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IDA/R2017-0285/1

August 10, 2017

Closing Date: Tuesday, August 29, 2017 at 6:00 p.m.

FROM: Vice President and Corporate Secretary

Zambia - Education Enhancement Project

Project Appraisal Document

Attached is the Project Appraisal Document regarding a proposed credit to Zambia for an Education Enhancement Project (IDA/R2017-0285), which is being processed on an absence-of-objection basis.

Distribution:
Executive Directors and Alternates
President
Bank Group Senior Management
Vice Presidents, Bank, IFC and MIGA
Directors and Department Heads, Bank, IFC and MIGA

Document of
The World Bank

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Report No: PAD1859

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF SDR 43.2 MILLION
(US$60 MILLION EQUIVALENT)

TO THE

REPUBLIC OF ZAMBIA

FOR AN

EDUCATION ENHANCEMENT PROJECT

August 8, 2017

Education Global Practice
Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective June 30, 2017)

Currency Unit	=	New Zambian Kwacha (ZMW)
ZMW 9.17	=	US$1
SDR 0.71870575	=	US$1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

CDC	Curriculum Development Center
CDD	Community-Driven Development
CoE	College of Education
CPS	Country Partnership Strategy
CSO	Central Statistical Office
DA	Designated Account
DEBS	District Education Board Secretaries
DLI	Disbursement-Linked Indicator
DP	Development Partner
ECZ	Examinations Council for Zambia
EEP	Eligible Expenditure Program
eGP	e-Government Procurement
EMIS	Education Management Information System
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environment and Social Management Plan
FA	Financing Agreement
FM	Financial Management
GDP	Gross Domestic Product
GEWEL	Zambia Girls Education and Women's Empowerment Project
GPS	Global Positioning System
GRS	Grievance Redress Service
GRZ	Government of the Republic of Zambia
ICT	Information and Communication Technology
IE	Impact Evaluation
IFMIS	Integrated Financial Management Information System
IFR	Interim Financial Report
IMF	International Monetary Fund
IPF	Investment Project Financing
IPR	Independent Post Review
IRR	Internal Rate of Return
IVA	Independent Verification Agency
JICA	Japan International Cooperation Agency
LCMS	Living Conditions Monitoring Survey
LFS	Labor Force Survey

LTA	Long-Term Agreement
M&E	Monitoring and Evaluation
MHM	Menstrual Hygiene Management
MoF	Ministry of Finance
MoGE	Ministry of General Education
MoHID	Ministry of Housing and Infrastructure Development
MoNDP	Ministry of National Development Planning
NAP	National Assessment Program
NAS	National Assessment Surveys
NIF	National Implementation Framework
NLA	National Learning Assessment
NPF	New Procurement Framework
NPV	Net Present Value
NSC	National Science Center
ONB	Open National Bidding
PAD	Project Appraisal Document
PDO	Project Development Objective
PEO	Provincial Education Office
PER	Public Expenditure Review
PETS	Public Expenditure Tracking Survey
PIC	Project Implementation Committee
PIM	Project Implementation Manual
PISC	Project Implementation Steering Committee
PIU	Project Implementation Unit
PMIS	Procurement Management Information System
PPA	Public Procurement Act
PPR	Procurement Post Review
P-RAMS	Procurement Risk Assessment and Management System
PPSD	Project Procurement Strategy for Development
PS	Permanent Secretary for Education
PSU	Procurement and Supply Unit
PTA	Parent-Teacher Association
QSDS	Quantitative Service Delivery Survey
RBF	Results-Based Financing
RCT	Randomized Control Trial
S&C	Directorate of Standards and Curriculum
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SBCPD	School Based Continuing Professional Development
SD	Standard Deviation
SNDP	Seventh National Development Plan
SoE	Statement of Expenditure
SORT	Systematic Operations Risk-Rating Tool
SPRINT	School Program of In-Service for the Term
STEP	System for Tracking Exchanges in Procurement
SW	Staff Weeks

TA	Technical Assistance
TCZ	Teaching Council of Zambia
TDDP	Teacher Development Data Platform
TESS	Directorate of Teacher Education and Specialized Services
TGM	Teacher Group Meeting
ToR	Terms of Reference
TVET	Technical and Vocational Education and Training
UNZA	University of Zambia
WA	Withdrawal Application
VfM	Value for Money
ZEEP	Zambia Education Enhancement Project
ZEPIU	Zambia Education Project Implementation Unit
ZPPA	Zambia Public Procurement Agency

Regional Vice President:	Makhtar Diop
Country Director:	Paul Noumba Um
Senior Global Practice Director:	Jaime Saavedra Chanduvi
Practice Manager:	Halil Dundar
Task Team Leader:	Xiaonan Cao

ZAMBIA

EDUCATION ENHANCEMENT PROJECT

Table of Contents

PAD DATA SHEET

Zambia

Zambia Education Enhancement Project (P158570)

PROJECT APPRAISAL DOCUMENT

AFRICA

Education Global Practice

Report No.: PAD1859

Basic Information			
Project ID P158570	EA Category B - Partial Assessment		Team Leader(s) Xiaonan Cao
Financing Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]		
Project Implementation Start Date 29-Aug-2017	Project Implementation End Date 31-Oct-2022		
Expected Effectiveness Date 01-Oct-2017	Expected Closing Date 31-Oct-2022		
Joint IFC No			
Practice Manager/Manager Halil Dundar	Senior Global Practice Director Jaime Saavedra Chanduvi	Country Director Paul Noumba Um	Regional Vice President Makhtar Diop

Borrower: Ministry of Finance			
Responsible Agency: Ministry of General Education			
Contact:	Henry Tukombe	Title:	Permanent Secretary
Telephone No.:	260975255590	Email:	dennisctukombe3@gmail.com

Project Financing Data (in USD Million)					
[ ]	Loan	[ ]	IDA Grant	[ ]	Guarantee
[X]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	204.00	Total Bank Financing:	60.00
Financing Gap:	0		

Financing Source	Amount
BORROWER/RECIPIENT	144.00
International Development Association (IDA)	60.00
Total	204.00

Expected Disbursements (in USD Million)

Fiscal Year	2018	2019	2020	2021	2022	2023
Annual	6.50	15.00	16.00	7.50	8.00	7.00
Cumulative	6.50	21.50	37.50	45.00	53.00	60.00

Institutional Data

Practice Area (Lead)

Education

Contributing Practice Areas

Proposed Development Objective(s)

The project development objective is to improve the quality of teaching and learning in mathematics and science in targeted primary and secondary schools and to increase equitable access to secondary education.

Components

Component Name	Cost (USD Millions)
Improving the Quality of Teaching and Learning	160.50
Increasing Equitable Access to Secondary Education	28.50
Enhancing Planning, Management and Monitoring and Evaluation Capacity, and Project Coordination	15.00

Systematic Operations Risk- Rating Tool (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Moderate
8. Stakeholders	Moderate
9. Other	
OVERALL	Substantial

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No [ ]
Is approval for any policy waiver sought from the Board?	Yes [ ]	No [ ]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	**Yes**	**No**
Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04		**X**
Forests OP/BP 4.36		**X**
Pest Management OP 4.09		**X**
Physical Cultural Resources OP/BP 4.11		**X**
Indigenous Peoples OP/BP 4.10		**X**
Involuntary Resettlement OP/BP 4.12		**X**
Safety of Dams OP/BP 4.37		**X**
Projects on International Waterways OP/BP 7.50		**X**
Projects in Disputed Areas OP/BP 7.60		**X**

Legal Covenants

Name	**Recurrent**	**Due Date**	**Frequency**
Project Implementation Steering Committee (FA, Schedule 2, Section I.A.1.)		1-Nov-2017	

Description of Covenant

The Recipient, not later than 30 days after the Effectiveness Date, shall create and thereafter maintain a steering committee (the Project Implementation Steering Committee), at all times during Project implementation, with a structure, functions and responsibilities acceptable to the Association, which shall be responsible for overall Project oversight and guidance. The Project Implementation Steering Committee shall be chaired by the Permanent Secretary of Education and shall include as members: (i) decision-making representatives from participants provincial and district education offices; (ii) representatives from relevant departments/units of MoGE, including the Director for Planning and Information, the Director for Teacher Education and Specialized Services, and the Director for Standards and Curriculum; (iii) the Ministries of Finance, National Development Planning and Housing and Infrastructure Development; and (iv) the chief coordinators responsible for each component, as well as the Project coordinator.

Name	Recurrent	Due Date	Frequency
Project Implementation Unit (PIU) (FA, Schedule 2, Section I.A.3.)		01-Jan-2018	

Description of Covenant

(i) Not later than 90 days after the Effectiveness Date, the Recipient shall create and thereafter maintain the PIU within the MoGE, with a structure, equipment, functions and responsibilities acceptable to the Association, including, inter alia, the responsibility of the PIU to assist the Recipient in the day-to-day management of all Projects activities, including technical supervision and coordination, overall Project planning, quality oversight, communication, reporting, procurement, financial management, safeguards management, and monitoring of Project activities.
(ii) The Recipient shall ensure that the PIU is headed by a Project coordinator and staffed, at a minimum, with a financial management specialist, a procurement specialist, an accountant, a safeguards specialist, a monitoring and evaluation officer, a communications specialist and technical specialists, and administrative staff, all hired with terms of reference, through competitive processes, in numbers and with qualifications and experience acceptable to the Association.

Name	Recurrent	Due Date	Frequency
Project Implementation Manual (FA, Schedule 2, Section I.A.4.)		01-Nov-2017	

Description of Covenant

i) Not later than 30 days after the Effective Date, the Recipient shall prepare and thereafter ensure that the Project is implemented in accordance with the provisions of a manual satisfactory to the Association ("Project Implementation Manual"), which shall include the following provisions: (a) institutional coordination and day-to-day execution of the Project; (b) Project budgeting, disbursement and financial management; (c) procurement; (d) monitoring, evaluation, reporting and communication of Project activities; (e) eligibility criteria for selection of pilot schools under Part 1 and 2 of the Project; (f) terms of reference for the selection of the Independent Verification Entity as well as the protocol for the verification of achievement of DLIs; (g) criteria for the selection of communities for Part 2 of the Project; and (h) such other administrative, financial, technical, and organizational arrangements and procedures as shall be required for the Project.
(ii) The Recipient shall not amend, abrogate, waive or fail to enforce any provision of the Project Implementation Manual without the prior written agreement of the Association; provided, however, that in case of any conflict between the arrangements and procedures set out in the Project Implementation Manual and the provisions of the Financing Agreement, the provisions of the Financing Agreement shall prevail.

Name	Recurrent	Due Date	Frequency
Independent Verification (FA, Schedule 2, Section I.C.)		01-April-2018	

Description of Covenant

For purposes of carrying out Parts 1 and 2 of the Project, the Recipient shall:
1. no later than six months after the Effective Date, select, hire and retain an Independent Verification Entity with qualifications and experience, and under terms of reference acceptable to the Association, in accordance with Section III of this Schedule;
2. cause the Independent Verification Entity to: (a) carry out a periodical technical verification of the level of achievement of the DLIs; and (b) (i) prepare Independent Verification Reports covering a period of one calendar quarter, of such scope and detail as set forth in the Project Implementation Manual, and (ii) furnish each Independent Verification Report, no later than forty-five (45) days after the end of each calendar quarter; and
3. no later than thirty (30) days after the receipt of each Independent Verification Report, forward to the Association each said report.

Conditions

Source of Fund	Name	Type
IDA	Disbursement Conditions (FA, Schedule 2, Section IV.B.1.)	Disbursement

Description of Condition

Notwithstanding the provisions of Part A of this Section, no withdrawal shall be made:

(a) for payments made prior to the date of this Agreement, except that withdrawals up to:
  (i) an aggregate amount not to exceed SDR 1,300,000 may be made for payments made prior to this date but on or after March 1, 2017, for Eligible Expenditures under Category (1); and
  (ii) an aggregate amount not to exceed SDR 7,340,000 may be made for payments made prior to this date but on or after March 1, 2017, for Eligible Expenditures under Category (2); and

(b) additionally under Category (2) unless and until the Recipient has furnished to the Association: (i) evidence, in form and substance satisfactory to the Association, that the respective DLIs specified in the table in Schedule 4 have been met and verified in accordance with Section I.C.2 of this Schedule; (ii) evidence of actual expenditures under the Eligible Expenditure Program ("EEP") to which the DLIs are attributed to and evidence that the expenditures have been verified in accordance with the Project Implementation Manual and the provisions of Section I.C.2 of this Schedule; and (iii) an EEP withdrawal application for said DLIs, in form and substance satisfactory to the Association.

Team Composition				
Bank Staff				
Name	**Role**	**Title**	**Specialization**	**Unit**
Xiaonan Cao	Team Leader (ADM Responsible)	Senior Education Specialist	Education Development	GED13
Wedex Ilunga	Procurement Specialist (ADM Responsible)	Senior Procurement Specialist	Procurement	GGO01
Lingson Chikoti	Financial Management Specialist	Financial Management Specialist	FM	GGO25
Charity Inonge Mbangweta	Team Member	Team Assistant	Team Assistant	AFMZM
Elif Yonca Yukseker	Team Member	Program Assistant	Program Assistant	GED13
Eliot Kalinda	Team Member	Consultant	Procurement	GHN01
Erica Renee Gallardo	Team Member	Consultant	Textbook Mgmt	GED13
George Sibanyama	Team Member	Consultant	Civil Engineering	GED13
Maiada Mahmoud Abdel Fattah Kassem	Team Member	Finance Officer	Loan & Disbursement	WFALA
Majbritt Fiil-Flynn	Social Safeguards Specialist	Consultant	Social Safeguards	GSU07
Margaret Png	Team Member	Lead Counsel	Legal	LEGAM
Mariana Margarita Montiel	Team Member	Senior Counsel	Legal	LEGAM
Mupuwaliywa Mupuwaliywa	Team Member	Consultant	Economic Analysis & Teacher Training	GED13
Mwansa Lukwesa	Environmental Safeguards Specialist	Environmental Specialist	Safeguards	GEN01
Nathalie S. Munzberg	Safeguards Advisor	Regional Safeguards Adviser	Regional Safeguards Adviser	OPSES
Seo Yeon Hong	Team Member	Consultant	Economic Analysis & Teacher Training	GED13
Sue Ellen Berryman	Team Member	Consultant	M&E	GED05
Tsuyoshi Fukao	Team Member	Education Spec.	Textbook Mgmt	GED02

Extended Team			
Name	**Title**	**Office Phone**	**Location**

Locations					
Country	**First Administrative Division**	**Location**	**Planned**	**Actual**	**Comments**

Consultants (Will be disclosed in the Monthly Operational Summary)	
Consultants Required?	Consultants will be required.

I. STRATEGIC CONTEXT

A. Country Context

1. Zambia is a large landlocked country of 752,600 km,[1] of which 56 percent is arable, located in southern Sub-Saharan Africa. As a lower-middle-income country**,** Zambia has a relatively stable macroeconomic environment largely because of improved macroeconomic policies since the mid-1990s. Increased copper prices produced average annual growth rates in gross domestic product (GDP) of about 7.6 percent between 2004 and 2014. In 2014, GDP was estimated at US$27.07 billion, equating to a per capita income of around US$1,721. The country has an open economy, sharing borders with eight countries that serve as an expanded market for its traded goods and as routes for international and regional trade. It is a democracy that is considered one of the most politically stable countries in Africa. The majority (58 percent) of the population of 15.5 million lives in predominantly rural areas, although the pace of urbanization has been increasing. With an estimated annual population growth rate of 2.8 percent, the total population is expected to double by 2041. At the time of the last population census in 2010, 46.4 percent of the population was below 15 years of age, numbers that challenge the education system and ultimately the absorptive capacity of the Zambian labor market.

2. **Despite its stable economic environment and recent growth, its dependence on copper exports posed challenges to the economy when copper prices began falling in 2011 and exports declined.** The slowdown in growth has reflected the tough external conditions, including low global demand for commodities, lower copper prices, and tight global financial conditions. Domestic challenges included frequent electricity outages that intensified in mid-2015 and a tight monetary policy that increased the cost of borrowing and constrained credit growth.[2] In addition, in 2016, high government consumption, driven by spending on subsidies and the general elections, has crowded out both private consumption[3] and public investments.

3. **In recent years, the Zambian economy has shifted away from agriculture.** Services and the non-mining industry were the key drivers of growth of non-mining GDP, with an average annual growth of 6.3 percent between 2004 and 2015. Meanwhile, the agriculture sector has grown more slowly than other sectors, and its share of GDP declined from 26 percent in 1996 to 8 percent in 2015. Still, about half of Zambians work in agriculture and about 80 percent of the poor in the country are farmers. Given that this sector contributes less than 10 percent to GDP, low productivity in agriculture is driving the country's high poverty levels. Between 2005 and 2008, the annualized average growth in value-added per employee in agriculture in Zambia was a negative 5.2 percent. Only after 2008 did the average labor productivity in agriculture grow, partly because labor shifted out of agriculture into services and industry. Poor farmers' low levels of education and skills are considered a main contributor to the low productivity of the agricultural

[1] World Bank. 2014. *Promoting Trade and Competiveness: What Can Zambia Do?*

[2] Smith, Gregory, Fiona Davies, and Zivanemoyo Chinzara, 2016. *Beating the Slowdown in Zambia: Reducing Fiscal Vulnerabilities for Economic Recovery*. Washington, D.C: World Bank. http://documents.worldbank.org/curated/en/858561475214134326/Beating-the-slowdown-in-Zambia-reducing-fiscal-vulnerabilities-for-economic-recovery

[3] Bank of Zambia. 2016. 'Monetary policy statement', November 15, 2016.

sector. As of 2014, the proportion of people working in agriculture, who have no education, was at least twice as high as those employed in any other sector and was often three to five times higher.

4. **The economic growth has not translated into commensurate improvements in living standards, as indicated by a Gini coefficient of 0.56 in 2015.** The benefits of economic growth, to date, have accrued mainly to the population in urban areas. Indeed, the levels of poverty and inequality increased in Zambia during the period of growth, especially in rural areas.[4] The poverty rate in Zambia is 54.4 percent, which is high relative to other Sub-Saharan Africa countries. While a recent survey[5] found that urban areas in the country have experienced a slight decline in poverty, in rural areas the rate of poverty has increased from 73.6 percent in 2010 to 76.7 percent in 2015, with the rates of extreme poverty increasing from 54.2 percent to 60.8 percent during the same period. While the rural population accounts for 58 percent of the country's total population, it accounts for 82 percent of the poor and 87 percent of the extremely poor. In addition, there are important regional disparities in poverty.[6]

5. **To promote inclusive growth, Zambia needs to provide equal human capital opportunities for the poor.** In the United Nations Development Programme 2015 Human Development Index, Zambia ranked 139 out of 188 countries. Zambians face unequal opportunities in education and health, as well as unequal access to services. The majority of the working-age population (between the ages of 15 and 65) has a low level of education, with 46 percent having attained some secondary education without completion and only 4 percent having completed secondary or tertiary education. Women's educational attainment is lower than that of men.[7] A large portion (92 percent) of the population that is not pursuing education is active in the labor market. However, although real GDP grew annually, on average, by 7.6 percent between 2004 and 2014,[8] the International Labour Organization (ILO) estimates that employment grew only 3.1 percent annually. Lack of opportunities for access to quality basic education, especially among women and those living in rural areas, constitutes a substantial obstacle to increasing productivity and diversifying the economy toward sectors that generate more jobs than the extractive sector.

6. **The Government of the Republic of Zambia (GRZ) has launched its new Seventh National Development Plan (SNDP, 2017–2021) to move Zambia toward its goal of becoming an upper-middle-income country.** [9] The new SNDP is focused on four strategic areas: diversifying and making economic growth inclusive, enforcing socially and environmentally sustainable development principles, improving competitiveness and innovation, and strengthening governance mechanisms and institutional capacities for sustained development. To progress toward its strategic goals, the SNDP identifies four specific objectives: diversify and make economic growth inclusive; enhance human development; reduce poverty, inequality, and vulnerability; and create an enabling business environment for entrepreneurship and private sector development to boost sustainable economic growth and job creation. The SNDP sees increased

[4] World Bank. 2016. *Zambia Jobs Diagnostic.*
[5] Zambia Central Statistical Office. 2015. *2015 Living Conditions Monitoring Survey (LCMS).*
[6] Zambia Central Statistical Office. 2015. *2015 Living Conditions Monitoring Survey (LCMS.*
[7] Based on the analysis using the Labor Force Survey (LFS) 2014 data.
[8] World Bank. 2016. *Beating the Slowdown: Making Every Kwacha Count*, 7th Economic Brief, Lusaka.
[9] Although it is under development, the National Implementation Framework (NIF) for the education sector is not yet available. However, it will constitute a road map for achieving the SNDP's objectives for education.

and more equitable access to substantially better quality education as instrumental to achieving both its strategic and specific objectives.

B. Sectoral and Institutional Context[10]

7. The GRZ has shown its strong commitment to education, as indicated by the national education budget for 2015 that exceeded 20 percent of total government expenditures. As a result, the education network has expanded, and enrollment has increased at all levels of education in Zambia for more than a decade. In the post-Millennium Development Goals era, public education financing is gradually shifting toward post-primary education to accommodate the growing demand for secondary education and higher education. A recent structural reform converted basic education (Grades 1–9) to primary education (Grades 1–7) and high school education (Grades 10–12) to secondary education (Grades 8–12).[11] The sector has also decentralized primary education to local authorities, started to implement a new competency-based curriculum, and emphasizes mathematics and science teaching and learning as important in supporting the country's economic diversification and increasing productivity.

8. **Despite relatively high levels of public investment, the education sector has a mixed record in terms of its access and learning achievement goals and the efficiency and equity with which these goals are pursued.** The country has achieved strong enrollment rates at the primary level (Grades 1–7). By 2015, the net enrollment and completion rates for primary education had reached a notable 89 and 86 percent, respectively.[12] Nonetheless, about 15 percent of those of primary school age (7–13 years) are out of school, and almost a quarter of children from the lowest income families are out of school.[13] There was a spike in repetition rates in Grades 7 and 9 in 2015, the grades before transitioning to the next level of education. However, the average annual repetition rate across the primary and secondary grades is less than 6 percent and does not vary by gender. Dropout rates are very low—less than 2 percent across the primary and secondary grades. However, especially in rural areas, girls drop out at higher rates than boys, starting in Grade 7, mostly due to pregnancy and early marriage.

9. **Student learning outcomes are persistently low and this is of major concern to the Government.** Despite relatively high levels of investment in the sector, the National Assessment Program (NAP) reports consistently low and flat student test scores in English and mathematics for Grade 5 students for the past 15 years.[14] Results from the 2007 Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) for Grade 6 students are also

[10] Analysis of the education sector is mostly based on two World Bank documents, 2016: *Education Sector Public Expenditure Tracking and Service Delivery Survey in Zambia* and the *Education Public Expenditure Review in Zambia.*

[11] General education in Zambia covers 12 grades: Primary education (Grades 1–7) and secondary education (Grades 8–12), which includes lower secondary education (Grades 8–9) and upper secondary education (Grades 10–12).

[12] Zambia. 2015 Educational Statistical Bulletin.

[13] World Bank. 2016. *Education Sector Public Expenditure Tracking and Service Delivery Survey in Zambia.* Figure 4.7, page 37.

[14] Zambia NAP's learning assessment survey reports, 1999–2014.

consistent with those from Zambia's NAP. Zambia performed at the bottom among the 15 participating African countries on mathematics.[15]

10. In 2014, the performance of students in Grades 5 and 9 was low in all subjects, regardless of student or school characteristics (Table 1). In particular, students' weak performance in mathematics and science is considered to threaten the achievement of the Government's Vision 2030. This strategy envisions Zambia becoming an upper-middle-income country by 2030, requiring that school leavers have the knowledge and skills to drive the technological development essential for economic growth.

Table 1. Learning Outcomes by Grade, Subject, Gender, School Location, and Family Income Tercile (2014)*

Grade by Subject	All Students and by Gender			Urban/Rural		Province		Family Social Economic Status by Income Tercile		
	All	Male	Female	Urban	Rural	Best	Worst	Poor	Middle	Rich
Grade 5										
Mathematics	35	36	35	39	34	38	32	34	36	42
English	32	32	32	37	29	37	27	30	31	42
Life Skills	35	34	35	42	31	NA		32	35	48
Zambian Language	35	36	35	36	35	NA		36	36	38
Grade 9										
Mathematics	29	31	27	30	28	NA		27	28	33
English	36	36	36	40	32	NA		31	35	45
Science	36	37	35	37	35	NA		35	35	41

Source: 2014 National Learning Assessment (NLA) and 2016 Public Expenditure Tracking Survey (PETS)/Quantitative Service Delivery Survey (QSDS).
Note: NA = not available. * Learning outcomes are at the end of Grades 5 and 9 and mean scores (out of 100) are presented. Poor is defined as the bottom 33.3 percent (tercile) in family income (asset index) and rich is defined as top 33.3 percent in family income.

Key Challenges

11. A 2016 World Bank Public Expenditure Review (PER) of the education sector identified two factors in addition to the shortage of classrooms that help account for the consistently low learning outcomes—lack of textbooks and lack of feedback loops between students' learning performances and those sector inputs directly related to students' learning achievements, such as teachers' professional development programs. The PER also found that transition to lower and upper secondary education was artificially constrained by a serious lack of seats in secondary school.

12. **Textbooks are not available to most students.** A new competency-based curriculum was developed in 2013[16] to accommodate the country's needs for cognitive and non-cognitive skills development of youth. However, the long-standing shortage of textbooks—particularly for

[15]SACMEQ 2007. Although SACMEQ has yet to publish the final results of the 2014 assessment, the preliminary results show that Zambia was tied with Malawi for the lowest performing, among the 15 participating African countries, in mathematics at Grade 6.
[16] Supported by the United Nations Children's Fund (UNICEF) and completed in 2013.

mathematics and science in rural schools at the secondary education level[17]—is a major obstacle to implementing the new curriculum and improving student learning. The need for students to share textbooks makes it difficult for teachers to require the use of textbooks for homework or individual in-class assignments.[18] Textbook shortages in primary education have been partly addressed by development partner (DP)-supported aid programs,[19] but no DP-supported programs provide textbooks at the secondary level in Zambia.[20] Sources of the textbook shortage include insufficient budget and an inefficient textbook management system (procurement and delivery) that result in seriously delayed or no delivery of textbooks. Further, a number of syllabi developed under the new curriculum do not have a corresponding textbook or any learning material.

13. **Zambia is not using its solid student and teacher assessment data to diagnose and remedy flaws in the education system that directly affect student learning.** For example, a majority of Zambia's teachers have at least a certificate or diploma qualification for teaching (usually awarded at the completion of a two-year or four-year program at a College of Education [CoE], respectively).[21] However, only a smaller percentage demonstrates a good grasp of the curriculum and pedagogy.[22] Teachers are regularly tested, answering the same examination questions given to their students. On these tests, they showed high scores: Grade 5 teachers scored over 90 percent for mathematics, English, and life skills[23] and Grade 9 teachers scored approximately 70 percent across all subjects. Their qualifications and performance on these tests (particularly in the case of Grade 5 teachers) have not, however, translated into improved learning outcomes among students for a few reasons such as teachers' poor pedagogic skills as revealed by classroom observations and lack of a feedback loop to integrate analyses of difficulties that students encounter in learning as evidenced by the NAP and classroom-based tests into the modification of the design and delivery of quality inputs such as teacher training programs.[24]

14. **Access to secondary education in Zambia is limited in part due to a limited supply of secondary schools/classrooms.** The capacity of current secondary schools in the country can accommodate only about 30 percent of the Grades 1–5 population. The number of schools offering lower secondary education drops to 3,764 from 7,691 primary schools. The number of schools

[17] World Bank, *Education Sector Public Expenditure Tracking and Service Delivery Survey in Zambia*, 2016.
[18] The World Bank's 2016 PETS/QSDS analysis conducted classroom observations in 268 sampled schools. It found that 84 percent of the teachers used the textbooks and only 8 percent of the students.
[19] For example, the United States Agency for International Development and Irish Aid, among others, have programs to provide textbooks to primary schools in Zambia.
[20] Secondary education is not free in Zambia but the Government is supposed to provide free textbooks to secondary schools.
[21] Only about 22 percent of Grade 5 teachers and a much smaller percent of Grade 9 teachers have a General Certificate of Education (or lower credential), awarded upon the completion of secondary education.
[22] A baseline survey conducted by the Ministry of General Education (MoGE), in 2016, showed that only about 7 percent of the sampled teachers were able to demonstrate good competence in knowledge of curriculum and teaching. The 2016 QSDS found that most teachers (90 percent and 94 percent) used a syllabus, but fewer teachers (62 percent and 63 percent) followed the curriculum. Only 85 percent and 89 percent of teachers used textbooks, 66 percent to 70 percent used learning objectives, and 54 percent to 68 percent used a learning plan.
[23] The January 7–11, 2017, issue of The Economist reports that in a 2007 study of South African mathematics teachers of 11- and-12-year-olds, 79 percent scored below the level of the students, paragraphs 37–38.
[24] The Organisation for Economic Co-operation and Development's analysis of its Program for International Student Assessment over the years found that a focus on constant improvement is one of the very few factors that distinguishes effective systems and not-so-effective education systems with regard to students learning.

offering Grades 10–12 drops to 512.[25] However, because many primary schools have been accommodating students in the lower secondary grades by adopting double-shift arrangements, schools often have no dedicated physical space for Grades 8 and 9. With the ongoing reform of decentralizing primary education to local authorities, the current arrangement of primary schools accommodating Grades 8 and 9 will be discontinued eventually.

15. Transition rates between Grades 7 and 8 (62 percent from primary to lower secondary education) and between Grades 9 and 10 (43 percent from lower secondary to upper secondary education) reflect this supply constraint. These rates differ significantly across provinces from 32 percent to 78 percent for lower secondary and from 29 percent to 58 percent for upper secondary.[26] In 2010, only about half of those enrolled had completed lower secondary education (Grades 8–9) and only a quarter of them had completed upper secondary education (Grades 10–12). This bottleneck for accessing secondary education is managed informally by using cutoff scores in examinations to cap the number of students who can proceed from Grades 7 to 8 and from Grades 9 to 10, depending on the available seats in schools offering secondary education. This has kept secondary school enrollment stagnant for the past five years while both the enrollment and completion rates of primary education have been increasing.

16. Although there is a national shortage of secondary seats, the shortage is more pronounced in rural and poorer areas than in urban and less poor areas. Such a shortage of space deprives thousands of youth of a secondary education that could positively impact their lifetime employment prospects and incomes. The pressure of having a sufficient number of schools and classrooms for secondary education is growing in the country.

17. **The Government has tried to address the above challenges with its limited resources and capacity.** For example, the Government has tried to address the space shortages in secondary education with two initiatives launched in 2014 (one aiming to build 118 new secondary schools and the other aiming to add more classrooms to 220 existing schools to offer secondary education). Due to resource constraints, however, some of the planned school construction has not yet been completed. The Government has also tried to deliver more textbooks to schools by providing financial incentives to the local district education offices, but the results have been limited. For teacher quality improvement, the Government has been trying to address them through the School Program of In-Service for the Term (SPRINT) framework[27] and the teacher performance evaluation enhancement but has faced challenges of funding and capacity.

18. To address these challenges, the Government has requested technical and financial support from the World Bank for the design and implementation of a general education quality improvement program in the context of its SNDP. Building on the SNDP's vision and strategic directions, the Government plans to develop a sector-wide, medium-term program to transform Zambia's general education system.[28] While the medium-term program is still being prepared, the proposed project will support the objectives of this plan to improve learning outcomes through

[25] Ministry of Education Statistics Bulletin 2013.
[26] World Bank. 2016. *Education Sector Public Expenditure Tracking and Service Delivery Survey in Zambia.* Figures 4.8 and 4.9, page 38.
[27] The SPRINT framework is a Government initiative for improving teaching competency of teachers.
[28] For implementing the SNDP, each ministry is required to develop a strategic plan consistent with the deliverables and aspirations outlined in the SNDP. An education sector plan is currently being developed.

teacher training and the provision of textbooks and learning materials and to increase access to secondary education for rural students.

