



DNA Economics



Early Childhood Education in Zambia

The Cost of Inaction

A report for the Ministry of Education (Zambia) funded by the Roger Federer Foundation

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SECTION A: ABBREVIATIONS / GLOSSARY

AMEP	Alternative Modes of Education Provision
CBA	Cost-Benefit Analysis
CBCC	Community-Based Childcare Centre
CDA	Child Development Associate
ECD	Early Childhood Development
ECE	Early Childhood Education
ECED	Early Childhood Educational Development
ECERS-R	Environment Rating Scale-Revised
ESSP	Education Sector Skills Plan
EU	European Union
GDP	Gross Domestic Product
GRZ	Government of the Republic of Zambia
IDELA	International Development and Early Learning Assessment
ISCED	International Standard Classification of Education
IQ	Intelligence Quotient
JICA	Japan International Cooperation Agency
LMIC	Low- and Middle-Income Countries
LTSM	Learning Teaching and Support Material
MACO	Ministry of Agriculture and Cooperatives
MoCD	Ministry of Community Development
MoE	Ministry of Education
MoFNP	Ministry of Finance and National Planning
MoH	Ministry of Health
MoLGH	Ministry of Local Government and Housing
MTEF	Medium-Term Economic Framework
NDP	National Development Plan
NIF	National Implementation Framework

NGO	Non-Governmental Organisation
NP	National Planning
PTR	Pupil-Teacher Ratio
QP4G	Quality Preschool for Ghana
RCT	Randomised Controlled Trial
RFF	Roger Federer Foundation
ROCS	Reformed Open Community Schools
SD	Standard Deviation
SDG	Sustainable Development Goal
SS	Social Services
ToC	Theory of Change
TPD	Teacher professional development
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
ZEEL	Zambia Enhancement of Early Learning
ZMW	Zambian Kwacha
ZOCS	Zambia Open Community Schools

Executive summary

This study aimed to assess the costs and benefits associated with the implementation of **comprehensive universal Early Childhood Education (ECE) services for children aged 3 to 6 in Zambia**. By assessing the costs and benefits, an evidence base will be provided to inform decision-making processes and policy development related to Zambia's commitments to delivering quality ECE services to all children aged 3-6 years across the country.

Five research questions were identified to support the study objective:

1. What is the current state of ECE services in Zambia?
2. What interventions are necessary to implement an ECE model that ensures quality and equitable ECE services?
3. What is the projected cost of implementing these interventions?
4. What are the potential benefits associated with these interventions?
5. What is the cost of inaction for the country?

The executive summary is structured to provide the key takeaways from each of these research questions.

The current state of ECE in Zambia

Zambia has made significant progress in its commitment to ECE. **With the Ministry of Education (MoE) taking the lead as the primary policymaker, the country has worked diligently to ensure access, equity, and quality education across all levels.** The inclusion of the ECE chapter in the *Zambian National Policy on Education* and on the 8th National Development Plan has not only strengthened support for ECE services but also amplified the voice advocating for their importance. Moreover, in alignment with the national vision, Zambia aspires to achieve universal access to education by 2030, signifying its dedication to providing quality education opportunities for all. ECE enrolments have shown substantial improvement since the responsibility for ECE was transferred from the Ministry of Local Government and Housing (MoLGH) to the MoE in 2004. UNICEF Brief (2022) revealed that the proportion of Grade 1 entrants with ECE exposure has significantly improved, moving from only 16% in 2004 to 41% in 2021, reflecting a positive trend in expanding access to ECE (UNICEF, 2022).

Despite the significant expansion of the ECE system, the teacher-to-child ratio (1:80) is still four times the international norm. Following the government's integration of ECE into the *Zambian Education Department* under the Directorate of ECE, ECE centres were annexed¹ to the existing primary schools, and 1 000 ECE teachers were recruited in 2013. Enrolments saw a significant increase from 47 317 in 2011 to 258 616 in 2020. Although more teachers were hired, the teacher-to-child ratio remained at 1 teacher for every 80 children, compared to the internationally recommended target of 1 teacher for every 20 children at the pre-primary level. However, some data sources estimate the teacher-to-child ratio to be much higher than the government-reported ratio of 1:80.

There is still a need for further efforts and interventions to ensure the provision of comprehensive universal access to high-quality ECE services. A study conducted by (UNICEF, 2023) revealed that only 29% of Grade 1 entrants had any ECE experience in 2022, a decline from 40% in 2021. This decline indicates

¹ At least one classroom in the primary school was allocated for ECE purposes.

that despite the continued increase in enrolments, approximately 70% of learners still lack access to pre-primary education.

A lack of understanding of the ECE curriculum by teachers is one of the challenges faced in ECE implementation. To address this, various stakeholders have joined forces to enhance ECE teacher capacity. Initiatives like the School Readiness Initiative, IT'S PLAY programme, and the United States Agency for International Development (USAID) Let's Read programme have trained and coached 1 600 ECE teachers, ensuring they are better equipped to deliver quality ECE².

Nutrition and infrastructure are critical for ECE in Zambia. Inadequate nutrition, resulting in stunting and undernourishment, affects children's learning and contributes to high dropout rates. The country reported prevalence rates for these conditions/outcomes among children under five years of age as follows: 34.6% for stunting, and 4.2% for wasting. The Home-Grown School Meals and Mary's Meals School are the key feeding programmes in the country. To improve ECE quality, increased funding for nutritious meals and parental education is recommended. It is further recommended that a universal feeding scheme be introduced at all ECE centres.

Infrastructure remains inadequate, with consequent overcrowding affecting ECE quality. To increase access to ECE, 3 972 ECE centres have been annexed to primary schools. In addition, the *hub-satellite model* has been introduced by the Ministry of Education to improve infrastructure and expand equitable ECE access, emphasising the importance of not compromising quality while ensuring access. The initiative assists in establishing a hub ECE centre, which functions as a focal point and quality assurer for smaller community-based satellite ECE centres. The hub-satellite model has value in a country where there is a large rural-based population that is geographically dispersed. However, the way the model is currently being implemented is quite expensive and will take time to roll out throughout the country. The same model could be implemented using alternative infrastructure approaches, explored in this report.

Education expenditure, despite being the third largest government spending category, has consistently fallen short of internationally recommended targets, with allocations as a share of the total budget declining from 15% in 2019 to 10% in 2022. However, the Ministry of Finance and National Planning (MoFNP) is proposing an increase in education spending, intending to reach 15% of the national budget in 2024/25. Some of this increase is likely to benefit government-provided ECE services.

While primary education remains a key focus of the Ministry of Education's budget, ECE continues to receive insufficient funding, with less than 1% of the total education budget spent on ECE services, well below the 10% of total education spending target recommended by UNICEF. The allocation is primarily directed towards ECE provision and infrastructure development, with limited support for curriculum development and teacher capacity building.

Interventions

In response to the above challenges, it is important to identify how they can be resolved. Figure A summarises the proposed interventions that could address the problems faced by the sector.

² From stakeholder engagements during an in-country visit

The proposed intervention package encompasses a holistic approach to addressing the challenges in the education sector. The package consists of a comprehensive set of ECE services aimed at improving management and administration, enhancing monitoring and evaluation, and upgrading infrastructure. It focuses on nutrition and health by supplying nutritious food, ensuring proper sanitation facilities, and providing access to clean water and cooking utensils. Additionally, the package prioritises quality early learning through teacher and caregiver training, increasing the number of educators within schools/ECE centres, and furnishing both teachers and learners with necessary learning materials.

Figure A: List of Interventions

Management/Enablers	Nutrition/Health	Quality early learning
• Management & Administration • Monitoring & Evaluation • Infrastructure (construct & upgrade)	• Supply of nutritious food • Appropriate sanitation facilities at schools • Potable water • Provision of cooking utensils	• Teacher/assistant/caregiver training • Increase the number of teachers within a school/ECE center • Provision of LTSM materials to both teachers and learners

To calculate the costs and benefits of this intervention package, two main scenarios were used:

1. Coverage of all children aged 3 to 6 through the provision of high-quality compulsory ECE services (universal access for children aged 3-6).
2. Coverage of children turning 6 (aged 5 and 6) through a compulsory year of pre-school education.

For both scenarios, the aim is to achieve full coverage, but the second scenario offers a less expensive overall programme. A compulsory year of preschool could be considered a first step in scaling up ECE services.

Table A lists the main assumptions for both scenarios. The executive summary presents the costs for scenarios 1 and 2.

Table A: Main assumptions

Item	Assumption	Note
Teacher-to-child ratio: 3-5 years	1:15	MoE ECE National Quality Standards
Teacher-to-child ratio: 5-6 years	1:20	MoE ECE National Quality Standards
School days	200	
Number of satellite centres in sub/satellite model	3	
Number of classrooms in hub-satellite model	5	
Qualified ECE teacher annual salary - Diploma	ZMW73 151	
Qualified ECE teacher annual salary - Degree	ZMW103 734	
Teacher assistant's annual salary	ZMW51 206	70% of qualified ECE teacher annual salary as there is currently no teacher salary data available for this type of position.
Caregiver annual salary	ZMW29 260	40% of qualified ECE teacher annual salary as there is currently no teacher salary data available for this type of position.
Staff housing allowance	20%	
Staff transport allowance	15%	
Inflation	0%	
Mark-up: Furniture and equipment	5%	
Prices	2023 prices	
Monitoring and Evaluation as a % of total cost	10%	
% of 5–6-year-old enrolments of total enrolments	33.3%	
% of children captured as part of any ECE exposure (enrolments) receiving a full year of ECE before entering grade 1.	20%	
Number of hubs (1 x 2 classroom)	1	
Number of satellites (1 x 2 classroom)	2	
1 x 2 classroom model: Number of children in classroom (3-6 years)	30	
1 x 2 classroom model: Number of children in classroom (5-6 years)	20	
Number of double Ventilated Improved Pit (VIP) latrines per classroom (1x2 classroom)	1	
Average monthly salary of an individual without high school	ZMW2 270	From Zambia Labour Force Survey (2021): Proxy for non-high school: Average salary of Skilled agriculture and forestry workers, Elementary occupation, Service, and sales workers
Average monthly salary of an individual with high school completion	ZMW4 345	From Zambia Labour Force Survey (2021): Proxy for high school: Average salary of Plant and machine operators and assembler, Craft and related trade workers and Clerical support workers
Learning Teaching and Support Material (LTSM) for teachers	Bought every 3 years	
Nutritious meal (maize, pulses, vegetables, and cooking)	ZMW33.46 per meal per child	
Home-grown food (ECE garden)		
Labour	Free	
Planting frequency per annum	2	
Average annual home-grown food seeds per classroom per year	ZMW14 660	

Source: Author's own

Costs

Scenario 1

The estimated total cost is presented relying on five approaches for the construction of ECE centres: (i) the Government (MoE) hub-satellite community mode of construction (cost) method, (ii) the Government hub-satellite contractor procurement mode of construction (contract) method, (iii) the Government hub-satellite hybrid model, (iv) the UNICEF-ChildFund hub-satellite (full model) and (v) The UNICEF-ChildFund hub-satellite (light model). The community mode of construction involves active community participation in project management, instilling a sense of ownership among community members. In contrast, the contractor procurement mode of construction involves awarding a contract to a construction company, which includes the costs for the contractor's overheads and profit margins. The hybrid model is a combination of the cost and contract model of construction, where the cost model is followed in rural areas and the contract model is followed in urban areas. Additionally, the UNICEF-ChildFund lower-cost model which comprises two variants is also used. One involves building ECE centres with comprehensive facilities, UNICEF-ChildFund hub-satellite (full model), while the other involves building ECE centres without solar, water systems and biogas services, UNICEF-ChildFund hub-satellite (light model).

Achieving *universal access to quality ECE services* between 2024 and 2030 requires an annual expenditure ranging between **ZMW36.4 billion and ZMW96.2 billion**, depending on the method of construction chosen. **This indicates that the ECE budget would need to significantly increase by approximately ZMW6 billion to ZMW15.9 billion per year, depending on the ECE infrastructure approach selected, over six years to meet the estimated total cost.** With Zambia's favourable economic outlook, there is potential to allocate a portion of the necessary additional resources for ECE from growth, but even with this additional allocation, it is likely to be insufficient. Additional funding for ECE can also be obtained through the process of reprioritisation and increased expenditure efficiency and the combined efforts of the government and collaborative partnerships with Non-Governmental Organisation (NGOs) in improving the quality of ECE create an investment case that may attract additional funding from donors.

A significant portion of the estimated total cost is allocated to infrastructure. The figures encompass the total estimated costs of different components, including staff package, nutrition, furniture and equipment, training, and LTSM. When analysing the estimated total cost of the ECE programme and how the allocated funds are distributed among its key components, we find that infrastructure constitutes the largest share, followed by staff package and nutrition. Tables B and C below summarise the total estimated costs and total costs per child per annum, respectively.

Table B: Summary of estimated costs by different models of constructions, billions.

