up enrolling in the new CDPs. Our qualitative interviews will help us determine the extent to which students from neighboring villages enroll in the new CDPs and contextualize our findings. In addition, if possible, we will use administrative school enrollment records to identify youth who live in unselected village clusters but are enrolled in one of the new CDPs. We will be able to identify them as a "crossover" youth and conduct separate analyses that account for the existence of this population to determine the impact of the subactivity on eligible youth.
- **Number of teachers trained by new ENS satellite campuses.** There is a strong possibility that the first few cohorts of teachers trained at the new ENS satellite campuses will be much smaller than the capacity of the campuses, and dropout rates may be higher than expected. These cohorts, therefore, may not be representative of teacher cohorts from the ENS satellite campuses in the long term, limiting the generalizability of our findings. Smaller cohort size could also result in smaller sample sizes for the teacher tracer study than anticipated, which may impact our ability to conduct certain subgroup analyses. We will closely monitor the situation as the new satellite campuses open. Baseline data collection will help us assess the size of the first two cohorts to be trained at the new satellite campuses, and we will adjust our evaluation design plans as needed based on the number of teachers being trained.
- **Implementation delays.** Delays in the implementation of any of the four subactivities could impact our proposed timeline for data collection, as it is based on implementation milestones. For example, we understand that the prefabricated CDPs to be constructed in Tranche 2 are arriving from abroad and delays in shipping could result in a delay of construction and implementation. Delays in the opening of the new CDPs would alter the timing of data collection for the Equitable Access pre-post evaluation. To mitigate this risk, we have proposed delaying data collection by one year, which will allow us to follow the second cohort of CM2 students to enroll in the new CDPs if there are no construction delays and the first cohort if delays force the schools to open a year later than anticipated. If there are delays in the finalizing the teacher training curriculum or opening of the new ENS satellite campuses, that could delay the training of the cohorts to benefit from the Teacher Training subactivity—which would impact the timeline of our teacher tracer study. We will continue to assume the current implementation timeline for the evaluation and make contingencies for delays that may arise over the next few years.

IV. ADMINISTRATION

A. Summary of IRB requirements and clearances

Mathematica will prepare and submit an IRB application for approval of the research and data collection plans. The application materials include three sets of documents: (1) a research protocol, which will draw heavily on the present design report and include more information about plans for protecting study participants' confidentiality and human rights; (2) copies of all data collection instruments; and (3) a completed IRB questionnaire that summarizes the key elements of the research protocol, plans for protecting participants' human rights, and possible threats to participants if their confidentiality were compromised. Based on prior experiences, we expect that the study will qualify for expedited review because it presents minimal risk to participants. If so, the IRB can typically review the application within one week of its submission.

IRB approval is valid for one year from the date of approval and must be renewed on an annual basis. We expect that the annual renewals will require minimal updates to the core application materials. In addition, if data collection instruments change substantially from those that the IRB approved, then we must reapply for approval. Small changes to the instruments (such as rewording or reordering of questions) do not require reapplication, but the finalized instruments must be submitted to the IRB for documentation.

After Mathematica drafts the IRB research protocol, we will coordinate with MCA-CI to ensure the data collector and local stakeholders agree on the data collection protocol. Because Mathematica will not have a contractual relationship with the data collector, the data collector's contract with MCA-CI must specify that it will abide by the IRB's recommendations. The data collector and Mathematica must also sign an IRB authorization agreement stating that the data collector will adhere to the IRB-approved data collection procedures and protocols.

B. COVID-19 risk mitigation measures

To ensure the safety and health of all staff, subcontracts, enumerators, and respondents, Mathematica will assess the COVID-19 related risk associated with each data collection activity and implement risk mitigation protocols in accordance with corporate and MCC guidelines and with respect to all local and national health ordinances. We will coordinate with MCA-CI to draft these protocols and ensure that they are incorporated into the data collector's contract with MCA-CI. Protocols may include limiting travel for Mathematica staff; conducting remote training and data collection when possible; compulsory wearing of masks by local staff, enumerators, and respondents; screening individuals for symptoms of COVID-19; routine hand washing; and social distancing of at least six feet between individuals. We will continue assessing the evolving health situation in Côte d'Ivoire prior to the first round of baseline data collection scheduled for 2023.