C. Higher Level Objectives to which the Project Contributes

19. **The proposed Zambia Education Enhancement Project (ZEEP) supports the World Bank Group's Country Partnership Strategy (CPS) (FY2013–2016)[29] that focuses on reducing poverty and inequality in the country**. In light of increased poverty and inequality, the World Bank's twin goals of ending extreme poverty and boosting shared prosperity are highly relevant in the Zambian context. The CPS supported analytic work in the education sector to identify education-focused interventions that could help reduce poverty. The 2016 PER identified challenges facing the education sector, such as uneven teacher quality, limited availability of textbooks, and classroom shortages in secondary education. The new CPS is now under preparation, and this project will focus on supporting efforts to address these challenges. Through improving the quality of general education, especially in the areas of mathematics and science and in rural schools, and increasing access to secondary education as well as the capacity of the education system, ZEEP will help equip younger generations with knowledge and skills to get out of poverty and share prosperity in Zambia.

20. The proposed ZEEP is aligned with and supports the objectives of the Government's SNDP.[30] The SNDP highlights education as one of the priority areas for helping the country achieve its poverty reduction, economic diversification, and socioeconomic goals for 2017–2022. Given these objectives, the proposed project will focus on improving teaching and learning in mathematics and science and on expanding access to secondary education, particularly in rural areas.

21. The proposed ZEEP also reflects the cooperation principle discussed and agreed at the Twangale meeting between the GRZ and the World Bank on June 9, 2017[31]. To accelerate poverty reduction efforts in the country, the World Bank was requested by the Government to focus its support in three-geographical areas where the level of poverty density is high. ZEEP will support the Government's efforts in poverty reduction by concentrating its investment on expanding access to secondary education in those three areas.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

22. The Project Development Objective (PDO) is to improve the quality of teaching and learning[32] in mathematics and science in targeted primary and secondary schools and to increase equitable access to secondary education.

[29] The CPS (Report No: 75089-ZM) was for FY2013–2016 and the new one is under preparation.
[30] The Government's Sixth National Development Plan (2011–2015) and the NIF III (2011–2015) for the education sector ended in 2015.
[31] The GRZ and the World Bank are working on concretizing the agreements reached at the Twangale meeting.
[32] 'Quality of teaching and learning' in the context of this project is defined as quality of teachers and teaching and learning materials.

B. Project Beneficiaries

23. **The primary beneficiaries of this project are students,** including those (a) enrolled in Grades 8–12 in the 82 schools whose expansion the project will finance (estimated to be 22,960 students of whom 45 percent are girls), in particular adolescent girls who will benefit from the provision of sanitation and boarding facilities; (b) enrolled in Grades 1–5 in 200 primary schools and in Grades 8–9 in 100 secondary schools (estimated to be 110,210 students of whom 45 percent are girls) in the pilot of improving teacher competencies and skills in mathematics and science teaching; and (c) enrolled in Grades 8–12 in secondary schools other than the schools mentioned in (a) and (b) above who receive textbooks through the improved textbook management system (estimated to be approximately 1.2 million primary and secondary school students, 45 percent of whom will be girls).

24. **The secondary beneficiaries are teachers** (approximately 764 teachers, of whom 50 percent are women). Most of them will participate in training-for-trainers in mathematics and science teaching. Mathematics and science teachers from the same zoning area as the new teacher training system pilot that is described below under Subcomponent 1.1 (approximately 2,310) will benefit from its trained teacher-trainers through the local teacher professional development networks. About 60 teachers will receive training on developing and writing learning materials under the capacity-building program for textbook writers. In addition, at least 1,600 teachers and administrators from the expansion schools (i.e., those schools selected for expansion under the ZEEP) are expected to benefit from the office space, accommodations, and other facilities provided as part of the expansion package.

25. Additional beneficiaries include: (a) students and teachers in schools where classrooms will be expanded and the teacher quality improvement pilot will be undertaken; (b) students and teachers in colleges of education who will be involved in the teacher quality improvement pilot; and (c) the Ministry of General Education (MoGE) who will benefit from capacity-building activities, as well as the support to an improved Education Management Information System (EMIS) and school mapping, in which at least 1,080 education officers from schools, local, and central education offices will benefit from training; and (d) communities that host schools that will be expanded (due to job creation and increased business opportunities).

C. PDO Level Results Indicators

26. There are three PDO-level indicators:

(a) Percentage increase of teachers who meet the prescribed curriculum competencies and pedagogical skills requirement in mathematics and science in Grade 5 and Grade 9 in targeted schools;

(b) Improved pupil-textbook ratio in math and science for Grades 8–9, and mathematics, physics, chemistry, biology, agricultural science, and science for Grades 10–12 in targeted schools; and

(c) Number of students enrolled in Grades 8–12 in the expanded secondary schools with additional classrooms and facilities.

III. PROJECT DESCRIPTION

A. Project Components

27. The proposed ZEEP will support the Government's efforts as indicated in the draft SNDP to improve the quality of education, particularly in relation to student learning outcomes and will address the three major challenges identified in the PER. Specifically, it aims to (a) improve teacher quality through increased content knowledge and improved teaching competencies and skills, (b) increase the availability of textbooks, and (c) expand access to secondary education. Building the education system's capacities underpins all improvement efforts. ZEEP therefore has three closely related components: (a) improving the quality of teaching and learning, (b) increasing equitable access to secondary education, and (c) enhancing planning, management and monitoring and evaluation (M&E) capacity, and project coordination.

28. To ensure a focus on results, the proposed project will use a results-based financing (RBF) modality to support the implementation of key reforms and interventions under Components 1 and 2. Under these components, project funds will be disbursed against specific line items in the annual MoGE's budgets [eligible expenditure programs (EEPs)] up to capped amounts and conditioned on achievement of the agreed set of disbursement-linked indicators (DLIs). Component 3 aims to strengthen the MoGE's planning, implementation, and M&E capacity and finance specific capacity development activities through training, technical assistance (TA), and provision of goods. Component 3 will use the traditional investment project financing approach.

Component 1: Improving the Quality of Teaching and Learning [The total cost for this component is US$160.5 million of which the IDA contribution is about SDR 17.3 million (US$24.0 million equivalent).]

29. The objective of this component is to improve the quality of teaching and learning in primary and secondary education in the targeted schools by strengthening the teacher training system and increasing the availability of textbooks in mathematics and science subjects at the primary and secondary levels. The targeting for Components 1 and 2 is summarized in Table 2. The 'targeted schools' for this project include the selected 200 pilot primary schools and 182 pilot secondary schools of which 82 are the selected expansion schools. This component has the following two subcomponents.

Table 2. Summary of Targeting by Component and Subcomponent

Targeted Areas	Component 1			Component 2
	Subcomponent 1.1	**Subcomponent 1.2 (Activity A)**	**Subcomponent 1.2 (Activity B)**	
Primary Education	Yes (Total 200 pilot primary schools selected from the district in each province with the poorest student learning outcomes)	Yes (Improved textbook management system tested for mathematics and life skills textbooks for Grade 4 in all pilot primary schools)	Yes (Achieving pupil-textbook ratio of 1:1 in mathematics and life skills for all pilot primary schools)	No
Secondary Education	Yes (Total 182 pilot secondary schools including 100 selected from the district in each province with the poorest student learning outcomes and 82 selected expansion schools)	Yes (Improved textbook management system tested for mathematics and science textbooks for Grade 8 in all pilot secondary schools)	Yes (Achieving pupil-textbook ratios of 1:1 in mathematics and science for Grades 8–9, and in mathematics, science, biology, chemistry, physics, and agriculture science for Grades 10–12, for all pilot secondary schools, plus 100 secondary schools newly constructed by the Government)	Yes
Subjects	For primary, mathematics and life skills only; For secondary, mathematics and science only for Grades 8–9, and mathematics, science, biology, chemistry, physics, and agriculture science only for Grades 10–12			Not applicable
Geography	Urban and rural schools			Rural schools only, no urban schools
Gender	Girls and boys treated equally			All-girl weekly boarding facility will be built for the 10 most remote of the 82 selected expansion schools. Gender-sensitive sanitary facilities will be provided in all these 82 schools

Subcomponent 1.1: Strengthening the Teacher Training System

30. This subcomponent will strengthen the existing teacher training system by establishing feedback loops for guiding continuous improvements and upgrading teacher training to ensure that teachers have the necessary content knowledge and pedagogical competencies and skills in teaching mathematics and science. As a first step in developing and establishing this new feedback-based system, both student assessment and teacher performance data will be thoroughly examined to identify; (a) topic areas where students show conceptual and skill difficulties; and (b) gaps in knowledge and pedagogical skills among teachers in mathematics and science teaching. Using these analyses, training materials will be developed and validated before being used in both in-service and pre-service teacher training programs. These programs and the results of the training will be monitored and evaluated to determine whether the revised training has resulted in better

content knowledge and pedagogy among trained teachers and whether changes in these teachers' performance resulted in improved learning among their students.

31. This new system will be tested through a pilot focused on mathematics and science teaching in Grades 1–5 and Grades 8–9[33] in 382 targeted schools (200 primary, 100 junior secondary, and 82 expansion schools under Component 2) and 12 area CoEs.[34] The 300 primary and junior secondary schools will be selected based on geographical location (rural versus urban) and enrollment size (see Annex 2 for details). The trained teachers will be monitored and evaluated with the existing instruments of the National Assessment Surveys (NAS) for Teachers and the Lesson Observation Form for their performance. Additionally, their students' learning outcomes will also be monitored with the national assessment results for Grades 5 and 9. At least 110,210 pupils in the targeted schools are expected to benefit from this intervention during the life-span of this project. The pilot will be conducted during the first four years of the project implementation. An impact evaluation (IE) of the pilot will be conducted to assess the effectiveness of this new teacher training system.

32. In addition to the planned IE, two studies will be undertaken under this subcomponent: (a) a review of the NAP, with capacity-building support for the MoGE to execute recommendations of the review; and (b) a study of the benefits, feasibility, and implementation of having subject-specialized teachers for Grades 5–7.

33. The Directorate of Teacher Education and Specialized Services (TESS) of the MoGE will lead the implementation of this subcomponent, collaborating with the Directorate of Standards and Curriculum (S&C) of the MoGE, the Examinations Council for Zambia (ECZ), and other relevant government agencies and institutions responsible for the operation of different aspects of the new teacher training system. For this subcomponent, disbursement will be linked to the achievement of DLI #1 - *improved teacher competencies and skills in teaching mathematics and science in targeted schools* (see Table 1.3 in Annex 1).

Subcomponent 1.2: Improving Textbook Availability

34. This subcomponent aims to tackle the issue of severe textbook shortage in the country by: (a) improving the current textbook management system; and (b) procuring and delivering mathematics and life skills/science textbooks to schools through the use of the improved system. The following two activities are designed to serve this purpose:

(a) **Activity A: Developing institutional capacity.** This activity will improve the current textbook management system by assessing and redesigning as needed and by providing technical support and training. An action plan comprising a set of tasks associated with textbook evaluation criteria, planning, procurement (reducing unit costs), delivery, and tracking functions will be developed to guide the implementation. A pilot will be conducted to test the newly improved textbook management system for Grade 4 and Grade 8 students and their teachers at the targeted schools plus 100 secondary schools newly constructed by the Government. The proposed training of

[33] The selection of the grades, to be included in the pilot, is based on the NAP's assessment survey targets—Grade 5 for primary and Grade 9 for secondary.
[34] These CoEs should be near the selected schools and will be determined once the school selection is complete.

experienced teachers in textbook writing skills will also be supported. This training will alleviate the shortage of textbooks and learning materials with local content for some syllabi developed under the new curriculum. It will also enhance the nation's capabilities for developing and writing their own textbooks in future.

(b) **Activity B: Textbook provision.** The objective of this activity is to procure and deliver textbooks in the subjects defined in Table 2 above to the targeted schools, plus about 100 secondary schools newly constructed by the Government to attain a 1:1 pupil-textbook ratio, using the improved textbook management system. After achieving this goal, the project will support the provision of additional textbooks in the subjects defined in Table 2 above for Grades 8–12 and distribute them to the remaining secondary schools across the country based on the estimated enrollment within each province.

35. The Procurement and Supply Unit (PSU) of the MoGE will lead the implementation of this subcomponent in collaboration with the S&C, the Provincial Education Offices (PEOs), and the District Education Board Secretaries (DEBS) under the MoGE. For this subcomponent, disbursement will be linked to the achievement of DLI #2A - *improved textbook management system* and DLI #2B - *textbooks procured and delivered to targeted schools* (see Table 1.3 in Annex 1).

Component 2: Increasing Equitable Access to Secondary Education [The total cost for this component is US$28.5 million of which the IDA contribution is about SDR 19.4 million (US$27.0 million equivalent).]

36. The objective of this component is to increase access to secondary education in underserved communities by adding new classrooms to selected existing schools in rural areas in six provinces – Muchinga, Luapula, Southern, Eastern, Central and Lusaka[35]. These six provinces are covered by the three-geographical areas with high poverty density defined at the Twangale meeting. The Government has pledged to finance the expansion of secondary schools by applying the same selection criteria as stated in Annex 2 in the remaining four provinces that are not covered by ZEEP. This component targets secondary schools with a minimum package of five classrooms (one classroom per grade, Grades 8–12) and necessary facilities such as laboratory, office space, teacher accommodation, and toilets to meet the Government's standards. Under the project, about 82 schools will be selected and expanded with the minimum package, resulting in at least 22,960 new secondary school seats.

37. To help reduce higher dropout rates of girls at secondary schools, under this component, sanitation facilities will be provided to meet adolescent girls' health needs in all selected expansion schools. In addition, 10 all-girl weekly boarding facilities in the 10 most remote selected expansion schools will be constructed and provided to allay fears about girls' safety and their selection criteria can be found in Annex 2.

38. The selection of schools for expansion in those six provinces will follow a set of transparent and objective criteria targeting disadvantaged communities in rural areas, as defined by poverty

[35] For the Lusaka province, ZEEP will focus on its rural and peri-urban areas where there is high poverty density.

level, primary to secondary school transition rate, pupil-classroom ratio, number of existing secondary schools, and coverage of recent Government initiatives on school construction (see details in Annex 2). The construction of classrooms and facilities will adopt a community-based approach where the local communities of the selected schools will be mobilized and delegated with management and execution responsibilities for construction-related activities by the central ministry (that is, MoGE). The respective PEOs of these local communities will provide supervision and quality control of their construction work. Though the communities will have a certain level of autonomy, they will be ultimately accountable to the MoGE for completing the classroom construction with quality. A two-phase implementation schedule will be used for construction to provide early access for student enrollment.

39. The Zambia Education Project Implementation Unit (ZEPIU) under the MoGE will be responsible for implementing this component in collaboration with the PEOs and local community committees (including parent-teacher associations [PTAs]) where the selected expansion schools reside. Construction is expected to be completed by the third year of project implementation. For this component, the disbursement will be linked to the achievement of DLI #3 - *classrooms constructed and utilized in selected expansion schools* (see Table 1.3. in Annex 1 for details).

Component 3: Enhancing Planning, Management and Monitoring and Evaluation Capacity, and Project Coordination [The total cost for this component is US$15.0 million of which the IDA contribution is about SDR 6.5 million (US$9.0 million equivalent).]

40. The objective of this component is to strengthen the capacity of the MoGE and its participating institutions for planning, management, and M&E and provide support for project implementation (for example, M&E, fiduciary, and safeguards). To address the capacity constraint, this component will support three activities: (a) strengthening the capacity of the MoGE and its relevant institutions for planning, management, and M&E; (b) strengthening data management and analysis, including upgrading the centrally managed EMIS at the MoGE to be able to connect with other data systems linked to teacher training and student assessments; and (c) completing school mapping for schools without Global Positioning System (GPS) coordinates for future real-time monitoring, decision making, and resource allocation.

41. The second objective of this component is to strengthen the existing capacity of the MoGE for project coordination and implementation (for example, financial management [FM], procurement, safeguards, M&E, and communication). It will also support M&E, IE, surveys and third-party independent verification, and provision of goods for specific activities.

42. The traditional Investment Project Financing (IPF) will be used to finance activities under this component. The Directorate of Planning and Information of the MoGE will supervise its implementation.

43. Throughout its implementation, ZEEP will engage citizens not only by informing them about the implementation status, but also by actively involving them in implementing certain activities and monitoring its progress. The community-based approach as a strategy for implementing classroom constructions under Component 2 will engage people in the communities of selected expansion schools in decision making on matters important to the quality and

completion of the construction. PTAs of the targeted schools will help monitor the implementation progress of Components 1 and 2 and provide feedback for improvement.

44. To work together with other World Bank-financed projects for greater impact on reducing poverty and inequality in the country, ZEEP will explore synergy with the Zambia Girls Education and Women's Empowerment Project (GEWEL, P151451)) and the Zambia Improved Rural Connectivity Project (P159330) during the implementation to maximize ZEEP's impact.

B. Project Financing

Lending Instrument

45. The proposed ZEEP uses an IPF lending instrument with an RBF modality. Components 1 and 2 use an RBF modality with identified DLIs and time-bound targets as links in a results chain that will incrementally contribute to the achievement of the PDO. Disbursements up to a capped amount will be made against specific line items in the MoGE's annual budgets that are included in the agreed EEPs and will be conditioned on the achievement of specified results, as measured by DLIs (see Annex 1 for the identified DLIs and their verification protocols). Once the agreed results have been verifiably achieved, funds will be disbursed against the items listed in the agreed EEPs. The RBF will require using country systems in areas such as FM, procurement, and M&E and will thus help the MoGE further develop its capacities in these areas. Component 3 uses the traditional IPF modality for its disbursement.

46. **EEPs**. In consultation with the MoGE, the World Bank selected the following EEPs: (a) personal emoluments and allowances; (b) training; and (c) operating costs, including rent, utilities, and communications. The selected EEPs comprise non-procurable items from both the recurrent and development budgets of the MoGE (see Annex 3 for the complete list of EEPs).

47. **DLIs.** The DLIs for the proposed project reflect the MoGE's reform priorities and include intermediate results, implementation performance targets, or institutional change indicators that build incrementally over the life of the project. Some DLIs are expected to improve the efficiency and effectiveness of the systems for teacher training and textbook delivery. Others constitute incremental improvements of the system that will have results beyond the life of the project, for example, improvements in the textbook management system. The results represented in the DLIs are critical to achieving the PDO. ZEEP has a total of three DLIs (see Table 3). From a disbursement point of view, the DLIs are independent of each other, that is, non-compliance with a particular DLI in a period will lead to withholding of the disbursement of the funds associated with that DLI, but will not affect disbursement associated with other DLIs. The pricing for each DLI, including its distribution among its activities across each year of the implementation period, provides incentive to the MoGE to achieve results that are critical to the Government and, at the same time, also enables the MoGE to start the project implementation and leverage other resources to work toward achieving the targeted results. Table 1.3 in Annex 1 provides the details of each DLI, including expected results, disbursement volume, and targets. Table 1.4 in Annex 1 displays how the results of each DLI will be verified for disbursement.

Table 3. Justification of Each DLI Employed by ZEEP

#	DLI	Justification
1	Improved teacher competencies and skills in teaching mathematics and science in targeted schools	Teacher quality is one of the key factors contributing to student learning. In addition to subject content knowledge, good teaching pedagogy boosts student learning outcome. The results from the teacher performance assessment in Zambia seem to suggest that teachers are particularly challenged by mastering effective teaching skills. The issue is more severe in mathematics and science subject areas. The proposed intervention of establishing a new teacher training system with a continuous feedback loop mechanism will try to address it through (a) diagnosing teacher training needs, (b) developing training materials, and (c) delivering and evaluating training and its results in teaching competencies.
2A	Improved textbook management system	Besides lack of funding, the current textbook shortage in Zambia is mostly caused by an inefficient textbook management system, from planning, procurement, to delivery and tracking. For better results, it is important to ensure that the present textbook management system is improved before investing in procuring more textbooks.
2B	Textbooks procured and delivered to targeted schools	In Zambia, schools often do not receive any textbooks or receive them in the middle of the school year. To address the severe shortage of textbooks and enable students' proper learning, it needs to be ensured that the procured textbooks are actually delivered to schools on time.
3	Classrooms constructed and utilized in selected expansion schools	Expanding access to secondary education in Zambia depends on reducing the supply constraint on secondary school seats. Having new classrooms constructed alone does not mean that students will enroll and use the newly created spaces.

48. The World Bank's FM guidelines will apply to the entire project and the World Bank's procurement guidelines will apply only to Component 3. Because Components 1 and 2 take the RBF approach, their procurement will follow the Government's procurement policies, procedures, and guidelines which are adequate to IDA based on the assessment conducted during the appraisal.

C. Project Cost and Financing

49. **The total project cost is estimated at about US$204 million.** This is about 4.4 percent of the estimated GRZ's spending on general education for the next five years, keeping its current budget for general education in 2017 constant (equivalent to about US$920 million). The counterpart funding from the GRZ for this project in the amount of US$144 million is expected to come from two main sources. The first source is from the Government in the form of (a) hiring, deploying, and compensating teachers who will teach Grades 8–10 in the expansion schools financed under this project and (b) maintaining the robustness of the existing systems critical to the successful implementation of ZEEP, such as the NAP and the teacher performance evaluation systems. At a minimum, the Government's annual expenditures for the salaries of teachers in the project-targeted schools is estimated at about US$18.7 million and for student learning subsidies at around US$8.6 million. Over the five-year ZEEP implementation period, these two estimates alone would total around US$136.5 million. The Government will also pay the salaries and benefits of education administrators involved in ZEEP implementation, data management, and other operational costs, estimated at around US$6.0 million. The second source is in-kind community contributions to the expansion schools. Their in-kind contributions to new classroom construction are estimated at around US$1.5 million (US$17,000 per school for a total of 82 schools).

50. The project cost by component, including contingencies, is presented in Table 4.

Table 4. Project Cost by Component (US$, millions)

Project Components	Project Cost	IDA Financing	% IDA Financing
Component 1: Improving the Quality of Teaching and Learning	189.0	51.0	30
Component 2: Increasing Equitable Access to Secondary Education [a]			
Component 3: Enhancing Planning, Management and M&E Capacity, and Project Coordination	15.0	9.0	60
Total Costs	204.0	60.0	29
Total Financing Required	204.0	60.0	29

Note: a. Component 2 takes the community-based approach for constructing additional classrooms. There will be in-kind support and contributions from the local community which has been factored in the costing for savings.

D. Lessons Learned and Reflected in the Project Design

51. **Prior sector experience in a country usually provides an important source of lessons for the design of a new project in the same setting**. However, the last project supported by the World Bank in the country's education sector was approved 15 years ago. It focused on technical and vocational education and training (TVET), an area which the proposed project does not address.[36] Accordingly, the last project had only very limited applicability to this project.

52. The design of this project relies on the 2016 Zambia education PER and PETS/QSDS; lessons from similar projects in other countries; and a rich body of education research, especially meta-analyses of rigorous evaluations of interventions for improving access and learning outcomes.[37]

53. **For example, research shows that structured pedagogy programs[38] have improved learning in most contexts, yielding relatively large improvements in test scores for both language and mathematics.** Factors proximate to the learning process are important drivers of learning when they are implemented in ways that leverage learning. These factors include the quality of the curriculum, textbooks, teachers, and learning assessments; alignment among these factors; student/textbook and student/teacher ratios; and the use of diagnostic analyses of the sources of students' learning problems to create a culture of constant improvement from the central level down through the schools. An important feature of successful programs is that, by design, they have components that address multiple constraints to learning, such as teachers' limited subject knowledge, a lack of textbooks and learning materials, and a lack of structured content (curriculum), and that they develop a culture of constant improvement.

[36] The World Bank-financed TVET project concluded a steady series of eight World Bank-financed investments in education projects in Zambia that started in 1969.

[37] For example: S. Birte, J. Stevenson, R. Menon, D. Phillips, E. Gallagher, M. Geleen, H. Jobse, T. Schmidt, and E. Jimenez. 2016. *The Impact of Education Programmes on Learning and School Participation in Low- and Middle-income Countries: A Systematic Review Summary Report. 3ie Systematic Review Summary 7*. London: International Initiative for Impact Evaluation (3ie).

[38] Structured pedagogy programs seek to directly address several barriers to learning. These barriers can be in the form of inadequately trained teachers, lack of appropriate materials, outdated curricula and instructional approaches.

54. **Recent World Bank-financed education projects are also relevant to the design of this project.** A pilot undertaken by the Government of Tanzania in 2015, assessed whether insufficient content knowledge and pedagogy of teachers in the subject areas of mathematics, physics, chemistry, and biology contributed to low learning outcomes among secondary students in these subjects. The pilot identified topic areas in each subject where many students failed in the national assessments of mathematics and science. Teacher training materials on these topics were developed and training sessions were complemented with classroom observations and support. An evaluation of the pilot program found a positive impact on teachers' performance and student learning in the pilot schools.[39] Education operations in Ethiopia (for example, General Education Quality Improvement Programs I and II) and in Uganda show that reforms of the textbook management system, especially of textbook procurement and delivery, can significantly reduce the unit cost of textbooks. In these settings, the production cost, including color printing, has come down to less than US$1 per book. These savings have enabled the purchase of more textbooks that can contribute to student learning.[40] Operations in education, as well as in health, that have adopted a community-driven development (CDD) approach have mobilized and empowered local communities in project implementation, producing more cost-effective and sustainable results.[41]

55. **Using an RBF modality supports the project's efforts to change the implementation culture toward results.** There is an increasing number of education projects financed by the World Bank that use RBF as a modality to strengthen education systems by aligning and incentivizing actors around a set of system results. Some of the benefits of using the RBF modality observed include (a) an increased focus of policy dialogue in identifying and implementing those changes which can generate sought results; (b) attracting and retaining much-needed attention (from policy makers to parents) on the ultimate results that are sought; (c) aligning a number of important (yet often uninvolved) actors in the pursuit of results (for example, Ministry of Finance [MoF]); and (d) instilling a culture of measurement, which can eventually be institutionalized through strengthening the country's systems and capacity. Projects similar to ZEEP involving school construction or quality improvement activities, such as the Ghana Secondary Education Improvement Project, Punjab Second Education Sector Project, and Bangladesh Third Primary Education Development Program, have demonstrated the positive effects of using the RBF modality. The two key lessons learned are that (a) adequate and predictable short- and medium-term financing is essential for the implementation of the project and (b) a robust M&E system is critical to measuring performance and refining interventions through better-informed decision making.

[39] Mtebe. J., A. Kondoro, M. Kissaka, and E. Kibga. 2015. "Using SMS Mobile Technology to Assess the Mastery of Subject Content Knowledge of Science and Mathematics Teachers of Secondary Schools in Tanzania" I*nternational Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering* 9 (11).
[40] T. Read. 2015.: *Where Have All the Textbooks Gone?* World Bank.
[41] S. Aiyar. 2001. *Sourcebook for Community Driven Development in Sub-Sharan Africa.* Washington, DC: World Bank; S. Theunynck. 2009. *School Construction Strategies for Universal Primary Education in Africa: Should Communities Be Empowered to Build their Schools?* Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/2637.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

56. **The implementation arrangements will rely on the existing institutional setup but will be further strengthened by establishing several coordination committees and the new Project Implementation Unit (PIU).** The MoGE will be the implementing agency with full responsibility for all aspects of the project implementation. A Project Implementation Steering Committee (PISC) will be established and will meet twice a year to provide oversight and guidance and to facilitate interdepartmental coordination on implementation activities. The Committee will be chaired by the Permanent Secretary for Education (PS). The members of the PISC will be: (a) decision-making representatives from involved provincial and district education offices; (b) relevant departments/units inside the MoGE, including the Director for Planning and Information, the Director for Teacher Education and Specialized Services, and the S&C; (c) the MoF, the Ministry of National Development Planning, and the Ministry of Housing and Infrastructure Development (MoHID); and (d) the chief coordinators responsible for each component and the Project Coordinator. The MoGE will establish a PIU with full-time staff to manage day-to-day project implementation.

57. **Each component or subcomponent will have a lead department/unit within the MoGE that is accountable for its successful implementation.** For improving teacher quality (Subcomponent 1.1), the TESS will coordinate the execution of piloting the new approach for improving teachers' mathematics and science competencies and skills. The Directorate will use specific taskforces (for example, for training materials development and M&E) to implement the component, with each taskforce being managed by a Directorate staff member who is appointed by the PS. Each taskforce will have clearly defined terms of reference (ToR) for the scope and responsibilities in relation to the new teacher training system pilot. The members of each taskforce will represent the institutions that must jointly implement the pilot, for example, the Teaching Council of Zambia (TCZ) and the TESS will form the teacher education coordination taskforce; the MoGE's Curriculum Development Center (CDC), the ECZ, the National Science Center (NSC), University of Zambia (UNZA), and the TESS will form the training material development taskforce; and the CoEs, the CDC, UNZA, the TCZ, the ECZ, and the TESS will form the M&E taskforce, and so on.

58. **Subcomponent 1.2 (Improving Textbook Availability) will be implemented by the PSU with support from the S&C within the MoGE.** The PSU will use the improved textbook management system to centrally procure secondary education textbooks. The delivery of the procured textbooks to secondary schools will be managed by the PSU through the Provincial Education and DEBS offices. The tracking of the delivery will be conducted by the CDC.

59. **The new classroom construction (Component 2) will use a community-based approach.** The ZEPIU at the MoGE will manage this component. The ZEPIU will oversee the technical quality control of the PEOs in construction and the coordination of DEBS for community mobilization and training. Each school selected for expansion will work with its community and form a joint committee to manage the day-to-day construction details, such as material procurement and finance and maintenance.

60. **The Directorate of Planning and Information of the MoGE will be responsible for the implementation of all capacity-building activities and overall project coordination and administration (Component 3)**.

B. Results Monitoring and Evaluation

61. **The MoGE will be responsible for overseeing and coordinating all project activities, including M&E.** These functions will reside with the Directorate of Planning and Information. The MoGE will be responsible for providing (a) status reports on project implementation by each activity financed under the project, (b) status reports on the progress made on all PDOs and intermediate indicators specified in the Results Framework (see Table 1.1 in Annex 1), (c) information on the level of achievement for each of the agreed DLIs (see Table 1.3 in Annex 1), and (d) interim financial reports (IFRs) and annual progress and audit reports.

62. **The project will use the MoGE's existing M&E infrastructure as much as possible to carry out M&E activities, with support for strengthening its capacities**. The design of each component/subcomponent under the project has its own built-in M&E mechanisms. For example, for the teacher quality improvement pilot under Subcomponent 1.1, a special committee will be tasked to monitor and evaluate its progress, reporting back to the PISC. For textbook delivery under Subcomponent 1.2, an agency (CDC) independent of the PSU will track the delivery of textbooks to the requesting schools. For classroom construction under Component 2, the Resident Engineers and Buildings Officers from the PEOs and DEBS and the community committees will be used to inspect the quality and monitor the progress of the construction.

63. **For the RBF parts of the project, a total of three DLIs have been defined and will be used for disbursement against their results achievement**. A third-party independent verification agency (IVA) will verify the DLI results.

C. Sustainability

64. **Historically, the Government has demonstrated commitment to education through its annual budgetary allocations.** The education sector's share of the 2017 national budget is about 17 percent, the highest ministerial allocation. This continued high commitment is an assurance that the GRZ will provide the recurrent cost for the interventions under the project (for example, salaries of teachers and administrators who will be involved in implementing the interventions). The Public Service Management Division of the Cabinet has a standing order with the MoGE to employ 5,000 teachers annually (some of these teachers will be posted to teach at the expanded schools under the project). Additionally, the MoGE provides a grant to each school for operation and maintenance purposes.

65. **The project is designed to build on existing systems so that the interventions carried out under the project can be sustained.** Under Component 1, its Subcomponent 1.1 is designed to leverage the already established SPRINT framework. SPRINT is well-integrated into the overall structure of the MoGE. Strengthening this framework through the planned capacity-building activities and engaging all stakeholders during the implementation will provide a strong base for continuing the effort beyond the project lifespan. The human resources and technical capacity created from implementing the project will be retained within the MoGE. The Ministry is already

funding different initiatives by the actors who will participate in implementing this component, such as the national assessment by ECZ, research by UNZA, teacher materials development by the CDC, and so on. Therefore, bringing these actors together and synchronizing their activities within the project should further consolidate the system. Various identified existing structures through which this component will be implemented include DEBS offices, resources centers and teacher colleges. Emphasis on school-based activities and engagement of school authorities should foster strong ownership of the new program. The pilot phase will provide a good environment for the MoGE to determine what does and does not work in order to refine the new program and to develop a sound basis for deciding whether or not to scale up the initiative up in the country.