Estimated total cost by construction model	2024	2025	2026	2027	2028	2029	2030
Government hub-satellite model:							
Contract model	91.4	92.1	92.9	93.7	94.5	95.3	96.2
Hybrid model	76.5	77.3	78	78.8	79.7	80.5	81.3
Cost model	73.9	74.6	75.4	76.2	77	77.8	78.7
UNICEF-ChildFund hub-satellite model:							
Hub-satellite full model	56.9	57.6	58.4	59.2	60	60.8	61.7
Hub-satellite light model	55.1	55.9	56.7	57.5	58.3	59.1	60
Lower-cost infrastructure community-led model:							
1x2 classroom	36.4	37	37.6	38.2	38.8	39.4	40.1

Source: Authors own

Table C: Summary of the estimated total cost per child per annum, 2024 - 2030

Estimated total cost per child per annum	2024	2025	2026	2027	2028	2029	2030
Government hub-satellite model:							
Contract model	48 546	47 94	47 430	46 907	46 380	45 865	45 358
Hybrid model	40 648	40 234	39 842	39 466	39 085	38 713	38 350
Cost model	39 234	38 853	38 488	38 139	37 783	37 438	37 100
UNICEF-ChildFund hub-satellite model:							
Hub-satellite full model	30 209	30 004	29 813	29 633	29 444	29 263	29 089
Hub-satellite light model	29 286	29 099	28 925	28 762	28 590	28 426	28 269
Lower-infrastructure community-led model:							
1x2 classroom	19 342	19 257	19 181	19 114	19 036	18 965	18 901

Source: Author's own

Scenario 2

Targeting one-year pre-primary education exposure emerges as a more viable option in response to budget constraints. In scenario 2 achieving universal access to quality ECE services between 2024 and 2030 requires an annual expenditure ranging between ZMW7.6 billion and ZMW20.6 billion, depending on the method of building ECE centres chosen.

Focusing on providing comprehensive access to quality ECE services for children in the year when they turn 6 (aged 5-6), results in a substantial reduction in ECE programme costs, ranging between ZMW7.6 billion to ZMW20.6 billion as compared to the broader range of ZMW36.4 billion and ZMW96.2 billion under Scenario 1. The very large difference in costs between Scenarios 1 and 2 is explained by the number of children in the lower age groups (children turning 4 and children turning 5) being almost twice as large as the number of children turning 6. The cost drivers are based on these numbers (number of classrooms and teachers needed) and the teacher-to-child ratio is also lower for the lower age groups, thereby generating significantly higher costs for Scenario 1.

Although the estimated cost remains well below the resources allocated to the ECE programme, this represents a significant cost reduction and becomes a practical choice for a country faced with budget constraints. **Achieving this Scenario would require an increase of approximately ZMW1.2 billion to ZMW3.1 billion per year over six years depending on the model of construction chosen.** This additional funding can be sourced through a combination of domestic revenue mobilisation, reprioritisation of existing resources and support from donors.

Table D: Summary of estimated costs by different models of construction, billions.

Estimated total cost by construction model	2024	2025	2026	2027	2028	2029	2030
Government hub-satellite:							
Contract model	17.8	18.1	18.3	18.5	18.7	19	19.2
Hybrid model	19.3	19.5	19.7	19.9	20.2	20.4	20.6
Cost model	15.6	15.8	16	16.2	16.5	16.7	16.9
UNICEF-ChildFund hub-satellite:							
Hub-satellite full model	13.4	13.6	13.9	14.1	14.3	14.6	14.8
Hub-satellite light model	13.1	13.3	13.6	13.8	14	14.3	14.5
Lower-infrastructure community-led model:							
1x2 classroom	7.6	7.7	7.8	8	8.1	8.2	8.4

Source: Author's own

Table E: Summary of estimated total cost per child per annum, 2024 - 2030

Estimated total cost per child per annum	2024	2025	2026	2027	2028	2029	2030
Government hub-satellite model:							
Contract model	29 183	28 943	28 719	28 509	28 294	28 088	27 888
Hybrid model	31 506	31 220	30 951	30 697	30 440	30 193	29 952
Cost model	25 455	25 292	25 141	25 001	24 855	24 717	24 584
UNICEF-ChildFund hub-satellite model:							
Hub-satellite full model	21 943	21 853	21 772	21 699	21 618	21 543	21 474
Hub-satellite light model	21 467	21 387	21 316	21 252	21 180	21 114	21 053
Lower-infrastructure community-led model:							
1x2 classroom	12 400	12 354	12 297	12 256	12 206	12 162	12 123

Source: Author's own

Benefits

Using selected empirical literature to identify impact sizes, the benefits of a nutrition/schooling feeding programme and a comprehensive (universal) ECE and pre-primary school programme were estimated in this study. The benefits of a school feeding programme were estimated separately from the benefits of a comprehensive ECE programme (which includes a school feeding programme) to emphasise the importance of the implementation of a national school feeding programme in ECE centres.

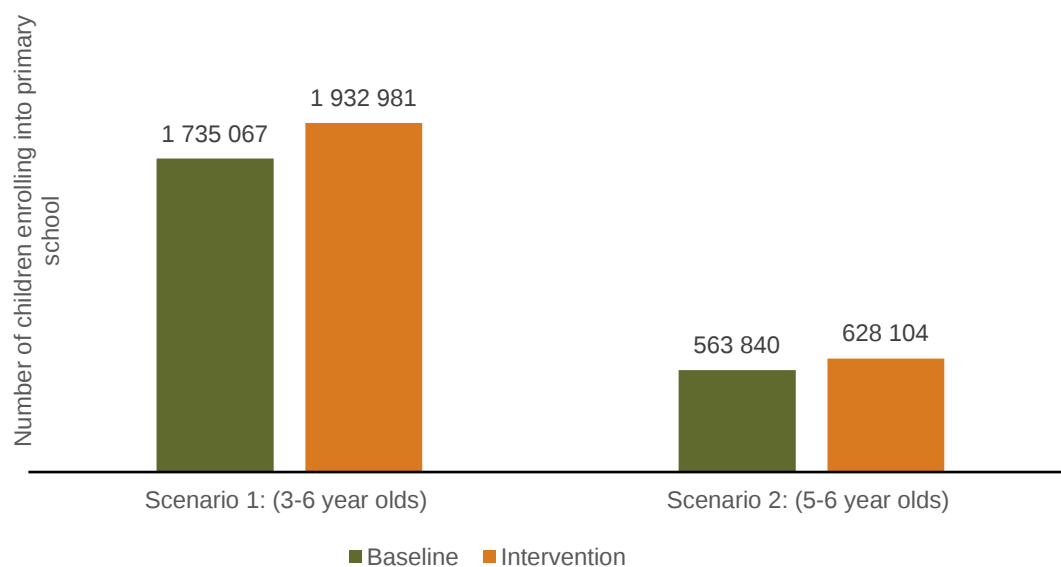
School feeding programme

Primary school enrolment and dropout

The impacts of a school feeding programme (providing students with a nutritious meal) on primary school enrolment and dropout are shown in Figure B and Figure C, respectively. It is estimated that the school feeding programme will increase primary school enrolment (at the appropriate age) by 9.6 percentage points. This translates to 197 913 and 64 264 additional children enrolling into primary school under scenarios 1 and 2, respectively. There are currently 3 415 770 primary school students, **the additional children enrolling into primary school results in a 5.8% and 1.9% increase in primary school enrolments by 2030 for scenarios 1 and 2, respectively.**

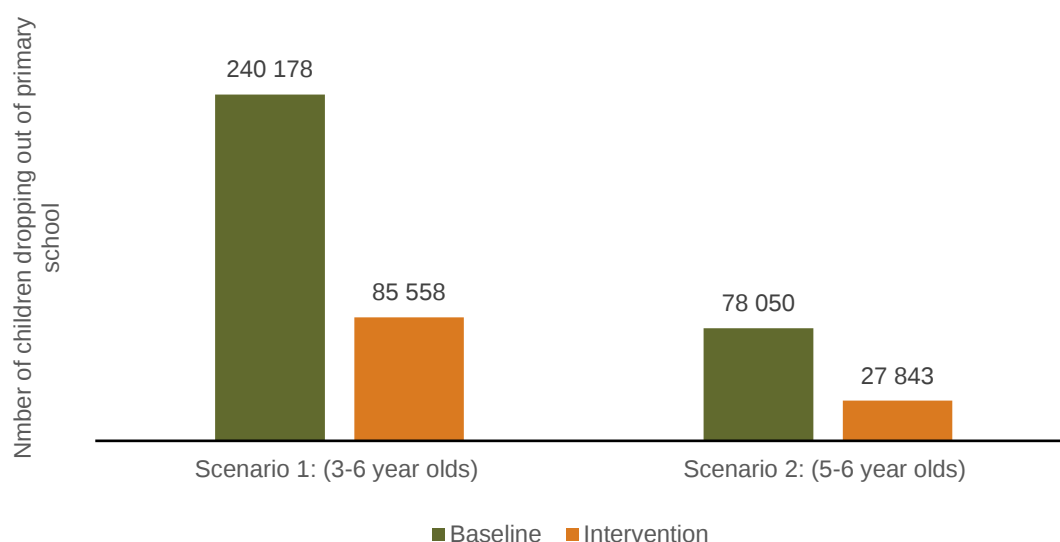
The impact of a school feeding programme, if fully implemented will result in fewer dropouts. Currently, it is estimated that approximately 11.3%³ of students drop out of primary school. After achieving full coverage in 2030, **the programme would decrease the number of children dropping out of primary school by 7.5 percentage points.** This translates into 154 620 and 50 207 fewer children dropping out of high school in scenarios 1 and 2, respectively.

Figure B: Impact of a school feeding programme on primary school enrolment



Source: Author's own

Figure C: Impact of a school feeding programme on primary school dropout



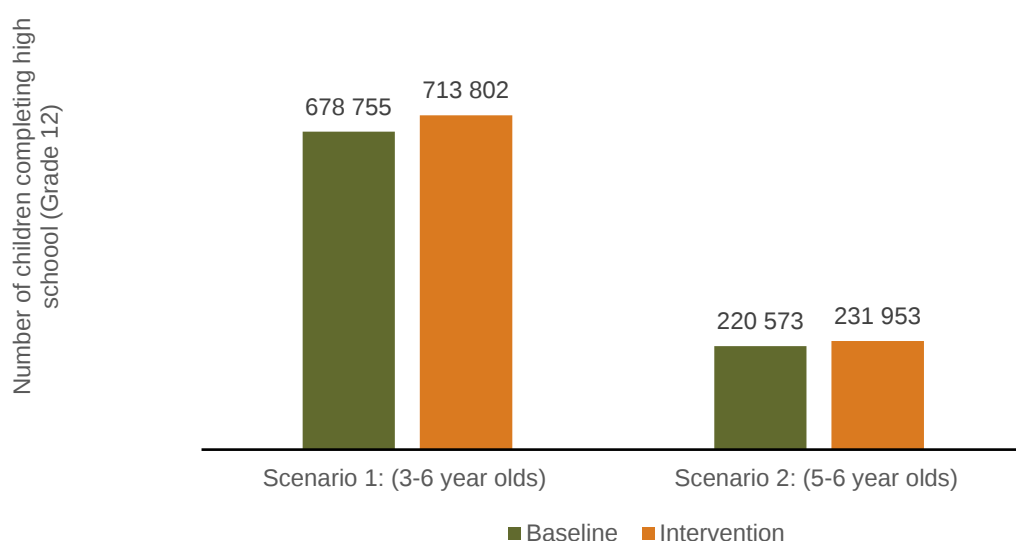
Source: Author's own

³ This calculation is a cumulative calculation based off the dropout rates from Grade 1-7 as reported in the Education Statistics Bulletin 2020

Completing high school (Grade 12)

The impact of a school feeding programme on completing high school for scenarios 1 and 2, respectively are shown in Figure D below. After achieving full coverage in 2030, the programme will increase the percentage of children completing high school by 1.7 percentage points. This translates into 35 047 additional children completing high school for scenario 1. In scenario 2, which covers only 5–6-year-olds (i.e., children turning 6), 11 380 additional children will complete high school. **The additional number of students completing Grade 12 reflects a 4% and 12.3% increase from the current number of high school students completing Grade 12 by 2030 for scenarios 2 and 1, respectively.**

Figure D: Impact of nutrition programme on completing high school (Grade 12)



Source: Author's own

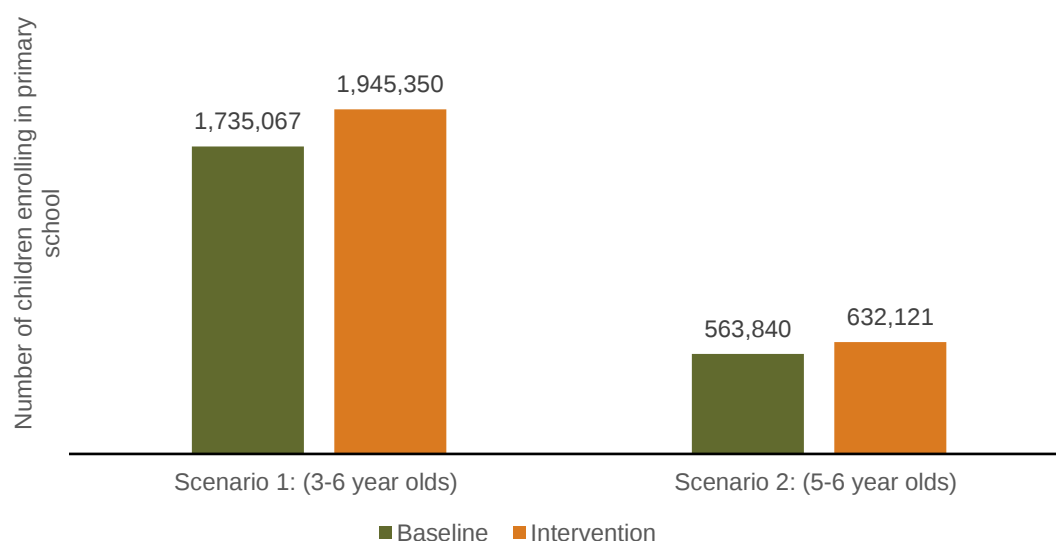
The additional number of learners completing high school would result in additional total lifetime earnings of **ZMW14 billion and ZMW43 billion** for scenarios 2 and 1, respectively. This can be seen as their economic contribution to Zambian society.