C. Data access, privacy, and documentation

After producing each of the baseline and endline reports, we will prepare corresponding de-identified data files and codebooks that can be made available to the public. These data files, user manuals, and codebooks will be de-identified according to the most recent guidelines set forth by MCC. The public use data files will be free of personal or geographic identifiers that would permit unassisted identification of individual respondents or their households. We will remove or adjust variables that introduce reasonable risks of

deductive disclosure of the identity of individual participants. Mathematica will remove all individual identifiers, including names, addresses, telephone numbers, government-issued identification numbers, and any other similar variables. We will also remove unique and rare data by using local suppression, replacing these observations with missing values instead. If necessary, we will also use top and bottom coding, which would set upper and lower bounds to remove outliers and would collapse any variables that make an individual highly visible (because of geographic or other factors, such as ethnic classifications or languages spoken) into less easily identifiable categories. We will introduce random errors into any gathered geographic data (for example, global positioning system or geographic information system coordinates), which would displace urban points from 0 to 2 kilometers, rural points from 0 to 5 kilometers, and an additional 1 percent of rural points from 0 to 10 kilometers. We would also introduce additional perturbation as deemed necessary. Data perturbation will take place in a manner that will not significantly degrade the data.

D. Evaluation team roles and responsibilities

Our team members have extensive experience in conducting mixed-methods evaluations, possess strong French language skills, and have experience working in Côte d'Ivoire and West Africa. **Mr. Matt Sloan** serves as technical advisor. He provides technical leadership and quality assurance. **Dr. Emilie Bagby** serves as program manager and education specialist for the evaluation and provides technical and methodological leadership as well as manages client and stakeholder communications and ensures the successful completion of the evaluation. In his role as economist and evaluation specialist, **Dr. Faraz Usmani** is responsible for the overall methodological design of the evaluation. **Dr. Audrey Moore**, who serves as qualitative researcher, is responsible for designing data collection instruments and methods and the implementation and oversight of qualitative data collection. As project analyst, **Ms. Margo Berends** contributes to the design of the evaluation and leads data collection, analysis, and reporting. Mathematica's in-country consultant, **Mr. Ezéchiel Abouro Djallo,** is a researcher and statistician who provides in-depth knowledge of the education sector in Côte d'Ivoire and helps us obtain administrative data, oversee quantitative data collection, and conduct interviews.

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APPENDIX A

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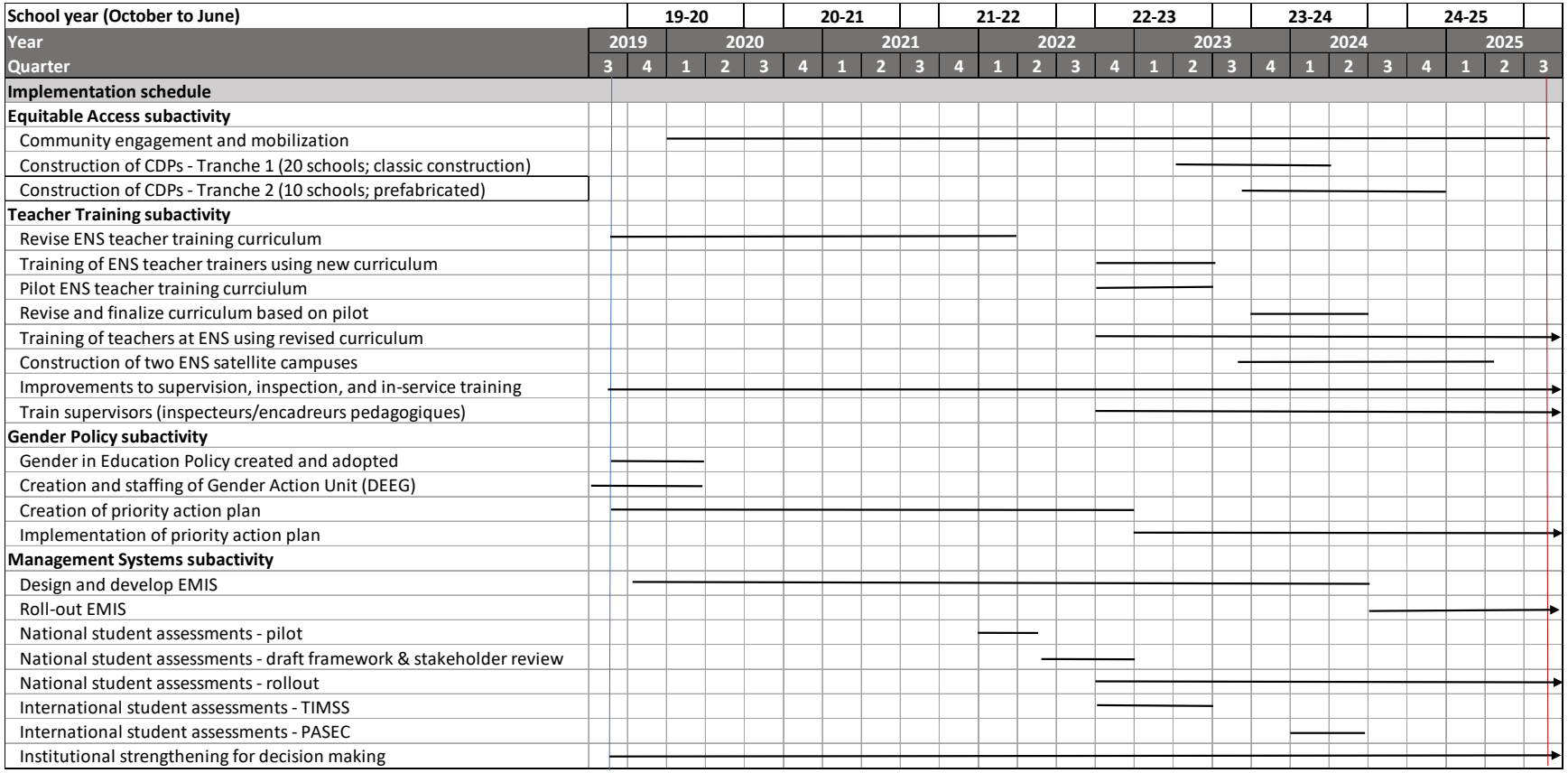
Figure A.1. Implementation schedule