66. **Subcomponent 1.2 builds on the existing infrastructure of textbook administration in the country (centrally administered by the MoGE).** It aims to improve the system's management from planning, procurement, delivery, and tracking. Improvements in the system will be piloted under the project through the actual procurement and delivery of textbooks in mathematics and science to selected schools. The results from the pilot will be used to refine the new system for scaling up. Improved procurement, delivery and tracking systems should reduce unit costs, allowing the Government to provide more textbooks to schools without budget increases.

67. **The design of Component 2 takes advantage of the fact that schools in Zambia have very strong links with local communities through the PTAs.** The community-based approach adopted for school construction under the project is expected to enhance local communities' sense of ownership of their schools, which, in turn will facilitate community participation in school maintenance activities. The approach provides the use of local artisans for classroom construction. Their enhanced skills during implementation can be used for future school maintenance activities.

V. KEY RISKS

68. **Based on the systematic operations risk analysis, the Overall Implementation Risk is Substantial** (see Table 5). Zambia held elections in the summer of 2016 and had a smooth political transition in the same year. The new administration has demonstrated its desire to continue reforms and lead the country's socioeconomic development for achieving an upper-middle-income country status by 2030. The SNDP has been endorsed recently by the Committee of Permanent Secretaries. This plan provides direction for the nation's development from 2017–2021, and education is one of its four priority sectoral areas. The sectors, including education, are now drafting plans for implementing the strategy. This provides a stable macro-environment for development and for the implementation of this project as well.

Table 5. Systematic Operations Risk Assessment

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Moderate
8. Stakeholders	Moderate
9. Other	
OVERALL	Substantial

69. **The technical design of the project involves certain risks**. Subcomponent 1.1 aims to establish a new feedback loop between analyses of students' learning assessments and modifications of the teacher training system. This loop will be used to continuously improve teachers' subject knowledge and pedagogical competencies. It carries risks because it requires coordinated actions by many players' involved in the chain of change. These risks will be mitigated by (a) the leadership of the TESS at the MoGE during implementation, with clearly defined ToRs for each task force and (b) the minister's or the PS's appointment of the head of each taskforce for accountability.

70. **Subcomponent 1.2 on reforming the current textbook management system may encounter resistance by actors with conflicts of interest.** The procured textbooks may still not reach schools even with the newly improved procurement and delivery systems. As part of the mitigation measures, the project will develop a concrete action plan to guide the reform step-by-step transparently and will have an IVA to track the delivery of the textbooks procured under the project.

71. **Component 2 for constructing additional classrooms will mostly use the community-based approach for efficiency and results, but it requires community mobilization.** The risk of community noninvolvement will be mitigated by a well-designed community outreach and training program based on the past experiences in the country.

72. **There are also risks related to implementation capacity as well as fiduciary risks.** The MoGE has limited implementation capacity (for an IDA-financed project) due to a long absence of engagement with the World Bank in the sector. Further, for the same reason, there are some fiduciary risks. Specifically, few MoGE staff have the experience of working on World Bank-financed projects and are not familiar with fiduciary policies and procedures of the World Bank. These risks will be mitigated through: (i) establishing a PIU inside the Ministry and recruit full-time staff, as needed, for the implementation of this project; (ii) training for fiduciary staff of the PIU and the MoGE will be conducted on a regular basis; (iii) a Project Implementation Manual (PIM), including FM procedures, has been prepared and reviewed by the World Bank; and (iv)

technical support will be provided to the MoGE to enhance implementation and monitoring capacity and coordination for the Project.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

73. **Research shows that education can play a crucial role in the development process of a country**. Countries successful in harnessing technological advances (for example, the 'Asian tiger' countries) invest heavily in their education systems. For the poor, education serves as an important means for breaking the intergenerational cycles of poverty. The Government is already heavily involved in the provision of education and continues to commit relatively large annual shares of its national budget, especially in the recent past. Between 2010 and 2015, public expenditure on education, as a share of the total government expenditure, ranged between 15.3 percent and 20.2 percent, translating into 3.7 percent to 5.2 percent of the nation's GDP. In 2017, as stated above, it is about 17 percent. This level of commitment is expected to continue at least in the medium term, given the growth projections.

74. **Despite this level of commitment, however, the education sector in Zambia still faces a number of challenges as described earlier,** including (a) lack of adequate classroom spaces to accommodate students, especially at the secondary level; (b) poor student learning outcomes in all subjects, including mathematics and science, partly attributed to insufficient teacher quality; and (c) high student/textbook ratios in schools in mathematics and science subjects.[42] Unaddressed, these problems can slow Zambia's progress toward its goal of becoming an upper-middle-income country by 2030.

75. **Evidence points to the likelihood that if implemented properly, the proposed project will contribute to improved student learning outcomes.** Strengthening the teacher training system and providing more textbooks under Component 1 and building more classrooms under Component 2 are all interventions that have been shown to have an impact on student learning. For instance,

(a) Teacher training on the use of teaching materials increased student learning by 0.23–0.55 percent in the Philippines.[43] Increasing student learning outcomes has shown a positive effect on subsequent labor market earnings with a 1 standard deviation (SD) increase in cognitive skills yielding about a 0.34–0.48 increase in returns in South Africa.

(b) In Ghana, the availability of textbooks increased learning outcomes by 0.06 SD. At an increase of 1 SD, returns on investment would be about 0.05.

[42] PER 2016.

[43] Jee-Peng Tan, Julia Lane, and Gerard Lassibille. 1999. "Student Outcomes in Philippine Elementary Schools: An Evaluation of Four Experiments. " The World Bank Economic Review. 13(3): 493–508. http://documents.worldbank.org/curated/en/648001468294319922/Student-outcomes-in-Philippine-elementary-schools-an-evaluation-of-four-experiments.

(c) A school construction project in Indonesia increased the education attained by students and their earnings. For each school constructed in the region, children between the ages of 2 and 6 received 0.12 to 0.19 more years of schooling. Using variation in schooling generated by this policy as an instrumental variable for the impact of education on wages, it produced an estimated economic return to education in the range of 6.8–10.6 percent.[44]

76. **The cost-benefit analysis indicates that benefits from the project outweigh its costs, even when the number of beneficiaries estimated is minimal**. The calculated internal rates of return (IRRs) under Component 2 range between 27.6 percent and 35.2 percent, which are quite high. The cost-benefit ratios are also significant, between 2.5 and 3.2. Both suggest that the undertaking of this project is a good investment. The analysis for Component 1 also shows that the interventions are likely to generate returns that are sufficiently positive to justify the investments. Estimated benefits for the project only capture benefits that are easily quantifiable. Thus, giving only the lower bound of the gain may underestimate the overall gains, which include positive externalities associated with higher educational attainment and better cognitive and non-cognitive skills (such as lower crime rates, better health outcomes, and higher tax revenue, among other public benefits).

77. **Labor market data[45] show that the majority of the working-age population (between the ages of 15 and 65) in Zambia has low educational attainment.** Most have only primary education, 46 percent have some secondary education, and only 4 percent have completed secondary education or higher. It also clearly shows that there are higher returns to education, especially for those who complete secondary education. For instance, workers with some secondary education earn 96 percent more in wages relative to those with none while, those who have completed secondary education, earn 220 percent. Investing in education, particularly in secondary education, will not only yield monetary gains by improving productivity and earnings in the labor market but also result in positive externalities, such as lower fertility rates.[46] Given the poverty levels in the country, education provided through the public sector appears to be an attractive option.

78. **From the financing perspective, it is estimated that the proposed project will contribute up to 1.2 percent to the total education expenditures[47] and in the range of 5.2 percent to 12.5 percent to the capital budget.** This is a huge contribution, especially given the declining DPs' contribution to education in the country since 2009 and the new reforms[48] that decentralize primary schools (most of which still host junior secondary schools) from the MoGE to the local authorities. Given that the benefits of general education accrue not only to individuals but also to the society as a whole and the small size of private education provision in the country,

[44] Esther Duflo. 2001. "Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment." American Economic Review 91 (4).
[45] LFS 2013/2014.
[46] About 60 percent of the women with secondary education participate in household decision making - LCMS 2013/2014.
[47] Using the current funding trends to the sector.
[48] Circular 22, devolvement of lower-level education sector, as well as adult education to the local authorities.

public financing is needed to ensure that investments in education allow Zambia to meet its development goals.

79. **World Bank value added.** The World Bank's involvement in general education in Zambia adds value in two ways. One is the global and local technical and operational experience in basic education that World Bank staff can bring to the MoGE. The PER and PETS/QSDS of the education sector in Zambia have already contributed to the diagnosis of sectoral issues and to the preparation of this project. The second is that the World Bank is the only DP supporting secondary education in Zambia.

B. Technical

80. **The project responds to the Government's sustainable development goals, especially to that for better learning outcomes required by the country's need for economic diversification and reduced poverty and inequality.** The design of this project is based on evaluations of interventions that affect student learning outcomes, recent studies of poverty, the recent Zambia PER, the recent Zambia QSDS and PETS, and lessons learned from World Bank education operations elsewhere. Increased learning is causally assumed to stem from teacher quality, a good curriculum, good and sufficient learning materials, and adequate infrastructure. Teacher quality is one of the most important factors in determining student achievement. Tightly marrying the diagnostic analyses of students' learning problems by the ECZ[49] with the in-service training system and the departments responsible for the school curricula and textbooks should ultimately positively leverage learning outcomes.

81. **Given the project's time frame, learning gains by students are expected to be limited.** It is acknowledged that many factors could contribute to student learning performance and yet this project only addresses three areas—teacher quality, textbooks, and classroom space. Whether student learning outcomes could be improved by the interventions financed under the project during the five-year life-span of the project is a legitimate question. However, a program financed by the Japan International Cooperation Agency (JICA) on improving teachers' skills in planning and delivering lessons in science subjects in Zambia has produced promising results. An IE of the program shows a better performance of Grade 12 students who received the intervention in science on the national examination.[50] The proposed interventions for improving teacher quality under this project are similar to those that were implemented.

82. Targeting school expansions and quality improvements in underserved schools/districts aims to ensure that poorer communities are better served. This will be achieved by a set of clearly defined and transparent criteria for the school selection for both the classroom expansion and the teacher quality improvement pilot under the proposed project. Most importantly, the project design aims to incentivize results rather than inputs through the use of an RBF modality. The capacity-building component (Component 3) complements the investments with critical TA to improve the

[49] Using the NLA and other data diagnostically to identify the sources of students' learning problems is a technically challenging task that should be supported by international assessment expertise. In this process, the ECZ and the technical support can again review the NLA for its psychometric soundness.
[50] MoGE and JICA. 2015. *Impact Survey of Lesson Study in Zambia*.

MoGE's capability of developing learning materials, M&E, and policy research for future educational reform and development.

C. Financial Management

83. The World Bank team conducted FM assessments of the MoGE to determine whether the FM arrangements: (a) are capable of correctly and completely recording all transactions and balances relating to the project; (b) will facilitate the preparation of regular, accurate, reliable, and timely financial statements; (c) will safeguard the project's entity assets; and (d) will be subjected to auditing arrangements acceptable to the World Bank. The assessment complied with the FM Manual for World Bank-Financed Investment Operations that became effective on March 1, 2010, the World Bank anti-corruption guidelines, "*Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants*", revised as of 1 July 2016, as well as with the World Bank Africa Region's FM assessment and risk rating principles.

84. **The assessment concluded that the FM arrangements in place at the MoGE meet the World Bank's minimum requirements under OP/BP 10.00.** They are, therefore, adequate to provide accurate and timely information on the status of the project as required by the World Bank. The overall FM risk of the project is, however, rated Substantial because both the accounting and internal audit staff of the MoGE have relatively little experience in implementing World Bank-financed projects. However, this risk rating is expected to be reduced to Moderate after the planned risk mitigation measures have been taken. The MoGE's capacity to carry out project-related activities will be further strengthened. First, training of both accounting and audit staff will be conducted on a regular basis. Second, a Project Implementation Manual (PIM), including FM procedures, has been prepared and reviewed by the World Bank.

85. The project will use two disbursement methods: (a) the reimbursable method for disbursement under Components 1 and 2 and (b) the transaction-based method of disbursements (Statements of Expenditure [SoEs]) for Component 3.

86. Components 1 and 2 will be DLI-based with the EEPs selected from MoGE's (a) personal emoluments and allowances, (b) training, and (c) operating costs, including rent, utilities, and communications (see Annex 3 for the complete list of EEPs). The EEPs will be submitted to the World Bank on the annual basis and will be subject to review by the Office of the Auditor General. Disbursements will be made directly to MoGE's sub-control account on the achievement of the DLIs using only a reimbursement method of disbursement.

87. Disbursements for Component 3 will be on SoE basis. The PIU will open a segregated Designated Account (DA) in U.S. dollars at the Bank of Zambia where IDA disbursements will be made. Replenishments to the DA and documentation of expenditure will be on monthly basis through withdrawal applications (WAs). Other methods of disbursing to the project under Component 3 would include reimbursements, direct payment, and use of special commitments (for example, letters of credit). The details of the FM assessment and aspects of the financial arrangements can be found in Annex 3.

D. Procurement

88. **The Public Procurement Act (PPA) No. 12 of 2008 and its Regulations of 2011 govern all public procurements issued by Zambian public institutions, including the education sector.** The provisions of the PPA and its Regulations apply to all procurement carried out under open national bidding (ONB).

89. **The World Bank's Board of Executive Directors approved the New Procurement Framework (NPF) for Investment Project Financing (IPF) in June 2016, and it became effective on July 1, 2016.** The use of the NPF is mandatory for all projects with a Project Concept Note dated July 1, 2016 and after, and most projects which will be submitted for Board approval after July 1, 2016. The NPF's vision is to achieve value for money (VfM) with integrity in delivering sustainable development. The use of the NPF will help client countries build and implement sound procurement arrangements and institutions to advance their own development. It will also seek assurance that acceptable procurement practices are applied to the financial resources transferred to clients.

90. **With the support of the World Bank, the MoGE has prepared the Project Procurement Strategy for Development (PPSD) in line with the NPF to identify specific provisions of the NPF that will apply under this project**. A summary of the results of the PPSD is included in Annex 3 with specific provisions of the NPF that will likely apply to ZEEP. It also includes the market research and analysis in procurement areas associated with the project's proposed activities. The MoGE has developed a procurement plan for Component 3 for the first 18 months of implementation, with a table of defined thresholds based on the risk analysis.

91. **In addition to carrying out the PPSD, the World Bank has also carried out a review of the MoGE's and the MoHI's institutional arrangements for procurement.** The predecessor of the MoGE previously implemented a World Bank-financed project which was completed in 2007. Because of the time lapse, most of the current procurement staff at the MoGE are not familiar with procurement requirements of World Bank-financed projects, especially with regard to the NPF itself which will be applied to ZEEP. Training and capacity building on the World Bank's new procurement policy and procedures will be needed for the project implementation team and other technical staff who will be involved in the project implementation at the MoGE.

92. **The procurement capacity assessment details procurement risks and risk mitigation measures.** The summary of the World Bank's Procurement Risk Assessment and Management System (P-RAMS) for the MoGE is included in Annex 3. The overall procurement risk rating for the project is Moderate.

93. **In addition to carrying out the P-RAMS, the World Bank carried out a review of the MoGE textbook procurement system.** This included the activities to be carried out by the CDC and the existing system for textbooks procurement, and delivery. It was noted that the pupil-textbook ratio is high, the cost of textbooks is relatively high compared to other countries, and that the existing delivery system faces challenges in getting textbooks to schools across the country in a cost-effective manner. The review of the textbook procurement system also identified areas for improvement and suggested some implementation changes in areas that would address some inherent challenges, including conflict of interests currently existing in the system which may be

contributing to higher costs. Procurements of textbooks, other learning materials, and equipment under Component 1 will use the Government's own PPA No.12 of 2008 and its Regulations of 2011.

94. It is envisaged that the implementation of Component 2 relating to classroom construction will take the community-based approach. Its procurement will be guided by the Zambia Public Procurement Regulations and its Guidelines as provided in the Act under Part IV Clause 36 'Community Participation in Procurement'. Because the provisions of procurement for activities under community-driven development (CDD) are not sufficiently elaborated in these regulations, the MoGE will need to elaborate procedures for procurements related to classroom construction under this project in its CDD procurement manuals and incorporate them in the PIM, subject to the review and clearance of the World Bank. The procurement of laboratory equipment, reagents, drilling of boreholes, school furniture, and solar equipment will be procured following PPA No.12 of 2008 and its Regulations of 2011. The MoGE will be responsible for ensuring the attainment of agreed results to qualify for disbursement.

95. With respect to Component 3, the project will procure training and implementation support consultants who are hired externally. Procurement of any goods and services, including purchase of equipment needed for school mapping and EMIS enhancement will be subjected to either prior and/or post review by the World Bank because traditional financing is used for this component. Engagement of the MoGE staff as consultants will be guided by the provisions in the NPF.

E. Social (including Safeguards)

96. The project is expected to have a positive social impact. It is expected to improve equity by strengthening mathematics and science teacher competencies, improving textbook availability and quality, and increasing access to secondary education by adding at least 22,960 new seats in the neediest communities. The project will enhance girls' abilities to complete secondary education through supporting construction of boarding facilities for girls, at 10 of the selected expansion schools, and the construction of ablution blocks—to support improved menstrual hygiene management (MHM).

97. The expansion of access to secondary education entails construction of classrooms and related facilities. The additional facilities will be built in rural areas only, within existing school perimeters, where land is already allocated for educational purposes and there is no encroachment. For this reason, a separate Resettlement Policy Framework is not required. However, an ESMF was prepared under OP 4.01. It includes site-specific screening and procedures that document development agreements with communities to comply with the World Bank's operational policies. The ESMF site screening will be used to eliminate any construction activities that would necessitate displacement of squatters, encroachers, or require land acquisition.

F. Environment (including Safeguards)

98. The project is categorized as Environmental Category B and triggers the safeguards policy on Environmental Assessment OP/BP 4.01 for Component 2. This component involves the construction of additional classrooms and support facilities at already existing schools across Zambia. The support facilities will include the provision of sanitation facilities such as toilets and

the sinking of boreholes to provide potable water to pupils and staff. From the 82 selected beneficiary schools, 10 of them will host all-girls weekly boarding facilities (dormitories). Because the exact locations of schools to benefit from the project have not yet been established, the MoGE, with the guidance of the World Bank, has developed and disclosed an ESMF that provides a detailed step-by-step process for identification for screening of critical environmental and social risks on the project. The instrument further provides mitigation and monitoring plans, including institutional arrangements for safeguards implementation and capacity building. A generic Environment and Social Management Plan (ESMP) has also been developed to guide the Ministry and contractors in monitoring and implementing mitigation measures. The ESMF was disclosed by MoGE on June 6, 2017. Because the project will not involve activities or subprojects that require an Environmental and Social Impact Assessment (ESIA), the ESMP will provide the best practices for waste management and any other safeguards concerns that will be identified during project implementation.

G. World Bank Grievance Redress

99. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org

Annex 1: Results Framework and Monitoring

ZAMBIA Education Enhancement Project (P158570)

Table 1.1. Monitoring Indicators

Project Development Objectives							
PDO Statement							
The Project Development Objective is to improve the quality of teaching and learning in mathematics and science in targeted primary and secondary schools and to increase equitable access to secondary education.							
These results are at	Project Level						
Project Development Objective Indicators							
			Cumulative Target Values				
Indicator Name		**Baseline**	**YR1**	**YR2**	**YR3**	**YR4**	**End Target**
Percentage increase of teachers who meet the prescribed curriculum competencies and pedagogical skills requirement in Mathematics and Science at Grade 5 and Grade 9 in targeted schools. (Percentage)		0.00	0.00	0.00	10.00	10.00	20.00
Improved pupil-textbook ratio in Mathematics and Science for Grades 8–9, and Mathematics, Physics, Chemistry, Biology, Agricultural Science, and Science for Grades 10–12 in targeted schools. (Text)		Baseline survey	Same as baseline	Same as baseline	3:1	2:1	1:1
Number of students enrolled in Grades 8–12 in the expanded secondary schools with additional classrooms and facilities. (Number)		0.00	0.00	4920.00	14760.00	18040.00	22960.00
Students benefiting from direct interventions to enhance learning (Number) - (Corporate)		0.00	0.00	76400.00	753408.00	926368.00	941648.00
Students benefiting from direct interventions to enhance learning - Female (Number - Sub-Type: Supplemental) - (Corporate)		0.00	0.00	23470.00	158880.00	262030.00	322010.00
Teachers recruited or trained-Female (RMS Requirement). (Number)		0.00	75.00	620.00	1040.00	1190.00	1340.00
Number of teachers trained. (Number)		0.00	742.00	2067.00	3474.00	3974.00	4474.00
Number of PTA meetings held to discuss progress of ZEEP implementation (Number)		0.00	82.00	182.00	260.00	300.00	382.00

Intermediate Results Indicators						
		Cumulative Target Values				
Indicator Name	**Baseline**	**YR1**	**YR2**	**YR3**	**YR4**	**End Target**
Impact evaluation of the new teacher training system on teaching and learning (Text)	None	Baseline Survey	None	Mid-Line Survey	None	End line Survey and Completion Report
Teacher Development Data Platform (TDDP) developed. (Yes/No)	No	No	Yes	Yes	Yes	Yes
Study on specialized teachers for Grades 5–7 completed. (Yes/No)	No	No	No	Yes	Yes	Yes
Improved textbook management system in place and being used. (Yes/No)	No	No	Yes	Yes	Yes	Yes
Number of teachers who have at least 5 years' experience trained as textbook and learning material writers. (Number)	0.00	20.00	40.00	60.00	60.00	60.00
Completed the selection of schools for expansion. (Yes/No)	No	Yes	Yes	Yes	Yes	Yes
Number of girls using the newly constructed dormitories. (Number)	0.00	0.00	0.00	200.00	320.00	400.00
Number of classrooms constructed – completed and ready for use in selected expansion schools. (Number)	0.00	0.00	164.00	410.00	410.00	410.00
Number of MoGE staff trained by the enhanced training program for education planning and policy analysis. (Number)	0.00	0.00	0.00	20.00	40.00	60.00
Number of schools remaining unmapped with GPS coordinates completed. (Number)	4674.00	4674.00	3837.00	2337.00	837.00	0.00
Number of EMIS users trained. (Number)	0.00	0.00	130.00	1080.00	1080.00	1080.00
Percentage of schools that meet MoGE's records management standards. (Percentage)	0.00	0.00	30.00	70.00	100.00	100.00

Table 1.2. Indicator Description

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Percentage increase of teachers who meet the prescribed curriculum competencies and pedagogical skills requirement in Mathematics and Science at Grade 5 and Grade 9 in targeted schools.	It measures the percentage point increase from the baseline in teachers who meet the competency and pedagogical skills requirement for Mathematics and Science teaching in Grade 5 and Grade 9 in targeted schools.	Every year	Lesson Observation Form	MoGE Headquarters
Improved pupil-textbook ratio in Mathematics and Science for Grades 8–9, and Mathematics, Physics, Chemistry, Biology, Agricultural Science, and Science for Grades 10–12 in targeted schools.	It measures the number of selected textbook titles as described in the indicator available per student (Grades 8–12) in targeted schools.	Yearly	School Mapping	PEO, CDC
Number of students enrolled in Grades 8–12 in the expanded secondary schools with additional classrooms and facilities.	It measures the actual number of students enrolled following the provision of additional classrooms.	Yearly (cumulative)	Monitoring reports & completion certificates	MoGE Headquarters, PEO, DEBS
Students benefiting from direct interventions to enhance learning	It measures the total number of students benefiting from direct interventions to enhance learning.	Yearly (cumulative)	Monitoring Reports	MoGE
Students benefiting from direct interventions to enhance learning - Female	It measures the total number of female students benefiting from direct interventions to enhance learning.	Yearly (cumulative)	Monitoring reports	MoGE
Teachers recruited or trained-Female (RMS Requirement)	It measures the number of female teachers trained.	Yearly (cumulative)	Monitoring report	MoGE
Number of teachers trained	It measures the total number of teachers trained, including female teachers.	Yearly	Monitoring Report	MoGE
Number of PTA meetings held to discuss progress of ZEEP implementation	It measures how many meetings of PTAs of ZEEP-targeted schools take place, at which matters related to ZEEP implementation at the respective schools are discussed.	Yearly	Monitoring reports	MoGE, ZEEP-targeted schools

Intermediate Results Indicators				
Indicator Name	**Description (indicator definition etc.)**	**Frequency**	**Data Source / Methodology**	**Responsibility for Data Collection**
Impact evaluation of the new teacher training system on teaching and learning	It measures the completion of an impact evaluation of the new teacher training system for its scaling up.	Once	Sample Survey	MoGE
Teacher Development Data Platform (TDDP) developed.	It measures the completion of TDDP which is an online platform that stores teacher and student data relevant for developing training materials and tools to improve teachers' subject knowledge and pedagogical skills.	Once	Monitoring Reports	MoGE
Study on specialized teachers for Grades 5–7 completed	It measures the completion of the study investigating whether having specialized teachers (that is, teachers trained in mathematics teach mathematics) would help improve students' learning	Once	Monitoring Reports	MoGE
Improved textbook management system in place and being used.	It measures the completion and adoption of the improved textbook management system by MoGE.	Once	Monitoring Reports	MoGE
Number of teachers who have at least 5 years' experience trained as textbook and learning material writers.	It measures the number of experienced teachers who are trained to be able to write textbooks and learning materials with local content knowledge (Year 4–5 gives them time to complete their writing which started during the training).	Yearly	Monitoring Report	MoGE
Completed the selection of schools for expansion.	It measures the completion of selection using the agreed transparent criteria designed to promote equity in access to secondary education.	Once	Selection Reports	MoGE
Number of girls using the newly constructed dormitories	It measures the number of female students who use the dormitory facilities constructed under Component 2.	Yearly	Monitoring reports	MoGE

Number of classrooms constructed – completed and ready for use in selected expansion schools.	It measures the number of new secondary school classrooms constructed and furnished for use in selected schools.	Yearly	Monitoring Reports and completion certificates	MoGE, PEOs, DEBS
Number of MoGE staff trained by the enhanced training program for education planning and policy analysis.	It measures the number of MoGE staff trained by the enhanced training program for education planning and policy analysis.	Yearly	Monitoring Report	MoGE
Number of schools remaining unmapped with GPS coordinates completed.	It measures the completion of mapping of the schools that still do not have GPS coordinates.	Yearly	Monitoring Reports	MoGE
Number of EMIS users trained.	It measures the number of staff from the MoGE, provincial and district offices, and their Data Management Committees under the project to use the enhanced EMIS for their decision making related to educational matters.	Yearly	Monitoring Reports	MoGE Headquarters
Percentage of schools that meet MoGE's records management standards.	It measures the number of schools out of the total number of public schools compliant with the MoGE data management standard.	Yearly (cumulative)	Monitoring Reports	MoGE

Table 1.3. Disbursement-Linked Indicators (DLIs)

DLI	Total Financing Allocated to DLI	DLI Baseline	Unit of Measurement (Number, %, Y/N)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
DLI #1 Improved teacher competencies and skills in teaching mathematics and science in targeted schools		Baseline survey	Number, Y/N, %	**1.1** Identification of 300 schools and 764 teachers using the agreed criteria for the pilot under Subcomponent 1.1 (US$2.0 million)	**1.2** First-round diagnostic of teacher training needs in mathematics and science subject areas completed (US$1.0 million) **1.3** Baseline survey completed which measures the prescribed curriculum competencies and pedagogical skills of teachers teaching mathematics and science in Grades 5 and 9 in targeted schools (US$2.0 million)	**1.4** At least 650 identified teachers in pilot schools trained in the first-round of training based on the outcome of the first-round diagnostic (US$4.0 million)	**1.5** Second-round diagnostic of teacher training needs in mathematics and science subject areas completed (US$3.0 million)	**1.6** At least 90% of teachers trained in first round receive second-round training based on the second-round diagnoses (US$2.0 million)	**1.7** At least 5% increase from the baseline in proportion of teachers (teaching Grades 5 and 9) who meet the prescribed curriculum competencies and pedagogical skills in mathematics and science for Grades 5 and 9, respectively, in targeted schools (US$6.0 million)
Allocated amount (US$, millions)	20.0			2.0	3.0	4.0	3.0	2.0	6.0

DLI	Total Financing Allocated to DLI	DLI Baseline	Unit of Measurement (Number, %, Y/N)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
DLI #2A Improved textbook management system		0	Y/N, %	**2A.1** Textbook Management System Improvement Plan completed by the MoGE (US$1.0 million)	**2A.2** The improved textbook management system and guidelines are piloted and revised (as needed) and adopted by the MoGE (US$3.0 million)	**2A.3** Training of representatives from at least 60% of all public schools in each district by the PEOs in advanced textbook delivery verification (US$1.0 million)			
Allocated amount (US$, million)	5.0			1.0	3.0	1.0	0	0	0
DLI #2B Textbooks procured and delivered to targeted schools		0	Y/N, %		**2B.1** Bidding documents prepared according to the international bidding protocols outlined in the Government's PPA and Regulations for procuring textbooks on predefined subjects and grade levels for the	**2B.2** Textbooks procured through the bidding process according to the MoGE's improved textbook procurement guidelines are delivered to at least 80% of the targeted schools on time (US$3.0 million)			

DLI	Total Financing Allocated to DLI	DLI Baseline	Unit of Measurement (Number, %, Y/N)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
					targeted schools (US$2.0 million)				
Allocated amount (US$, millions)	5.0			0	2.0	3.0	0	0	0
DLI #3 Classrooms constructed and utilized in selected expansion schools		0	Number, Y/N, %	**3.1** Beneficiary schools (funded under the project for their expansion) identified and selected using the agreed criteria (US$1.5 million) **3.2** Action plan for preconstruction activities completed (US$1.5 million)	**3.3** Classrooms under Phase 1 construction are constructed up to wall plate level in at least 50% of the selected expansion schools (US$4.0 million)	**3.4** Students are enrolled and use the classrooms constructed under Phase 1 in the selected expansion schools US$1.2 million for every 1,000 students (capped at 5,000 students)	**3.5** Classrooms under Phase 2 construction are constructed up to wall plate level in at least 50% of the selected expansion schools (US$3.0 million)	**3.6** Students are enrolled and use the classrooms constructed under Phase 2 in the selected expansion schools US$0.5 million for every 1,000 students (capped at 10,000 students)	
Allocated amount (US$, million)	21.0			3.0	4.0	6.0	3.0	5.0	
Total DLI Disbursement (US$, millions)	**51.0**			**6.0**	**12.0**	**14.0**	**6.0**	**7.0**	**6.0**

Table 1.4. Disbursement-Linked Indicator Verification Protocol

DLI	Protocol to Evaluate Achievement of the DLI and Data/Result Verification			
	Data Source/Agency	**Verification Entity**	**Description of Achievement[a]**	**Verification Procedure[b]**
DLI #1 Improved teacher competencies and skills in teaching mathematics and science in targeted schools	Reports/TESS	Third party hired by the MoGE	**Year 0:** **1.1** Achieved when 200 primary and 100 secondary schools and 764 teachers (2 from each selected pilot school and 2 from each of 82 selected expansion school) have been selected according to the criteria agreed between the MoGE and the World Bank in paragraph 18 of Annex 2 of the Project Appraisal Document (PAD). (US$2.0 million)	The MoGE submits the report of the selection results of pilot schools and teachers to the PIU who sends it to the third party for verification to confirm that the selection was based on selection criteria agreed between the MoGE and the World Bank in paragraph 18 of Annex 2 of the PAD. The verifier submits the verification letter to the World Bank for approval.
	National Assessment Survey for Teachers, National Assessment of Learning Achievement Survey, Lesson Observation Form/ECZ, S&C, TESS	IVA hired by the MoGE	**Year 1:** **1.2** Achieved when the teacher training needs in mathematics and science subject areas are identified from the results of the diagnostic analyses (carried out in accordance with the ToRs agreed between the MoGE and the World Bank) on the basis of the first round of teacher data collection from the baseline survey, as described in DLI #1.3. (US$1.0 million)	The ECZ submits the diagnostic report which should, at a minimum, include (a) a comprehensive analysis of teachers' competencies and needs in relation to student learning outcomes and (b) in-depth overview and identification of problematic areas in teacher content knowledge and pedagogy, to the PIU, who gives it to the IVA for verification based on the requirement outlined in the inception report of this study approved by the MoGE and the World Bank. Once the verification is complete, the IVA submits the verification report to the PIU, who submits it to the World Bank for approval.