Comprehensive ECE programme

Primary school enrolment

The net enrolment rate for primary school is 81.8% (USAID, 2023). It is estimated that the programme will increase primary school enrolment (at the appropriate age) by 10.2 percentage points. This translates to 210 283 and 68 281 additional children enrolling into primary school under scenarios 1 and 2, respectively (Figure E). There are currently 3 415 770 primary school students, the additional children enrolling into primary school results in a 6.2% and 2% increase in primary school enrolments by 2030 for scenarios 1 and 2, respectively.

Figure E: Impact of a comprehensive ECE programme on primary school enrolment



Source: Author's own

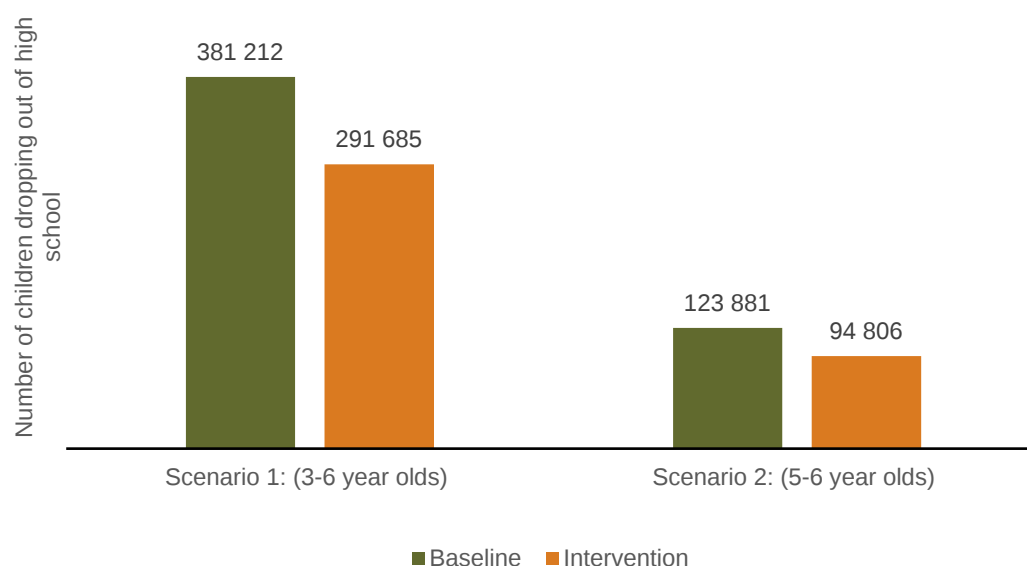
High school dropout

The estimates for the number of dropouts under both baseline (2023) and intervention (2030) for scenarios 1 and 2, respectively are shown in Figure F below. The impact of a comprehensive preschool programme, if fully implemented will result in fewer dropouts. Currently, it is estimated that approximately 18%⁴ of students drop out of high school. After achieving full coverage in 2030, **the programme would decrease the percentage of children dropping out of high school by 24%**. This translates into 89 527 and 29 076 fewer children dropping out of high school in scenarios 1 and 2, respectively.⁵

⁴ This calculation is a cumulative calculation based off the dropout rates from Grade 1-11 as reported in the Education Statistics Bulletin 2020

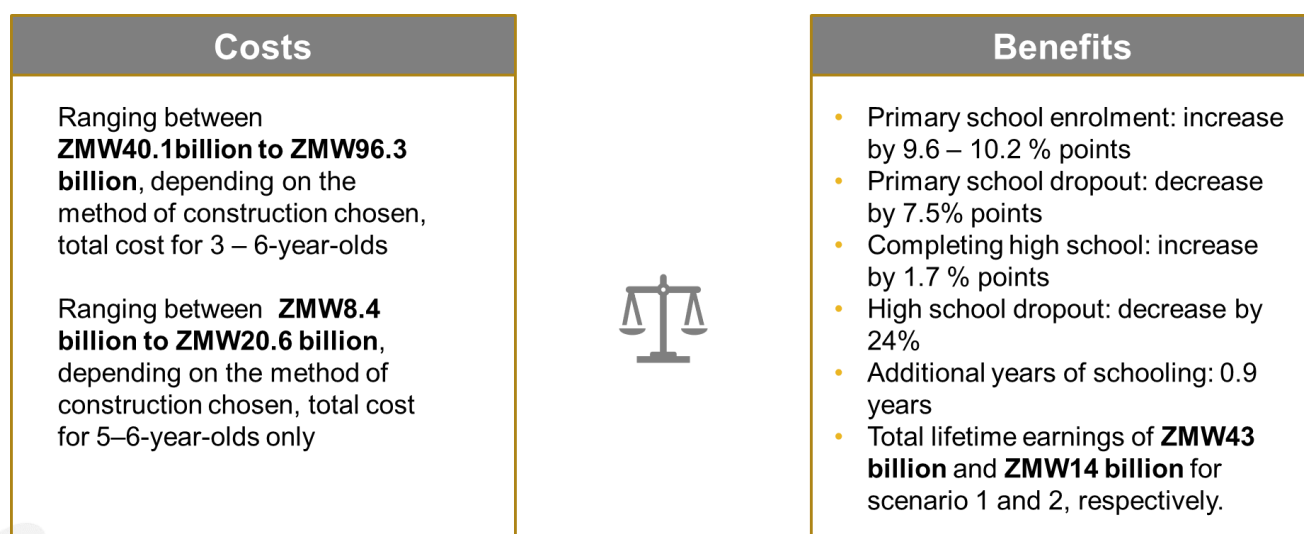
⁵ Dropout here refers to dropping out in the last year of high school, i.e., Grade 12.

Figure F: Impact of comprehensive ECE programme on high school dropout



Source: Author's own

Figure G: Summary of costs and benefits



Cost of Inaction

The cost of inaction is defined as the benefits foregone from the proposed set of interventions (a school feeding programme and a comprehensive ECE programme).⁶ The failure to implement the school feeding programme would result in the foregone opportunity for **197 913 additional children to enrol in primary school**, **154 620 fewer children dropping out of primary school**, and **35 047 additional children completing high school by 2030**. Moreover, the additional number of learners completing high school would result in additional total lifetime earnings of **ZMW14 billion and ZMW43 billion** for scenarios 2 and 1, respectively. This could be seen as their economic contribution to society.

⁶ The benefits reflected here relate to Scenario 1

The absence of a comprehensive ECE programme could lead to significant societal losses. **Without a comprehensive ECE programme, 210,283 additional children may not enrol in primary school, each child could potentially lose an extra year of schooling, and 89,527 are at risk of dropping out of high school by 2030.** These figures highlight the potential losses if a comprehensive ECE programme is not implemented.

It is imperative to weigh the costs and benefits carefully to make informed policy decisions.

Recommendations

The Zambian government's introduction of a free education policy, starting from the ECE level, has opened opportunities for learners to access ECE services. However, this policy should be accompanied by a significant increase in the budget allocated to ECE. This step is essential to ensure an adequate number of qualified teachers and improved education facilities that can accommodate the growing number of enrolments.

While universal nutritional support is not yet a standard practice in ECE centres, well-nourished children will be more likely to reach their full potential. The Zambian government will need to allocate funds for the implementation of universal nutritious meals programmes in ECE centres. Such initiatives would play a crucial role in ensuring comprehensive and equitable access to quality education.

Furthermore, there is a lack of resources allocated to LTSM and an absence of well-defined norms and standards concerning the LTSM required for teachers and learners in a classroom. The government should prioritise efforts aimed at enhancing this aspect to elevate the overall quality of education.

Furthermore, ECE stakeholders have acknowledged that for ECE to expand significantly in Zambia, community ownership and involvement in ECE centres, both in construction and ongoing management, will be needed. There is also a need for innovation and experimentation in the construction of ECE centres to arrive at lower-cost approaches, while ongoing quality control is needed during the construction and later maintenance phase.

To enable universal ECE, either for just a compulsory preschool year or three years of compulsory ECE prior to primary school, the number of formally trained ECE teachers in Zambia will have to be significantly expanded. While the study provided high-level indicative costs for teacher training, more work will be needed to determine how teacher training capacity can be expanded to meet the demand for ECE teachers which will accompany universal ECE provision.

Currently, the Zambian government allocates approximately 2% or less of its total education budget to ECE services. To improve access and quality of ECE services, there is an urgent need for a substantial increase in its budget allocation. Considering fiscal constraints faced by the country, it may be more feasible to provide universal access to children aged 5-6 years only, at least initially.

1. Introduction

The Zambian National Policy on Education (1996), *Educating our Future*, states that in Zambia, **everyone has a right to quality education** and obligates the state and the Ministry of Education (MoE) to protect and fulfil this right (Minister of Education). The United Nations Sustainable Development Goal 4 suggests that one tool to ensure inclusive and equitable quality education is through providing both girls and boys with equal access to quality pre-primary learning. As a signatory to global conventions, Zambia also acknowledges the important function that early childhood education (ECE) can have in getting children ready to adjust to the more structured learning environment of primary school and has made efforts to improve access to quality ECE services. Several countries such as South Africa, Malawi, Cameroon, and Brazil have made significant investments towards ECE provision, indicating the importance of its impact on children's readiness for formal primary and secondary schooling.

1.1 The concept of ECE

The International Standard Classification of Education 2011 (ISCED) defines **ECE as the provision of comprehensive learning and education experiences that take a well-rounded approach, aiming to foster the initial cognitive, physical, social, and emotional growth of children** (UNESCO, 2011). It serves as an introduction to structured learning beyond family context to cultivate children with the skills necessary for school readiness and facilitate a smooth transition into primary education. The ISCED further explains ECE by categorising it into two phases: (1) early childhood educational development (ECED) and (2) pre-primary education. ECED is characterised by a visually engaging learning setup, while pre-primary education involves engaging with peers and teachers to develop children's logical and reasoning skills, which helps them to verbalise their thinking process.

In the World Health Assembly of 2018, the World Health Organization, UNICEF and the World Bank Group launched the internationally recognised Nurturing Care Framework for Early Childhood Development (ECD). This framework provides the nurturing care components that can help children achieve their full potential (World Health Organization et al., 2018). These interconnected and critical components are summarised in Figure 1.

Figure 1: The Nurturing Care Framework



Each component of the nurturing care framework is described in Table 1 below.

Table 1: Description of nurturing care components

	Adequate nutrition refers to the nourishment of mothers and children as the nutritional status of the mother affects the well-being of the child.
	Responsive caring refers to the parent or caregiver's capacity to observe and promptly and appropriately react to the child's
	Safety and security encompass creating environments that are safe and secure for both children and their families.
	Early learning refers to any occasion in which an infant, toddler, or child engages with a person, place, or object within their environment.
	Good health pertains to the overall health and well-being of both the children and their caregivers.

Source: World Health Organization, 2018

While the framework primarily focuses on the period from pregnancy to age three, the principles of nurturing care extend beyond infancy. During the ages of 3-6 years old, children continue to experience critical stages of development, both physically and cognitively. The foundation established during the early years sets the stage for continued growth and development throughout childhood. Therefore, while the framework concentrates on the earliest stages of life, its principles and practices remain relevant and essential for supporting the holistic development and wellbeing of children aged 3-6 years old.

The operationalisation of the definition of ECE varies between countries. The Zambian National Policy on Education (1996) defines **ECE as a structured form of educational provision (formal and informal) designed for children aged 3-6 years old.** The Zambia National Literacy Framework emphasises the crucial role of ECE in equipping children with essential pre-literacy skills necessary for a successful transition into primary education. ECE in Zambia operates at two levels: nursery school and reception. The nursery level, designed for children aged 3 to 4 years, focuses on holistic development by promoting social, mental, and emotional growth through interactive play and engagement with peers. **This level emphasises social interaction among children, promoting essential skills through play-based activities.** The reception level focuses on children aged 5 to 6 years, preparing them for Grade 1 by blending informal learning with some formal teaching elements, accounting for 40% of the ECE curriculum. **This balanced approach ensures a smoother transition to formal education, laying a strong foundation for their journey into Grade 1.** The delivery of ECE services is spread across the Government of the Republic of Zambia (GRZ), grant-aided (from GRZ), private, and community-based ECEs (such as those that are part of the Roger Federer Foundation's School Readiness Initiative).

The Zambia Demographic and Health Survey (2018) revealed that only 27.8% and 5.8% of children between the ages of 0-5 have attended any ECE in urban and rural areas, respectively. In addition, the Zambian MoE Education Statistics Bulletin (2020) also shows that **only 37.10% of Grade 1 entrants have any pre-school experience** (Zambia Statistics Agency, 2020).

1.2 Objective

This study aims **to assess the costs and benefits associated with the implementation of comprehensive universal ECE services for children aged 3 to 6 in Zambia**. By assessing the costs and benefits this study will establish an evidence base to inform decision-making processes and policy development related to Zambia's commitments to delivering quality ECE services to all children aged 3-6 years across the country.

1.3 Research Questions

To support the achievement of the study objective, the study will address the following five research questions:

RQ1: What is the current state of ECE services in Zambia?

RQ2: What interventions are necessary to implement an ECE model that ensures quality and equitable ECE services?

RQ3: What is the projected cost of implementing these interventions?

RQ4: What are the potential benefits associated with implementing these interventions?

RQ5: What is the cost of inaction for the country?