CDP = *collège de proximité*; DEEG = *Direction de l'Egalité et de l'Equité du Genre*; ENS = *École Normale Supérieure*; EMIS = education management information system; PASEC = *Programme d'Analyse des Systèmes Educatifs de la CONFEMEN* ; TIMSS = Trends in International Mathematics and Science Study

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APPENDIX B

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Table B.1. Quantitative data sources for the evaluation

Subactivity	Data type	Source	Sample size	Timing	Outcomes/indicators
Equitable Access	Administrative	DESPS student-level data	All primary and lower secondary students in Gbêkê and San Pedro	Initial request for school years 2018/19-2021/22 Annual requests for school years 2022/23–2029/30	• Enrollment, attendance, promotion, transition, and dropout
		DECO student exam scores	All lower secondary students in Gbêkê and San Pedro	Initial request for school years 2014/15–2020/21 Annual requests for school years 2021/22–2028/29	• Student exam scores • Lower-secondary completion
		Population and Housing Census	All villages in Gbêkê and San Pedro	2014 data received 2021 data requested as soon as available	• Household- and community-level socioeconomic and demographic indicators
	Primary	Student skills assessments	1,200 youth (20 boys and 20 girls in each CM2 cohort in village clusters receiving a CDP)	Baseline 2025 Endline 2029	• Numeracy and literacy • Soft skills (such as critical thinking, self-esteem, self-control, perseverance, and social skills)
		Director surveys	30 directors (director of each newly constructed CDP)	Endline 2029	• Quality and use of infrastructure and equipment • Availability and skills of teachers
		Teacher surveys	150 teachers (5 teachers per new CDP)	Endline 2029	• Teacher skills and support received • Quality and use of infrastructure and equipment

Subactivity	Data type	Source	Sample size	Timing	Outcomes/indicators
		Infrastructure assessments	30 assessments (one per new CDP)	Endline 2029	• Availability and quality of infrastructure and equipment
Teacher Training	Primary	Teacher tracer survey	800 teachers	Baseline • Abidjan cohort: 2024 • Satellite campuses cohort: 2026 Midline • Abidjan cohort: 2026, 2028 • Satellite campuses cohort: 2028 Endline 2030	• KAPs regarding pedagogical innovations • Satisfaction with training • Employment status and type of job (including reasons for pursuing current employment) • Whether additional training was received and why • Reasons for not completing ENS training (if relevant)
		Classroom observation	475 teachers	Conducted near the end of the 2027-28 and 2029-30 school years	• Hours of instruction • Time on task • Use of pedagogical innovations from teacher training • Student time spent studying
	Administrative	DESPS student-level data	All lower secondary students in Côte d'Ivoire	Initial request for school years 2018/19-2021/22 Annual requests for school years 2022/23–2029/30	• Student enrollment, promotion, transition, and dropout
		ENS teacher-level data	All lower secondary teachers trained at all ENS campuses	Initial request for school years 2007/08–2021/22 Annual requests for school years 2022/23–2029/30	• Teacher enrollment and graduation from ENS
		CODIPOST teacher-level data	All lower secondary teachers in-service in Côte d'Ivoire	Initial request for school years 2007/08–2021/22 Annual requests for school years 2022/23–2029/30	• Number of teachers employed • Number of unfilled posts