DLI	Protocol to Evaluate Achievement of the DLI and Data/Result Verification			
	Data Source/Agency	**Verification Entity**	**Description of Achievement[a]**	**Verification Procedure[b]**
			1.3 Achieved when the following are produced: (a) data from the baseline survey collected in accordance with the ToR and (b) the inception report approved by both the MoGE and World Bank on teacher content knowledge and pedagogical skills in mathematics and science at Grade 5 and Grade 9 in targeted schools, respectively. (US$2.0 million)	The ECZ submits the baseline survey report (which should include at a minimum, the baseline data required for ZEEP's Results Framework outlined in Annex 1 of the PAD) to the PIU, who gives it to the IVA for verification based on the requirement outlined in the inception report approved by both the MoGE and World Bank. Once the verification is complete, the IVA submits the verification report to the PIU, who submits it to the World Bank for approval.
	Report/TESS		**Year 2:** **1.4** Achieved when at least 650 of 764 teachers selected under DLI #1.1 have been trained, using the training materials developed/updated with the results of the first-round training diagnostic analysis of training needs under DLI #1.2. The package of the training materials should include at least (a) a program description, (b) a syllabus and materials addressing the problematic areas identified in the diagnostic analysis, and (iii) evaluation methods and implementation plan. (US$4.0 million)	Training provider submits the evaluation report of the training, together with participant contact information, to the PIU, who invites the IVA to verify based on (a) results of post-training assessment of participants and (b) confirmation of participation by calling randomly selected 10 percent of the participants. Once the verification is done, the IVA submits the verification report to the PIU, who submits it to the World Bank for approval.
	National Assessment Survey for Teachers, National Assessment of Learning Achievement Survey, Lesson Observation Form/ECZ, S&C, TESS		**Year 3** **1.5** Achieved when the second-round teacher training needs in mathematics and science subject areas are identified from the results of the diagnostic analyses (carried out in accordance with the ToRs agreed between the MoGE and World Bank) on the basis of data collected from (a) the first-round	The ECZ submits the diagnostic report which should, at a minimum, include (a) a comprehensive analysis of teachers' competencies and needs in relation to student learning outcomes and (b) in-depth overview and identification of problematic areas in teacher content knowledge and pedagogy, to the PIU,

DLI	Protocol to Evaluate Achievement of the DLI and Data/Result Verification			
	Data Source/Agency	**Verification Entity**	**Description of Achievement[a]**	**Verification Procedure[b]**
			training from Year 1, (b) the evaluation report of the first-round training, and (c) the second-round of student and teacher assessment data. (US$3.0 million)	who gives it to the IVA for verification based on the requirement outlined in the inception report of this study approved by the MoGE and World Bank. Once the verification is complete, the IVA submits the verification report to the PIU, who submits it to the World Bank for approval.
	Report/TESS		**Year 4** **1.6** Achieved when at least 90 percent of the teachers trained in the first round, as described in DLI #1.4, have been trained using the training materials developed/updated with the results of the second-round training diagnostic analysis of training needs under DLI #1.5. The package of the training materials should include at least (a) a program description, (b) a syllabus and materials addressing the problematic areas identified in the diagnostic analysis, and (c) evaluation methods. (US$2.0 million)	Training provider submits the training evaluation report of the training, together with participant contact information, to the PIU, who gives it to the IVA to verify (a) results of post-training assessment of participants and (b) confirmation of participation by calling randomly selected 10 percent of the participants. Once the verification is done, the IVA submits the verification report to the PIU, who submits it to the World Bank for approval.
	National Assessment Survey for Teachers/ECZ, S&C, TESS		**Year 5** **1.7** Achieved when the results of the IE in accordance with the ToRs agreed between the MoGE and World Bank show at least 5% increase from the baseline in the proportion of teachers in the targeted schools in Grade 5 and Grade 9 who meet the MoGE's prescribed curriculum competencies and pedagogical skills requirement in teaching mathematics and science, respectively (measured through the IE).[c]	The ECZ submits a report on the teacher assessment survey that shows the results of the assessment of pedagogical competencies and skills of teachers teaching mathematics and science at Grade 5 and Grade 9 in the targeted schools, together with the IE report that should include, at a minimum, methods used, sampling frame, data and data analysis, and improvement recommendations, to the PIU, who gives it to the IVA for verification based on the ToRs agreed between the MoGE and

DLI	Protocol to Evaluate Achievement of the DLI and Data/Result Verification			
	Data Source/Agency	**Verification Entity**	**Description of Achievement[a]**	**Verification Procedure[b]**
			(US$1.2 million for every 1 percent increase from the baseline, with allocation capped at US$6.0 million)	World Bank. Once the verification is complete, the IVA submits the verification report to the PIU, who submits it to the World Bank for approval.
DLI #2A Improved textbook management system	'Green Book'/PSU, CDC	IVA hired by the MoGE	**Year 0** **2A.1** Achieved when the improved textbook selection criteria with clearly defined standards for textbook selection, as described in paragraphs 33–36 in Annex 2 of the PAD and agreed between the MoGE and World Bank, are endorsed and adopted by the MoGE in its textbook procurement. (US$1.0 million)	The PSU and the CDC submit the 'Green Book'[d] to the PIU, who invites the IVA to verify whether the textbooks identified and listed in the 'Green Book' did apply the improved selection criteria agreed between the MoGE and World Bank. Once the verification is complete, the IVA submits the verification report to the PIU, who submits it to the World Bank for approval.
	Reports/PSU, S&C, CDC		**Year 1** **2A.2** Achieved when the pilot of the newly improved textbook management system adopted by the MoGE and endorsed by the World Bank through the delivery of mathematics and science textbooks to Grade 4 and Grade 8 students and teachers in the targeted schools under Subcomponent 1.2 has been completed. (US3.0 million)	The PSU submits a completion report on the pilot which should include, at a minimum, (a) the assessment of textbook planning, procurement, delivery, and tracking under the newly improved textbook management system through the pilot; (b) suggestions emerging from the assessment to further improve the new system; and (c) actual number of textbooks delivered to the targeted schools under the pilot and the unit cost per textbook, to the PIU, who invites the IVA to verify based on the description of the improved textbook management system adopted by the MoGE and endorsed by the World Bank and the ToR for the pilot agreed between the MoGE and World Bank. Once the verification is complete, the IVA submits the verification report to the PIU, who

DLI	Protocol to Evaluate Achievement of the DLI and Data/Result Verification			
	Data Source/Agency	**Verification Entity**	**Description of Achievement[a]**	**Verification Procedure[b]**
				submits it to the World Bank for approval.
	Reports/public schools, PEOs, DEBS, CDC		**Year 2** **2A.3** Achieved when representatives (one staff from each school) from at least 60% of all public schools in each district have (a) received training in accordance with the requirements outlined in the improved textbook management system, endorsed and adopted by the MoGE, especially on delivery verification and (b) provided information/evidence on the current textbook availability in their respective schools to the CDC office. (US$1.0 million)	Training provider(s) submits the training report(s) which should include at least the training description and training delivery information, together with participant contact information, to the PIU, who invites the IVA to verify based on (a) the training program description approved by the MoGE and (b) confirmation of participation by calling two randomly selected participants from each district. Once the verification is done, the IVA submits the verification report to the PIU, who submits it to the World Bank for approval.
DLI #2B Textbooks procured and delivered to targeted schools	Reports/PSU	n.a.	**Year 1** **2B.1** Achieved when the bidding documents for the textbooks procurement defined in Activity B under Subcomponent 1.2 of ZEEP that follow the requirements and procedures of the PPA are made available. (US$2.0 million)	The PIU submits the bidding documents to the World Bank for review and approval.
	Reports/targeted schools, DEBS, CDC, PSU	IVA hired by the MoGE	**Year 2** **2B.2** Achieved when the mathematics and life skills/science textbooks procured in accordance with the PPA and the MoGE's new textbook procurement guidelines endorsed by the World Bank are delivered to all grades in at least 80 percent of the targeted schools and 100 new secondary schools built by the Government, for the requested number of textbooks submitted by those schools to reach a 1:1 pupil-textbook	The PSU submits the delivery report which should include, at a minimum, (a) the description of the textbook delivery and tracking methods used; (b) the actual number of textbooks delivered; and (c) the unit cost per textbook, to the PIU, who invites the IVA to verify based on (a) the MoGE's new textbook procurement, delivery and tracking guidelines; (b) the textbook requests of the targeted schools and 100 new

DLI	Protocol to Evaluate Achievement of the DLI and Data/Result Verification			
	Data Source/Agency	**Verification Entity**	**Description of Achievement[a]**	**Verification Procedure[b]**
			ratio in those schools, by October of Year 2 before the start of the next school year. (US$3.0 million)	secondary schools built by the Government; and (c) confirmation of textbook delivery by calling randomly selected 10 percent of these schools. The IVA submits the verification report to PIU, who submits it to the World Bank for approval.
DLI #3 Classrooms constructed and utilized in selected expansion schools	Reports/ZEPIU	Third party hired by the MoGE IVA hired by the MoGE	**Year 0** **3.1** Achieved when the 82 selected expansion schools have been selected using the criteria agreed between the MoGE and World Bank under Component 2, which includes criteria on poverty level, pupil-classroom ratio, Grade 7–8 transition rate, number of existing secondary schools, and number of new or upgraded secondary schools built by recent government initiatives (see paragraphs 54–57 in Annex 2 of the PAD). (US$1.5 million) **3.2** Achieved when an action plan for preconstruction activities, which includes, at a minimum, (a) establishment of Project Implementation Committees (PICs) of the communities where the selected expansion schools reside, (b) requirement of ESMPs, (c) required accountability, and (d) activities schedule, is prepared and submitted to the satisfaction of both the MoGE and World Bank. (US$1.5 million)	The PIU submits the selection results report, which includes (a) selection criteria and method used and (b) the list of selected schools, to the third party for verification based on the selection criteria agreed between the MoGE and World Bank and outlined in paragraphs 54–57 in Annex 2 of the PAD. The third party sends the verification report or letter to the World Bank for approval. The Directorate of Planning and Information submits the preconstruction activity plan to the PIU, who submits it to the World Bank for approval.
	Construction progress reports; technical audit report by a third party		**Year 1** **3.3** Achieved when classrooms to be constructed under Phase 1 construction which is described in paragraphs 65–68 in Annex 2 of	Each PEO submits the progress report to the PIU, who will invite the IVA to verify only after the PIU has received reports from at least 50 percent of the selected

DLI	Protocol to Evaluate Achievement of the DLI and Data/Result Verification			
	Data Source/Agency	**Verification Entity**	**Description of Achievement[a]**	**Verification Procedure[b]**
			the PAD are constructed up to wall plate level in compliance with the MoGE's design package and quality requirement as well as the ESMP approved by both the MoGE and World Bank. Disbursement verification will start when at least 50 percent of the selected expansion schools have achieved the up-to-wall-plate-level target. (US$4.0 million)	expansion schools that have achieved the up-to-wall-plate-level target under Phase 1. The IVA's verification should include the actual site visit and be based on (a) PIC's implementation plan, (b) compliance with the MoGE's design package and quality requirement, and (c) the ESMP approved by both the MoGE and World Bank. The IVA submits the verification report covering the above requirements to the PIU, who submits it to the World Bank for approval.
	School registers the MoGE enrollment reports		**Year 2** **3.4** Achieved when students are enrolled and use the classrooms newly constructed under Phase 1 in the selected expansion schools, reported by the school register through the PEO. US$1.2 million for every 1,000 students (capped at 5,000 students) (US$6.0 million)	Each PEO submits the enrollment report to the PIU, who invites the IVA to verify by the combination of calling each selected expansion school and visiting randomly selected 10% of the selected expansion schools to verify the claimed enrollment. The IVA submits the verification report based on the above verification approach to the PIU, who submits it to the World Bank for approval.
	Construction progress monitoring reports; technical audit report by a third party		**Year 3** **3.5** Achieved when classrooms to be constructed under Phase 2 construction, which is described in paragraphs 65–68 in Annex 2 of the PAD, are constructed up to wall plate level in compliance with the MoGE's design package and quality requirement as well as the ESMP approved by both the MoGE and World Bank. Disbursement verification will start when at least 50 percent of the selected expansion schools have achieved the up-to-wall-plate-level target.	Each PEO submits the progress report to the PIU, who will invite the IVA to verify only after the PIU has received reports from at least 50 percent of the selected expansion schools that have achieved the up-to-wall-plate-level target under Phase 2. The IVA's verification should include the actual site visit and be based on (a) PIC's implementation plan, (b) compliance with the MoGE's design package and quality requirement, and (c) the ESMP approved by both the MoGE

DLI	Protocol to Evaluate Achievement of the DLI and Data/Result Verification			
	Data Source/Agency	**Verification Entity**	**Description of Achievement[a]**	**Verification Procedure[b]**
			(US$3.0 million)	and World Bank. The IVA submits the verification report covering the above requirements to the PIU, who submits it to the World Bank for approval.
	School registers the MoGE enrollment reports		**Year 4** **3.6** Achieved when students are enrolled and use the classrooms newly constructed under Phase 2 in the selected expansion schools, reported by the school register through the PEO. US$0.5 million for every 1,000 students (capped at 10,000 students) (US$5.0 million)	Each PEO submits the enrollment report to the PIU, who invites the IVA to verify by the combination of calling each selected expansion school and visiting randomly selected 10% of the selected expansion schools to verify the claimed enrollment. The IVA submits the verification report based on the above verification approach to the PIU, who submits it to the World Bank for approval.

Note:

a. 'The targeted schools' in this column, as defined in the main text, are those pilot schools selected for the new teacher training system pilot under Subcomponent 1.1 (that is, 200 primary schools and 100 junior secondary schools) and those selected expansion schools for receiving new classrooms and facilities under Component 2 (that is, 82 selected expansion schools).

b. The process of DLI disbursement is such that the verification report/document for the achievement of a particular DLI target should be submitted to the World Bank for approval. If satisfactory, the World Bank then lifts the disbursement condition and advises the Government to submit the withdrawal application together with the IFR. On the basis of this, disbursement will be made.

c. To demonstrate whether the interventions supported by the project has any impact on student learning improvement, an IE will be conducted under Subcomponent 1.1, which includes baseline, mid-line, and end-line surveys.

d. 'Green Book' is a list of titles of textbooks approved by and a list of supplementary materials recommended by the MoGE, based on a set of transparent criteria, for the use of schools to select textbooks and supplementary materials for teaching and learning of the subjects required by the national curricula at all grade levels.

Annex 2: Detailed Project Description

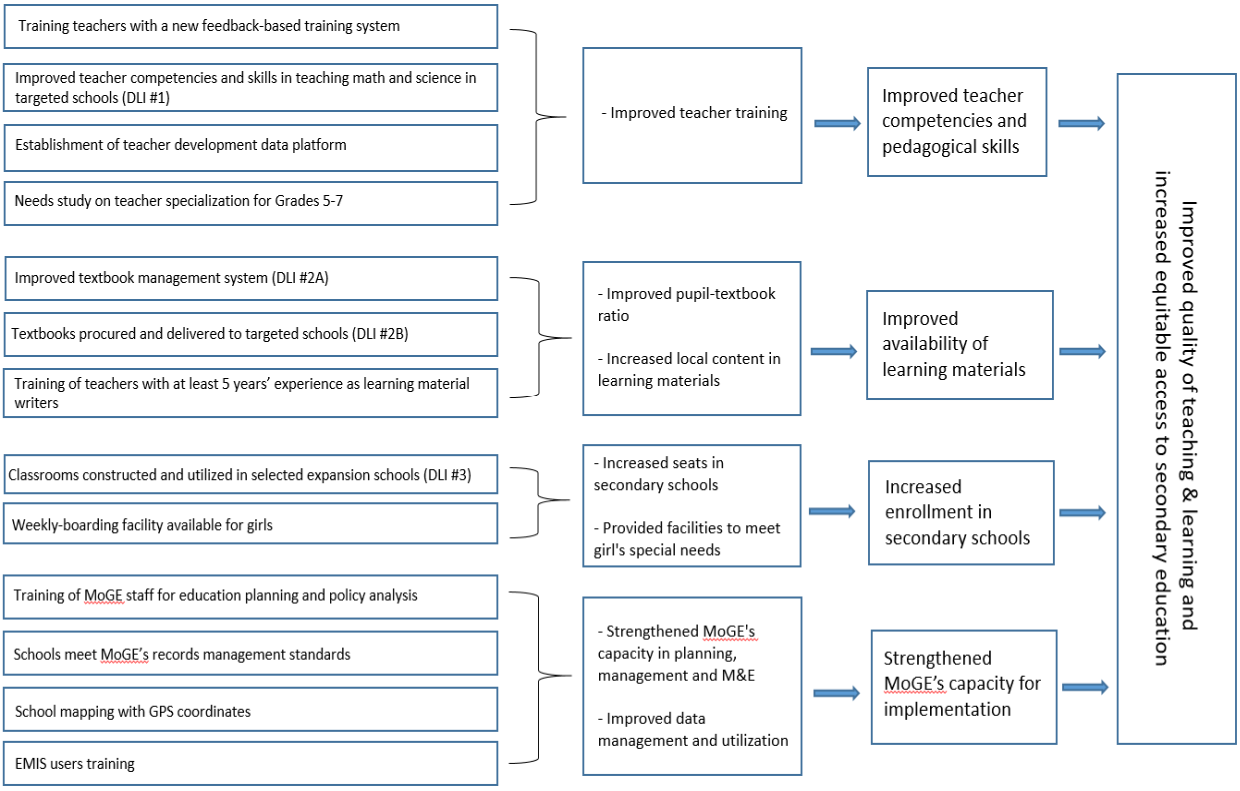
ZAMBIA Education Enhancement Project (P158570)

1. General education in Zambia comprises primary and secondary education (Grades 1 to 12). The primary challenges confronting the Zambian education system are poor learning outcomes, which have been largely stagnant for the past 15 years, and low rates of transition from primary to secondary education. A number of studies, including the education sector PER, identified at least three factors driving low student learning outcomes and poor transition rates to secondary education. These include: uneven teacher quality; the limited availability of textbooks; and the lack of classrooms for secondary education, particularly in rural areas. The proposed ZEEP will support the Government's efforts to improve the quality of education, particularly with regard to learning outcomes, and will address the three abovementioned challenges. Specifically, the project will support improvements in the quality of teaching and learning through interventions to provide teacher training and textbooks (Component 1); improve access to secondary education through the provision of additional physical infrastructure at select existing schools (Component 2); and enhance the Government's capacity for educational planning, management and M&E, and ZEEP implementation coordination (Component 3). Table 2 under the Project Components section in the main text of this document details how the project will support both primary and secondary education, promote equitable access, and focus on improved teaching and learning in mathematics and science.

2. The PDO is to improve the quality of teaching and learning in mathematics and science in targeted primary and secondary schools and to increase equitable access to secondary education. An evidence-based theory of change links interventions to the outcomes sought. As Table 2 indicates, a focus on equity cuts across these components through the selection of schools targeted for expansion in rural and poor areas and the provision of boarding and ancillary facilities for girls in some of these schools. Synergy with other World Bank-financed projects, such as GEWEL and the Zambia Improved Rural Connectivity Project, will be explored during the implementation to maximize the impact of ZEEP's interventions.

3. With its results chain (Figure 2.1), ZEEP uses an IPF instrument based on an RBF approach with three defined DLIs. An overview of the project's three components is provided in the following paragraphs.

Figure 2.1. ZEEP Results Chain



Source: The World Bank Project Team.

Component 1: Improving the Quality of Teaching and Learning [The total cost for this component is US$160.5 million of which the IDA contribution is about SDR 17.3 million (US$24.0 million equivalent).]

4. This component addresses two conditions that are critical for supporting student learning: teacher quality and access to quality textbooks. Studies identify both areas as likely contributors to persistently low student learning outcomes in Zambia. This component has two subcomponents.

Subcomponent 1.1: Strengthening the Teacher Training System

5. The objective of this subcomponent is to strengthen the teacher training system. Zambia has an established teacher education and training system. However, persistently low student learning outcomes (less than 40 percent pass rate)—ranking near the bottom on the regional competency assessment (SACMEQ)—indicate that inputs proximate to the teaching and learning process are not being continuously modified to respond to student needs and to address difficulties encountered by students. Diagnostic analyses identify issues with the curriculum, textbooks, the learning assessments themselves, the teacher training system, or teachers that impact learning outcomes. However, all of these factors manifest themselves in the personage of the teacher through their knowledge and practice. Leveraging content knowledge and teaching skills is influenced by the quality of the teacher training system, which should be tailored to respond to the findings of diagnostic analyses. For example, certain challenges relating to student learning may be traced to the curriculum. As a consequence, the curriculum should be modified, but the teacher

training system must also ensure that teachers incorporate changes into their content knowledge and practice.

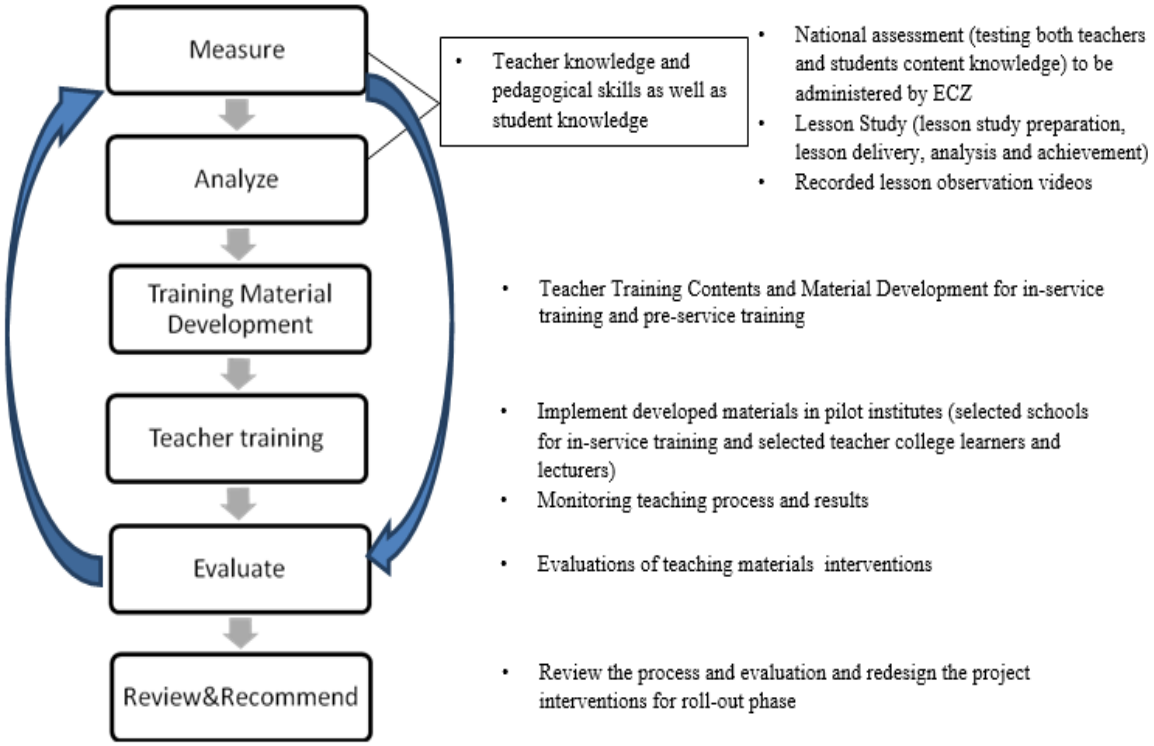
6. Student learning assessments and teacher training and performance evaluations do exist, but there is no means for ensuring a feedback loop wherein the content of student assessments inform teacher training. This component is designed to enhance the teaching competencies and skills of mathematics and science teachers in Grades 1 to 5 and Grades 8 to 9 by creating and strengthening feedback mechanisms between analyses of learning outcomes and the teacher training system. The SPRINT framework[51] will be used to implement this component. Because many factors contribute to improved student learning, an evaluated pilot will be undertaken to determine whether the proposed interventions have a positive impact on student learning achievement.

7. Zambia's existing teacher evaluation system assesses teachers' subject knowledge and pedagogical skills. Routine visits to schools by the education officers constitute the primary means for the assessment of pedagogical skills. Subject knowledge is assessed through National Assessment Surveys (NAS) conducted by the ECZ every two years. To improve teachers' subject knowledge, the system uses teacher group meetings (TGMs) (School-based Continuing Professional Development [SBCPD]) at the school level and runs holiday programs at the teacher resource zone centers. However, this system is undermined by several shortcomings: (a) there is no mechanism to compile and analyze collected information on teachers' pedagogical skills, (b) there is no mechanism to use the results of the NAS in SBCPD; and (c) there is no analysis of the links between teachers' subject knowledge/pedagogical skills and student learning outcomes. As a result, difficulties faced by students in the learning process, are not treated as a function of teaching challenges.

8. This component will address these gaps by creating a feedback-based training system to ensure continuous improvements to teacher competencies and skills, with a focus on mathematics and science subjects in Grades 1 to 5 and Grades 8 to 9. Figure 2.2 illustrates the process of teacher training incorporating a feedback loop.

[51] Under the SPRINT framework, the school plans for its own term activities for continuing professional development.

Figure 2.2. Teacher Competencies and Skills Enhancement System



9. The proposed project through this component will support the following:

(a) **Establishment of a feedback system.** The project will help create a national online platform that will provide real-time information on students' learning outcomes and teachers' competencies and skills. The platform will require relevant teacher and student data,[52] collected from different actors and at different levels, including data collected by the central MoGE and by DEBS and provincial offices.

(b) **Analysis of collected data to link students' learning problems to teachers' knowledge and pedagogy gaps.** These analyses will be used to flag areas where teachers' subject knowledge and pedagogical skills need to be improved.

(c) **Development of training materials.** The analyses outlined will be used to develop teacher training materials that are learner-centred, user-friendly, and aligned with the curriculum. At present, the teacher training materials are only revised when the curriculum changes, and they do not systemically take into account analyses of problems undermining student achievement.

(d) **Training of teachers.** Training will be conducted for selected teachers from pilot schools and lecturers from the participating CoEs using the new training materials.

[52] Data on teachers' subject knowledge and pedagogical competencies as well as student learning outcomes.

(e) **M&E.** Trained teachers and lectures will be continuously evaluated and monitored, to assess progress and to identify further areas for improvement.

(f) **Further strengthening and consolidation of the system.** Through each iteration of this process, a strong and informed feedback loop will be progressively developed and strengthened, linking the analysis of learning outcomes and data on teachers' pedagogical skills and subject knowledge, to continuously inform and improve teacher training.

10. The component includes a pilot to test the effectiveness of the proposed intervention. The pilot will be nation-wide and include 200 primary schools, 100 secondary schools, and 82 selected expansion schools (under Component 2). Only one district in each province, demonstrating the poorest student learning outcomes, will be targeted. Twelve CoEs will participate. At least 764 in-service teachers (two teachers per pilot school—one for mathematics and one for science at both primary and secondary levels) will be trained as trainers and will be counted for the purpose of the result achievement under DLI #1 (improved teacher competencies and skills in teaching mathematics and science in targeted schools). Sixty lecturers from the selected CoEs will be trained as trainers. It is estimated that 110,210 students will benefit from this intervention during the life of the project. Further, approximately 300 trainee teachers will benefit from the project through their participation at the school level during in-service practical training and through their work with trained teachers (those trainers who will play a facilitation role in the process). Each group of five trainee teachers will be supervised by one trainer. With guidance from the TESS of the MoGE, school authorities will be responsible for selecting in-service teachers to be trained as trainers. To insulate the pilot from the effects of attrition, stemming from promotion or other factors, replacement teachers will be trained as trainers/facilitators in the respective subjects.

A. Measurement and Data Collection

11. **Teacher training data management system.** The 'Measure' stage starts with establishing a functioning Teacher Development Data Platform (TDDP) that contains all relevant data and reports from participating departments and institutions on teachers' qualification, competencies, and skills. The NSC is in charge of data collection and compilation. The NSC will develop this TDDP (a common data platform and management system) either through in-house development or consultancy for all stakeholders who can access, contribute, and use data. All the data on teachers' training and qualifications will be linked to school data in the EMIS and the ECZ's learning assessment data. The NSC is responsible for developing a user guide and instructional manual for user training and the recruitment of one data coordinator to coordinate with stakeholders for data inputs.

12. **Data collection on teachers' subject knowledge (pedagogical content knowledge) and student knowledge.** In collaboration with the S&C, the ECZ will collect data on teachers' subject knowledge and pedagogical content knowledge and skills through classroom observation and other measures in the pilot schools. The project will support three cycles of data collection during project implementation—in Years 1, 3, and 5.

13. **Compilation of lesson study assessment in schools**. The TESS and the NSC will improve the lesson study data compilation by strengthening capacity in the teacher resource zone centers and data centers in all the provinces, including pilot districts and teacher colleges.

B. Analysis and Training Material Development

14. A team of experts (local and international), in collaboration with experts on information and communication technology (ICT) in education, will analyze: (a) national assessment data (Grades 5 and 9 student learning assessment data); (b) lesson study data (lesson preparation, delivery, analysis, and achievement); and (c) teacher evaluation data, to identify where training materials should be revised.

15. The training materials will be developed in the following three phases:

(a) **Selection of topics.** Identify mathematics and science topics that students in Grades 1 to 5 and Grades 8 to 9 have difficulty learning, premised on analyses of students' learning assessment and examination data in mathematics and science.

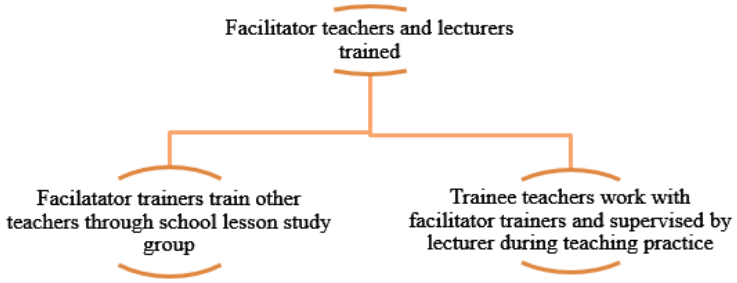
(b) **Identification of issues.** Analyze teachers' pedagogical/contents knowledge and lesson study data and identify gaps in teachers' competencies and skills that may undermine student learning achievement in mathematics and science.

(c) **Development of training materials.** Develop training materials in the most appropriate format (short messaging service, such as text messages, video, other types of ICT, or prints) to improve teacher competencies and skills in mathematics and science for Grades 1 to 5 and Grades 8 to 9.

C. Training

16. The teacher training pilot will target mathematics and science teachers of Grades 1 to 5 and Grades 8 to 9 in 382 pilot schools. The TESS will provide overall guidance to local school authorities on the selection of pilot schools and teachers using specified criteria (see section D). The proposed training modality to support this activity, is a cascaded training model wherein trained teachers train other teachers (in-service and preservice) through TGMs (see Figure 2.3) to facilitate learning and practice. In addition, the trainer teachers are also expected to share practices with other teachers at a zonal level, especially during zonal training organized through teacher resource zone centers.

Figure 2.3. The Cascaded Model for Teacher Training Employed by Component 1



17. The training will focus on three different levels, as follows:

(a) **In-service training**. Two Grade 1 to 5 teachers and two Grade 8 to 9 teachers in mathematics and science (one for each subject) will be selected from each pilot school as potential 'facilitators/trainers'. These teachers will be trained at training centers for five days (one day of orientation, one day for Grades 1 and 2, one day for Grade 3, one day for Grade 4, and one day for Grade 5). Similar arrangements will be made for Grade 8 to 9 teachers. Lecturers from local teacher colleges will also participate in the training for the purposes of improving preservice training programs.

(b) **Preservice training**. The practical component of preservice training will be supported by the project, through the placement of student teachers in pilot schools for practical training. Trainee teachers will work closely with trained facilitator teachers and participate in the TGM's lesson study meetings at the school. For every five students, there will be a mentor teacher from the pilot school. They will also receive academic support from lecturers from their CoEs. A team will comprise a practicing teacher (mentor), five student teachers, and a CoE lecturer. Twelve CoEs will participate in the project.

(c) **Lesson study framework**. Both in-service and preservice teacher training will be implemented through the existing lesson study framework (SBCPD). The lesson study capitalizes on the TGM where teachers of different subjects from different grades meet at the school level to discuss common issues in classrooms and on topics related to each subject. For a chosen subject, the teacher facilitator will lead discussions with teachers in Grades 1–5 and Grades 8–9, working through the lesson study cycle. Typically, this involves eight steps: (i) defining problems and challenges, (ii) collaboratively planning the lesson, (iii) implementing a demo-lesson, (iv) discussing the demo-lesson and reflecting on its effect, (v) revising the lesson, (vi) teaching the revised lesson, (vii) discussing the revised demo-lesson and reflecting again, and (viii) compiling reflections and sharing them with other teachers.