1.4 Study Phases and Report Structure

Various relevant sector stakeholders were interviewed for this report during a data collection visit to Lusaka in September 2023. In November 2023, the preliminary study results of a first draft of the report were shared during an online webinar and stakeholders were invited to submit their comments on the report by mid-December 2023. These comments, as well as comments made during the online webinar, were responded to in a second draft which was shared with stakeholders during February 2024. All study findings were thoroughly discussed during a one-and-a-half-day report validation workshop hosted by the Ministry of Education and the Roger Federer Foundation in Lusaka on 6 and 7 March 2024. This version of the report is the third and final version which reflects all comments received from the validation workshop.

This study is organised into six sections:

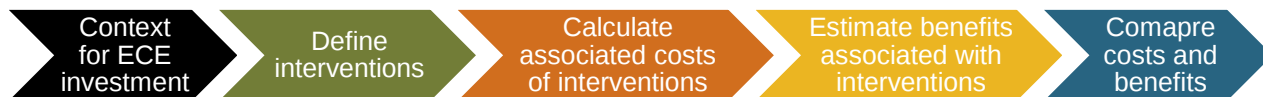
Section 1 introduces the study, the concept of ECE, the study objective and the research questions. **Section 2** provides a global review of ECE in other countries with similar characteristics to that of Zambia. **Section 3** provides a context for ECE investment in Zambia. This section consists of an overview of the Zambian overall education sector, ECE institutional framework and findings from secondary data collection and stakeholder consultations. This section addresses RQ1.

In Section 3 the appropriate interventions required to improve the provision of ECE in Zambia are shared. **Section 4** describes the methods and data used to conduct the study. This section also introduces a package of interventions, assumptions, and scenarios, which address RQ2. This section further explains how the costs of interventions and benefits were calculated.

Section 5 presents the results of the study, which addresses RQ3, 4, and 5. This section includes (1) **Section 5.1** provides the associated costs of implementing these interventions, (2) **Section 5.2** presents the potential benefits associated with the costed interventions, (3) **Section 5.3** focuses on the cost of inaction and (4) **Section 5.4** focuses on sensitivity analysis. The final section concludes the study and makes recommendations.

Figure 2 summarises the sequential steps followed to carry out the ECE cost-benefit analysis (CBA) study in Zambia.

Figure 2: Study phases



2. Global Review of ECE interventions

In this section, some of the best available empirical evidence on the size of the impacts of different ECE interventions are described. The review of interventions is categorised into the following sub-sections: 1) ECE impacts in Zambia, 2) nutrition, and health; 3) teachers (number of and quality as captured by qualification and in-service training), 4) teaching, and learning materials, 5) comprehensive ECE programmes (including low- and middle-income country evidence) and a 6) caveat section on access vs. quality of education.

2.1 Early childhood education impacts in Zambia

Not many rigorous, causal studies on the impact of ECE have yet been done in Zambia. However, it is a field of research likely to expand over the coming years.

DevTech⁷, in collaboration with the Ministry of General Education, carried out a research study in Zambia, examining the performance of learners and the ECE environment over time. A key finding from this research was the disparity in school readiness skills⁸ among Grade 1 students who had and had not received ECE programming. In all aspects of school readiness, learners who had participated in ECE demonstrated statistically higher scores. On average, assessed Grade 1 students who had undergone ECE outperformed their peers by 5% (Saunders et al., 2021).

The results suggest that ECE programmes in the sampled schools contribute to enhanced motor development, emergent literacy, social and emotional development, and emergent literacy skills. DevTech also investigated the factors influencing school readiness among ECE learners, and it was observed that students performed better when taught in their native language and had someone reading to them at home. As for teachers, students achieved higher scores when educators provided opportunities to develop expressive language skills and encouraged free play or open-choice activities (Saunders et al., 2021).

McCoy et al. (2017) investigate the relationship between ECE participation and seven domains of children's school readiness (receptive vocabulary, letter naming, nonverbal reasoning, fine motor skills, executive function, prosocial behaviour, and task orientation) for 6-year-olds. Children who participated in **any type of ECCE programme** scored better than their non-participating peers on all seven-school readiness and developmental outcomes tested (effect size ranging from 0.09 standard deviation (SD)-0.65 SD).

⁷ DevTech is an international consulting firm dedicated to development. Founded in 1984, DevTech has provided advisory services and technical assistance to government, private-sector, and civil-society stakeholders in more than 100 countries. <https://devtechsys.com/>.

⁸ DevTech measured school readiness as an average of the International Development and Early Learning Assessment (IDELA) domains: emergent numeracy, emergent literacy, social & emotional skills, and motor development.

2.2 Nutrition and Health

Early-life nutrition significantly shapes long-term well-being, as supported by various studies on its effects on health, education, and earnings. Numerous studies indicate that early-life exposure to disease and malnutrition affects adult health, education, and employment prospects (Almond and Currie, 2011; Barker, 1992). This suggests that consuming a nutritious diet could enhance cognitive development, potentially leading to academic success and post-school productivity (Bütikofer et al., 2018).

While experiments show that nutritious supplements can boost education (Maluccio et al., 2009), there is a lack of evidence on the lasting effects of policy-based nutrition improvements. Bütikofer et al. (2018) research this by analysing a free school breakfast programme's impact on long-term well-being in Norwegian cities. The study's findings reveal that a nutritious school breakfast enhances education by 0.1 years and raises **later-life earnings by 2-3%**. The study provides empirical evidence that early exposure holds greater significance, and a lengthier programme duration results in more pronounced effects. Specifically, the school breakfast programme's positive impact on educational outcomes is most notable during early ages.

Cognitive impairments linked to childhood protein-energy malnutrition, childhood iron-deficiency anaemia, and being born to a mother with goitre tend to become nearly irreversible by the time a child enters school. These cognitive deficits are associated with reduced adult productivity. Malnourished children demand increased healthcare services **and are at higher risk of grade repetition or school dropout** (Horton, 1999). Horton (1999) estimates productivity losses of 2-3% of Gross Domestic Product (GDP) because of malnutrition.

An extensive field of literature exists on the effect of health interventions on cognitive development in early childhood. This is summarised in Table 2 below.

Table 2: The impact of health interventions on cognitive development in early childhood

Study	Country	Intervention	Age	Sample characteristics	Effect size	Outcomes
Jukes et al. in prep	India	Iron (30d) + deworming	2-6 yrs.	ECD pupils	0.18 SD	Attention
Seshadri and Golpadas (1989)	India	Iron (60d)	5-8 yrs.	Anaemic vs. Non-anaemic	Positive effect	IQ
Seshadri and Golpadas (1989)	India	Iron (60d)	5-6 yrs.	Anaemic vs. Non-anaemic boys	0.33SD 0.67 SD	Verbal IQ Performance IQ
Soewondo and Pollitt (1989)	Indonesia	Iron (56d)	4 yrs.	Anaemic vs. Non-anaemic	Positive effect No effect	Learning task 3 cognitive tests
Stoltzfus et al. (2001)	Zanzibar	12 months iron + deworming	6-59 months	Community	0.14 SD	Language

Study	Country	Intervention	Age	Sample characteristics	Effect size	Outcomes
McKay (1978)	Columbia	Nutrition + Education from 42 months	84 months	Malnourished	0.80 SD	Cognitive ability
Grantham McGregor (1991)	Jamaica	Psychosocial stimulation	9-24 months	Malnourished	0.67 SD	Mental development
Grantham McGregor (1991)	Jamaica	Nutritional Supplementation	9-24 months	Malnourished	0.79 SD	Mental development
Vermeersch and Kremer (2004)	Kenya	School feeding	4-6 yrs.	ECD pupils	0.4 SD (for sub sample)	Educational achievement

Source: (Jukes, 2006).

Table 3 presents the results of research that examined the lasting cognitive effects of **preschool health interventions**. Among these studies, in three studies there was continued observation of enhanced cognitive function as participants progressed into adolescence. Notably, the studies conducted in Jamaica revealed substantial and persistent impacts from psychosocial stimulation and education interventions, **whereas nutritional supplementation showed no such effects**. Nutritional supplementation was given over a two-year period and began at a mean age of 18.7 months. It is possible that if supplementation had continued throughout childhood or started at an earlier age, the benefits would have been sustained (Walker et al., 2000).

In contrast, in a Guatemalan study, there was an impact of nutritional supplementation on both long-term health and earnings (Hoddinott et al., 2008; Maluccio et al., 2009). The Guatemala study involved providing nutritional supplements to pregnant women and children from birth to age 6/7 years, aiming to prevent stunting during the critical first 1 000 days. In contrast, most Jamaican children were older than 12 months and already stunted when they received nutritional support, which likely explains the lack of long-term nutritional effects in Jamaica. Other contributing factors include the smaller size of the Jamaican supplements and their shared distribution among family members, while in Guatemala, supplements were directly given to the child at a central location (Hoddinott et al., 2008; Walker et al., 1992; Walker, S. et al., 1990).

The Gambia's malaria prevention study is noteworthy for its community-wide impact. Collectively, these four studies affirm that **preschool health programs enhance school readiness or ability to learn when entering school**, benefiting children's education in the long run (Jukes, 2006).

Table 3: Long-term effects of early childhood health interventions on cognitive and educational outcomes

Study	Country	Intervention	Age	Sample characteristics	Effect size	Outcomes
Grantham - McGregor et al., 1994	Jamaica	Maternal education	14	Severely malnourished	0.68	IQ
Walker et al 2000	Jamaica	Stimulation	11-12	Stunted	0.38	IQ

Study	Country	Intervention	Age	Sample characteristics	Effect size	Outcomes
Pollitt et al, 1997	Indonesia	Nutritional supplements	8	Initially > 18 months	Positive effect	Working memory
Jukes et al., submitted	Gambia	Malaria prevention	14-19	Community cohort	0.25-0.4	Cognitive function

Source: Jukes (2006).

Note: The age does not refer to the age at which the intervention was introduced, it is the age at which the longer-term impacts were assessed (post-intervention).

2.3 Teachers

Teachers matter for ECD both in terms of their numbers (contributing to both access to and quality of education) and their pedagogical quality and practices in the classroom. In this section, the available evidence on both 1) the number of teachers (playing out in the teacher-to-child ratio) and 2) the quality of teachers (qualifications and in-service training) are reviewed.

2.3.1 More teachers: Access and the teacher-pupil ratio (quality)

Lower teacher-to-pupil ratios improve student achievement. Bowne et al. (2017) focused on a comprehensive database of U.S. ECE programme evaluations spanning from 1960 to 2007 to evaluate the relationship between class size, child-teacher ratio, and programme effect sizes for cognitive, achievement, and socioemotional outcomes. Their analyses utilised evaluations of centre-based ECE programmes catering to children aged 3 to 5 years old, which offered a minimum of 10 hours of ECE programs per week for at least four months. Notably, their findings indicate that when it comes to **child-teacher ratios of 7.5:1 or lower**, reducing this ratio by just one child per teacher can result in a significant effect size (on cognitive and achievement outcomes) increase of 0.22 standard deviations. Similarly, for class sizes of 15 students or fewer, **having one less child in the class is associated with a 0.10 standard deviation increase in effect size** (on cognitive and achievement outcomes). These insights shed light on the potential impact of teacher-child ratios and class sizes in centre-based ECE programs on educational outcomes for young children.

In the context of Zambia, where the recommended teacher-pupil ratio is 25:1, the ratios studied in this research (7.5:1 or lower) may seem impractical to implement due to resource constraints and differing educational system conditions. Nonetheless, these findings offer valuable insights into the potential impact of teacher-pupil ratios on educational outcomes. While the specific ratios mentioned may not directly apply to Zambia, they serve as a reference point for the significance of reducing teacher-pupil ratios to enhance student achievement. **Policymakers should consider local conditions and available resources when exploring opportunities for incremental improvements in teacher-pupil ratios.**

Higher pupil-teacher ratios (PTR) result in lower academic scores. Waita et al. (2016) assess the impact of pupil-teacher ratio on academic performance in national examinations in 24 public primary schools in Kenya. The average PTR amongst the schools was 47.3:1 (ranging from 46.6:1 to 54.7:1). When examining PTR data and its influence on academic performance, the study found a significant negative correlation (-0.323) between PTR and test scores, suggesting an inverse relationship. Using a regression model, the results show that **a 1 unit increase in the pupil-teacher ratio would decrease test scores by 0.76** (all else equal).

2.3.2 Better teachers: teacher qualifications

Children under the care of educators possessing both a bachelor's degree and specialised training in child development and early education tend to display enhanced sociability, and more advanced language skills, and achieve better results in cognitive tasks compared to children who are looked after by less qualified individuals (Lobman et al., 2005). In childcare studies, the majority of research suggests a positive relationship between increased levels of teacher education and both the overall quality of centre-based care and the improved academic skills of children (Blau, D. M., 2000; de Kruif, R. E. L. et al., 2000; Howes et al., 1992; Scarr et al., 1994).

Increased levels of teacher qualifications can have positive impacts on children's reading and mathematics skills. Croninger et al. (2007) conducted an analysis that explored the relationship between the qualifications of elementary school teachers and the academic achievements of first-grade students in reading and mathematics. The study revealed positive outcomes associated with the type of degree and the level of experience acquired by teachers on reading achievements. First-grade students displayed higher levels of proficiency in reading and mathematics when attending schools where teachers placed a greater emphasis on coursework in these subjects.

Students taught by teachers with an elementary education degree (focused teaching degree) demonstrate greater reading improvement (0.08 SD) compared to students instructed by teachers with different degrees. Students taught by beginning teachers (0-2 years' experience) exhibit lower gains in reading (0.06 SD) than those taught by teachers with more experience (Croninger et al., 2007).