Subactivity	Data type	Source	Sample size	Timing	Outcomes/indicators
Gender Policy	Administrative	DESPS student-level data	All lower secondary students in Côte d'Ivoire	Initial request for school years 2018/19-2021/22 Annual requests for school years 2022/23–2029/30	• Student enrollment, promotion, transition, and dropout
Management Systems	Administrative	MENA/EMIS data	All data in the system	Annual requests once the system is functional (likely 2024) through 2029/30	• Quality of data in the system (such as completeness, accuracy, and usability) • Enrollment, attendance, promotion, and transition among the cohort of students that completed primary school (those that complete CM2) in selected village clusters in the academic year prior to CDP construction • Student grade and exam scores (annual and end-of-cycle)

Note: For the Equitable Access subactivity, the primary data sample sizes depend on the final number of village clusters that will receive a new CDP and the number of villages within those village clusters. For administrative data for the Teacher Training subactivity, we will request historical data for as many years as are available, likely beginning in 2008 or 2010. CODIPOST is the human resources management system for teachers.

CDP = *collège de proximitè*; EMIS = Education Management Information System; DESPS = *Direction des Etudes, des Strategies, de la Planification et des Statistiques* (Directorate of Strategies, Planning and Statistics); DECO = *Direction des Examens et Concours ;* EMIS = education management information system; ENS = *École Normale Supérieure* (teacher training school).

Table B.2. Qualitative data sources for performance evaluation

Subactivity	Respondents	Sample size	Timing	Themes
All	**MCA-CI and local MCC staff KIIs**	7 interviews (MCC technical leads, MCA-CI subactivity leads, and GSI lead)	Baseline 2023 Midline 2025	• Perceptions of how the subactivities have been implemented • Strengths and weaknesses of the design, implementation, and performance of the subactivities • Implementation challenges • Sustainability of the interventions • Facilitators of and barriers to change • Examples of systems or processes that have changed; how and why they have changed • Changes to governance of gender in the education sector • Implementation of the Gender Policy priority action items in Gbêkê and San Pedro
All	**MENA staff KIIs**	Approximately 20 interviews (national and regional staff)	Baseline 2023 Midline 2025 Endline 2030	• Perceptions of how the subactivities have been implemented and integrated • Strengths and weaknesses of the subactivities • Implementation challenges • Sustainability of the interventions • Facilitators of and barriers to change • Examples of systems or processes that have changed; how and why they have changed • Implementation of the Gender Policy priority action items in Gbêkê and San Pedro • Changes to governance of gender in the education sector • Implementation of the EMIS and student assessments • Perceptions of quality of the EMIS and data • How data are being used to inform decisions on the management of the education sector, including funding

Subactivity	Respondents	Sample size	Timing	Themes
All	**Staff at implementing partners KIIs**	4–8 interviews (including staff from GOPA, C2D, and AETS)	Midline 2025	• Perceptions of implementation, successes and challenges • Sustainability of the interventions • Facilitators of and barriers to change • Examples of systems or processes that have changed; how and why they have changed
All	**Other donors in the sector**	2-3 interviews (such as UNICEF, World Bank, and/or AFD)	Endline 2030	• Awareness and perceptions of the subactivities, including perceived sustainability • Key donor activities in the secondary education sector and synergies with the subactivities
All	**Document review**	n.a.	Baseline 2023 Midline 2025 Endline 2030	• Implementation plans • Implementer quarterly and annual reports • Research studies conducted by implementers • Policy documents • Teacher supervision reports • Policy changes and their implementation
Equitable Access	**GSC FGDs**	6 focus groups (1 in each of 6 village clusters)	Midline 2025	• Perceptions of implementation, particularly construction and community engagement, successes and challenges • Attitudes and perceptions of the quality of the CDPs
Equitable Access; Gender Policy	**Students/ school-aged youth FGDs**	12 focus groups (1 male and 1 female FGD in each of 6 village clusters)	Endline 2029	• How students have improved their reading, math, and soft skills • How students' interest in STEM fields has changed (particularly for girls) • Why students decide to remain in school or dropout • What the biggest changes in the quality of schooling are and why • Students' educational plans and reasoning behind the plans