D. Selection of Pilot Schools

18. The pilot schools will be selected using the following criteria:

(a) One district in each province, demonstrating the poorest student learning outcomes, will be selected.

(b) The total number of schools in that district, both primary and secondary, will be confirmed for allocating number of pilot schools within the district.

(c) Schools will be coded for their geographical location[53] and size, as defined by the student population (that is, a large school has a big student population).

[53] This categorization is according to the EMIS specification.

(d) Schools will then be spatially categorized (rural versus urban) within the district, with more weight given to the category with more schools.

(e) For each geographical area, there are large, medium, and small schools. Large schools will be assigned a higher weight.

(f) To determine the exact number of schools, weights will be multiplied by the total number of schools belonging to that category. For instance, the weight for urban and large schools is multiplied by all the schools within that district that are large and urban.

(g) Once the exact number of schools is determined by category (urban-large and urban-medium), schools fitting that category are ranked in descending order, with the worst performers, as measured by students' learning outcomes, at the top. The cutoff is determined by the actual number of pilot schools to be selected for that category.

(h) In addition, all selected expansion schools (a total of 82) under Component 2 will be included.

E. Monitoring and Evaluation

19. Process monitoring reports and internal evaluation reports will be produced and published annually for all activities supported by Subcomponent 1.1. These reports will be used for evaluating the new teacher training system. Three external evaluation reports will be prepared by evaluation experts to assess training materials and mechanisms. The results of this component will be measured and monitored against the defined indicators, with annual targets, over the project life-span. Annex 1 includes details on the project indicators.

20. As described earlier, the pilot will be subject to an IE to assess the effectiveness of the new teacher training system on student learning outcomes. The IE will commence with a baseline survey in the first year of implementation and have a midline survey and an end-line survey (which will be undertaken in Year 5). The IE will be completed in the final year of the project. Surveys will focus on teacher competencies and student learning achievements and will be conducted for both treatment and control groups of schools. Each group will have 382 schools, including 200 primary schools and 182 secondary schools. Together, a total of 764 schools will be targeted by the IE. Schools that are not pilot schools receiving the intervention (the treatment group), but share similar characteristics as pilot schools, will be selected as the control group for the study. Due to the design of the intervention (for example, the cascaded training model, the use of local teacher resource zone centers, and so on), to minimize potential interference and contamination, schools in the control group will be selected from the neighboring districts of the pilot schools (not within the same district where a pilot school resides) instead of random sampling. The same selection criteria outlined for selecting pilot schools will apply in selecting the control group. It is expected that the results of this IE will inform any decisions on the part of the MoGE as to whether or not the pilot intervention should be scaled up across the entire education sector.

F. Schedule of Activities

21. The timelines for implementing and completing the activities supported under this subcomponent can be found in the PIM.

22. Finally, two TA activities will be financed under Subcomponent 1.1:

(a) **A review of the NAP and capacity-building support to the MoGE to execute the improvement recommendations of the review.** Specifically, to ensure the robust learning assessment instruments, support will be provided to the MoGE to conduct a thorough review of the NAP. This TA will help to build capacity within the NAP for improved governance and implementation.

(b) **A study of the benefits, feasibility, and implementation of having specialized teachers catering to Grades 5–7.** Currently, primary school teachers in Zambia teach all subjects without subject specification. This practice makes the deployment of primary teachers easier. However, it may contribute to the stagnant and low learning outcomes. Available research does highlight the importance of teacher specialization in subject content knowledge and pedagogy for student learning outcomes. Globally, countries with better learning outcomes use trained subject teachers to teach specific subjects in the later years of primary education.

23. **Implementation arrangements.** The TESS will lead and coordinate the execution of the pilot through specific taskforces (for example, for training material development and M&E). Each taskforce will be managed by a staff member with a clearly defined mandate, appointed by the PS from the directorate. The members of the taskforce will represent the institutions which will jointly implement the pilot, for example, the TCZ, the MoGE's CDC, the ECZ, the NSC, UNZA, and the CoEs. Each taskforce will have clearly defined ToRs detailing the scope and responsibilities of the taskforce in relation to the pilot. Details can be found in Annex 3. To ensure the results, DLI #1 (improved teacher competencies and skills in teaching mathematics and science in targeted schools) will be used for disbursement under this subcomponent.

Subcomponent 1.2: Improving Textbook Availability

24. This subcomponent aims to tackle the issue of severe shortages of textbooks in the country by: (a) improving the current textbook management system; and (b) improving the system for procuring and delivering mathematics and life skills/science textbooks to schools. To ensure the results, DLI #2A (improved textbook management system) and DLI #2B (textbooks procured and delivered to targeted schools) will be used for disbursement under this subcomponent.

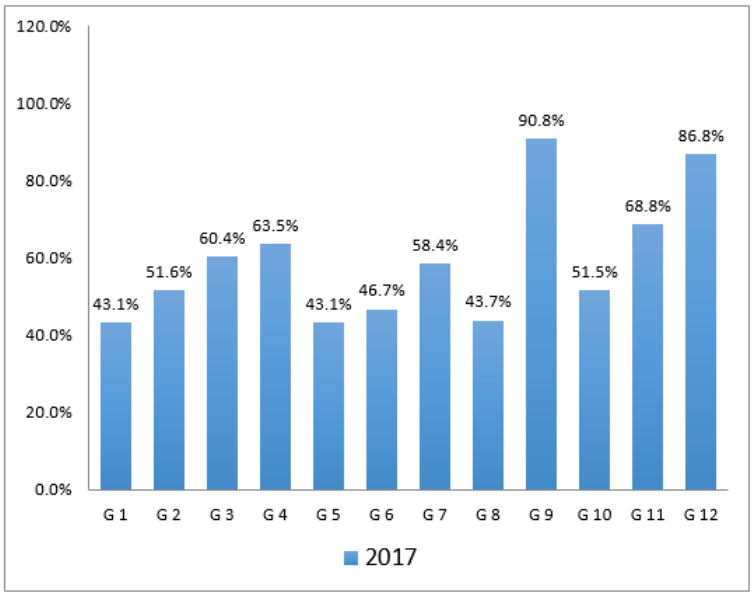
25. **Current status of textbook availability.** The recent QSDS and PER for Zambia found significant textbook shortages in all subjects at the primary and secondary levels. At the secondary level, the present textbook-pupil ratio is about 1:5 in the subjects of mathematics and science.

26. In 2014, in alignment with the implementation of the new curriculum, the MoGE started an initiative to improve the availability of textbooks at the school level. Textbook planning and procurement is implemented centrally. The current intervention to improve textbook availability is being implemented in four phases, to be completed by the 2017/18 academic year. By the end

of Phase 4, the most optimistic scenario envisions that approximately 60 percent of primary students and 70 percent of secondary students will have textbooks supporting study in the main subjects. This scenario assumes no budget shortage and no distribution leakage. Even in this best-case scenario, the current national program will be insufficient to achieve availability of textbooks for all enrolled students.

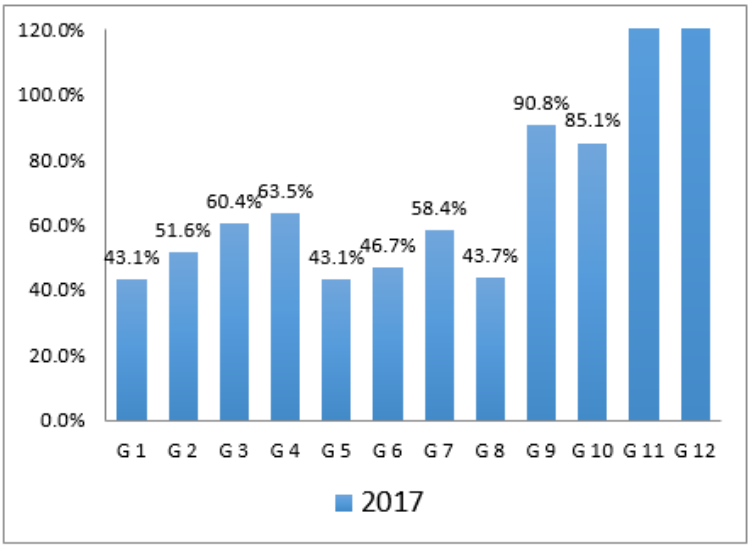
27. Data relating to the availability of mathematics and science textbooks for each grade is presented in Figures 2.4 and 2.5, respectively. Notably, for the above-mentioned scenario, the projected availability of mathematics textbooks after the four phases in academic year 2017/18 will be 52.2 percent for the primary level and 68.0 percent for the secondary level.

Figure 2.4. Projection of Mathematics Textbook Availability in Academic Year 2017/18[a]



Source: World Bank project preparation team.
Note: a. This projection is based on the numbers provided by the MoGE procurement office and the following assumptions: (a) full implementation of Phase 3 and 4 in 2017, (b) no leakage of textbooks during the delivery phase, and (c) 10 percent of annual loss rate of textbooks.

Figure 2.5. Projection of Science Textbook Availability in Academic Year 2017/18



Source: The World Bank project preparation team.

28. Two activities of this subcomponent are designed to address severe textbook shortages in Zambia. The first focuses on improving the current textbook management system, and the second uses this improved system to procure and deliver textbooks to schools.

Activity A: Developing Institutional Capacity

29. The objective of this activity is to improve the current textbook management system by assessing and redesigning the system as needed and by providing technical support and training to improve stewardship of the system. To ensure the results, the disbursement of this activity will be linked to the achievement of DLI #2A (improved textbook management system) (see Table 1.3 in Annex 1).

30. **Current textbook management chain.** The textbook management chain[54] identifies the key steps spanning textbook development to textbook use by students. Understanding each step and the connection between steps is critical to the overall functioning of the system. If these relationships function well, textbooks will be successfully provided to students. Analytically, the chain can be used to identify weaknesses in the current textbook supply system.

31. The development and printing of textbooks in Zambia have been privatized since 2011. The S&C in the MoGE sets the curricula and syllabi for Grades 1 through 12. This directorate is responsible for consolidating textbook demand, developing textbook plans, and submitting plans to the procurement office. Private publishers are subsequently screened and selected by the CDC. Only selected publishers can bid for procurement (12 publishers were eligible in 2015). The PSU, under the MoGE, manages the procurement process centrally.[55] Once the procurement process is

[54] Crabble, R., M. Nyingi, and H. Abadzi. 2014 *Textbook Development in Low-Income Countries: A Guide for Policy and Practice*. World Bank.

[55] Since 2014, the MoGE has procured textbooks centrally as the ministry implements the four-phase national program to improve textbook availability at the school level.

completed, publishers and/or the MoGE central office deliver the printed textbooks to schools in urban areas. In rural areas, DEBS are expected to deliver the textbooks to schools. However, this process does not work well due to a shortage of funds to support transportation costs. Once the textbooks are delivered, tracking is conducted by the standards officers based in DEBS.[56]

32. Several strengths and weaknesses can be identified from a review of Zambia's textbook management chain. The strengths of the current system are: (a) high capacity at the central level of MoGE (S&C, CDC, and procurement office); (b) sufficient numbers of qualified private publishers in the market; and (c) a competitive procurement system. Weaknesses include (a) inadequate planning capacity, (b) procurement capacity at the subnational level, (c) processes for evaluating textbook quality, (d) lack of available distributors to schools in many rural areas, and (e) a weak monitoring system to track textbooks at the school level. The European Commission identified these weaknesses in its 2009 textbook study, and they remain largely the same today.

33. **The project will support interventions in three areas.** The MoGE and the World Bank discussed the current bottlenecks in textbook management and agreed on activities to improve the capacity of textbook management. The capacities to be targeted under the project are (a) planning and procurement, (b) delivery, and (c) tracking/verification of delivery. An advanced approach to textbook management will enable the MoGE to clear the bottlenecks in the existing textbook management chain and prepare for a future shift toward decentralized textbook planning and procurement. Column (a) of Table 2.1 presents the existing approach for each stage of textbook management and column (b) contains the proposed support by the project to progress toward the advanced approach. The project will fund capacity development in textbook management to accelerate the advanced planning and procurement approach in textbook planning and procurement. Detailed descriptions are provided in Table 2.1.

Table 2.1. Potential Support to Improve Textbook Management

Activity	a. Existing Approach	b. Agreed Advanced Approach
1. Planning and Procurement	Centralized planning and procurement	• Improve procurement mechanism, using ZPPA's eGP system for long-term agreements (LTAs) under the Centralized Framework Contracts; • Improve mechanism for the CDC review and evaluation of book titles so that only the best and limited titles are chosen for each grade and subject; and • Strengthen planning and procurement capacity of DEBS/PEOs and schools (for example, placing orders and quantifying requirements for better planning).
2. Delivery	Provision of funds to DEBS for the delivery of books to hard-to-reach schools	• Delivery cost from publisher to schools should be factored in the bidding price (including the use of results-based payments as in the case of Kenya and Rwanda) and • Easy-to-reach schools and hard-to-reach schools for textbook delivery should be identified through the exercise.
3. Tracking at school level	Manual reporting from standards officers	• Strengthen the current monitoring system through DEBS and the PEOs by standards officers through revision of the existing monitoring tools and guidelines and • Introduce new community-based delivery verification and tracking system by the PTA or communities.

Note: eGP = e-Government Procurement; ZPPA = Zambia Public Procurement Agency.

[56] Starting in 2017, the textbook delivery and tracking responsibilities will shift to the PEO.

34. **Planning and procurement.** Currently, the national program applies a centralized, supply-driven planning and procurement approach. The MoGE wants to shift to an approach that combines decentralized planning and central procurement. This requires the consolidation of textbook requirements from the school, district, province, and national levels before procurement is undertaken, taking into account the logistical requirements and challenges of each site. The advanced approach will (a) improve quantification of textbook requirements from the school level to the subnational and national level, (b) improve the quality of review and identification of book titles, and (c) include delivery costs to schools in procurement. The project will finance (a) TA for improved logistics and (b) a series of capacity-development activities for provincial and DEBS officers and schools to implement the advanced planning, procurement, and supply logistics approach.

35. There are several potential activities that can improve planning and procurement. One is to improve the procurement mechanism, using the ZPPA and eGP system for LTAs under the Centralized Framework Contracts with actual orders from the framework contracts and payments still being decentralized. A second is to improve the CDC process for reviewing books so that only the best, and a limited number of titles, are chosen for each grade and subject. The result would be to prequalify a list of books by publishers, using more stringent evaluation criteria based on comparable parameters, to maintain comparability in the selection and to introduce competition in price. The third is to improve the bidding and evaluation systems. The objective of related interventions would be to approve no fewer than three book titles for each grade and subject. On this basis, publishers with approved books would compete for contracts on an item basis, in a procurement process premised on framework contract basis. This would result in one book being approved per grade per subject. Delivery costs to the final destinations for each contract that is awarded would typically be included in the prices bid separately, because, in some cases, the MoGE would determine that delivery to the final destination may or may not be included in the contract amount. Subject to review and approval by the World Bank, the MoGE may determine whether to make alternative logistical arrangements for delivery of textbooks to specific school sites, particularly for hard-to-reach schools. This reform will require the MoGE to increase its capacity for quantification and supply logistics, with the support of TA. In addition, training is needed for DEBS/PEOs and schools to place orders and quantify requirements to improve planning and put in place a mechanism for improved accountability to monitor the delivery of books to the final destination sites before payments can be made.

36. To facilitate local market development, the MoGE could work with the local textbook publishing industry by (a) reaching out to explain the changes and improvements proposed to the textbook procurement and delivery process to be undertaken through ZEEP (including private delivery to final destinations, in contrast to the current system of delivery to the capital only) and by (b) considering decentralized procurement throughout the entire textbook supply chain, before using government resources to deliver textbooks.

37. **Delivery.** Getting textbooks to beneficiary schools and students on time is problematic. In many low-income countries, textbook delivery is the biggest challenge in textbook management.[57] Even in cases where the Ministries of Education are involved, many African countries struggle

[57] Brickhill, P., C. Chirwa, and B. Lindahl. 2006. *Changing Public/Private Partnerships in the African Book Sector*. ADEA.

with delivering textbooks from district education offices to schools.[58] In this regard, Zambia is no exception.

38. There are two feasible options for textbooks delivery: contracts which include supply of textbooks and delivery by publishers or supply to the Government with delivery being carried out under a government system. A third option, a mix of private and public delivery,[59] is currently being used by the Government but is not considered to be an optimal solution. The first solution consists of linking distribution with publishing at the bidding stage. Publishers increase contract sums to include textbooks prices and a margin to cover the cost of school delivery (usually the delivery by private publishers costs much less than using the government system). In this case, both prices are presented separately, with a final cost combining both costs indicated. This system works well in Uganda, Kenya, and Mongolia. In the second option, the government distribution systems have not worked well in many low-income countries.[60] Nevertheless, the government distribution systems can function effectively, as in the cases of Moldova and Mozambique. It is important to consider which approach would work better in Zambia.

39. In the third option, which the MoGE currently uses, the MoGE delivers the textbooks through different approaches for easy-to-access schools and hard-to-reach schools. The MoGE or publishers deliver textbooks to easy-to-access schools, while the MoGE or publishers deliver most of the textbooks to DEBS, in cases of hard-to-reach schools. DEBS then deliver textbooks to schools, using an additional one-time grant (ZMW 6,000 per DEBS in 2016). It was, however, reported that many DEBS struggle with the delivery of textbooks to schools in rural and remote areas. One of the primary bottlenecks identified was limited funding to support transportation costs (and/or equipment) to transport textbooks from DEBS to schools.[61]

40. There are potential activities to improve the delivery of textbooks under the project: (a) identify easy-to-access schools and hard-to-reach schools based on logistics analysis based on geographical location, distance, and accessibility; (b) include the delivery costs to schools in the bidding price; (c) examine the best approach and cost estimates for last mile delivery costs to schools from either PEO/DEBS or zone schools, possibly with technical support of logistics TA; (d) contract with local suppliers from PEO/DEBS to schools; and (e) examine the feasibility of transit storage for selected hard-to-reach schools. The transit storage facilities would preferably be those that are part of the MoGE. In this case, the total transit period should not exceed two weeks from the time of the delivery of textbooks, and the World Bank team would clear the cost of transportation from storage points to final destinations.

41. **Tracking.** Tracking textbooks at the school level helps verify the completion of delivery and also helps in determining the number of textbooks needed for subsequent years. Currently, there is a tracking mechanism for textbook distribution by standards officers based in DEBS.

[58] Read, T. 2015 *Where Have All the Textbooks Gone?* World Bank.
[59] There is also a third option: to tender school-level distribution to professional haulage companies. However, the cost is usually too high to be affordable by low-income countries.
[60] Read, T. 2015. *Where Have All the Textbooks Gone?* World Bank.
[61] The MoGE increased the budget from ZMW 1,500 to ZMW 6,000 per DEBS for delivery from DEBS to schools as a temporary measure in Phase 2 of its current program to improve textbook delivery**.**

However, this mechanism does not work well, primarily because DEBS has insufficient funds to conduct monitoring in schools.

42. Effective delivery verification and tracking systems should be introduced in Zambia. There are several success cases internationally: (a) using an electronic tracking system for district offices linked to the central and school levels; (b) conducting sample-based tracking from central (or provincial) offices to schools; and (c) school-based tracking practices within a school-based management framework, preferably working with the PTAs or community service organizations, through third-party monitoring. In neighboring countries, innovative methods have been used, including computer-based tracking databases, and the use of mobile technologies. For instance, Rwanda and Namibia are using an innovative tracking system, based at local education offices, linked to textbook ordering systems.

43. To improve the tracking capacity in the Zambian context, the proposed project will support the MoGE to (a) revise the existing monitoring tools and guidelines to strengthen the current monitoring system through DEBS by standards officers and (b) introduce a new community-based tracking system for the PTAs and/or communities.

44. These activities will be included in an action plan for managing their implementation. After completing the activities listed in the Action Plan for Improving Textbook Management System, the MoGE will conduct a pilot to test the new textbook management system. The pilot will test the new system through the selection and procurement of mathematics and science textbooks for both students and teachers for Grade 4 and Grade 8 at ZEEP's targeted schools as well as in 100 secondary schools newly constructed by the Government at MoGE's request. The pilot will cover the procurement and delivery of 350,000 textbooks for Grade 4 in 480 primary schools and 326,000 textbooks for Grade 8 in 282 secondary schools. It is envisaged that all the bottlenecks and weaknesses to be encountered during this pilot would be addressed to enhance the selection and procurement of the new textbook management system which aims to help the MoGE attain a 1:1 pupil-textbook ratio in future.

45. In the long run, Zambia needs to develop capacity for textbook development and writing. Quality education in Zambia needs to include local content in textbooks and learning materials. The lack of capability to produce learning materials in Zambia makes textbooks more expensive. It also makes it difficult to find appropriate books for some subjects and syllabuses, jeopardizing the implementation of the new curriculum launched in 2013. Therefore, the proposed project will support the training of experienced teachers in textbook writing skills.

Activity B: Textbook Provision

46. The objective of this activity is to procure and deliver textbooks in the subjects defined in Table 2 on page 10 of this document to targeted schools, as well as in an additional 100 newly constructed Government secondary schools, to attain a 1:1 pupil-textbook ratio, using the improved textbook management system. After achieving this goal, the project will purchase additional textbooks in the subjects defined in Table 2 on page 10 of this document for Grades 8–12 and distribute these textbooks to the remaining secondary schools across the country, based on the estimated enrollment within each province. To ensure the results, the disbursement of this

activity will be linked to the achievement of DLI #2B (textbooks procured and delivered to targeted schools) (see Table 1.3 in Annex 1).

47. **Implementation arrangements for textbook activities.** The textbook implementation team should comprise three members from the PSU, three members from the S&C (including the CDC), and one member from the Directorate of Early Childhood Education. The Director of the PSU will be responsible for the oversight of the textbook subcomponent. The PSU team will be in charge of implementation of planning and procurement and delivery activities in collaboration with PEOs and DEBS, while the S&C team will be in charge of implementation of delivery verification and tracking activities and one specific activity (improve comparability of the 'Green Book') under Activity 1 in Table 2.1.

Component 2: Increasing Equitable Access to Secondary Education [The total cost for this component is US$28.5 million of which the IDA contribution is about SDR 19.4 million (US$27.0 million equivalent).]

48. The objective of this component is to increase access to secondary education in underserved communities by constructing additional classrooms and other relevant infrastructure in some existing schools to create space for secondary-level education. This component will provide opportunities to children who pass Grade 7 examinations but are denied entrance to Grade 8 due to an inadequate supply of secondary school places. Under this component, secondary school classroom space will be provided at selected primary schools to be run as autonomous secondary school sections, to serve deserving students in the local underserved communities in rural areas in six provinces – Muchinga, Luapula, Southern, Eastern, Central and Lusaka[62]. These six provinces are covered by the three-geographical areas with high poverty density defined at the Twangale meeting[63]. The Government has pledged to finance the expansion of secondary schools by applying the same selection criteria as stated below on page 63 in the remaining four provinces that are not covered by ZEEP. To enhance MHM, lockable washroom/toilets and incinerators for sanitary disposal will be added in each school receiving additional classrooms. Ten all-girls weekly boarding facilities will be constructed to reduce the likelihood of girls' dropping out of school.

49. Since 1996, a number of restructuring initiatives have been implemented in the education system in Zambia. In 1996, the education system was transformed from the primary school (Grades 1–7) and secondary school (Grades 8–12) system into a basic school (Grades 1–9) and high school (Grades 10–12) system. Some primary schools were transformed to basic schools, with lower secondary education offered in addition to primary education. This development increased the number of pupils accessing lower secondary education and created a huge supply of students wanting to transition to a small number of schools that offered higher secondary education. In 2011, the primary school (Grades 1–7) and secondary school (Grades 8–12) system was reintroduced. Following the 2011 reform, some former basic schools are reverting to primary school status while only a few are being transformed into secondary schools. This situation has reduced the classroom spaces available for Grade 8, the entry grade for secondary education. As a

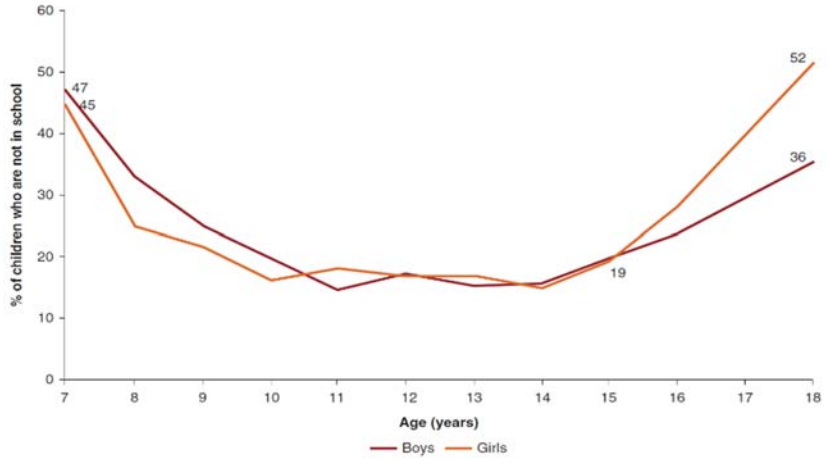
[62] For the Lusaka province, ZEEP will focus on its rural and peri-urban areas where there is high poverty density.
[63] The Twangale meeting took place on June 9, 2017 at which the GRZ and the World Bank discussed and agreed on the principles of cooperation between the two parties. To accelerate the poverty reduction effort in the country, the World Bank was requested by the GRZ to focus its support in three-geographical areas where the level of poverty density is high.

consequence, many pupils who are eligible to proceed to secondary school are not able to do so and are forced to either drop out or repeat a year of primary education due to lack of classroom space in existing secondary schools.

50. The number of schools offering lower secondary education (Grades 8–9) is only equivalent to approximately 50 percent of the number offering primary education (Grades 1–7), and the number of schools offering higher secondary education (Grades 10–11) is only equivalent to approximately 14 percent of the schools offering lower secondary education (7,691 schools offer primary education against 3,764 and 512 offering lower and higher secondary education, respectively). Implementation of the 2011 reform has created a bottleneck at lower and upper secondary education. When the 2011 reform is fully implemented, if all current high schools start offering lower secondary education, the number of schools offering lower secondary education will drop from 4,764 to a maximum of 512. This bleak picture is only reflective of national averages, and some areas and communities will be far worse off than others.

51. **Gender equity.** Commencing at approximately 15 years of age, girls begin dropping out of school at a disproportionately higher rate than boys (see Figure 2.6). While early marriage contributes more to the decision to drop out of school than poor MHM and distance to school, poor MHM and distance are significant factors informing decisions on the part of female students to exit the education system.[64]

Figure 2.6. Percentage of Out-of-School Children, by Age and Gender



Source: 2010 LCMS.

52. Many studies support the conclusion that improved MHM can contribute to keeping girls in school.[65] Improved MHM would mean that female students are less likely to skip class for health reasons. Lack of access to secondary schools within walkable distances forces some girls to travel long distances to attend school. To mitigate this obstacle, girls often rent small rooms in local areas to stay near the school during the school week. Both walking long distances to school and renting rooms in local areas expose the girls to sexual exploitation, which can result in early pregnancies and often results in the student dropping out of school. This problem may be mitigated by the

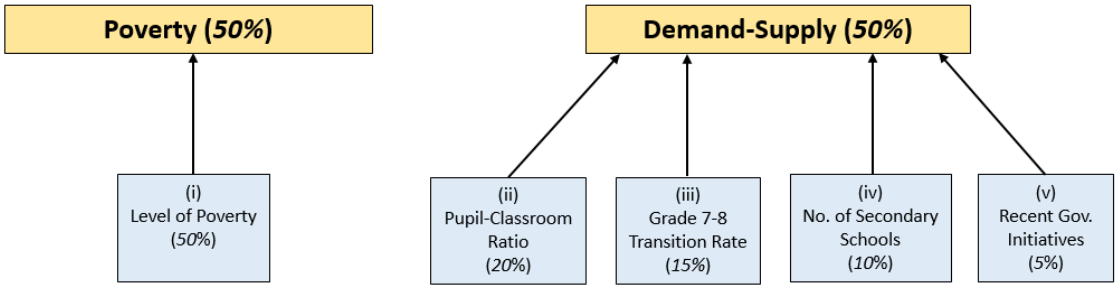
[64] *PETS-QSDS*, World Bank, 2014.
[65] Roy, S. 2011. *Menstrual Hygiene Key to Keeping Girls in School*. UNICEF.

provision of weekly boarding facilities at schools that can be monitored by school authorities to ensure safety.

53. Premised on the availability of project funds and the cost of the MoGE's minimum package for school construction, the project will support the expansion of approximately 82 existing schools in underserved communities. In so doing, the project will create approximately 280 new seats for Grades 8 to 12 in each school, for a total of 22,960 seats in the selected 82 expansion schools. Out of the total number of beneficiary students, at least 45 percent are expected to be girls. In addition, school expansion will benefit approximately 1,600 teaching and support staff at the expanded schools.

54. **Selection criteria.** The selection of existing schools to be expanded with new classrooms and facilities must be transparent, objective, and explainable to the public. Selection should serve the intended objectives of the project, contribute to the results sought, and maximize the impact of the proposed activities under the project. To support the education sector objectives of the Government, ZEEP will target existing underserved rural communities and their schools in rural areas in six provinces – Muchinga, Luapula, Southern, Eastern, Central and Lusaka[66]. As a consequence, the incidence of poverty and the demand-supply disjuncture for secondary school seats will be the main criteria for school selection. Each criteria will receive a 50 percent weight in the consideration. Demand for secondary school seats is measured by pupil-classroom ratios (indicating the crowdedness of classrooms in secondary schools) and the primary to secondary (Grades 7 to 8) transition rate (indicating the shortage of seats in secondary schools). Supply of secondary school seats is measured by the number of existing secondary schools (availability of secondary schools) and the number of newly constructed/upgraded secondary schools (level of benefit from the recent Government initiatives). These four indicators constitute the criteria to determine demand-supply for secondary education. The weighting of these criteria are subject to their perceived importance. Together with the criteria of poverty level, they can form a set of objective criteria for ZEEP's school selection, as shown in Figure 2.7.

Figure 2.7. School Selection Criteria and Their Weighting Distribution



55. **Selection methods.** School selection will be undertaken at three levels: national, provincial, and district. The national and provincial selection could follow the criteria described earlier. Data on each criterion can be collected, normalized, and ranked to demonstrate the need for more secondary schools in relation to each other. In the event of a lack of data for a specific criterion at a particular level, that criterion will be excluded from selection criteria for that level. The district-level selection can use three criteria: (a) remoteness of the candidate school measured

[66] For Lusaka, ZEEP will focus on its rural and peri-urban areas where there is high poverty density.

by distance from the district administration center, (b) number of feeder primary schools, and (c) distance between feeder schools and a candidate school.

56. **Selection formula.** The actual number of schools to be selected in a particular province or a particular district can be calculated with the formula

$$N_P = N \times S_P / S_T,$$

where N_P is the school allocation for a particular province by applying the five criteria; N is the estimated total number of expansion schools the project fund can afford, based on the standard package design and cost; S_P is the total normalized score for the province, based on the province's data on each criterion; and S_T is the sum of the normalized scores for all the provinces.

57. **Ranking of demand.** Data obtained from the 2015 LCMS (produced by Zambia's Central Statistical Office [CSO]) is used for the poverty criterion. Data obtained from the 2015 Education Statistical Bulletin (produced by Zambia's MoGE) is used for the demand/supply criteria (four in total). The data for each criterion for each of the targeted six provinces are weighted and normalized. The overall normalized scores are then ranked from 1 to 6 (according to the number of provinces), with those having the greatest needs being ranked 1 and those with least needs ranked 6. Table 2.2 presents the results of the distribution of number of schools which will be selected for expansion under ZEEP.