Early et al. (2007) examine **the relationship between teachers' education**, specifically educational degree and major, **and classroom quality as well as children's academic skills** in the year before kindergarten entry. The authors used comparable data from seven major studies to conduct their analysis. The Environment Rating Scale-Revised (ECERS-R) is used to measure classroom quality. The ECERS-R assesses classroom quality for children aged 2.5 to 5, with scores ranging from 1 to 7, indicating inadequate to excellent quality. This study uses the mean ECERS-R score and measures academic skills, including receptive language, pre-reading, and early math skills.

In classrooms, graduate degree-holding teachers had higher ECERS-R scores compared to those with a Bachelor's degree (d=0.65). Bachelor's degree teachers outperformed Associate's degree (d=0.42) and high school degree (d=0.55) teachers, with no significant difference between Associate's and high school degree teachers. When comparing all teachers with a Bachelor's degree or higher to those without, quality was higher with Bachelor's degree teachers (d=0.45).

2.3.3 Better teachers: In-service training

In most low- and middle-income countries (LMICs), a concerning trend is observed where children are enrolled in schools but are not effectively acquiring reading skills. This is exemplified by South Africa, where an alarming 78% of students fail to comprehend written text even after four years of schooling (Mullins et al., 2017). This deficiency in reading proficiency is also documented in regions such as South Asia and various parts of sub-Saharan Africa (Banerji, R et al., 2013; Bold et al., 2017). Since reading serves as a fundamental gateway to future educational attainment, it is imperative that addressing these shortcomings becomes a prioritized policy objective.

Evidence strongly indicates that there exists considerable potential to enhance learning **outcomes by elevating the quality of teaching, but changing ingrained teaching practices presents a significant change** (Cilliers et al., 2018). Multiple studies have consistently demonstrated the pivotal role that teachers play in shaping a child's educational trajectory (Clotfelter et al., 2010; Das et al., 2007; Rivkin et al., 2005; Staiger and Rockoff, 2010). Furthermore, a positive correlation has been established between effective teaching techniques and accelerated learning (Allen et al., 2013; Araujo et al., 2016).

Teacher training improves education. Cilliers et al. (2018) studied 180 South African primary schools, comparing two methods to enhance home language reading: "Training" had short, intense sessions at a central venue, while "Coaching" involved monthly visits from reading specialists. Both gave daily lesson plans and materials. Coaching costs \$43 per student annually, while training costs \$31. After 2 years, students with coached teachers improved reading by 0.24 standard deviations, compared to 0.12 with centralized training.

Preschool interventions in Malawi initially boosted child development. Özler et al. (2018) studied a government initiative enhancing community preschools through teacher training, incentives, and parenting support. A four-arm experiment compared groups receiving only supplies, supplies plus training, supplies plus training and stipend, and supplies plus training and parenting education. At 18 months, the group with parenting education showed higher language and socio-emotional skills. However, by 36 months, there were no significant long-term effects, suggesting a six-week program might be too brief.

2.4 Learning teaching support material (LTSM)

LTSM, when not supplemented with teacher training and support, exhibit no discernible impact. Andrew et al. (2019), conducted a comparative analysis of the impact of addressing various dimensions of preschool quality on children's development. The authors designed a three-armed randomised controlled trial (RCT) in conjunction with the nationwide implementation of a government programme in Colombia, aimed at enhancing the quality of public preschools catering to underprivileged children.

Within one arm of the trial, public preschools received supplementary resources, such as play materials and the means to hire additional caregivers, to enhance their structural quality. In another arm, they received an added layer of support in the form of teacher training, intended to improve the quality of daily interactions between educators and students. The findings suggest that solely investing in structural quality improvements (arm 1) is ineffective. Maloney, (2022) also suggests that providing books in a classroom without training for teachers has no impact. In contrast, **adding well-designed pedagogical training** to such spending (arm 2) raises the quality of the learning environment directly observed in classrooms and **improves children's cognition, language, and school readiness by around 0.15 of an SD**, with the biggest gains of around 0.3SD observed for the most disadvantaged children (Andrew et al., 2019).

2.5 Comprehensive ECE programmes in low- and middle-income countries

ECE participation yields higher educational attainment. Shafiq et al. (2018) examine the relationship between participation in ECE and various long-term outcomes: post-ECE educational attainment, cognitive skills, socioemotional skills, and labour market outcomes in 12 low- and middle-income countries. The study reveals compelling statistical evidence suggesting a positive connection between ECE engagement and higher later-life educational attainment. Specifically, individuals who partook in ECE experienced **an approximate increase of 0.9 years in their overall years of schooling**. The effect sizes of the ECE coefficient are slightly more pronounced for children originating from **socioeconomically disadvantaged backgrounds**. This observation aligns with existing literature that underlines greater benefits of ECE for children facing the most

pronounced disadvantages. The findings demonstrate a range of associations with ECE, spanning from an additional 0.2 to 1.8 years of schooling. Significantly robust associations between ECE participation and educational outcomes are particularly pronounced in countries classified as lower-middle-income, such as Ghana, Vietnam, and Yunnan Province.

Malawi's remarkable progress in ECE revolves around Community-Based Childcare Centres (CBCCs). These are essentially preschools, catering to children aged 3 to 5, that are managed by parents and the local community (Copenhagen Consensus Center et al., 2021). These CBCCs serve a dual purpose – not only do they offer crucial ECE, but they also aim to free up caregiver time to engage in economic activities (Munthali et al., 2014).

CBCCs in Malawi prove a highly beneficial short-term investment. According to the findings by Copenhagen Consensus Center et al. (2021), the projected expense for CBCCs is approximately MWK 5,700 per child per annum. In conjunction with this, local community members would be required to contribute volunteer hours equating to roughly MWK 11,300 per child annually. An immediate and noteworthy advantage of this initiative would be the liberation of parents' time, permitting them to engage in income-generating activities. This benefit is estimated at around MWK 63,400 per child. These calculations demonstrate that CBCCs are a beneficial investment for communities. The time saved significantly outweighs the total startup costs per child by threefold in the short term.

CBCCs in Mozambique led to remarkable educational improvements, including a 44.3% relative increase in enrolling at the appropriate age and an increased labour supply for primary caregivers. Martinez, Sebastian et al. (2017) examine an experiment by the World Bank involving CBCCs in Mozambique. The study assesses the impacts of a community-based preschool intervention that was randomly allocated to 30 out of 76 eligible rural communities in the Gaza province. The intervention, costing US\$3.09 per child per month, entailed the provision of up to three preschool classrooms per community, activities to mobilize the community, educational materials, training for instructors, and monthly parenting meetings. The research was carried out with a starting point of 2,000 households, evaluated the academic performance of a sample of first-grade students and conducted interviews with local community leaders.

Two years later, a follow-up survey was conducted on the original group of children, as well as on first graders and community leaders in all 76 evaluation communities. The findings indicated that children who participated in preschool exhibited a 21.2 percentage point increase in the likelihood of being enrolled in primary school at the time of the survey, along with an 18.2 percentage point rise in the probability of ever enrolling. Attending preschool also raised the chances of children enrolling in school at the appropriate age by 14.9 percentage points, reflecting a 44.3% relative increase compared to the control group.

Early childhood stimulation intervention (alone)

Early childhood intervention yielded higher earnings, as evidenced by Gertler et al.'s (2014) study in Jamaica. Gertler et al. (2014) present findings regarding the impact of an intervention on the earnings of growth-stunted toddlers (between 9 and 24 months old) living in poverty. The intervention involved two years of psychosocial stimulation, facilitated by community health workers. These workers conducted weekly visits, teaching parenting skills and promoting interactions between mothers and children to foster cognitive and socioemotional development. When the authors re-interviewed 105 out of the initial 129 participants after 20 years, **they observed a 25% increase in earnings attributed to the intervention.**

Low- and middle-income country evidence summary on the impact of comprehensive ECE programmes

This section primarily focuses on LMIC evidence, as it holds greater relevance for Zambia. However, Appendix A contains the best available evidence regarding the impact of comprehensive preschool programmes.

Summarising findings from various low- and middle-income countries proves to be informative. Doing so highlights the tangible advantages of well-designed educational programs and underlines their positive outcomes in diverse contexts. The key takeaways from multiple studies conducted in Africa and Latin America are presented in Table 4, showcasing an array of immediate and long-lasting benefits associated with different types of interventions.

Table 4: Low-and middle-income country evidence

Country	Intervention type	Impact	Reference
South Africa	Longitudinal analysis of stunted children	Weaker psychosocial outcomes (R-PQD test)	(Casale, Desmond, & Richter, 2014)
Burkina Faso	Feeding scheme	Improved weight-for-age and weight-for-height	(Kazianga, De Walque, & Alderman, 2009)
Tanzania	Feeding scheme	Improved attendance and pass rates	(Chaula, 2015)
Developing countries	Analysis of stunted children	Fewer years of schooling and lower test scores	(Galasso & Wagstaff, 2019)
South Africa	Teacher training (primary school teachers)	Improved educational performance: students' reading proficiency increased by 0.18 and 0.29 SDs if their teachers received training or coaching respectively.	(Cilliers, Fleisch, Prinsloo, & Taylor, 2019)
Chile	Comprehensive ECD programme	Between 0.17 and 0.21 standard deviations higher on Grade 4 mathematics, reading and social science test scores	(Cortázar, 2015)
Mozambique	Comprehensive ECD programme	Improved attendance, enrolment, cognition, and school readiness	(Martinez, Naudeau, & Pereira, 2012)
South Africa	Mandatory implementation of Grade R	Higher scores in mathematics (2.5% of an SD) and home language (10.2% of an SD)	(Van der Berg et al., 2013)
Argentina	Expanded pre-school to poor areas	Higher scores in mathematics and Spanish	(Berlinski, Galiani, & Gertler, 2009)

Country	Intervention type	Impact	Reference
Uruguay	Pre-school	More years of schooling completed and less likely to drop out	(Berlinski, Galiani, & Manacorda, 2008)

Source: DNA Economics (2021) *Universal ECD in Malawi: A cost-benefit approach*. Roger Federer Foundation.

2.6 Quality vs. quantity (access)

Investments in ECE have witnessed an upsurge in both parental commitment and governmental initiatives within low- and middle-income countries (LMICs) over the past decade (Yoshikawa et al., 2018). **While access to ECE services has considerably broadened, concerns persist regarding service quality.** This encompasses queries about the effectiveness of structured ECE services in fostering the learning and growth of young children, as well as meeting the educational standards sought by parents (Britto et al., 2011). Consequently, the extent to which the expansion of ECE in LMICs translates into enhanced child development and school preparedness remains ambiguous (Wolf et al., 2019).

Wolf et al. (2019) investigated two main questions regarding ECE quality. First, they examined if improvements in ECE quality, leading to short-term benefits, also resulted in sustained advantages for children, a topic of increasing interest globally. Second, they explored whether these sustained impacts varied based on specific child and household characteristics and between private and public educational institutions. These questions are crucial considering the limited resources for educational investments and the importance of equitable outcomes, especially for marginalized groups and in the context of the growing presence of private preschools.

Teacher training in Ghana's QP4G program had lasting effects, particularly on social-emotional and executive function skills. One year after completing the program, significant impacts persisted in these areas. Although the effects on early literacy and numeracy diminished, positive impacts on social-emotional skills remained consistent, and new effects on executive function skills emerged. This suggests a shift towards enhancing "soft" skills over foundational academic skills following the intervention (Wolf et al., 2019).

Additionally, Wolf et al. (2019) explored the potential moderation of impacts by specific child, household, and school characteristics to discern sources of variability in the outcomes. Previous studies on the impacts of ECE interventions often revealed that relatively disadvantaged children, those with lower initial skill levels, and younger children tend to show a stronger response to interventions compared to their more privileged, higher-skilled, and older children (Yoshikawa et al., 2013). However, **the authors did not discover any significant moderation of treatment impacts based on household wealth, initial skills, grade level, gender, or the nature of the educational institution (public vs. private) where children were enrolled.**

3. The Zambian ECE Context: Situational Analysis

This section discusses the context for a comprehensive universal ECE investment in Zambia with the primary aim of addressing the first research question; ***What is the current state of ECE services in Zambia?*** In doing so, the section provides:

- (3.1) Landscape of ECE services in Zambia
- (3.2) ECE institutional frameworks; and
- (3.3) Financing of ECE

The analysis in the section was informed by secondary data collection and stakeholder consultations with the Directorate of ECE and other divisions within Zambian MoE, non-government organisations, civil society organisations and other key stakeholders.

3.1 Landscape of ECE services in Zambia

The section aims to provide a holistic understanding of the current state of ECE services in Zambia in both urban and rural areas, shedding light on both strengths and areas that require improvement.

Zambia Education Sector Overview

The Zambian education system consists of four stages/phases of education: ECE, primary education, secondary education, and tertiary education. ECE provides education to children between the ages of three and six, while primary education runs from Grades 1 to 7 for children between the ages of 7-13 years. Secondary education runs from Grades 8 to 12 (14-18 years) while tertiary education consists of the education services provided by all colleges and universities (Ministry of Education Zambia).