Subactivity	Respondents	Sample size	Timing	Themes
				• Perceptions of the school environment, particularly as it relates to gender • Attitudes about and experiences of gender equality in the classroom
Equitable Access; Gender Policy	**Parent, COGES, and CMEF FGDs**	24 focus groups (in each of 6 village clusters: 1 FGD with COGES members, 1 FGD with CMEF members, 1 FGD with male parents, 1 FGD with female parents)	Endline 2029	• Barriers to and facilitators of access to secondary education • Attitudes and perceptions about lower secondary education and quality • Attitudes about students, and girls in particular, attending lower secondary school • Existence of school cooperatives, clubs and associations, and the extent to which students participate in activities they offer • Parental/community involvement in school activities (including activities that facilitate teachers' integration into communities and community members' contributions to school operations, e.g., canteens) • Parental perspectives on changes in student behavior, goals, and ambitions • Parental expectations of a student's future • Parental knowledge of a student's school performance (grades, assessment results)
Equitable Access; Gender Policy	**Teacher interviews (open-ended questions added to Equitable Access teacher survey; Gbêkê and San Pedro)**	150 interviews (5 teachers per CDP; included as open-ended questions in teacher survey)	Endline 2029	• Why a teacher decides to retain their post or switch posts • How the subactivity has influenced community members' perceptions about lower secondary education • Teacher's perceptions of the continued support they received in-service • Role teachers play in monitoring and supervising student initiatives launched by school cooperatives, clubs and associations • How the school environment has changed a result of the Gender Policy priority action items

Subactivity	Respondents	Sample size	Timing	Themes
				• Attitudes about gender equality in the classroom
Equitable Access; Gender Policy; Management Systems	**School director interviews (open-ended questions as part of Equitable Access director survey; Gbêkê and San Pedro)**	30 interviews (director of each newly constructed CDP; included as open-ended questions in director survey)	Endline 2029	• How changes to teacher training curriculum, supervision, and in-service training have influenced teachers' integration into communities (e.g., communication with community leaders) and their relationship to school operations (e.g., participation in COGES) • How data are used to inform school management, needs, and performance (in particular, budgeting, assessment, and accountability) • Role school directors play in student life (including accessibility to students and contributions to school activities) • Effects of expanded support for teacher supervision (including school visits by inspectors, and availability of structured teacher- and school-level support) • How school environment has changed a result of the Gender Policy priority action items • Attitudes about gender equality in the classroom • Facilitators of and barriers to change
Teacher Training; Gender Policy	**Teachers who received pre-service training FGDs (ENS campuses)**	6 focus groups (1 male and 1 female FGD at each ENS campus)	Midline 2025	• How well the pre-service training has prepared teachers to begin teaching • How the pre-service training has influenced teaching plans (for example, what subjects they plan to teach, where they want to teach) • How the pre-service training has influenced perceptions relating to teaching • Availability and use of STEM classroom materials and equipment during teaching • What factors influenced female teacher's interest in teaching STEM fields • What are the specific challenges facing bivalent (dual subject) teachers

Subactivity	Respondents	Sample size	Timing	Themes
Teacher Training; Gender Policy	**Teacher KIIs (national)**	12 teachers who graduated from the three ENS campuses after the new curriculum was implemented (4 from each campus; 6 male and 6 female) 12 teachers who graduated from the ENS prior to the curriculum improvements	Endline 2030	• How well the pre-service training prepared teachers to begin teaching • Teacher's perceptions of the in-service supervision, inspection, and training (and changes to these systems for those who graduated from the ENS prior to 2023) • Attitudes about gender equality in the classroom • Why a teacher decides to retain their post or switch posts • How the school environment has changed a result of the Gender Policy priority action items
Teacher Training; Gender Policy	**Teacher interviews (open-ended questions as part of the teacher tracer survey; national)**	800 interviews (included as open-ended questions in teacher tracer survey)	Baseline 2024, 2025 Endline 2030	• How well the pre-service training prepared teachers to teach • How the in-service training and supervision program supports ongoing training for teachers • Why teachers decide to retain their post or switch posts • Teachers' interest in continuing to serve as bivalent teachers • How teachers have applied the teaching methods they learned; what facilitated or hindered application • How (through examples) teachers assist students to learn and use soft skills
Teacher Training; Gender Policy	**ENS and INJS staff KIIs**	Approximately 12 interviews (director of each ENS campus and 5 instructors per campus; director and 1 instructor from INJS)	Midline 2025 Endline 2030	• Perceptions of how the Teacher Training subactivity was implemented • Influence of the training program on female teachers' interest in teaching STEM fields • Strengths and weakness of the Teacher Training subactivity • Perceptions of the new satellite campuses • Perceptions of the quality of pre-service teacher training • Perceptions of how the subactivity influenced teacher KAPs
Teacher Training	**CIFE KIIs**	Approximately 5 interviews	Midline 2025	• Perceptions of implementation, successes and challenges