Table 2.2. School Selection Criteria, Rankings, and Number of Schools Selected for Expansion under ZEEP at Provincial Level

Province	Criteria															Total Normalized Score	Overall Ranking	Distribution of Number of Schools for Expansion ***
	Poverty level* (weighting 50%)			Demand/Supply for Secondary Schools Space**** (weighting 50%)														
				Demand						Supply								
				Pupil-Classroom Ratio for Secondary School (weighting 20%)			Grade 7 to Grade 8 Transition Rate (weighting 15%)			Number of Existing Secondary School (weighting 10%)			Recent Govt. Initiative** (new & upgraded schools) (weighting 5%)					
	Data (%)	*Normalized Score*	*Ranking*	*Data*	*Normalized Score*	*Ranking*	*Data (%)*	*Normalized Score*	*Ranking*	*Data (No.)*	*Normalized Score*	*Ranking*	*Data (No.)*	*Normalized Score*	*Ranking*			
Central	56.2	0.693	5	27.4	0.288	5	69.6	0.634	5	82	0.646	3	37	0.865	3	0.607	5	12
Eastern	70.0	0.863	2	25.2	0.265	6	59.8	0.737	2	83	0.639	4	38	0.842	4	0.701	4	14
Luapula	81.1	1	1	27.7	0.291	4	69.7	0.633	6	66	0.803	2	34	0.941	2	0.780	2	15
Lusaka	20.2	0.249	6	95.2	1	1	64.4	0.685	4	127	0.417	6	34	0.941	2	0.516	6	14
Muchinga	69.3	0.855	3	39.9	0.419	3	44.1	1	1	53	1	1	39	0.821	5	0.802	1	15
Southern	57.6	0.710	4	75.2	0.790	2	62.2	0.709	3	108	0.491	5	32	1	1	0.719	3	12

* Data from the 2015 Living Condition Monitoring Survey.
** "Recent Govt. Initiative" means the Government's investment in building 115 new secondary schools and upgrading 220 basic schools to secondary schools in recent years.
*** The allocation of the number of schools is adjusted slightly to reflect the surged needs for secondary schools in rural and peri-urban areas of Lusaka.
**** Data from the 2015 Educational Statistical Bulletin published by MoGE.

58. **Gender equity considerations.** To address issues related to gender equity, the project will support (a) the construction of ablution blocks with lockable toilets and showers as well as incinerators to support improved MHM for female students at expanded schools and (b) the

construction of girls' self-catering houses (weekly self-catering boarding facilities) at 10 of the selected schools. These two interventions are expected to increase retention and enrollment of girl students in the expanded schools.

59. **Selection of schools to have girls' dormitories.** The MoGE will conduct a district-level needs assessment, taking into account poverty levels and distances from feeder primary schools within the selected provinces and districts to complete the selection of 10 schools where self-catering boarding facilities will be financed and constructed under the project. In general, the selection will follow these criteria: (a) most remote school in the selected district, (b) having the longest distance from the feeder schools, (c) having the longest distance from the town center (boma), and (d) distance from the next nearby secondary school.

60. **Component resource requirement.** The total financial requirements for the component is estimated to be approximately US$27 million, comprising the costs of materials, labor, furniture, equipment and tools, transportation, administration, supervision, capacity-building activities under the component, and contingency.

61. **School construction package.** The MoGE has produced a typical school layout plan with flexibility for future expansion (scaling up the school infrastructure). A typical school package under the project will comprise the following infrastructure:

- 1 x 3 classroom block
- 1 x 2 classroom block
- 1 x 2 classroom block (one room used as a laboratory and other for home economics)
- Administration block
- Furniture and mobile lab equipment
- 2 ablution blocks for boy and girls, respectively
- Water supply system
- Sewage disposal system
- Incinerator
- 4 low-cost staff houses
- Power supply

62. In addition to this infrastructure package as noted above, 10 schools will be provided with self-catering weekly boarding facilities for girls.

63. The school structures will follow the same architectural program and design layout for all schools, although the layout can be modified to accommodate individual site conditions such as orientation, access to school, and so on, as may be determined. The design of the laboratory and home economics rooms will enable flexible usage for teaching and learning. This flexibility will allow enrollment of pupils at each school by the equivalent of two extra classes.

64. The typical cost estimate of a school package without the girls' boarding facilities is approximately US$326,000 (equivalent to ZMW 3,260,000) (which will comprise an IDA contribution of US$309,000 (equivalent to ZMW 3,090,000) and a local community contribution of US$17,000 (equivalent to ZMW 170,000). On the other hand, the estimate of a school package with boarding facilities is approximately US$375,000 (equivalent to ZMW 3,750,000) which will

comprise an IDA contribution of US$355,000 (equivalent to ZMW 3,550,000) and a local community contribution of US$20,000 (equivalent to ZMW 200,000). The total IDA direct contribution to the cost for expansion of 82 school under the project component will, therefore, be approximately US$27 million (equivalent to ZMW 270,000,000), inclusive of the provision of the girls' boarding facilities at 10 schools. These estimates include costs for materials, labor, transport, furniture and equipment, water and sanitation, power supply, small tools, administration costs, and contingency. The actual cost will be monitored and evaluated during project implementation.

65. **Phasing of the school package.** A community-based approach will be used for construction-related activities. This approach involves the delegation of management and execution of project activities to local communities by the central ministry. In this context, the local community exercises some level of independence but is still accountable to the central ministry. The benefits of this approach include: (a) empowering the community by enhancing their capacity in project implementation and sense of ownership, which in turn enhances the community's care and management of their school facilities; (b) economically benefiting the local community as it makes use of locally available labor and other resources (without compromising on quality); and (c) taking advantage of the potential of the lower cost for future scaling up. Although this approach has great potential to scale up the number of schools in a context of limited financial resources, it is best implemented when the project packages are small. The total school package may not be the most suitable approach for some communities. To take advantage of the scaling-up potential of the strategy, this component will be implemented in two phases to ensure that each phased package is of an appropriate size to suit this methodology.

66. The delivery of different size packages by phase will enable quick completion of sufficient numbers of classrooms and other relevant facilities to create space and early pupil enrollment and learning opportunities by Year 3 of project implementation (2018). By the end of Phase 1 construction, adequate learning spaces for Grades 8 to 10 will be created. Phase 2 construction activities will be undertaken when the initial set of pupils are enrolled in lower secondary education. At the completion of the Phase 2 construction of the package, adequate learning spaces should have been created for pupils in all grades at the secondary school level (Grades 8 through 12).

67. **Phase 1 construction package.** The activities using the community-based approach per school package under Phase 1 will consist of construction of a 1 x 2 classroom block, a 1 x 2 laboratory and home economics rooms, an ablution block, an administration block, a 1 x 2 semidetached house block, sewage disposal facilities (septic tank and soakaway), and an incinerator. The cost estimate for these activities is approximately US$141,000 (equivalent to ZMW 1,410,000). Activities using a centrally based approach will consist of provision of water supply (borehole drilling and equipping and water reticulation), power supply (solar power or hydro as may be determined on site), and furniture and equipment. The cost estimate for activities to be undertaken using the centrally based approach under Phase 1 is approximately US$61,000 (equivalent to ZMW 610,000).

68. **Phase 2 construction package.** The activities using the community-based approach under Phase 2 for the 10 schools with girls' boarding facilities will consist of construction of a 1 x 3 classroom block, a weekly boarding facility for female students, one 1 x 2 semidetached house block, and a sewage disposal system (septic tank and soakaway). The cost estimate for these

activities is approximately US$124,000 (equivalent to ZMW 1,240,000). Activities using a centrally based approach, under Phase 2, for school packages with boarding facilities will consist of power supply (solar power or hydro as may be determined on site) to Phase 2 buildings and the provision of furniture to a 1 x 3 classroom block and girls' dormitory. The cost estimate for activities to be undertaken using the centrally based approach under Phase 2 construction is approximately US$33,000 (equivalent to ZMW 330,000). For the 72 school sites that will not have boarding facilities, the same arrangements as for packages with boarding facilities will be used, excluding the boarding facility component. The cost estimate for activities to be undertaken using the community-based approach for each of the 72 school sites is approximately US$87,000 (equivalent to ZMW 870,000). Other activities that will be undertaken using the centrally based approach will also not include furniture for dormitories and their cost estimate is approximately US$24,000 (equivalent to ZMW 240,000).

69. **Implementation strategy.** With the use of the community-based approach, there is greater potential for scaling up the number of schools to be supported within the same resource envelope due to the lower costs of construction. The local community, through its PIC, will be empowered to manage the construction of project-supported infrastructure. The central ministry and its lower-level offices' responsibility will be reduced to the training of local communities and monitoring and supervision. Local communities that are involved in project implementation are more likely to develop a sense of school ownership, which usually translates into protecting and maintaining the school. Before the commencement of project-related construction, during the launch of a subproject, local communities will be trained to carry out procurement and FM methods to ensure transparency, economy, and efficiency through adapted training methods. This strategy is not new to Zambia: it was implemented under the European Union-funded Micro-projects program from 1985 to 2004, the IDA-funded Social Recovery Fund (SRF 1 and 2), and Zambia Social Investment Fund (ZAMSIF) from 1991 to 2005. The centrally based project management approach (full contract with private service providers) was adopted for delivery of boreholes, power (solar) supply, furniture, and equipment. The ZEPIU will be responsible for implementing this component in collaboration with the PEOs and local community committees (including PTAs) where the selected expansion schools reside. To ensure the envisaged results will be achieved, DLI #3 (classrooms constructed and used in selected expansion schools) is assigned to this component.

Component 3: Enhancing Planning, Management and Monitoring and Evaluation Capacity, and Project Coordination [The total cost for this component is US$15.0 million of which the IDA contribution is about SDR 6.5 million (US$9.0 million equivalent).]

70. The objective of this component is to (a) strengthen the capacity of the MoGE and its participating institutions to more effectively and efficiently plan and manage the delivery of education services, and to increase accountability to its key stakeholders and (b) support the MoGE's capacity for project implementation, coordination, communication, and M&E. This component will use the traditional financing modality to finance proposed activities. The Directorate of Planning and Information at the MoGE is the designated department in charge of planning and monitoring of education development and progress. To strengthen the capacity of the MoGE for planning, management, and M&E, three related activities will be supported under the project:

(a) **Capacity development of planning, management, and M&E.** This activity is designed to strengthen the capacity of the MoGE for planning, policy analysis, and M&E. As part of a long-term capacity development in the country, this project will also provide support for a selected qualified higher education institution [67] to strengthen its capacity in the area of education planning and policy analysis to provide training and carry out relevant research. It is envisaged that in the long term, this support will enhance and sustain the capacity for education planning and policy analysis in Zambia to provide technical support to the MoGE and other relevant ministries for more effective and efficient delivery of education services.

(b) **EMIS.** The project will support the MoGE to upgrade the centrally managed EMIS. The MoGE considers the enhanced EMIS paramount as the ministry is moving toward evidence-based planning and policy making. The MoGE has conducted a needs assessment of EMIS across all districts in the country. However, this assessment was at a high level and did not assess challenges at the school level, which is the source of most education data. ZEEP will support the improvement of EMIS policies, guidelines, procedures, and tools; enhance record management; and improve the effective use of EMIS for decision making at all levels of the education system (that is, central, provincial, district, and school levels). Training will be provided to MoGE staff and Data Management Committees at all levels to ensure the harmonization of data collection and management based on identified need. In addition, the MoGE aims to link the enhanced EMIS with other databases, such as the TDDP, under Subcomponent 1.1 for teacher training and student learning assessment datasets to provide coherent and comprehensive information to improve timely decision making. Through this TA activity, further capacity at the district and school levels will be developed to support data management, reporting, analysis, and utilization.

(c) **School mapping.** The MoGE commenced school mapping a few years ago but has not completed the process due to resource constraints. ZEEP will support the MoGE to complete school mapping by taking advantage of mobile technology and connecting MoGE systems with other mapping data collected by agencies in the country to target those schools that do not have GPS coordinates in the system. The completion of the school mapping initiative will enhance the capacity of the MoGE for future real-time monitoring, decision making, and resource allocation.

71. This component will also provide support to strengthen MoGE implementation capacity through the financing of short- and long-term international and local TA, studies, surveys and evaluation, and training for the MoGE and participating institutions—particularly for those with fiduciary (FM and procurement), safeguards, and M&E responsibilities. In particular, individual expert consultants (or panel), or an IVA, will be retained to verify the achievement of targets set for Components 1 and 2 (see DLIs in Table 1.3 in Annex 1), following the defined DLI verification protocols (see Table 1.4 in Annex 1). This component will be implemented under the supervision of the Directorate of Planning and Information of the MoGE.

[67] An institution selected to play this role needs to have an existing training program(s) at the graduate level in relevant areas such as planning and public policy. Detailed selection criteria are stated in the PIM.

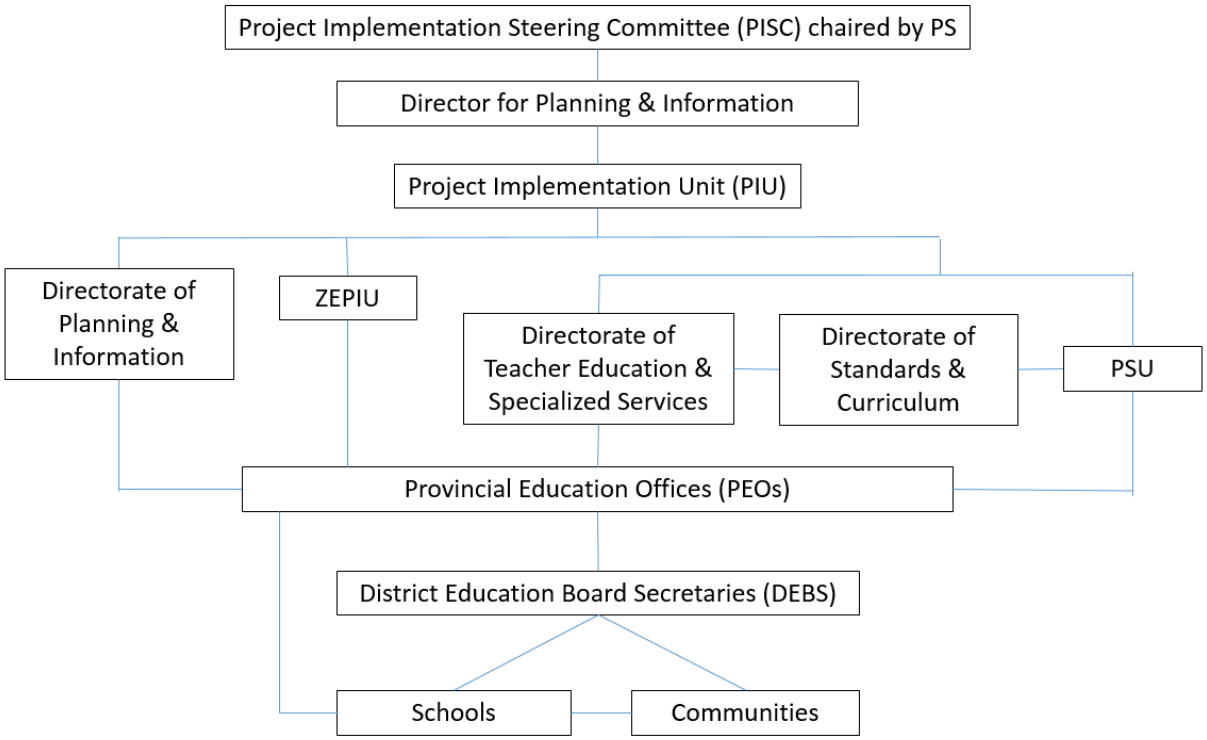
Annex 3: Implementation Arrangements

ZAMBIA Education Enhancement Project (P158570)

Project Institutional and Implementation Arrangements

1. The proposed ZEEP will be implemented over a five-year period from 2017 to 2022. The MoGE will be the implementing agency with full responsibility for all aspects of project implementation. A PISC will be established and will meet twice a year to provide oversight and guidance to facilitate interdepartmental coordination on implementation activities. The PISC will be chaired by the PS and comprise decision-making representatives from involved PEOs and DEBS; involved staff from departments/units inside the MoGE, including the Director for Planning and Information, the Director for Teacher Education and Specialized Services, the Director for S&C, the MoF, the Ministry of National Development Planning, and the MoHID, as well as the chief coordinators responsible for each component and the Project Coordinator. The MoGE will establish a PIU with full-time staff to manage day-to-day project implementation. The PIU composition will include a project coordinator (head of PIU), a project accountant (FM), an M&E specialist, a procurement specialist, a safeguards specialist, three component coordinators (for Subcomponents 1.1 and 1.2 and Component 2), a communication specialist and administrative staff. The overall project administration is summarized in Figure 3.1.

Figure 3.1. Outline of the Implementation Arrangements



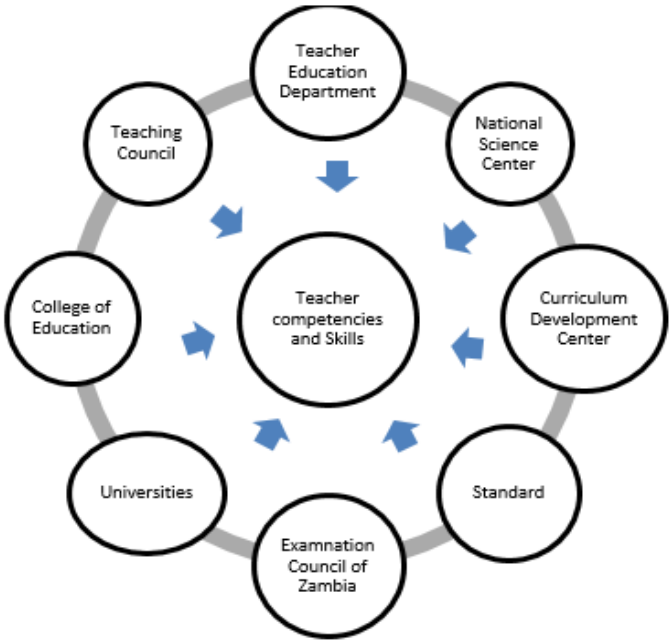
2. Each component will have a lead department/unit within the MoGE which will be accountable for the successful implementation of the component. The detailed implementation arrangements for each component are summarized in the following paragraphs.

Component 1: Improving the Quality of Teaching and Learning

Subcomponent 1.1: Strengthening the Teacher Training System

3. To improve teacher quality under this subcomponent, all relevant actors (departments and institutions under the MoGE) that affect teacher competencies and skills should be involved (Figure 3.2). The TESS will be responsible for coordinating the execution of piloting the new training approach for improving teacher competencies and skills in mathematics and science teaching through specific[68] taskforces that will be established. Each taskforce will be managed by a staff member from the TESS who will be appointed by the PS with a clearly defined mandate. The members of the taskforce will represent the institutions which will jointly implement the pilot of the newly developed feedback-based teacher training system (see Annex 2 for details), for example, the TCZ, the MoGE's CDC, the ECZ, the NSC, UNZA, and the CoEs. Each taskforce will have clearly defined ToRs for the scope of their work and responsibilities in relation to the pilot.

Figure 3.2. Participating Departments and Institutions



4. The TESS will implement and provide overall leadership for the component. Through the office of the PS, relevant departments and institutions will work together on specific tasks. The TESS will ensure that functional taskforces are constituted by the start of the project. For instance, a team comprising representatives from the CDC, the ECZ, UNZA, the NSC, and the Teacher Education Department will be assembled to develop teacher training materials. Full-time staff employed under this subcomponent in the PIU will coordinate with the TESS to ensure that the implementation is smooth and activities are carried out within the specified time frame.

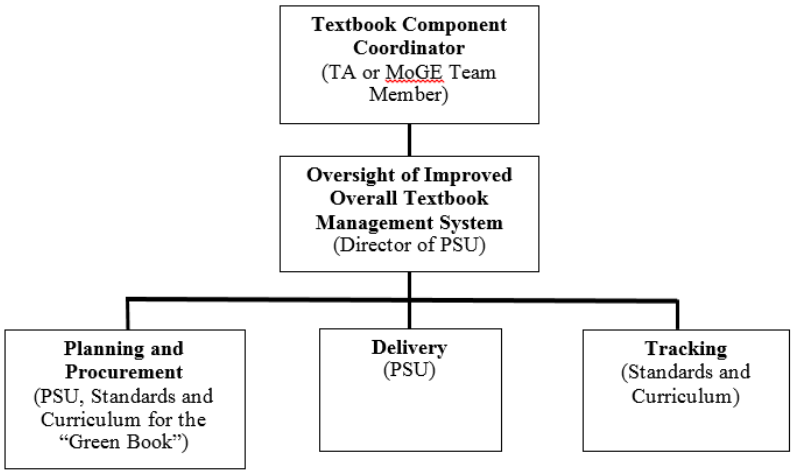
[68] At present, three taskforces, including teacher education coordinating, training material development, and M&E, have been identified but more could be set up.

Subcomponent 1.2: Improving Textbook Availability

5. To improve the textbook management system and to procure/deliver textbooks using the improved system, the PSU and the S&C within the MoGE will be responsible for implementing this subcomponent. Using the improved textbook management system, the actual procurement of textbooks for the targeted schools under the project will be carried out centrally by the PSU. The delivery of the procured textbooks to the targeted schools will be managed by the PSU through the PEOs and DEBS. The CDC will track the delivery of these textbooks to targeted schools.

6. The textbook implementation team will comprise three staff from the PSU, three staff from the S&C (including CDC), and one staff working in the Directorate of Early Childhood Education within the MoGE. The Director of the PSU will be responsible for the oversight of the textbook component. The PSU team will be in charge of the implementation of planning, procurement, and delivery activities, while the S&C team for this subcomponent will be in charge of the implementation of tracking activities and one specific activity—improving comparability between titles accepted into the 'Green Book'.[69] The team will be eligible for TA, if requested, to provide necessary support especially for logistics, as well as to coordinate activities across the involved MoGE departments. Figure 3.3 illustrates the organizational structure of the arrangement.

Figure 3.3. Textbook Component Institutional Arrangements



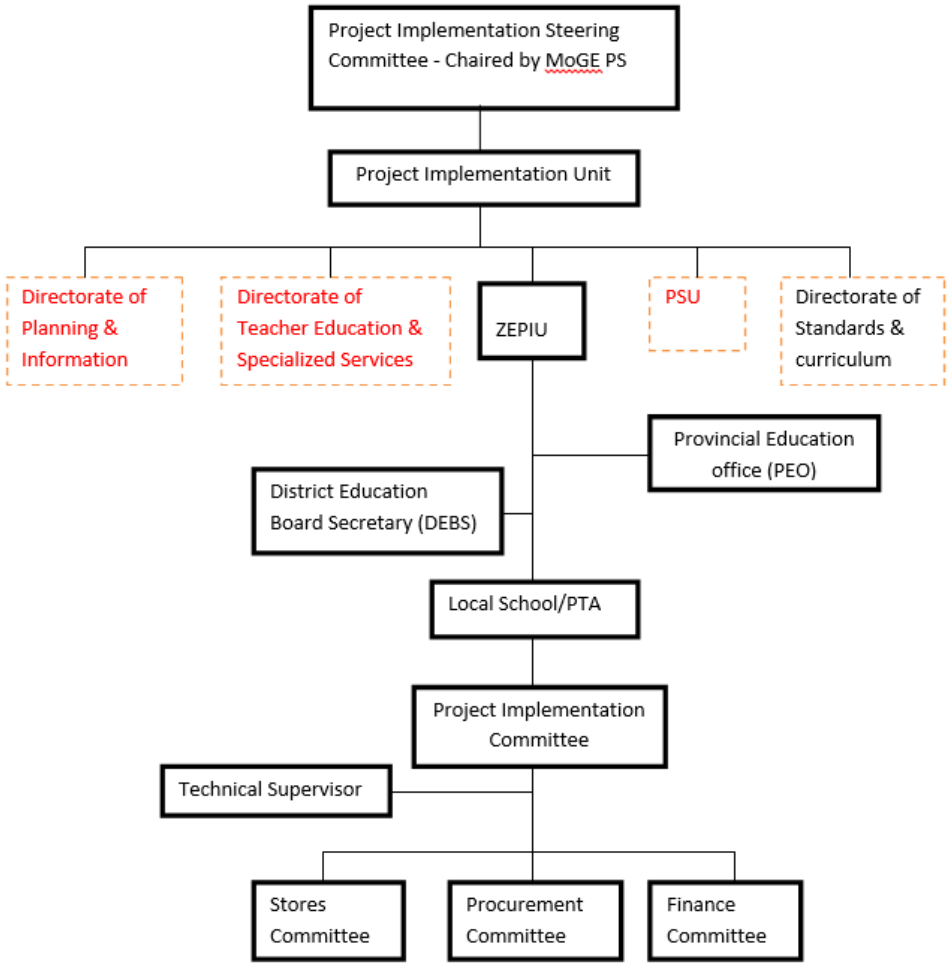
Component 2: Increasing Equitable Access to Secondary Education

7. For new classroom construction, a community-based approach will be used and its implementation will be managed by the ZEPIU at the MoGE. The ZEPIU will oversee the technical quality control, which is the responsibility of the PEOs, in construction and the coordination of DEBS for community mobilization and training. Each school selected for expansion will work with its community and form a joint committee to manage day-to-day construction activities and issues, such as procurement of materials, finances, and maintenance of completed buildings. The

[69] 'Green Book' is a list of titles of textbooks approved by and a list of supplementary materials recommended by the MoGE, based on a set of transparent criteria, for the use of schools to select textbooks and supplementary materials for teaching and learning of the subjects required by the national curricula at all grade levels.

component will be implemented through a four-tier structure (national, provincial, district, and school/local community) with the MoGE and MoHID[70] providing joint oversight (Figure 3.4).

Figure 3.4. Implementation Arrangements for Component 2



- **National level.** The implementation team will comprise the MoGE staff in the infrastructure section (ZEPIU) under the Directorate of Planning and Information.[71] It will consist of architects, engineers, and quantity surveyors. This team will be led by an architect and will be responsible for the oversight of the implementation of this component at the national level. It will work with the MoGE's PSU to procure all services, furniture, and equipment that will need to be procured at the central level. As the implementation takes a community-based approach, the Ministry of Local

[70] In early 2017, the GRZ centralized the responsibility of the nation's infrastructure, including school buildings, and mandated the MoHID to be responsible for it. It has been agreed between the MoGE and MoHID that the ZEPIU would remain at the MoGE for completing the ZEEP preparation and gradually move to the MoHID but would continue to be in charge of Component 2's implementation.
[71] Ibid.

Government will be consulted and its support will be solicited to provide support to ensure the overall quality of infrastructure at the community level.

- **District/provincial level.** At the provincial level, all construction under this project will be coordinated by a team of two staff (Resident Engineer and Senior Buildings Officer), both under the MoGE. The team leader will be the Resident Engineer. At the district level, all of the construction under this project will be coordinated by the DEBS, which shall include the District Buildings Officer under the MoGE and other officers who may be appointed by DEBS to facilitate community mobilization and training. If the local system is already decentralized, the Resident Engineer at the provincial level will coordinate and supervise construction activities at the school/local community level.

- **School/local community level.** At this level, a Project Implementation Committee will be elected by members of the community where a selected expansion school resides to coordinate project implementation activities. The PIC will report to the PTA, the DEBS, or the PEOs. It will form subcommittees, such as the procurement subcommittee responsible for procurement of materials, the stores subcommittee responsible for storing and issuing material and tools, and the finance committee responsible for ensuring that construction is properly funded and that all payments are made on time.

Component 3: Enhancing Planning, Management and Monitoring and Evaluation Capacity, and Project Coordination

8. The Directorate of Planning and Information will manage and supervise the implementation of all capacity-building activities and overall project coordination and administration. As mentioned previously, Figure 3.1 outlines the implementation arrangements of the project among key players.

Financial Management, Disbursements, and Procurement

Financial Management

9. In November 2016, an FM assessment was carried out by the World Bank and the MoGE, by updating an earlier assessment carried out in February 2015 under the World Bank-financed GEWEL. The assessment was done in accordance with the FM Manual for World Bank-Financed Investment Operations, issued by the Financial Management Sector Board on March 1, 2010, and the Operational Risk Assessment Framework Financial Management Draft Interim Guidance Note issued by the Africa Region Financial Management Unit on September 30, 2010. The objective of the FM assessment was to determine whether the ministries' FM arrangements: (a) were capable of correctly and completely recording all transactions and balances relating to the project; (b) would facilitate the preparation of regular, accurate, reliable, and timely financial statements; (c) would safeguard the project's entity assets; and (d) would be subjected to auditing arrangements acceptable to the World Bank.

10. The conclusion of the assessment was that the FM arrangements in place in the MoGE meet the World Bank's minimum requirements under OP/BP10.00 and are, therefore, with reasonable assurance, adequate to provide accurate and timely information on the status of the project as required by the World Bank. The overall FM risk rating of the project is Substantial because both the accounting and internal audit staff of the MoGE have relatively little experience in implementing World Bank-financed projects. However, this risk rating is expected to be reduced to Moderate after the risk mitigation measures have been adopted. Therefore, it is recommended that training of both accounting and audit staff be conducted on a regular basis. A PIM, including FM procedures, has been prepared and will be finalized one month after ZEEP becomes effective.

11. **Budgeting arrangements.** Budget preparation and monitoring will follow national procedures, the complete details of which is documented in the PIM.

12. **Staffing.** The MoGE is adequately staffed with a Chief Accountant, who is assisted by three senior accountants and nine accountants, some of whom have experience with World Bank project accounting. Therefore, the MoGE has seconded a qualified and experienced project accountant, who will report to the Chief Accountant and will be part of the PIU. Both the accountants and internal auditors will need continuous training in World Bank FM and disbursements procedures during the project.

13. **FM Manual.** The project will develop an FM procedures manual which will be incorporated into the PIM before effectiveness. The manual will document the accounting policies and procedures to be used for the project.

14. **Information systems.** The MoGE is connected to the country's Integrated Financial Management Information System (IFMIS), but an IFMIS module for projects is not currently functional. Therefore, the project will use manual systems to prepare the project accounts until the IFMIS project module is operational.

15. **Accounting basis.** The project will use cash basis accounting in line with International Public Sector Accounting Standards.

16. **Internal auditing.** The MoGE has a functional internal audit unit with two staff members. There is also an audit committee which is active and meets regularly, and the project will rely on both the internal audit unit and the audit committee of the MoGE for internal audit functions.

17. **Internal control systems.** The project will rely on an FM procedures manual. The manual will document the policies and procedures that are specific to World Bank-financed projects and will identify expenditures that are eligible for financing under these projects.

Funds Flow and Disbursement Arrangements

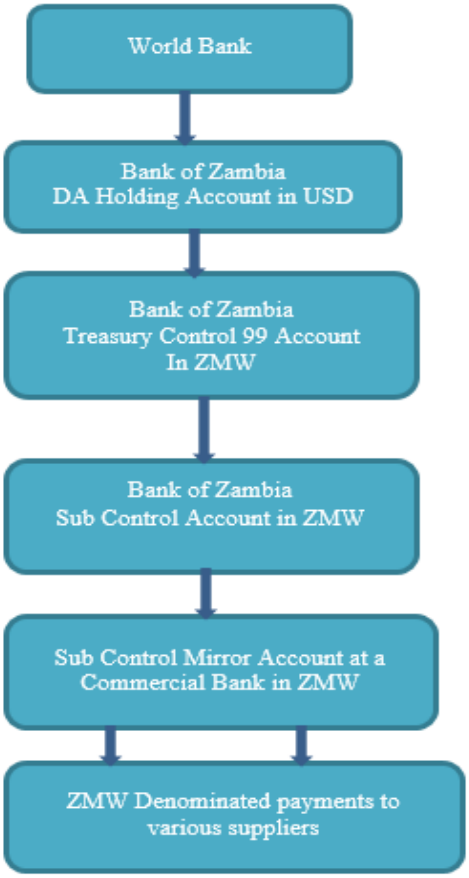
Funds Flow

18. **Components 1 and 2**. The World Bank will disburse funds directly to the MoGE's sub-control account, and, as a result, IDA funds will be comingled with Government funds and there will be no dedicated DA for these two components. Releases of funds from the sub-control accounts to these two components by MoGE will follow Government procedures. IDA funds will

be disbursed against the following EEPs, which are non-procurable items, as reflected in the MoGE's annual budget: (a) personal emoluments and allowances; (b) training; and (c) operating costs, including rent, utilities, and communications.

19. **Component 3.** Under this component, the project will use a system under which funds will flow from the World Bank to a DA or a holding account denominated in U.S. dollars at the Bank of Zambia (details to be documented in the PIM). An operational account in Zambian kwacha at the Bank of Zambia as well as a mirror account at a suitable commercial bank for making payments in the local currency will be opened. Project funds will flow from a DA account to them through the Control 99 Account (see Figure 3.5 for the funds flow).