Open and distance learning serves groups which are not being included in the mainstream education system. In addition to the formal education system, there is open and distance learning that caters to various groups, including individuals with disabilities, displaced individuals, school dropouts, those who have never attended formal schooling, geographically isolated children, orphans, street children, and child labourers (Ministry of Education Zambia). These programmes utilise platforms such as television and radio, benefiting over 1 000 learners.⁹

The MoE is the main education policymaker. The MoE is responsible for the provision of education and is guided by the Zambian National Policy on Education (1996), *Educating Our Future*. This policy emphasises access, equity, and quality in formal institutional education across all levels, recognising the importance of ECE in preparing children for later schooling. The addition of the ECE chapter to the new policy framework has strengthened support for the provision of ECE services, aligning with Zambia's National Long-Term Vision 2030 goal of universal education access by 2030.

ECE enrolments have improved since the programme was moved from the MoLGH to the MoE in 2004. The provision of ECE services began in 1957 under the Nursery Day Care Act of 1957, initially overseen by the Ministry of Local Government and Housing (MoLGH) until 2004 when it was transferred to MoE. Since then, the Ministry has undertaken various strategies and initiatives aimed at enhancing ECE services, led by

⁹ Stakeholder consultations – Department of Distance Education

the Directorate of ECE established in 2015. The ECE Directorate aims to establish a conducive operational environment for effective ECE delivery. UNICEF Brief (2022) revealed that the proportion of Grade 1 entrants with ECE exposure has significantly improved, moving from only 16% in 2004 to 41% in 2021 (UNICEF, 2022).

Despite significant expansion of the ECE system, the teacher-to-child ratio is four times the international norm. Following the government's integration of ECE into the Zambian education system, ECE centres were introduced in primary schools through annexing to existing primary schools, and 1 000 ECE teachers were recruited in 2013. Enrolments saw a significant increase from 47 317 in 2011 to 258 616 in 2020 (8NDP). *Although more teachers were hired, the teacher-to-child ratio remained at 1 teacher for every 80 children, compared to the internationally recommended target of 1 teacher for every 20 children at the pre-primary level* (UNICEF, 2019)

Before 2015, the private sector was the main provider of ECE and since then the Zambian government has become and remains the main provider of ECE services. Since 2017, the government has retained its status as the largest provider of ECE services. In 2020 258 616 children had any type of ECE exposure, with government-provided ECE services accounting for 62% of this number, equivalent to 160 863 children, while the community, private and grant-aided sectors were responsible for the ECE services of 20%, 15% and 2%, respectively, of ECE-attending children (Education Statistics Bulletin, 2020).

ECE Coverage

This section assesses ECE coverage in Zambia, focusing on ECE centres and enrolment rates. ECE centres are classified by urban and rural regions, with urban defined as areas providing basic facilities like schools, hospitals, and sanitation, while rural areas lack these amenities. In addition, these centres are categorised as annex, stand-alone, private and community ECE centres. The annex model refers to those ECE centres that are established within existing primary schools, while the stand-alone refers to ECE centres operating independently, under the direct monitoring of the District Education Office (World Bank, 2020)

As a result of the low-cost annex model, 3 972 ECE centres have been annexed across the country. Table 5 shows the distribution of ECE centres in urban and rural areas, with annexed centres predominating in both regions. Currently, Zambia has a total number of 5 350 ECE centres, with 810 in urban and 4 540 in rural areas (Table 5)¹⁰. (UNICEF, 2023) revealed the Zambian government's intention to establish an additional 500 ECE centres and hubs across the country.

Table 5: Number of ECE centres, urban vs rural regions, 2023

	Government Annex	Government Stand alone	Private	Community
Urban	376	3	254	177
Rural	3 596	72	413	859
Total	3 972	75	667	1 036

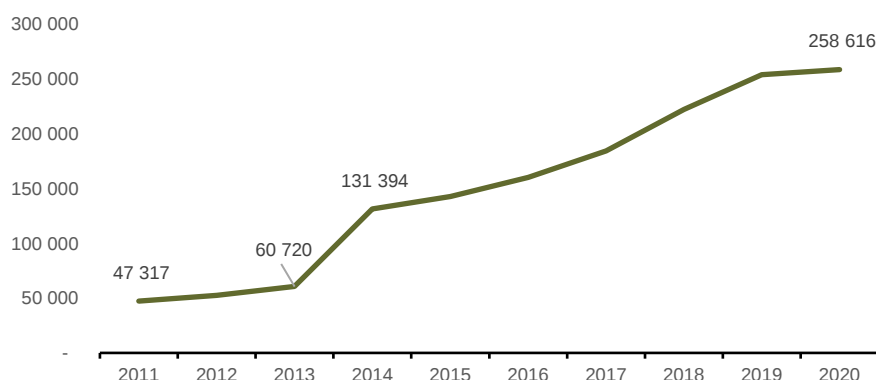
Source: Ministry of Education

Zambia currently has a total of 9 385 primary schools. Leveraging this existing infrastructure, the country could establish 1 232 ECE hub centres attached to a primary school, with the remaining 8 153 primary and community schools serving as cost-effective satellite ECE centres.

¹⁰ Based on figures provided by the MoE – ECE Directorate

The number of children with ECE exposure has increased significantly since the launch of the annex model. Figure 3 shows a remarkable growth in the number of children with *any type of ECE experience* over the last decade, mainly driven by the introduction of the annex model. A significant increase mainly occurred between 2013 and 2014 with this number increasing from 60 720 in 2013 to 131 394 in 2014. The number of children with pre-primary education exposure has since increased to 258 616 in 2020, leading to the improved proportion of Grade 1 entrants with pre-primary experience, increasing from 15% in 2015 to 37.10% in 2020.

Figure 3: Number of children with ECE exposure, 2011 - 2020



Source: Education Statistical Bulletin 2019 & 2020

The repetition rate has improved while the completion rate saw a small improvement and the dropout rate has remained the same. Table 6 summarises the efficiency and quality indicators since the introduction of the annex model in 2013. Efficiency indicators show a 1.4% point improvement in primary education repetition rate, while quality indicators show slight improvements in completion rates up to Grades 9 and 12. However, it is not clear whether these changes are statistically significant.

Table 6: Efficiency and Quality Indicators, 2013 vs 2020

Efficiency indicators	2013	2020
Repetition rate		
Primary	6.2%	4.8%
Secondary	1.0%	1.0%
Dropout rate		
Primary	1.8%	1.8%
Secondary	1.2%	1.2%
Quality indicators		
	2013	2020
Completion rate		
Up to Grade 9	61.5%	61.9%
Up to Grade 12	31.0%	32.0%

Source: Education Statistical Bulletin 2013 & 2020

The newly introduced free education policy has given the most marginalised learners an opportunity to access education. The government of Zambia introduced free education from the ECE level in 2022 (USAID, 2022). This significant step towards universal access to education has been widely welcomed and has played a crucial role in the continuous increase of ECE enrolments. Between 2020 and 2023, children with ECE exposure increased from 258 616 (Education Statistics Bulletin) to 321 486 (MoE), reflecting a 24% increase.

While the free education policy is a positive step in the right direction, it also creates challenges. While free education has increased access to ECE exposure, it risks compromising the quality of education, as classrooms often accommodate double the recommended number of learners. A study conducted by (USAID, 2020) found an average of 74 children per ECE classroom, significantly increasing the teacher-to-child ratio and affecting the quality of learning. This highlights the importance of striking a balance between the continued increasing enrolments and the expansion of ECE centres across the country.

Despite the significant improvement in ECE enrolments, there is still a need for further efforts and interventions to ensure the provision of comprehensive universal access to high-quality ECE services. A study conducted by (UNICEF, 2023) revealed that only 29% of Grade 1 entrants had ECE experience in 2022, a decline from 40% in 2021. This decline indicates that despite the continued increase in enrolments, approximately 70% of learners still lack access to pre-primary education.

ECE Teachers and their Qualification Status

The provision of ECE is a specialised service that should be provided by trained educators. In Zambia, ECE qualification is available at three institutions costing ZMW5 400 per year for a three-year diploma programme. The MoE National Quality Standards¹¹ requires each ECE classroom to have three staff members: a qualified teacher with a minimum of three years of training, a trained teacher assistant with a minimum of one year of training, and a caregiver with a minimum of a Grade 9 qualification. In addition, the ECE centre must also have first aid kits and basic medicines, necessitating ECE staff with basic medical training. Currently, the country has a total of 4 057 qualified ECE teachers on the government payroll, with an additional 768 qualified ECE teacher volunteers. Additionally, there are 1 914 unqualified ECE teachers. Notably, only three higher education institutions offer training programmes for ECE teachers.

While there are currently no ECE caregivers employed in the system, it is foreseen that they will be introduced. The shortage of teacher assistants and caregivers in ECE centres makes it difficult for ECE teachers to focus on teaching. Formally introducing caregivers into the ECE sector, will enable ECE teachers have more capacity to facilitate learning.

A lack of understanding of the ECE curriculum by teachers is one of the challenges in ECE implementation. (Chakwaba and Mukalula-Kalumbi, 2023) found that the shortage of trained ECE teachers, lack of in-service training, and their poor understanding of the ECE curriculum are some of the major challenges in ECE implementation. This highlights the need for increased investment in teacher capacity building.

A group of stakeholders has collaborated on enhancing the capacity of ECE teachers. The Zambia Open Community School (ZOCS) and Reformed Open Community School (ROCS) in partnership with the Roger Federer Foundation (RFF) have implemented a School Readiness Initiative focusing on teacher capacity building. Through this tablet-based course, untrained ECE teachers have been exposed to the ECE curriculum. Furthermore, VVOB Zambia, in partnership with the LEGO Foundation, also enhances teacher capacity through its IT'S PLAY programme, training and coaching 1 600 ECE teachers. The USAID Let's Read programme, which is expected to run from 2019 to 2025 in five provinces, also prioritises ECE teacher training and coaching. Implemented in 3 651 ECE centres, it has trained 4 331 ECE teachers, 659 zonal head teachers and 279 master trainers. The programme also conducts school visits to evaluate the effectiveness of the

¹¹ National Quality Standards Document provided by the MoE - ECE

training and coaching provided to ECE teachers (USAID, 2022). Table 7 summarises a group of stakeholders that collaborated to capacitate ECE teachers.

Table 7: Summary of continuous professional development coverage provided by various stakeholders.

Stakeholder	Programme	Coverage
ROCS and ZOCS in partnership with RFF	School Readiness Initiative (2019 – 2026)	- Scale access to quality ECE in 400 Community Schools. - Enhance the competency of 800 ECD/Grade 1 teachers in 400 Community Schools.
VVOB in partnership with the LEGO Foundation	IT'S PLAY (2021 – 2025)	Support teacher professional development providers to train and coach 1 600 teachers.
USAID	Let's Read (2019 – 2025)	Improve reading skills for 1.4+ million children in pre-primary to Grade 3 across 4,500+ schools in Eastern, Muchinga, North-Western, Southern and Western provinces

Source: Stakeholder interviews

Although more teachers were hired, the teacher-to-child ratio remains at 1 teacher for every 80 children, compared to the internationally recommended target of 1 teacher for every 20 children at the pre-primary level (UNICEF, 2019). 2 170 ECE teachers were recruited in 2022 and additional 561 have been recruited in 2024. Despite the increase in the number of ECE teachers recruited in the last two years, the teacher-to-child ratio continues to increase as the number of learners enrolled continues to rise. Consequently, it becomes a challenge for ECE teachers to attend to every child.

Health and Nutrition in ECE centres

Proper nutrition and good health are critical for children for the brain to develop to its full potential. A study done by (Kalinde et al., 2023) on nutrition in selected ECE centres in Zambia revealed that undernutrition deficiencies continue to adversely affect the growth of children and reduce their capacity and enthusiasm for learning, leading to school dropout rates and underperformance. According to the Zambia Demographic Health Survey (2018), the country reported prevalence rates among children under five years of age as follows: **34.6% for stunting, 4.2% for wasting, and 5.2% for overweight**, highlighting inadequate access to nutrition. To enhance the quality of ECE, increased government resource allocation to provide nutritious meals at ECE centres, and concurrently educating parents about the significance of proper nutrition is crucial. Furthermore, there is a need to improve a multi-sectoral approach among different ministries to address the issue of malnutrition effectively.

For children to fully participate in learning and realise their utmost potential, they require proper nourishment and good health. While there is no universal provision of nutritional support at ECE centres, Zambia's National School Health, and Nutrition Policy (2006) emphasises that children must be well-nourished and healthy to actively engage in the educational process and reach their full potential (Minister of Education Zambia, 2006). The Ministry of Community Development and Social Services ((MoCD & SS) oversees ECD for children between the ages of 0-3, ensuring their nutritional needs are met. However, there is currently no mechanism in place to seamlessly integrate ECD and ECE, resulting in a gap in maintaining optimal nutrition for children. Budgetary allocation for universal nutritious meals at ECE centres is essential to bridge this gap and ensure comprehensive access to quality education. The current nutritious meal includes maize, pulses, vegetables, and cooking, amounting to ZMW33.46 per meal per child (MoE).

The Home-Grown School Meals (HGSM) and Mary's Meal are the key school feeding programmes. The HGSM programme is being implemented in 39 districts, targeting one million children from ECE level to primary school by 2024. This programme ensures that children receive a locally produced meal daily. The HGSM basket consists of maize, legumes (beans or cowpeas) and fortified cooking oil. In addition, Mary Meal's also extends its support to over 420 000 children in 752 schools across 11 districts, catering to ages 4 to 18 years. Mary's Meal nutritious meals include maize and soya porridge enriched with essential vitamins and minerals. The annual cost to provide a child with meals through Mary's meal amounts to US\$25.20.