Subactivity	Respondents	Sample size	Timing	Themes
			Endline 2030	• Sustainability of the interventions • Facilitators of and barriers to change • Examples of systems or processes that have changed; how and why they have changed
Teacher Training	**Inspector and supervisor KIIs**	12 interviews (6 with inspectors and 6 with supervisors)	Midline 2025 Endline 2030	• How the supervision/inspection program has changed as a result of the subactivity • Perceptions of how the subactivity influenced teacher KAPs • Perceptions of how the Gender Policy subactivity influenced teacher KAPs

CDP = *collège de proximité*; CMEF = *Club de Mères d'Elèves Filles* (Club for Mothers of Girls); CIFE = *Comité Interministériel pour la Formation des Enseignants du Premier Cycle du Secondaire* (Interministerial Committee for Lower Secondary School Teacher Training); COGES = Comité de Gestion des Établissement Scolaires (School Management Committee); EMIS = education management information system; ENS = *École Normale Supérieure*; FGD = focus group discussion; GSC = *Groupes de Soutien à la Construction* (Construction Support Groups); GSI = gender and social inclusion; INJS = *Institut National de la Jeunesse et des Sports*; KAPs = knowledge, attitudes, and practices; KII = key informant interview; MCA-CI = Millennium Challenge Account-Côte d'Ivoire; MCC = Millennium Challenge Corporation; MENA = *Ministère de l'Education Nationale et de l'Alphabétisation*; n.a. = not applicable; STEM = science, technology, engineering, and math.

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APPENDIX C

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Evaluation Gender Type

Background

MCC originally developed the following typology to document which of its independent evaluations produced "gender data" in accordance with its 2015 commitment to publish all such data in support of the Data 2X initiative. These categories were later included in the agency's Women's Economic Empowerment Learning Agenda, which was adopted in 2019, to help identify and consolidate findings about the extent to which gender issues have been incorporated into the design, implementation, evaluation, and learning related to MCC's investments.

A Gender Type will be assigned by the MCC Evaluation Management Committee (EMC) for each MCC evaluation at two points in time:

1. Upon approval of Evaluation Design Reports (EDRs)
2. During review of final evaluation reports in case changes to the program or evaluation have implications for the original assignment

This assignment will be recorded in MCC's evaluation pipeline database for management and reporting purposes.

Definitions of MCC's Gender Types

- **Type 1**: Gender is/was part of the logic and evaluation design of the program being evaluated
- **Type 2**: Gender is/was not part of the logic of the program being evaluated, but the evaluation design incorporates gender issues, e.g., in the evaluation questions or data collection methods
- **Type 3**: Gender is/was not part of the logic or evaluation design of the program being evaluated, but sex-disaggregated data will be/were collected
- **Type 4**: Gender is/was not part of the logic or evaluation design of the program being evaluated, and sex-disaggregated data will not be/were not collected
- **N/A**: This applies if interventions will not be evaluated or if an evaluation is canceled before an Evaluation Design Report has been approved

Assigned Gender Type

At the time of Evaluation Design Report completion, the EMC determined the Cote d'Ivoire Secondary Education Activity evaluation's Gender Type to be Type 1 based on the definitions above and the fact that this Activity includes the Gender in Education Policy and Institutional Strengthening Sub-Activity, which strives to reduce or mitigate gender disparities in the Ivorian education system. This Sub-Activity is incorporated in the Activity's logic and the success of the Sub-Activity's targeted outcomes will be assessed as part of the evaluation design.

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