Figure 3.5. Funds Flow Chart for Component 3



20. **Financial reporting arrangements.** The project will submit quarterly IFRs, the format of which has been agreed with the World Bank, within 45 days of the end of each calendar quarter. The project will prepare financial statements within three months after the end of the financial year in accordance with accounting standards acceptable to the World Bank. The project will also be responsible for ensuring that the financial statements are audited and submitted to the World Bank within six months of the end of each financial year.

21. **Auditing arrangements.** The project's financial statements will be audited by the Office of the Auditor General, the supreme audit institution in Zambia, which may contract with acceptable private audit firms to conduct the audits on their behalf. All audits should be carried

out in accordance with the International Standards on Auditing and according to the ToRs for audits of the project. Audit reports, together with management letters, should be submitted to the World Bank within six months after the close of each fiscal year. Audit reports will be publically disclosed by the World Bank in accordance with the World Bank's disclosure policy. The audits will be financed by the project as part of its operating costs.

Table 3.1. FM Action Plan

	Action	Date Due By	Responsible Entity
1	Train accountants and internal auditors in the World Bank's FM and disbursement procedures	Continuously during the life of the project	IDA
2	Secondment of a qualified and experienced accountant to the project	Completed	MoGE
3	Develop a PIM including FM and procurement procedures	Developed, will be finalized after effectiveness	MoGE

22. **Implementation support plan.** The World Bank will conduct FM supervision based on the risk rating of the project. Quarterly on-site supervisions will be carried out until capacity is built. Other forms of supervision will include desk reviews of IFRs and audit reports.

Disbursements

23. The project will use the IPF instrument based on an RBF approach for the disbursement of its Components 1 and 2. For activities that do not use the RBF approach under Component 3, financing transaction-based method of disbursements with SoEs will be used. Thus, the project will use (a) DLIs under Components 1 and Component 2 on a reimbursement method only and (b) the transaction-based method of disbursements (SoEs) under Component 3. Other methods of disbursing to Component 3 will include reimbursements, direct payment, and use of special commitments (for example, letters of credit). The FM arrangements are detailed in the PIM.

24. Under Components 1 and 2 (RBF components), project funds will be disbursed against selected line items included in the MoGE's annual budgets (EEPs), up to the capped amounts and conditioned on the achievement of the agreed set of DLIs (see Table 1.3 in Annex 1). Using the RBF can help the Government focus on actual results rather than inputs and outputs. It provides incentives to implementing agencies and institutions for achieving the agreed results but not necessarily specifying inputs needed for completing the agreed tasks. Once the agreed results are achieved and verified, funds will be disbursed against the items listed in the agreed EEPs. Because the RBF will require using country systems in areas such as FM, procurement, and M&E, it can also help the MoGE further develop its capacities in these areas. Component 3 will use the traditional IPF approach based on unaudited IFRs. The arrangement of combining the RBF and the traditional IPF approaches for this project will not only provide flexibility to meet fiduciary requirements and service delivery needs but will also enhance the MoGE's renewed focus on achieving results.

25. The DLIs for this project reflect the MoGE's reform priorities and include intermediate results, implementation performance targets, and institutional change indicators that build incrementally over the life of the project. Some DLIs are expected to improve the efficiency and effectiveness of the systems for teacher training and textbook delivery. Others constitute

incremental improvements of the system (for example, improvements in the textbook management system) that will have impact beyond the life of the project. The results represented in the DLIs are critical to achieving the PDO. ZEEP has a total of three DLIs (see Table 1.3 in Annex 1). From a disbursement point of view, the DLIs are independent of each other, that is, non-compliance with a particular DLI in a period will lead to withholding of the disbursement of the funds associated with that DLI but will not affect disbursement associated with other DLIs. The pricing for each DLI, including its distribution among its activities across each year of the implementation period, provides incentive to the MoGE to achieve results that are critical to the Government and, at the same time, enables the MoGE to start the project implementation and leverage other resources to work toward achieving the targeted results. Table 3.2 shows the estimated disbursement by DLI and by year under Components 1 and 2 of ZEEP.

Table 3.2. ZEEP Disbursement by DLI (US$, millions)

DLI #	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	2	3	4	3	2	**6**	**20**
2A	1	3	1	0	0	**0**	**5**
2B	0	2	3	0	0	**0**	**5**
3	3	4	6	3	5	**0**	**21**
Total	**6**	**12**	**14**	**6**	**7**	**6**	**51**

26. For Components 1 and 2, in the first year, the MoGE will receive funding for having achieved the agreed results for the preparation work (Year 0), for example, completion of school selection for expansion based on the criteria agreed between the MoGE and the World Bank, as reflected in the DLI matrix (Table 1.3 of Annex 1). At the end of each fiscal year (Year 1–5), the MoGE will prepare a report justifying the corresponding value of each DLI as agreed with the World Bank in the DLI matrix. This report will be supported by an IFR on the EEPs from the MoF based on the audited financial statement or unaudited financial statements where applicable. This financial report will be audited (audited financial statements take up to nine months to be released). An IVA will be hired to verify whether the result targets have been met by comparing the reported results to actual results on the field for disbursement.

27. **EEPs.** In consultation with the MoGE, the World Bank has selected EEPs which are (a) personal emoluments and allowances; (b) training; and (c) operating costs, including rent, utilities, and communications. These are non-procurable items in the MoGE's annual budget and are considered to most directly affect the objectives of the project, for example, personal emoluments and allowances as well as training are directly linked to the teacher quality improvement interventions under Component 1. The budget lines in the MoGE's annual budget for the selected EEP items are summarized in Table 3.3.

Table 3.3. EEP - MoGE Budget Lines

Agency-Budgetary Institutions	Line Ministry/Institution Code	Item Code and Description	Sub-Program Code	Program Description
MoGE	80	5502	001-008	Primary education
MoGE	80	5503	001-008	Secondary education
MoGE	80	5508	001-008	Management and support services

Procurement

28. As Components 1 and 2 use the RBF with DLIs, their procurement will follow the GRZ's own procurement system. For classroom construction under Component 2, it will use the Community Participation in Procurement as provided by the Zambia PPA No. 12 of 2008 and its Regulations of 2011. In instances where contractors are required, based on the estimated contract value, the MoGE will use appropriate procurement methods from the PPA such as ONB or simplified bidding (request for quotations) as provided in Part IV Methods of Procurement Clause 26 and 31 of the PPA respectively. In cases where local materials are not available for classroom construction, the MoGE could procure the required materials with contracting approaches which allow the use of appropriate technical solutions such as prefabricated steel structures. This may include appropriate procurement methods such as Shopping and ONB to enable the completion of the implementation for achieving the DLIs.

29. Procurement activities under Component 3 will follow a traditional approach for which a procurement plan needs to be prepared by the MoGE and reviewed and approved by the World Bank. The plan will identify the estimated costs, procurement or selection methods, and the contracts which will be subject to the World Bank's prior review. Activities which will not be subject to the World Bank's prior review will be subject to post review of the World Bank.

30. Procurement in the education sector in Zambia is guided by the PPA No. 12 of 2008 and its Regulations of 2011; all public procurement issued in Zambia by public institutions are guided by these two regulations. The provisions of the PPA and the Regulations will apply in all ONB procurement, subject to modifications to make the ONB acceptable to procurement standards/guidelines under World Bank financing, as detailed in the following paragraphs. The World Bank will communicate the ONB modifications to the Government.

31. The modifications to ONB that make the process acceptable to the World Bank are as follows: the procurement procedure to be followed for ONB shall be the ONB procedure set forth in the PPA, 2008, Act. No.12 of 2008, as amended by the Public Procurement (Amendment) Act, 2011, Act No. 15 of 2011 (the 'PPA'), and the Public Procurement Regulations, 2011, Statutory Instrument No. 63 of 2011 (the 'Regulations'), provided, however, that such procedure shall be subject to the provisions of the World Bank Procurement Regulations for IPF Borrowers applicable to Procurement in Investment Project financing - Goods, Works, Non Consulting, and Consulting Services of July 2016.

(a) **Eligibility.** The eligibility to participate in a procurement process and be awarded a World Bank-financed contract shall be as defined under Section I of the Procurement Guidelines. Accordingly, no bidder or potential bidder shall be declared ineligible for contracts financed by the World Bank for reasons other than those provided in Section I of the Procurement Guidelines. No restriction based on nationality of bidders and/or origin of goods shall apply, and foreign bidders shall be allowed to participate in National Competitive Bidding without application of restrictive conditions such as, but not limited to, mandatory partnering or subcontracting with national entities.

(b) **Domestic preference.** No margins of preference of any sort shall be applied in the bid evaluation.

(c) **Bidding documents.** The procuring entities shall use bidding documents acceptable to the Association.

(d) **Bid validity.** An extension of bid validity, if justified by exceptional circumstances, may be requested in accordance with Appendix 1 of the Procurement Guidelines. A corresponding extension of any bid guarantee shall be required in all cases of extension of bid validity. A bidder may refuse a request for extension of bid validity without forfeiting its bid guarantee.

(e) **Qualification.** The qualification criteria shall be clearly specified in the bidding documents. All criteria so specified, and only such specified criteria, shall be used to determine whether a bidder is qualified. Qualification shall be assessed on a 'pass or fail' basis, and merit points shall not be used. Such assessments shall be based entirely upon the bidder's or prospective bidder's capability and resources to effectively perform the contract, taking into account objective and measurable factors, including (i) relevant general and specific experience and satisfactory past performance and successful completion of similar contracts over a given period; (ii) financial position; and, where relevant, (iii) capability of construction and/or manufacturing facilities.

(f) **Prequalification procedures** and documents acceptable to the World Bank shall be used for large, complex, and/or specialized works. Verification of the information upon which a bidder was prequalified, including current commitments, shall be carried out at the time of contract award, along with verification of the bidder's capability with respect to personnel and equipment. Where pre-qualification is not used, the qualification of the bidder who is recommended for award of contract shall be assessed by post-qualification, applying the qualification criteria stated in the bidding documents.

(g) **Bid evaluation.** All bid evaluation criteria, other than price, shall be quantifiable in monetary terms. Merit points shall not be used, and no minimum point or percentage value shall be assigned to the evaluation criteria or significance of price in bid evaluation. No negotiations shall be permitted.

(h) **Guarantees.** Guarantees shall be in the required format, shall have the period of validity, and shall be submitted when and as specified in the bidding documents.

(i) **Cost estimates.** Detailed cost estimates shall be confidential and shall not be disclosed to prospective bidders. No bids shall be rejected on the basis of comparison with the cost estimates without the World Bank's prior written concurrence.

(j) **Rejection of bids and re-bidding.** No bid shall be rejected solely because it falls outside a predetermined price range or exceeds the estimated cost. All bids (or the sole bid if only one bid is received) shall not be rejected, the procurement process shall not be cancelled, and new bids shall not be solicited without the World Bank's prior written concurrence.

(k) **Fraud and corruption.** In accordance with the Procurement Guidelines, each bidding document and contract shall include provisions stating the World Bank's policy to

sanction firms or individuals found to have engaged in fraud and corruption as set forth in the Procurement Guidelines.

(l) **Inspection and audit rights.** In accordance with the Procurement Guidelines, each bidding document and contract shall include provisions stating the World Bank's policy with respect to inspection and audit of accounts, records, and other documents relating to the submission of bids and contract performance.

32. The Government piloted a new eGP system, which has Procurement Management Information System (PMIS) features, in July 2016 for the procurement of textbooks under a framework contract. The World Bank conducted a review of 'Procurement Systems and Practices for the Education Sector in Zambia' in 2016 to identify (a) material bottlenecks, challenges, risks and (b) capacity development and institution building focus areas as part of the World Bank's review of public procurement of textbooks. In addition to the suggested improvements in seven specific areas,[72] the review concluded that the level of risk for procurement in the education sector in Zambia is Moderate. Based on the recommendations of the review, the proposed project will finance several activities: improve the current practice of procurement at the MoGE, including the establishment of transparent selection criteria for new school construction and development and pilot of new textbook procurement and delivery tracking systems; address possible conflicts of interest in the sector; and improve stakeholder participation and acceptance of the changes that will be proposed to improve textbooks procurement and delivery system. A review of the implementation modalities and procurement systems for classrooms and other school-related infrastructure aimed at maximizing outputs and reduction in costs while maintaining acceptable design and construction practices and so on has also been carried out.

33. The macro-environment for public procurement in Zambia is encouraging; the existing law is being revised and is likely to introduce a higher degree of openness, transparency, and accountability. Furthermore, the MoGE is an institution with a few structural yet manageable risks. The eProcurement system being tested has the potential to reduce the challenges identified with PMIS and contract management. The MoGE has managed to resolve the formula applied in the commercial adjudication for acquiring textbooks. This milestone is expected to level the playing field and reduce unit costs of textbooks delivered to schools, which in turn is expected to shift the high student to textbook ratio closer to 1:1. The textbook distribution method is under review to see what further improvements could be made in the distribution network so as to lower the high costs associated with logistical challenges—to ensure that the procurement process is in full compliance with World Bank guidelines. Vendors are now being asked to quote for full distribution costs to point of consumption for comparative costs.

34. The MoGE should be strategic and introduce a non-disruptive reform policy for textbook acquisition that would create benefits for all; that is, the Government, citizens, students, teachers, the communities, and even local publishers. Specifically, the MoGE could fully use eProcurement and ensure that procurement contracts are in line with 'The NPF for IPF Borrowers' paragraph 6.57. This could simplify repetitive purchases (like those of textbooks and basic school materials) such that they become based on annual projections and then procure as and when required from

[72] Reflected in the review of 'Procurement Systems and Practices for the Education Sector in Zambia' (Section 5) by M. Mispelaar, World Bank, 2016.

the vendor. This would go a long way in improving VfM and increasing the transparency and visibility of the procurement processes. More details of the strategies to be applied are included in the PPSD.

35. To enhance the eProcurement, vendors are now being asked to use the electronic procurement platform. Because this is a new development to most vendors, use of simple PMIS to improve general contract management and empower senior management with analytical information could bridge the time gap between 'now' and the full implementation of eProcurement. The NPF is expected to enhance public procurement for the MoGE in various aspects including the following:

(a) Alignment of terms for **procurement methods similar** to those of the World Bank Procurement Regulations for IPF Borrowers of July 2016.

(b) Introduce the **Standstill Period** in line with paragraphs 5.78–5.80 following Notification of Intention to award the contract in line with paragraphs 5.72–5.77 of the World Bank Procurement Regulations for IPF Borrowers of July 2016.

(c) Use of the **World Bank Group sanctions framework** which carries the possibility or flexibility for the World Bank to accept sanctions that may be carried out by the borrower based on satisfaction by the World Bank that the said sanctions have been preceded by a "relevant judicial or administrative proceeding which afforded the firm or the individual adequate due process," in line with the provisions of Section III Governance - paragraph 3.3 (f).

(d) Provide guidelines on how the MoGE staff or other civil servants could be engaged to support the project implementation. The provisions within the NPF, in particular regulation paragraph 7.32, clearly stipulate how such staff could be engaged. These staff would be engaged as project implementation staff, as individuals contracted by the MoGE to support project implementation, rather than being selected as individual consultants identified in the procurement plan approved by the World Bank. They may be selected by the MoGE in accordance to its hiring procedures of personnel for such activities, as reviewed and found to be acceptable by the World Bank.

(e) From an economic and capacity to implement the contract standpoint, the NPF has provisions, including a methodology to guide the borrowers on how to treat **Abnormally Low Tenders** in paragraph 5.65. The NPF also has provisions **in paragraphs 5.65 and 5.66** for the borrowers to address **"seriously unbalanced or front loaded bids or proposals."**

(f) Expedite **procurements**, by reducing prior reviews by World Bank staff for low-risk and low-value contracts by raising the prior review thresholds**.**

(g) **Use of the recently developed System for Tracking Exchanges in Procurement (STEP)** which applies to all World Bank-funded projects since July 1, 2016. STEP will facilitate online procurement planning and end-to-end tracking of procurement and allow for users—both Government and the World Bank—to monitor timeliness

and/or efficiency of procurement. In Zambia, training has been carried out for all projects and hands-on support continues to be provided to STEP users.

36. In light of the NPF Policy and procedures for IPF for use by World Bank borrowers since July 2016, this project will adopt and follow the new IPF Procurement Guidelines. To this end, a PPSD was developed, which included market research and analysis in potential procurement areas on the basis of activities proposed under each component (for example, procurement of textbooks) to support procurement decision making (related to the approach and methods for procurement) using the latest market information. The MoGE has developed a procurement plan for the first 18 months of implementation for Component 3 satisfactory to the World Bank, with a table of defined thresholds based on the risk analysis that is based on the revised thresholds. Though the MoGE has implemented World Bank-financed projects before, it was a long time ago and there have been many staff changes. Training and capacity building on the new procurement policy and procedures will be needed for the PIU and those institutions involved in project implementation, due to personnel changes in the MoGE.

37. The PPSD describes the borrower's procurement capacity needs and other actions proposed to address the implementation needs of ZEEP based on an in-depth assessment, taking into account the specific technical advice and implementation support that may be needed by the MoGE from the World Bank in implementing the project. The main findings and recommendations of the PPSD assessment for ZEEP are as follows:

(a) **Strengthening textbook procurement.** The World Bank, along with the MoGE, reviewed the current textbook procurement system and identified possible modalities and areas for improvement to strengthen the procurement of textbooks to increase VfM.

(b) **Improving access through school infrastructure.** As part of project preparation, the World Bank and the MoGE reviewed the criteria used by the MoGE to identify locations for new school constructions. The review resulted in the amendment of the criteria which will be applied in selecting schools to be upgraded under ZEEP. Accordingly, the design for the school infrastructure package was reviewed and revised to increase VfM and maximize the number of schools that would be covered under the program.

(c) **Consideration for the possible engagement of civil servants and individual consultants as part of the project implementation team.** In the interest of building capacity for project implementation, the Government may hire, as needed, individual consultants based on procedures as provided for in the World Bank's Regulations for Investment Project Financing (IPF) for borrowers. The Government may also identify members of staff from within the civil service who are deemed necessary for project implementation as part of the PIU. They will be hired using the government procedures and the level of their payment will be set by the Government and be cleared by the World Bank.

(d) **Training the MoGE staff in the use and application of the NPF.** Given that the last project financed by the World Bank in the MoGE's predecessor closed over 10 years

ago, the World Bank noted the need to conduct training early in the project life for selected staff of the MoGE who will be responsible for supporting project implementation. This will enable them to carry out the project from a procurement perspective, using the NPF as applicable. As with many projects in Zambia, the World Bank noted the need for the MoGE to carry out due diligence of the bidders who would be recommended for contract award to determine if they are sufficiently qualified and able to execute the contract. This may include independent verification of the bidders' qualification, experience, and financial capability information, going beyond information provided by the bidders in their bid proposals. For the MoGE to apply the World Bank Group sanctions framework (that is, allowing the World Bank to accept sanctions that may be carried out by the borrower), the MoGE will need to develop and/or share with the World Bank, to its satisfaction, the arrangements and evidence that "relevant judicial or administrative proceeding will have afforded to a firm or the individual" each time sanctions are implemented. This is in line with provisions of the World Bank's NPF, Section III Governance - paragraph 3.3 (f).

(e) **Use of the RBF with DLIs under Components 1 and 2.** Disbursements will be made based on achieving the agreed DLIs, which will be verified by IVAs. It would be preferable that an IVA is identified and selected before the project effectiveness so that a contract could be signed with the IVA right after the effectiveness.

(f) The disbursed funds would then be used by the MoGE for other activities related to the project objectives. The utilization of these funds will follow the borrower's own administrative and procurement policies or guidelines, as provided by the PPA No.12 of 2008 and its Regulations of 2011. Activities under Component 3, which are not DLI-bound but procurable and will be procured after the first 18 months of implementation[73], will require the MoGE to prepare a procurement plan which needs to be reviewed and approved by the World Bank before its implementation.

(g) **Procurement risk assessment and management for ZEEP.** Based on the application of the World Bank's online P-RAMS, the procurement risk for ZEEP is rated Moderate, largely due to the recognition that the MoGE has developed capacity over many years to carry out projects using its own funds. Implementation of the risk mitigations actions would, over time, reduce the overall procurement risk rating to Low.

(h) **Procurement Post Reviews (PPRs) and Independent Post Reviews (IPRs) by the World Bank under Component 3.** Based on the assessed agency implementation risk for procurement, which is Moderate, the World Bank will carry out PPRs or IPRs for contracts under Component 3 based on the approved procurement plan; a sample of 10 percent will be used. Based on continuing assessment of risk and the success of risk mitigation measures implemented, the sample size will be reduced as risk mitigation measures are successfully implemented.[74] Any changes in the review will

[73] The MoGE has developed a procurement plan for the first 18 months of implementation which is acceptable to the World Bank.

[74] High risk represents a sample PPR/IPR size of 20 percent, Substantial risk represents 15 percent, Moderate risk represents 10 percent, and Low risk 5 percent.

be communicated to the MoGE, the MoF, and the Ministry of National Development Pplanning (MoNDP) as outcomes of the PPR/IPR exercise. As needed, such changes will also result in the World Bank revising the procurement methods and prior review thresholds, as shown in Table 3.4.

(i) Procurement methods will take into account the available choices following the PPSD.

Table 3.4. Threshholds For Procurement Approaches and Methods (US$, thousands, as of June 2016)

		Works			Goods, IT, and Non-Consulting Services			Short List of National Consultants	
Country	Region	Open International ≥	Open National <	Request for Quotation ≤	Open International ≥	Open National <	Request for Quotation ≤	Consulting Services <	Engineering and Construction Supervision ≤
Zambia	AFR	10,000	10,000	200	2,000	2,000	100	200	300

Source: World Bank Guidance Thresholds for Procurement Approaches and Methods by Country (Section III B).

38. Procurement methods will be guided by the threshold values obtained by the respective purchases as per the guidelines of the World Bank Guidance Thresholds Approaches and Methods by Country (Section III B) of 2016.

Environmental and Social (including safeguards)

39. The safeguards policy on Environmental Assessment OP/BP 4.01 is triggered as Component 2 of ZEEP will involve the construction of additional classrooms and support facilities at existing schools across Zambia. The support facilities will include the provision of sanitation facilities, such as toilets and the sinking of boreholes to provide potable water to students and staff. From the 82 selected beneficiary schools, 10 of them will host all-girls weekly boarding facilities (dormitories). Because the beneficiary schools and their exact locations are yet to be determined, the MoGE, with the guidance of the World Bank, has developed an ESMF that provides a detailed step-by-step process for identification and screening for critical environmental and social risks of the project. The instrument further provides mitigation measures and monitoring plans, including institutional arrangements for safeguards implementation and capacity building. Furthermore, a generic ESMP has been developed to guide the MoGE, the involved communities, and contractors in monitoring and implementing mitigation measures. Because the project will not involve activities or subprojects that require an ESIA, the ESMP is designed to provide the best practices for waste management and any other safeguards concerns that are identified during project implementation.

40. The project is expected to have a positive social impact and improve quality of learning through strengthening mathematics and science teacher competencies, improving textbook availability and quality, and increased access to secondary education by adding at least 22,960 new seats in the most deprived communities as defined through relative poverty levels, primary to secondary school transition rate, pupil-classroom ratio, number of existing secondary schools, and

coverage of recent Government initiatives on school construction. The project will specifically support improvement of facilities to enhance girls' ability to complete secondary education through supporting construction of boarding facilities for girls at 10 of the selected schools for expansion as well as the construction of ablution blocks. This will be important for girls in supporting improved MHM and improve the learning environment for the most disadvantaged children in Zambia. The targeting is expected to increase the equity of educational quality, in particular for prospective girl students. The schools that will benefit from expansion are located in rural areas and primarily serve low-income children, factors that significantly determine school achievement.

41. The expansion of access to secondary education entails construction of classrooms and related facilities. The additional facilities will be built in rural areas only, within existing school perimeters, where land is already allocated for educational purposes and there is no encroachment. For this reason, a separate Resettlement Policy Framework is not required. However, as noted earlier, an ESMF was prepared under OP/BP 4.01 and includes site-specific screening and procedures that document development agreements with communities to comply with the World Bank Operational Policies. The ESMF site screening will be used to eliminate any construction activities that would necessitate displacement of squatters and encroachers or require land acquisition.

Monitoring & Evaluation

42. As the leading implementation agency of this project, the MoGE will be responsible for overseeing and coordinating all the activities financed under the project, including M&E. The M&E function will reside within its Directorate of Planning and Information. The project is designed to use the existing M&E infrastructure established by the MoGE as much as possible to carry out M&E activities. Given that the MoNDP has the mandate to monitor national development projects, ZEEP will keep the MoNDP informed about its progress and seek the MoNDP's guidance in M&E of the project. The World Bank team will provide support in M&E capacity building.

43. Each component under the project has its own built-in M&E mechanisms by design. For example, for the teacher quality improvement pilot under Subcomponent 1.1, a special committee will be tasked to monitor and evaluate its progress, reporting back to the PISC. For the textbook delivery under Subcomponent 1.2, an agency (CDC) independent of the PSU will do the tracking and monitoring to ensure that the textbooks are indeed delivered to the selected schools. For the classroom construction under Component 2, the Resident Engineer and Buildings Officer from the PEOs and DEBS, as well as the PICs will be used to inspect the quality and monitor the progress of the construction. The verification of the DLIs under these two components will be undertaken by an independent third party (IVA) to ensure the achievement of the agreed results.

44. Overall, the MoGE will be responsible for providing (a) status reports on project implementation by each activity financed under the project, (b) status reports on the progress made on all PDO-level and intermediate indicators specified in the Results Framework (see Table 1.1 in Annex 1), (c) level of achievement for each of the agreed DLIs (see Table 1.3 in Annex 1), and (d) consolidated IFRs and annual progress and audit reports.

Annex 4: Implementation Support Plan

ZAMBIA Education Enhancement Project (P158570)

Strategy and Approach for Implementation Support

1. To ensure effective and efficient implementation of ZEEP, systematic and just-in-time support will be employed as a strategy throughout the implementation. Unlike traditional project supervision where the emphasis is on ensuring inputs needed for producing outputs are in place, the implementation support of this project will focus on results achievements, especially DLIs. Due diligence in fiduciary and safeguard procedures and oversight on procedures and transactions will remain an important part of the project supervision. The World Bank team will aim to maintain an open dialogue and continuous communication with the Government and implementing agencies to discuss and resolve any issues/difficulties faced during implementation as they arise, preventing and reducing delays in implementation that could threaten progress toward the achievement of the PDO.

2. The implementation support mechanisms that are expected to enhance timely and effective monitoring include (a) regular implementation support missions, (b) regular technical meetings and field visits by the World Bank between formal review missions, (c) comprehensive reporting based on the MoGE's internal monitoring, (d) independent third-party verification, and (e) internal audit and FM reporting.

Implementation Support Plan

3. The World Bank will provide strong implementation support to the MoGE and other implementation agencies regarding technical, fiduciary, and safeguards issues. Some of the World Bank team members will be based in the Zambia country office to provide timely and effective support in these areas. Formal supervision and field visits will be carried out semiannually, with more frequent technical support missions during the first year of implementation. Detailed inputs from the World Bank team would comprise the following:

- **Technical inputs.** Additional technical supervision will be provided to ensure that Year 0 and Year 1 results are achieved on time. Training for the community committees on managing and supervising classroom construction will be conducted. Support to review preparation of bidding documents and ToR for specific activities will also be provided as needed.

- **Fiduciary requirements and inputs.** Training on FM, procurement, and M&E will be provided to the MoGE and others involved in implementation. They will be led by specialists from the World Bank. The World Bank team will help the MoGE and relevant agencies to identify capacity-building needs in FM and procurement management. Implementation support missions, including procurement and FM reviews, will be semiannual.

- **Safeguards.** Technical support on the preparation of the ESMF will be provided at the initial stage of the project. In addition to training, the World Bank safeguard

specialists will provide further technical support at any stage during the project implementation. As the project activities include new classroom construction, safeguards compliance will be closely monitored by both the Government and the World Bank during implementation support missions.

Table 4.1 Focus of Implementation Support

Time	Focus	Resource Estimate	Number of Staff Weeks	Partner Role
First twelve months	Technical review/support	Senior Education Specialist	10	n.a.
		M&E Specialist	8	
		School Construction Specialist	12	
		Teacher Training Specialists	12	
		Textbook Specialist	12	
	FM training and supervision	FM specialist	8	
	Procurement training and supervision	Senior Procurement Specialist	8	
	Environment and Social monitoring and reporting	Environment Specialist	4	
		Social Development Specialist	4	
	Institutional arrangement and project supervision coordination and Team Leadership	Task Team Leader	20	
		Senior Operation Officer	10	
12–48 months	Technical review and operation support	Senior Education Specialist	10	n.a.
		M&E Specialist	4	
		School Construction Specialist	8	
		Teacher Training Specialists	8	
		Textbook Specialist	8	
	Environment and social monitoring and reporting	Environment Specialist	2	
		Social Development Specialist	2	
	FM disbursement and reporting	FM Specialist	4	
	Procurement management	Senior Procurement Specialist	4	
	Institutional arrangement, project supervision, coordination, and team leadership	Task Team Leader	12	
		Senior Operation Officer	10	

Note: n.a. - not applicable.

Table 4.2 Staff Skills Mix Requirement

Skills Needed	Number of Staff Weeks (SWs)	Number of Trips	Comments
Operations	10 SWs annually	Fields trips as required	Headquarters and country office based
Teacher training	12 SWs first year, then 8 SWs annually in the following years	Fields trips as required	Country office based and externally based
Textbook management	12 SWs first year, then 8 SWs annually in the following years	Fields trips as required	Externally based
School construction	12 SWs first year, then 8 SWs annually in the following years	Fields trips as required	Country based
M&E	8 SWs first year, then 4 SWs annually in the following years	Fields trips as required	Country office based
Procurement	8 SWs first year, then 4 SWs annually in the following years	Fields trips as required	Country office based
Social safeguards	4 SWs first year, then 2 SWs annually in the following years	Fields trips as required	Country office based
Environmental safeguards	4 SWs first year, then 2 SWs annually in the following years	Fields trips as required	Country office based
FM	8 SWs first year, then 4 SWs annually in the following years	Fields trips as required	Country office based
Task Team Leaders	20 SWs first year, then 12 SWs annually in the following years	Field trips as required	Headquarters Based

Annex 5: Economic and Financial Analysis

ZAMBIA Education Enhancement Project (P158570)

Project Development Impact

1. The proposed project will contribute to Zambia's development by (a) improving students' science and mathematics learning outcomes in schools selected for their low outcomes in these subjects, (b) increasing secondary seats in rural and poor areas, (c) contributing to the diversification agenda, and (d) improving the future earnings of beneficiaries. The following are the project's focus areas:

(a) **Increasing Zambia's human capital.** Zambia's illiteracy rate is quite high at 39.5 percent[75] of the population. This project should support better human capital by making secondary education accessible to more students and exposing these students to an improved quality of education through teachers with better competencies and skills and increased availability of textbooks.

(b) **Increasing access to secondary education.** The discussion of Component 2 in Annex 2 documents the severe shortage of secondary school seats. This project creates a window for the MoGE to increase the number of seats for admitting more students to secondary education, especially in selected rural and poor areas.

(c) **Diversifying the economy in the direction of greater industrialization.** The Government flags this as a priority development objective, partly to grow economic sectors that generate more jobs than extractive industries that have up to this time disproportionately dominated the economy.[76] To achieve this goal, the Government is accelerating efforts[77] to ensure that a cadre of students sufficiently trained in science and mathematics can pursue the engineering and science courses needed for industrialization. This project fits this agenda, given its focus on improving students' learning outcomes in mathematics and science by ensuring that teachers are competent in teaching these subjects.

(d) **Poverty rates are high in Zambia (more than 60 percent of the population is poor)[78] and addressing it requires several interventions, including better education.** Students benefiting from the interventions of this project should be able to command higher wage returns to their education.