Access to adequate WASH in schools is essential to ensure good health, well-being, and quality education (WinS National Strategy, 2019-2030). MoE Zambia National Quality Standards require ECE centres to have self-contained toilets either within the classroom or within 100m from it, maintaining a 10 toilet-learner ratio. USAID Baseline Report (2020) highlighted that most selected ECE classrooms latrines, but 30% lacked adequate facilities, while 40% met minimum standards. The remaining 30% had high-quality facilities that fully met the requirements (USAID, 2020).

Infrastructure in ECE centres

Inadequate infrastructure and overcrowded classrooms continue to affect the provision of quality ECE. Research findings from (Kalimaposo et al., 2023), (Chakwaba and Mukalula-Kalumbi, 2023) and (USAID, 2020) reveal inadequate infrastructure in ECE centres in Zambia, exacerbated by overcrowding due to the free education policy. The implementation of the free education policy has led ECE centres to continue enrolling children regardless of the available space, resulting in overcrowded classes and, a shortage of equipment, furniture and learning and teaching support material. The USAID Let's Read Endline report shows a 188% increase in ECE enrollments since 2020, straining the already limited space and resources (USAID, 2022).

The hub-satellite model, though with strong community-based roots, was introduced by the MoE to improve infrastructure and expand equitable ECE access. It emphasises the importance of not compromising quality while ensuring access. Hub ECE centres serve as focal points for satellite centres in regions with existing primary school ECE services. Each hub ECE centre accommodates three satellite ECE centres and is staffed with a qualified ECE teacher to support caregivers at satellite ECE centres. In addition, the initiative funds centres in areas with operational but inadequate primary school ECE services, with the primary school annex centre serving as a hub for quality assurance and development (World Bank, 2020). This model is now the standard for ECE centre construction in government infrastructure expansion initiatives. The hub-satellite model has value in a country where there is a large rural-based population that is geographically dispersed. The manner in which the Ministry is currently implementing the model is quite expensive and will take time to roll out throughout the country. The same model could be implemented using alternative infrastructure approaches.

Learning and Teaching Support Material

A study by (Kalimaposo et al., 2023) revealed that ECE teachers were uncertain of the specific LTSM required for ECE, which indicates insufficient knowledge of teachers concerning the requirements needed for quality ECE services. During an in-country visit, the research team visited one ECE centre and observed that ECE teachers were using self-made LTSM following guidance received in training. The government of Zambia provides grants to ECE centres, which teachers use to purchase the materials used to make self-made LTSM. Although this may be cost-effective, the country needs to establish LTSM norms and standards and allocate more resources towards this aspect to improve the overall quality of ECE. These do not currently seem to exist.

3.2 ECE Institutional Framework and Policy Focus in Zambia

The Zambian government has committed to increasing the provision of equitable and inclusive ECE through the Education Sector Skills Plan (ESSP). Zambia shows its commitment to quality education and lifelong education and skills training for all through its educational roadmap, the ESSP 2017–2021. This plan integrates policy goals from Education Our Future and Vision 2030, emphasising education as a primary driver of national development (Ministry of General Education Zambia and Ministry of Higher Education). The Plan's key strategic areas include ECE, primary education, secondary education, alternative modes of education provision (AMEP), teacher education, management and specialised services, university education and TEVET. Zooming into ECE as one of the seven priority areas, ESSP's key strategic priorities for ECE are as follows:

1. Enhance the availability of appropriate play and learning resources.
2. Execute school readiness assessments.
3. Implement assessments for child developmental milestones.
4. Institute internal quality assurance for the delivery of ECE education.
5. Establish internal quality assurance for Physical Education delivery.

The government prioritises recruiting more teachers and building more ECE establishments. The Eighth National Development Plan (8NDP) is one of the frameworks which emphasises increasing access to and improving the quality of education, aligning with Zambia's Vision 2030 (Republic of Zambia, 2022). In doing so, *the priority is building more ECE centres, recruiting more teachers, and supporting initiatives aimed at improving the physical and cognitive health outcomes for children up to six years*. In the 2023 Budget, the government committed to complete building 56 ECE centres in 2024.

Quality ECE will be enhanced through improved health and nutrition activities. The provision of quality ECE is also guided by the School Health and Nutrition Policy 2006. Aligned with Educating Our Future, the government plans to institutionalise health and nutrition education at all levels of education, collaborating with other major players including MoE, Ministry of Health (MoH), MoCD & SS, Ministry of Agriculture and Cooperatives (MACO), National Food and Nutrition Commission. While nutrition services are currently limited in ECE centres, efforts are underway, particularly in regions with extreme nutritional needs, supported by the World Food Programme.

New government education policy to be issued at the end of 2023/early 2024 to replace Educating our Future (1996). It is understood from stakeholders that in the new policy ECE will have its own chapter. There had been no such focus on ECE in the Educating Our Future policy. The new policy framework is expected to provide stronger legislative support for both ECD and ECE.

3.3 Financing ECE services

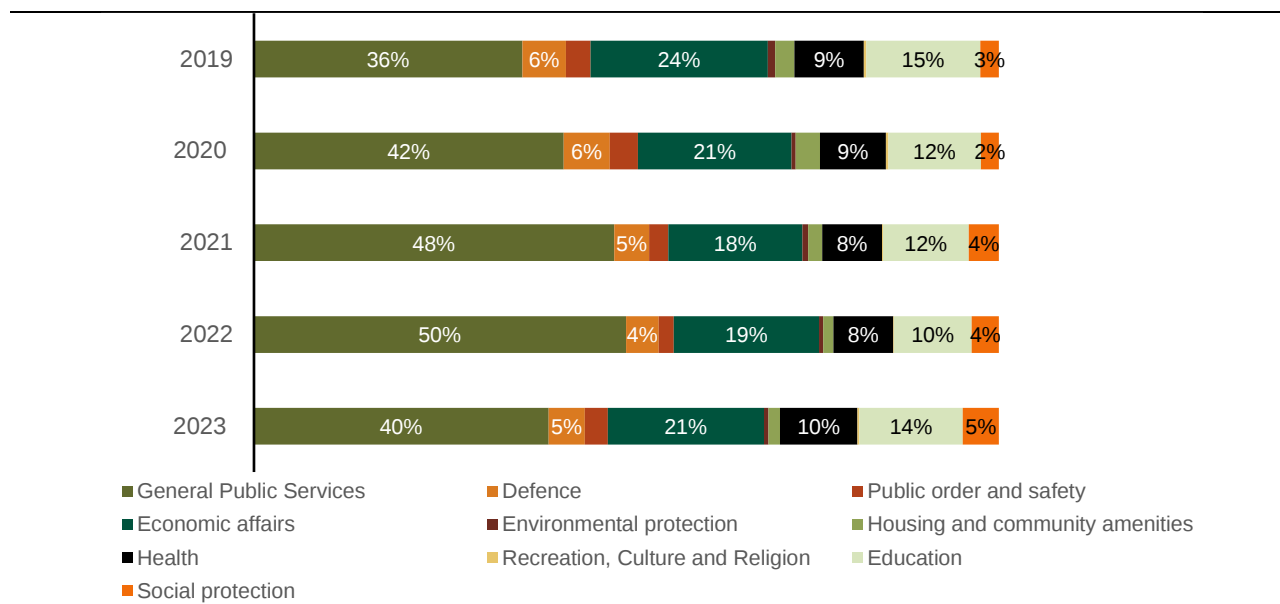
This section focuses on the allocation of resources for the provision of ECE services in Zambia. It starts by analysing Zambia's overall education expenditure, beginning with an overview of the country's budget across government ministries. Subsequently, it delves into the breakdown of expenditures specific to ECE services.

Education financing

Education expenditure remains the country's third largest spending item, with most of its budget allocated to primary education. Figure 4 provides a comprehensive summary of the resources allocated to different

government ministries while Figures 5 and 6 provide insights into the MoE's resource allocation strategies across its programmes and economic classifications.

Figure 4: Budget allocation to Ministries, 2017 - 2023



Source: Own calculations using figures from Budget Speech

The Ministry of Education receives about 10% to 15% of the total Zambia's government budget. This budget is used to fulfil the Ministry's vision:

"To provide quality, lifelong education for all that is accessible, inclusive and relevant to individual, national and global needs and value systems."

As a share of Zambia's total expenditure, education spending remains the third largest spending component. More than 80% of Zambia's budget is allocated to four ministries. In the 2023 Budget, General Public Services received 40%, Economic Affairs received 21%, the Ministry of Education received 14%, and the MoH received 10% while the remaining budget of 15% was allocated to the other six ministries.

Despite education being the third largest focus of government spending, Zambia's education spending has remained below the internationally recommended target. The Education 2030: Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal (SDG) 4 recommends that countries allocate at least 15%-20% of their total budget to education, or at least 4-6% of their GDP (UNESCO). However, Zambia's government spending on education has declined in recent years. Figure 4 (above) shows government spending over the past five years. Between 2019 and 2022, education allocation decreased from 15% to 10% of the total budget. During this period, a significant portion of the country's budget went to General Public Services, accounting for 50% of the total budget in 2022. Of this 2022 General Public Services allocation (ZMW86.4 billion), 91% was utilised for servicing both domestic (ZMW27.4 billion) and external (ZMW51.3 billion) debts.

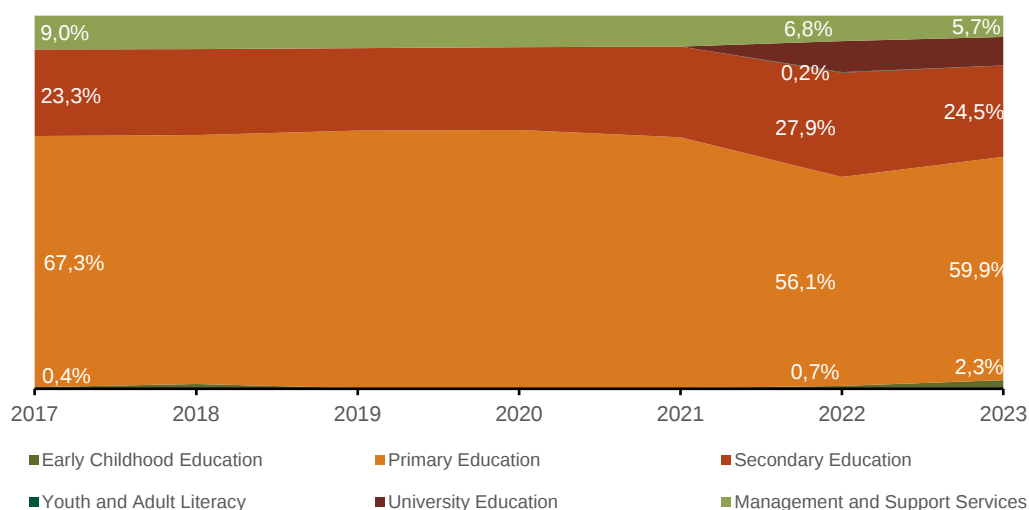
However, in 2023, education expenditure started to recover, moving from ZMW18 billion in 2022 to ZMW23.2 billion, equivalent to 14% of the total budget. This increase was largely driven by the recruitment of 30 000 teachers, an additional 4 500 teachers to be recruited in 2023, the provision of bursaries for disadvantaged

learners, and the construction of new schools, including 56 ECE centres to be completed in 2023¹². Despite its continued commitment to ensuring inclusive and equitable quality education and the 2023 increase, Zambia is still below the internationally recommended minimum spending level on education.

The Zambian government intends to increase education spending in the next National Budget.

Following four consecutive years of spending below the international benchmark, the MoFNP has proposed an increase towards education from ZMW23.3 billion in 2023 to ZMW27.4 billion in 2024/25 Budget, equivalent to 15% of the National Budget (Budget Speech 2024/25). Among others, this increase is mainly driven by grants to schools in line with the country's free education policy, recruitment of 5400 education staff, increase in allocation towards the School Feeding Programme to increase coverage and quality of meals provided in schools.

Figure 5: Education spending by programme, 2017 - 2023

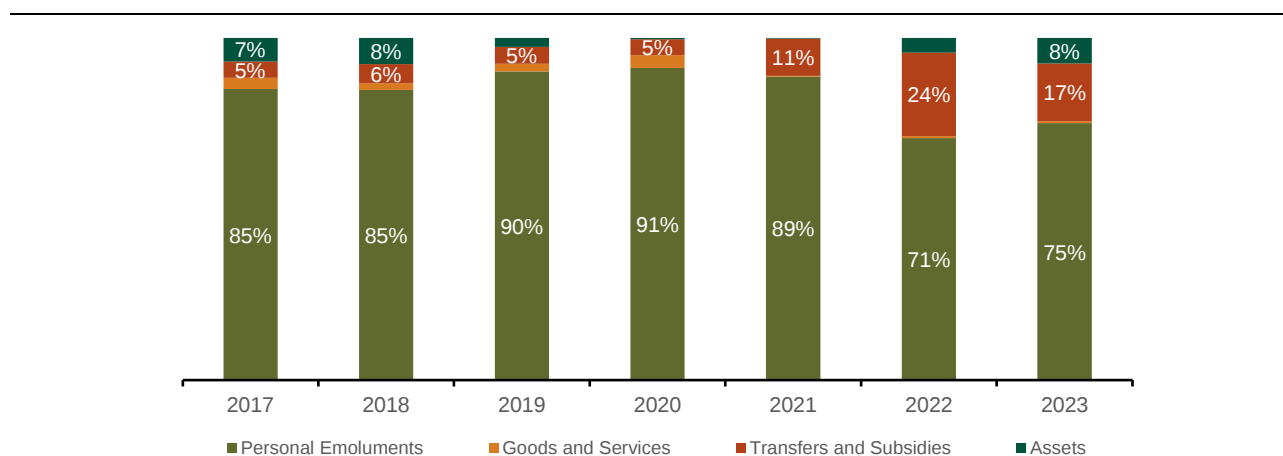


Source: Own calculations using figures from National Budgets

Most of the MoE budget is allocated to Primary Education. Between 2017 and 2021, almost 70% of the MoE was allocated to primary education, followed by secondary education and management and support services. However, from 2022 there was an allocative shift from primary education in favour of secondary education. ECE spending also saw an increase from ZMW37 million in 2017 to ZMW462 Million in 2023, equivalent to only **0.4% and 2% of the MoE budget**, respectively. This increase in ECE allocation can be attributed to the government's introduction of ECE centres in primary schools, and recruitment of ECE staff, thereby becoming the largest ECE provider in Zambia. Despite the increase, the allocation for ECE is still significantly lower than the 10% of total education spending recommended by (UNICEF, 2019). In the 2024/25 Budget, the government intends to keep allocation towards ECE at 2% of the total budget. This is an indication that Zambia is well below the target of achieving equitable and inclusive quality ECE across the country.