Data Sources for the Economic Analysis

2. The economic analysis of Components 1 and 2 uses the international literature that relates the size of learning gains to wage returns, the 2014 LFS data from the CSO, 2015 EMIS data from

[75] 2010 population census.
[76] This is outlined in the Revised Sixth National Development Plan.
[77] The Government has identified a number of secondary schools, countrywide, to be centers of excellence, and this initiative is also being pursued at the higher education level.
[78] According to the 2014 poverty map report by CSO and the World Bank.

the MoGE, the World Bank's 2016 QSDS, and the World Bank's 2016 Zambia Education PER. For Component 2, the earnings return to education are well documented, and the internal rate of return (IRR) with multiple scenarios can be estimated. However, for Subcomponents 1.1 and 1.2, the effects of quality interventions on earnings are not well documented. In these cases, it is hard to make reasonable assumptions required to calculate IRR. For these two subcomponents the effects that have to be realized to justify the project intervention (in other words, nonnegative net present value [NPV]) are presented. Economic returns to Component 3 are not estimated.

Component 1: Improving the Quality of Teaching and Learning

Subcomponent 1.1: Strengthening the Teacher Training System

3. A large body of international research from various settings shows that (a) higher-quality teachers, defined as teachers with better content knowledge and pedagogic skills, enhance their students' cognitive skills and (b) higher cognitive skills carry employment and wage premiums. Students exposed to high-quality teaching typically get 7–10 percent of an additional year of school attainment. Table 5.1**Error! Reference source not found.** summarizes some of the international evidence on the effects of students' higher cognitive skills and their earnings when they leave school. Hanushek and Woessmann[79] found that the economic growth rate differences between 1960 and 2000 for eight regions of the world can be explained by differences in the population's acquisition of cognitive skills. Years of schooling were unrelated to differences in economic growth rates. In other words, it is the cognitive skills that students acquire in school, not 'seat time' in school, that powerfully affect individual earnings, the distribution of income, and economic growth.

Table 5.1. Relationship between Skills Acquisition and Earnings

Country	Estimated Effect on Earnings	Source	Comments (Returns to 1 Standard Deviation Increase in Cognitive Skills)
Chile	0.15–0.20	H.A. Patrinos and C. Sakellariou, 2008	1 SD increase in test scores in literacy increased wages by 15% to 20%
Ghana	0.14–0.30	P. Glewwe, 1996	Incomes related to mathematics and reading skills
Ghana	0.05–0.07	D. Jolliffe, 1998	Household income related to average mathematics score
Kenya	0.19–0.22	M.X. Boissiere, J. B. Knight and R. H. Sabot, 1985; J.B. Knight and R.H. Sabot, 1990	Total sample estimates: small variation by primary and secondary school leavers
Pakistan	0.25	Behrman et al. 2013	Significant effect of cognitive skills (combined scores for math and reading)
South Africa	0.34–0.48	P.G. Moll, 1998	Primary schooling, cognitive skills, and wages in South Africa
Tanzania	0.07–0.22	M.X. Boissiere, J. B. Knight and R. H. Sabot, 1985; J.B. Knight and R.H. Sabot, 1990	Smaller effect for primary than for secondary school leavers

Source: H.A. Patrinos and G. Psachoropolus, 2010[80]

[79] E.A. Hanushek and L. Woessmann: "Do Better Schools Lead to More Growth? Cognitive Skills, Economic Outcomes, and Causation." *NBER Working Paper* 14633, Cambridge, MA, 2009.
[80] "Returns to education in developing countries", Elsevier Ltd, 111-134.

4. The economic analysis for Subcomponent 1.1 involves calculating how large an increase in learning outcomes is required to create enough additional future earnings to offset the costs of the investment itself. In the absence of Zambia-specific estimates, the international estimates presented in Table 5.1 are used as a proxy. The lowest estimate of an standard deviation (SD) increase in cognitive skills in Ghana was at 5 percent. The average of the highest estimates is 22 percent. The base case scenario assumes 12 percent returns to 1 SD increase in cognitive skills. Earnings data from the 2014 LFS were used to calculate the needed annual increase in earnings to justify the investment under this subcomponent. Table 5.2 summarizes the assumptions used for this analysis.

5. The project plans to invest US$9 million in Subcomponent 1.1. Under this subcomponent, 382 schools (200 primary and 182 secondary) in 10 districts will be reached, translating to about 100,400 beneficiary students (64,000 primary and 36,400 junior secondary). The class size is assumed to be that of the sector's standard of 40 students per classroom, which is a conservative assumption, given the overcrowding situation in most schools. Given the age restriction on when one can start work,[81] only the benefits for three cohorts graduating Grade 9 during the life-span of the project are considered. With the pass rate of 49 percent in junior secondary school, there would be 10,702 graduates (base scenario). In other words, the cost per graduate will be approximately US$654 (Table 5.2). The average annual increase in a graduate's earnings required to produce US$654 over 35 years discounted at 12 percent per year is equal to only 0.83 percent.

Table 5.2. Summary of Assumptions for Cost-Benefit Analysis of Teacher Quality

Assumptions	Values
1. What effect on earnings is needed to justify the investment in creating a teacher system to improve teacher quality?	
Total investment cost into teacher quality, US$	7,000,000
The project will affect all students in the targeted grades when the project starts and at least two new cohorts at Grades 1 and 8 during the life-span of the project.	100,400
Considering the legal working age of 16 years, only 3 cohorts who complete Grade 9 during the life-span of the project are considered.	Pass rate @ Grade 9 - 49%
Total investment cost per child, US$	654
Graduates begin earning the year following graduation and stop in 35 years [a]	35 years
Graduates will have only 2 years of lower secondary schooling	—
Exchange rate	US$ 1 = ZMW 10
Discount rate, %	12.0
Required impact on future earnings discounted at 12% needed to justify US$654	0.83%
2. How large an effect on cognitive skills, measured in SDs, is needed to result in the required impact?	
Scenario 1: low return of 5% (in Ghana, Table 5.1)	0.17 SD
Scenario 2: average return of 12%	0.069 SD
Scenario 3: average of the highest returns of 22% (in Tanzania and Kenya, Table 5.4)	0.04 SD

Note: a. To have similar time span as for school construction intervention (from 2017 to 2057).

[81] In Zambia, the legal working age is 16 years.

6. The increase in cognitive skills required to offset the cost of improving teacher quality by strengthening a teacher system is very small: only 0.17 SD in the case of low returns of 5 percent, 0.069 SD in the case of average returns of 12 percent, and 0.04 SD under high returns of 22 percent.

Subcomponent 1.2: Improving Textbook Availability

7. The project will also support the procurement and distribution of textbooks in schools at the secondary level. Currently, the ratio of pupils to textbooks in Zambia is 5:1 according to the Zambia QSDS (2016). This ratio is below what is deemed adequate by international standards (ratios of 1:1 or 2:1).[82] Improved textbooks provision in schools can lead to monetized benefits through increasing students' cognitive skills that improve their future productivity and wage returns.

8. The economic analysis for this component requires information on (a) the effects of textbook availability on student learning and (b) the causal relationship between students' cognitive skills and earnings. Because data on these relationships are not readily available for Zambia, international estimates are used. As discussed, the estimated effects of cognitive skills on earnings are presented in Table 5.1. Table 5.3 summarizes some of the studies that estimate the effects of textbook availability on learning outcomes. An IE of a basic education program in Ghana found that progress in mathematics and English test scores between 1988 and 2003 was partly due to the increased availability of textbooks.[83] Similarly, a cross-country analysis based on data from regional assessments in 22 Sub-Saharan African countries shows that pedagogical resources, especially textbooks in core subjects of reading and mathematics, are effective in improving learning: providing one textbook to every student in a classroom increased literacy scores by 5 to 20 percent.[84] However, these benefits can only be realized if the textbooks reach the students, are in appropriate languages, and at appropriate levels of difficulty,[85] and are used by teachers in their instruction.

[82] *Global Education Monitoring Report*, UNESCO, 2016.
[83] White: "In South Africa, students, especially girls, do better on reading tests when they have their own copies of textbooks." 2004.
[84] S. Fehrler, K. Michaelowa and A. Wechtler: "The effectiveness of inputs in primary education: Insights from recent student surveys for sub-Saharan Africa", *Journal of Development Studies*, 45(9), 1545-1578, 2009.
[85] M. Boissiere: "Rationale for Public Investments in Primary Education in Developing countries. The World Bank, Washington, 2004.

Table 5.3. Impact of Key Interventions on Student Learning Outcomes

Country	Effect Size	Source	Intervention
Uganda	0.2 SD	A.M. Lucas, P.J. McEwan, M. Ngware, and M. Oketch, 2014[86]	Early grade reading program (change in the reading instructions, training of primary and head teachers, provision of learning materials, and teacher support)
Nicaragua	0.33 SD	D.T. Jamison, B. Searle, K. Galda, and S.P. Heyneman, 1981[87]	Impact of textbooks on learning (RCT)
Philippines	0.31–0.51 SD	S.P. Heyneman, D.T. Jamison, and X. Montenegro, 1984[88]	Impact of textbooks on learning (RCT)
Thailand	0.06 SD	M.E. Lockheed, S.C. Vail, and B. Fuller, 1986[89]	Textbooks: value added
Philippines	0.23–0.55	J.P. Tan, J. Lane, G. Lassibille, 1999[90]	Teacher training on using teaching materials
United States of America	0.24	C. Greenleaf, P.D. Pearson, and E. Moje, 2010[91]	Academic literacy for science teachers

Note: RCT = Randomized Control Trial.

9. Table 5.4 shows the assumptions made for the cost-benefit analysis of this subcomponent. According to the 2015 MoGE EMIS data, there are at least 328 full-fledged[92] government secondary schools, 2,236 basic schools, 29 schools offering Grades 1–12, 9 junior secondary schools, and 19 high schools (Grades 10–12). Using a conservative approach for the class size of 40 students, there are about 530,000 students who will benefit from the intervention during the project's life-span. Assuming a pass rate of 49 percent for the junior secondary level, a 57 percent pass rate for the senior secondary level, and that at least two cohorts at Grade 8 and one at Grade 10 will undergo the full grade cycles using additional textbooks, 132,946 students are expected to graduate during the project's life cycle. The benefits for the graduates are calculated over a 35-year working period. The budget for this subcomponent is about US$12 million, of which approximately US$9.9 million is allocated to the procurement and distribution of textbooks. The calculated cost per child for this subcomponent is US$74.3. On average, 0.07 percent will be the required annual increase in the graduate's earnings to produce US$74.3 over 35 years discounted at 12 percent per year.

[86] "Improving Early-Grade Literacy in East Africa: Experimental Evidence from Kenya and Uganda", *Journal of Policy Analysis and Management*, 33(4), 950-976.
[87] "Improving elementary mathematics education in Nicaragua: An experimental study of the impact of textbooks and radio on achievement", *Journal of Educational Psychology*, 73(4), 556–567.
[88] "Textbooks in the Philippines: Evaluation of the pedagogical impact of a nationwide investment", *Educational Evaluation and Policy Analysis*, 6(2), 139–150.
[89] "How textbooks affect achievement in developing countries: Evidence from Thailand", *Educational Evaluation and Policy Analysis*, 8(4), 379-392.
[90] "Student outcomes in Philippine elementary schools: an evaluation of four experiments", *World Bank Economic Review*, 13, 493–502.
[91] "Literacy and Science: Each in the Service of the Other", *Science*, 328, 459-463.
[92] Full-fledged schools are secondary schools that have Grades 8–12; this is used to differentiate with secondary schools that only have Grades 10–12, definition provided by MoGE.

Table 5.4. Summary of Assumptions for Cost-Benefit Analysis of Textbooks

Assumptions	Values
1. What size effect on earnings is needed to justify the investment on textbooks?	
Total cost of textbook procurement under Subcomponent 1.2, US$	9,873,700
Project beneficiaries: The project will benefit all students in the respective targeted grades at the start and at least two new entrants at Grades 8 and 10 during its lifetime.	530,000
Pass rate: At least two intakes at Grade 9 and one intake at Grade 12 will have undergone the full grade cycle [a] during the life-span of the project.	49% at Grade 9 57% at Grade 12
Total investment cost per child, US$	74.3
Graduates begin earning the year following completion and stop in 35 years [b]	35 years
Graduates will have only 2 and 5 years of secondary schooling	Lower and upper secondary
Exchange rate	US$ 1 = ZMW 10
Discount rate, %	12.0
Required impact on future earnings discounted at 12% needed to justify US$74.3	0.07%
2. What size effect on cognitive skills, measured in SDs, is needed to create the required earnings effect?	
Scenario 1: low return of 5% (for example, Ghana)	0.014 SD
Scenario 2: average return of 12%	0.006 SD
Scenario 3: average of the highest returns of 22%	0.003 SD

Note:
a. Going through Grades 8–9 and 10–12 with a reduced book-pupil ratio
b. To have similar time span as for school construction intervention (from 2017 to 2056).

10. The analysis shows that the required increase in cognitive skills needed to offset the cost of producing and providing textbooks available is small (from 0.003 to 0.014 SD). The case of low returns of 5 percent requires only 0.014 SD; the case of average returns of 12 percent, 0.006 SD; and the case of high returns of 22 percent, 0.003 SD. Therefore, if making textbooks available in schools can have as much of an effect as the Thailand textbook program (Table 5.3), the SD of a 0.014 effect on cognitive skills will be more than sufficient to justify the investment in this subcomponent.

Component 2: Increasing Equitable Access to Secondary Education

11. This component funds the construction of additional classrooms in selected existing secondary schools (Grades 8–12). Annex 2 describes the severe shortage of secondary schools and classrooms in Zambia.

12. As noted earlier, it is the cognitive skills acquired, not seat time per se that are associated with better labor market outcomes. Thus, access is a necessary but not sufficient condition for increased cognitive skills and thus better labor market outcomes. However, international evidence shows that school construction affects not only access but also learning outcomes (see Table 5.5). For example, an evaluation of a World Bank-funded Indonesia project between 1973 and 1978 (considered one of the biggest and most successful school construction projects found that the construction of schools led to an increase in education attainment and earnings. For each school constructed in the region, children received 0.12 to 0.19 more years of schooling in 1974. Estimates from the study also show that the project generated about 6.8 percent to 10.6 percent[93] in economic returns to education. This outcome reflects the fact that, when a school is easily accessible, it may

[93] E. Duflo: "Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment." *American Economic Review* 91 (4), 2001.

encourage students to stay longer in school, thereby potentially increasing their cognitive skills and better labor market outcomes.

Table 5.5. Studies on the Effects of School Construction on Student Learning

Author/s	Year	Results
Esther Duflo	2001	Construction of schools in Indonesia led to increase in education attainment and earnings. For each school constructed in the region, children received 0.12 to 0.19 more years of schooling in 1974. Using variation in schooling generated by this policy as the instrumental variable for the impact of education on wages, it generates an estimated economic return to education in the range of 6.8% to 10.6%.
Christopher Neilson and Seth Zimmerman[94]	2011	US$10,000 of investment per student in school construction raised reading scores for elementary and middle school students by 0.027 SD in the United States
M. Lewis[95] Buckley, Schneider, and Shang[96]	2000 2004	Students in better-maintained schools in the United States, after accounting for the other influences, have higher reading scores among elementary and high school students when compared to the poorly maintained schools.

13. Research from various settings has also found a positive relationship between the physical conditions of the school and student learning outcomes. Students attending schools with an appropriate learning environment have shown greater levels of learning achievement (of between 5 percent and 10 percent), leading to higher earnings throughout their lifetime and faster economic growth at the national level.[97] It is assumed that classrooms constructed under the project will be in decent physical condition after they are constructed.

14. Figures 5.1 and 5.2 show the relationships in Ethiopia between the years of school completed, which Component 2 should leverage, and wage returns. Compared to workers with no education, Figure 5.1 shows that workers with some secondary education earn 96 percent more and the wage premium increases to 220 percent for those who have completed secondary education (A Level). Ethiopia's current labor market pays high wage premiums to higher levels of education, but only after individuals have achieved some secondary education. The wage premium is significantly higher for those who complete secondary education compared to those who have only some secondary education, partly because, as Figure 5.2 shows, completing secondary education increases the individual's access to the formal sector that pays better wages.

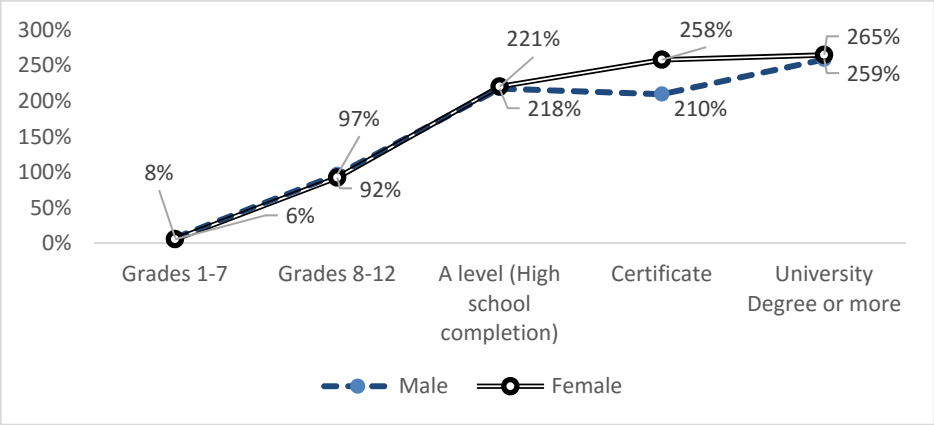
[94] "The effect of school construction on test scores, school enrolment, and home prices". Discussion Paper No. 6106, Institute for the study of Labour (IZA).

[95] "Where Children Learn: Facility Condition and Student Test Performance in Milwaukee Public Schools". Scottsdale, Ariz.: Council of Educational Facility Planners.

[96] "*Los Angeles Unified School District School Facilities and Academic Performance"*. Washington, D.C.: National Clearinghouse for Educational Facilities.

[97] For example, E.A. Hanushek, 1995. "Interpreting Recent Research on Schooling in Developing Countries", *The World Bank Research Observer*, 10(2), 227-246 found that of 34 production function studies in developing countries that investigated the links between physical facilities and student learning, a large majority revealed a positive effect of school infrastructure quality on learning achievement. Similar results have been observed throughout Latin America, Africa and high-income countries like the United States.

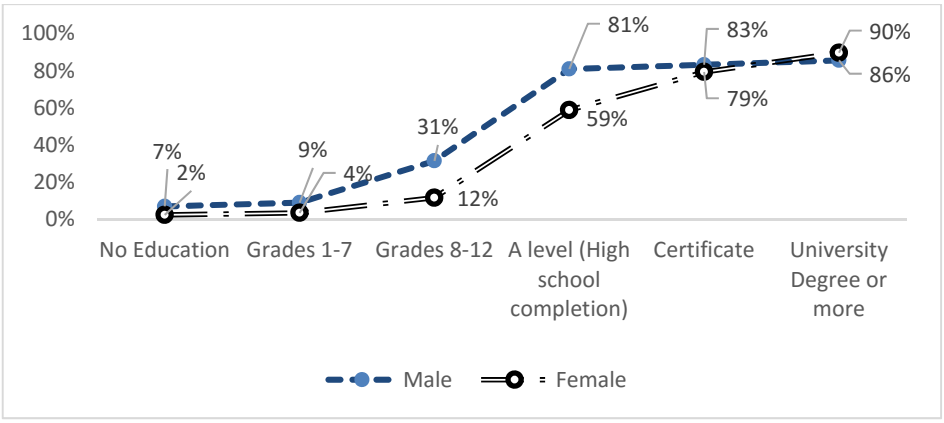
Figure 5.1. Rate of Returns to Education by Gender



Note: Wage premium is calculated based on the regression of the log of monthly income on educational attainment and age group dummy variables by gender using LFS 2014.

15. In addition to affecting wage returns to education, education plays an important role in controlling fertility and gender-balanced household decision-making. The 2013/14 Demographic and Health Survey shows that education significantly and positively affects the use of contraceptive methods and child-bearing decisions. Women with no education have an average 5.6 children compared to 3.5 for those with more than a secondary education. The survey also shows that educated women are more inclined to delay motherhood. Education is associated with an increased the probability that births will be attended by a medical specialist and decreases the likelihood that either the mother or the child dies at birth. Higher levels of education of a mother are also associated with a lower probability of malnutrition among children.

Figure 5.2. Share of Formal Sector Employment (%) by the Level of Education and Gender



Note: Analysis using LFS 2014.

16. The economic analysis of Component 2 takes into account only benefits that are easily quantifiable. Therefore, the estimated benefits capture only the lower bound of the gains and may underestimate the overall gains, which include positive externalities associated with higher educational attainment and better cognitive and non-cognitive skills (such as lower crime rates,

better health outcomes, and higher tax receipts, among other public benefits).[98] There are also potential increases in economic growth for which this analysis does not account. As a result, it is likely that the computed IRR presents a lower bound for the impact of the project.

17. The cost-benefit analysis performed is guided by the assumptions specified in Table 5.6. First, the number of additional students that will enroll or be retained at secondary schools as a direct result of the investment is estimated.[99] Second, the benefits for students who graduate from both junior and senior secondary school are estimated (graduates are assumed to work for 35 years). The NPV of the potential savings related to the project uses a discount rate of 12 percent.[100] The benefits result from the higher expected earnings generated by a more qualified and educated pool of graduates. The number of beneficiaries is expected to increase gradually during project implementation, yielding financial benefits upon the graduates' entry into the labor market. The calculations also take into account the wage gains of students with incomplete education (dropouts). The base wage is the average wage (new Zambian kwacha) in the 2014 LFS received by workers with primary education level adjusted upward for inflation in 2017. Wage gains are obtained by differencing the average wage of those with primary education and those with some or complete lower secondary education for junior secondary, while senior secondary wage gain is calculated using average wage of those with Grade 9 education and those with some or completed senior secondary education. A discount factor of 7 percent[101] is used in calculating the lifetime value of both junior secondary and senior secondary certificates.

Table 5.6. Assumptions for the School Construction Cost-Benefit Analysis

Assumptions	Scenarios			
	Base Scenario	**Scenario 1**	**Scenario 2**	**Scenario 3**
Number of schools	82			
Number of classrooms	410	410	492	308
Additional enrollments for Grades 8–12	249,280	311,600	373,920	186,960
Beneficiary graduates for Grades 8–12, thousands	116,342	145,427	170,986	87,256
Student pass rate	49% at lower secondary 57% at upper secondary			
Classroom completion schedule, %	Year 2 - 40	Year 3 - 80	Year 5[a] -100	Year 5[b] - 75
Construction timeline	On time	On time	On time	Delayed
2017 monthly wage gain: Junior secondary education, US$	44			
2017 monthly wage gain: Senior secondary education, US$	143			
2015 per student funding of public schools, US$	85 for junior secondary 226.5 for senior secondary			

Note: An exchange rate of ZMW 10 = US$ 1 is used.
a. Construction is completed on time.
b. Only 75 percent of the schools are constructed by Year 5.

[98] Literature on positive externalities as summarized in Davies, J. 2003. *Empirical Evidence on Human Capital Externalities*. Ontario, Canada: The University of Western Ontario.
[99] The enrollment of Grades 8 and 10 starts in 2019 after Phase 1, and the beneficiary calculation is not done until 2056.
[100] The discount rate used if a real rate calculated using Bank of Zambia interest rate of 19.5 percent as of January, 2017 and the CSO reported inflation of 7.5 percent.
[101] This level of discount is chosen due to high inflation level.

18. The school construction package has five classrooms, a laboratory, and a home economics room for up to 82 schools. This translates into 492 classrooms for secondary school students if the home economics room is used for lessons as well. Using the recommended 40 students per classroom,[102] and also allowing for two classes per grade at lower secondary, about 23,000 students will be given access to secondary school annually. Four different scenarios are considered.

19. By giving an opportunity to students to attain secondary education, the project expects to boost the cognitive skills of attendees and thus their labor market outcomes with regard to improved employment rates and future earnings. The analysis (scenario 3) indicates that the investment will be beneficial with the lowest benefit-cost ratio of 2.5 and the IRR at 27.6 percent.

20. Table 5.7 presents these results and provides summaries of the sensitivity analysis. The scenarios and sensitivity tests performed differ with regard to the number of beneficiaries and the project progression period. For example, while the base scenario assumes that each classroom accommodates 40 students, scenario 2 assumes an increase in the number of students to 50 per class. The number of beneficiaries and graduates could easily be increased by assuming a higher enrollment rate (for instance, instead of 50 students per class in scenario 2, it could be increased to 60, which in fact could reflect the real situation in most schools). However, the analysis tries to be conservative in nature.

Table 5.7. Sensitivity Results by Scenario

Scenario	Sensitivity Test Results		
	NPV of Net Benefits (US$, in millions)	Benefit to Cost Ratio	IRR (%)
Base	102.6	2.9	31.8
1	134.4	3.2	35.2
2	115.0	2.9	33.3
3	71.0	2.5	27.6

Note: This calculation takes into account the US$25 million invested under the component as part of the costs in the cost-benefit analysis, taking into account the benefits of graduates and the dropouts.

Conclusion

21. In conclusion, it is highly likely that the proposed project interventions will positively influence access and cognitive gains and subsequent labor market performance of Zambia's school graduates. In addition, without the quality enhancing interventions associated particularly with Component 1, worsening education outcomes are likely to continue.[103]

Financial Analysis

22. The Zambian economy has been one of the fast-growing economies in Sub-Saharan Africa, consistently posting above 5 percent annual GDP growth since the early 2000s. Mainly due to low

[102] Guidance from the MoGE and reported in the 2015 EMIS bulletin.

[103] Education outcomes have been worsening. There was a significant decline in the proportion of secondary 2 (second year of secondary school) students displaying proficiency in biology, mathematics, and English language in 2012. In 2012, only 17.7 percent of sampled secondary 2 students were proficient in biology compared with 36.7 percent in 2008. For mathematics, the 2012 figure was 43.3 percent compared with 69.4 percent in 2008 while in English language it was 48.3 percent compared with 81.9 percent five years earlier.

performance of commodity prices, this level of growth has slowed in recent years (ranging between 3 percent and 3.9 percent in 2015–2017). However, it is expected to pick up in the medium term (2017–2021, to reach at least 5.5 percent by 2021), under a further increase in mining production due to large foreign direct investment in the sector.[104] GDP per capita was estimated at US$1,490 in 2015.[105] Since 2006, the education sector has seen strong commitment from the Government, as evidenced by its relatively large share of the national budget. Between 2010 and 2015, the proportion of public expenditure on education in the total government expenditure varied between 15.3 percent and 20.2 percent, which translated to between 3.7 percent and 5.2 percent of GDP. In 2017, more than 15 percent of the national budget is committed to the education sector. This level of commitment is expected to continue at least in the medium term, given the growth projections.

23. Historically, two sources have financed the education expenditure: the GRZ as the main funder and the DPs, who mainly support specific programs. Up until 2009, the DPs played a significant role in supporting the education sector. They mainly funded skills-related programs. The Government's decongesting exercise reduced the number of active DPs from 12 in 2005 to only 5 DPs by 2010.[106] DP support declined from 18 percent in 2009 to only 3 percent in 2014. It is expected that as the country reforms the education sector, more players, including more DPs, will support the Government's efforts in education.

Table 5.8. Trend in Sector Financing by Development Partners (US$, in millions)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
DP financing	58	84	67	102	33	45	49	12	37
GRZ financing	361	378	566	462	574	679	826	953	1,361
Total education expenditure	420	462	633	564	606	725	875	965	1,398
DP financing (%)	14	18	11	18	5	6	6	1	3

Source: Ministry of Education, Science, Vocational, Training and Early Education Annual Report (various years).
Note: Exchange rate is the annual average of official exchange rate.

24. To assess the contribution of the project to the education expenditure of the Government, a brief analysis of the expenditure trends for the MoGE is conducted (Table 5.9). The GDP and government expenditure projections are based on IMF figures while education expenditures are based on the MoF financial statements. An expected 20 percent annual increase in education expenditure is based on the expenditure trends for the MoGE between 2005 and 2016.

[104] Based on the International Monetary Fund (IMF) 2017 projections.
[105] World Bank data.
[106] Zambia PER, World Bank, 2016.

Table 5.9. Trend and Fiscal Analysis of the Education Sector

Item	2017	2018	2019	2020	2021
GDP (ZMW, in billions)	252.210	282.528	313.052	346.009	382.056
Real GDP growth (%)	4.0	5.0	5.5	5.5	5.5
Govt. expenditure (ZMW, in billions)	61.796	69.468	71.547	79.019	83.453
Govt. expenditure as % of GDP	24.5	24.6	22.9	22.8	21.8
Education expenditure (ZMW, in billions)	10.61	12.74	15.28	18.34	22.01
Education expenditure as % Gov. Expenditure	17.2	18.3	21.4	23.2	26.3
Zambia Education Sector project (US$1 = ZMW10)	0.118	0.156	0.092	0.072	0.063
Share of the project to the total education budget	1.1	1.2	0.6	0.4	0.3

Source: World Bank staff calculations based on the IMF projections and MoF's annual Financial Statement 2006–13.

25. From the analysis, the expected contribution of the project to the total annual education expenditure varies between 0.3 percent and 1.2 percent. The Government is currently building schools countrywide and is in the process of implementing the Cabinet Circular No. 22.[107] The expected impact of the construction component of the project to the total expenditure on construction is analyzed using three scenarios. On average, construction expenditures are about 7.7 percent of total education expenditures (based on 2012 to 2015 sector budgets). Scenarios 1 and 2 are based on the expected completion time for the project (say, only three years of implementation, 2017–2019) while a delay is considered in scenario 3. The construction of schools will be two-phased (Phase 1 starts in 2017 to mid-2018, and Phase 2 starts in the second half of 2018 to 2019). The details are as follows:

(a) **Scenario 1.** The project has no implementation delays. Contribution of the construction component of the project to the total education construction expenditure in this case is between 5.2 percent and 12.5 percent.

(b) **Scenario 2.** Completion of Phase 1 construction is delayed such that it is only completed at the end of 2018. Phase 2 only commences in 2019, and all payments including the last one are released in 2019. In this case, the contribution of the construction component of the project to the total education construction expenditure of the ministry ranges between 7.5 percent and 9.9 percent.

(c) **Scenario 3.** Completion of Phase 1 delays and is only completed in 2019. Phase 2 begins in 2019 and only the first part of Phase 2 is completed in 2019. The last amount is released only in 2020 to complete the construction. In this case, contribution of the construction component of the project to the total construction expenditure of the ministry ranges between 2.2 percent and 9.9 percent.

[107] Cabinet Circular No. 22 delegates the responsibility for the lower level of the education sector (that is, early childhood education and primary education) as well as adult education to the local authorities.

Table 5.10. Sensitivity Analysis of the Contribution of Project Construction under Component 2 to the Overall Construction Expenditure of the MoGE (Expenditures in ZMW, in billions)

	2017	2018	2019	2020
Scenario 1				
Project expenditure on construction	0.065	0.123	0.062	n.a.
Total construction expenditure	0.817	0.981	1.177	—
Share of project expenditure to total education construction expenditure (as %)	8.0	12.5	5.2	—
Scenario 2				
Project expenditure on construction	0.065	0.097	0.088	n.a.
Total construction expenditure	0.817	0.981	1.177	—
Share of project expenditure to total education construction expenditure (as %)	8.0	9.9	7.5	—
Scenario 3				
Project expenditure on construction	0.065	0.097	0.026	0.062
Total construction expenditure	0.817	0.980	1.177	1.177
Share of project expenditure to total education construction expenditure (as %)	8.0	9.9	2.2	5.2

26. Overall, the project will contribute to the total expenditure in education. As illustrated by the construction component, this contribution is greater for certain components.

Rationale for Government Involvement in the Sector

27. The Government and the private sector (which includes the church and the community) are the two main providers of education in Zambia. Before liberalization of the economy, private sector provision of education was mainly through the church. The landscape has since changed to include other private providers (individuals and community schools). However, despite increasing private provision of education, the Government is the main provider of education services. As of 2015, about 20 percent of the secondary schools in the country are private. The cost of enrolling in these privately-owned schools (school fees and other fees)[108] and their location (mostly in urban areas) still make them essentially a place where reasonably wealthy families send their children to school. Thus, alternative options to the proposed project (for example, making bursaries/scholarships available for students to access private schools or incentivizing the private schools to take on more students) would be costly for the public and only a limited number of students[109] would benefit. In the face of this current market failure, it is economically justifiable for the Government to provide access to secondary school through this project.

[108] For instance, from spot-checking, it shows that in 2015, the school fees charged for secondary school at some of the privately-owned schools ranged between US$10,000 and US$20,100 per year.

[109] Taking a conservative approach (using the estimates for the construction component, for instance) to assume no growth in the fees and no inflation consideration, only 2,500 beneficiaries would benefit compared to 240,000 beneficiaries.