¹² 2023 Budget Speech

Figure 6: Education spending by economic classification, 2017 - 2023



Source: Own calculations using figures from National Budgets

While staff remuneration (personal emoluments) remains the largest education spending item, a substantial allocation has been made towards grants. Since 2021, there has been a shift towards transfers and subsidies, driven by increased grants to schools for the free education policy. From 2017 to 2022, the share of the total MoE spending for transfers and subsidies increased significantly, moving from 5% to 24%, indicating the government's commitment to expanding access to education through increased grants.

Funding from donors

In addition to the government's investment in the education sector, there are also donor-funded projects focused on improving the quality of education in the early learning years (not just limited to ECE and including early primary school years). This financial support amounts to a total of ZMW15 billion over the planned period and an average amount of ZMW3 billion annually, six times higher than the current annual government allocation for ECE. Except for the Zambia Enhancement of Early Learning funded by the World Bank, it remains unclear how much of this funding is actually directly allocated to the provision of ECE services.

The ZEEL project is expected to improve access to ECE services in the most disadvantaged districts across 10 provinces. The ZEEL project funded by the World Bank is the country's first externally funded ECE investment project aimed at improving equitable access to quality ECE services in 45 disadvantaged districts (World Bank, 2020). This project is scheduled to be implemented between 2021 and 2025 by the MoE. Although this project is undoubtedly a significant step towards improving ECE provision, the fact that the government plans to build 110 hub centres and 330 satellite centres while 62.9% of Grade 1 entrants without ECE exposure highlights the challenges that remain in addressing the needs of the sector.

Table 8 provides a breakdown of these ongoing donor-funded projects.

Table 8: Summary: Funding from Donors

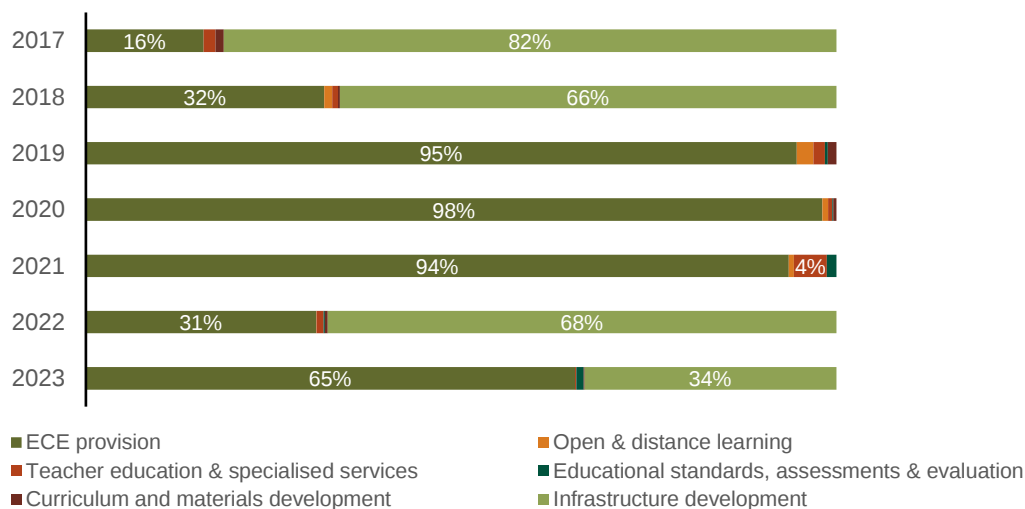
Donor	Description	Amount	Timeline
USAID	Let's Read: Primary literacy, teacher training and data.	USD48 million	2019-2025
	Transforming teacher education: pre-service teacher training	USD11 million	2020-2025
	EduFinance: non-state schools	USD4 million	2020 - 2024
European Union (EU)	ECED and TVET: Health/education	EU50 million	2024 – 2032
	Regional Teacher Initiative in Southern Africa: Early learning	EU60 million	2024 – TBD
	WASH, infrastructure, nutrition, and continuous capacity improvement for teachers	EU110 million	2024 - TBD
UNICEF	ECED	USD146.54 million	2023 – 2027
	Learning Quality and Systems Strengthening	USD7.32 million	
	Adolescent Learning and Skills Development	USD7.32 million	
JICIA	Improvement of pedagogical knowledge of Maths and Science educators in SMASE Africa	USD416 000	
World Bank	Zambia Education Enhancement Project	USD223 million	
World Bank	Zambia Enhancement of Early Learning: mainly focusing on ECE and WASH facilities in 45 disadvantaged districts	USD39 million	
ZOCS and ROCS in partnership with RFF	Scale access to quality ECE in 400 Community Schools. Enhance the competency of 800 ECD/Grade 1 teachers in 400 Community Schools.	ZMW146.2 million	2019 - 2026

Source: USAID

Composition of ECE expenditure

Zambia's MoE increased the ECE allocation from ZMW37 million in 2017 to ZMW462.2 million in 2023, which is a large increase from 0.4% to 2.3% of the total education budget. Despite this massive increase, the country continues to allocate less than 10% of its total education budget to ECE services. This section delves into the extent to which the allocated 2% of the Ministry's total budget effectively serves the initiatives related to ECE. The focus will be on ECE expenditure by its sub-programmes (Figure 7).

Figure 7: ECE expenditure by sub-programme, 2017-2023



Source: Own calculations using figures from National Budgets

The bulk of the ECE budget is allocated to ECE provision and infrastructure development. Between 2017 and 2023, an average of 97% of the total ECE budget focused on ECE provision and infrastructure development. The allocation is specifically for the establishment of ECE centres, ECE teacher recruitment and providing grants to support the implementation of the free ECE policy. In the 2024/25 Budget, the government intends to increase ECE spending from ZMW462 million in 2022 to ZMW523 million in 2024, **totalling 2.3% of the Ministry's total budget**. This increase is mainly driven by increased allocation towards ECE school grants and school feeding programmes. A substantial 99% of this budget is allocated to ECE provision and infrastructure development while the remaining 1% is allocated to other ECE sub-programmes.

The allocation for ECE curriculum and teacher capacity building is inadequate to balance access and quality education. With the ECE sector characterised by a lack of qualified ECE staff and knowledge of the ECE curriculum, it is concerning that resource allocation to curriculum and material development has declined from 1% of the total ECE budget in 2017 to 0,4% in 2022. In addition, the allocation for teacher education and specialised services increased from 2% of the total ECE budget in 2017 to 4% in 2021, however, it is concerning to observe a massive decline to only 1% of the total ECE budget in 2022. *In the next fiscal year, the government intends to spend only 0,3% of the total ECE budget for both ECE curriculum and teacher capacity building.* As the country strives to balance universal access to and quality education, additional resources are required for curriculum and material development, teacher education, and specialised services sub-programmes.

The increase in resource allocation towards monitoring and assessing ECE implementation is an encouraging development, but more is needed. Since 2019, MoE has significantly increased its allocation towards the supervision of ECE standards, evaluations, and assessments. This allocation increased from ZMW55 497 in 2019 to ZMW200 000 in 2022, equivalent to a 260% increase. This sub-programme plays a crucial role as the government strives to achieve the best possible education outcomes by ensuring a balance between access and maintaining high quality at the foundational level of education.

3.4 Macroeconomic Conditions

This section provides insights into Zambia's macroeconomic landscape, with a primary focus on the following key aspects:

1. Current fiscal conditions
2. Medium-Term Economic Framework (MTEF) economic outlook

Government expenditure on ECE services cannot be evaluated in isolation; it must be examined within the broader fiscal context. The analysis aims to provide a comprehensive understanding of both the current fiscal situation and projected economic conditions, shedding light on the available resources. The purpose of this section is to show the context within which possible ECE budget increase decisions will have to be made.

Current fiscal conditions

Zambia commits to fiscal discipline. Zambia's 2023 mid-year Economic Report revealed that in the first half of 2023, the country's total revenue collections and grants amounted to ZMW57.3 billion which was 0.4% lower than expected while total expenditures amounted to ZMW76.2 billion (MoFNP, 2023). The country's external debt saw a 0.8% increase to US\$14.07 billion and a 1.85% increase in domestic debt to ZMW213.88 billion. For the rest of the fiscal year, the country anticipates total revenue of ZMW119.1 billion and a total expenditure of ZMW157.5 billion, resulting in a projected fiscal deficit of 5.8% of GDP, which is below the 7.7% target. This lower fiscal deficit reflects the government's commitment to fiscal discipline.

Zambia's economic growth is expected to slow down compared to the previous year's figures. Compared to a 5.2% growth recorded in 2022, the projection for economic growth in 2023, as stated in the 2024/25 Budget Speech, is 2.7%. This slowdown is mainly attributed to reduced production in the mining sector and the country's high exposure to climate change.

MTEF economic outlook

Zambia's economic growth is expected to accelerate over the MTEF period. Although 2023 is expected to show moderate growth, there is an expectation of accelerated growth in 2024, which will stabilise at approximately 5% over the medium-term period (IMF, 2023). Table 9 highlights the key macroeconomic projections from Article IV.

Table 9: Macroeconomic projections

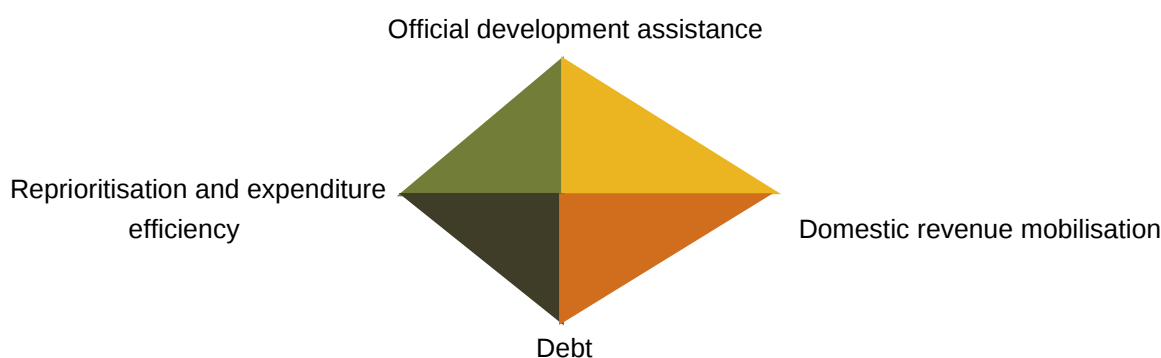
	2023	2024	2025	2026
GDP at constant prices	3.6%	4.3%	4.5%	4.7%
GDP at market prices (FY) (ZMW millions)	585 449	671 332	752 580	841 746
Primary balance (% of GDP)	2.9%	2.9%	3.3%	2.4%
Total public debt	110.2	100.8	94.1	88.5

Source: IMF 2023 Article IV

Fiscal space analysis: Financing options for ECE services

There are four possible options that governments can use to create more budgetary room. In 2004, the World Bank and the IMF's Development Committee outlined four main categories of fiscal instruments that governments can employ to create fiscal space. A generally used definition is that of Heller (2005), who defines fiscal space as "the availability of budgetary room that allows a government to provide resources for a desired purpose without any prejudice to the sustainability of a government's financial position." Figure 8 illustrates the four pathways for creating fiscal space: (i) official development assistance (donor funding), (ii) domestic revenue mobilisation, (iii) borrowing and (iv) reprioritisation and expenditure efficiency.

Figure 8: Fiscal space pathways



Domestic revenue mobilisation: This is generally the main source of revenue and most of it comes from taxes. In its 2024/25 Budget, Zambia's government has proposed measures that will improve its domestic revenue mobilisation. These measures include increased specific excise duty on non-alcoholic beverages, tobacco and specific solid fuels made from coal.

Official development assistance (donor funding): Donor funding is currently the most attractive option to finance public spending as it provides additional funding at no cost to the state's solvency.

Reprioritisation and expenditure efficiency: Improving the efficiency of public expenditure is another source of creating more fiscal space. This includes reducing wasteful expenditure and improving technical efficiency. Improving access to quality ECE services may lead to efficiency savings over time as shown in Figure 9. For example, improved access to quality education will lead to improved educational outcomes, which will lead to improved economic outcomes and better labour market outcomes.

Debt: Additional borrowing is the most expensive option for financing public spending as it comes with the cost of repaying the debt with interest. Once the country has exhausted the above-mentioned three options, deficit financing becomes an option. After being the first African country to default on its sovereign debt, through its long-delayed debt restructuring deal with the IMF, Zambia is expected to save US\$7.65 billion by 2026.

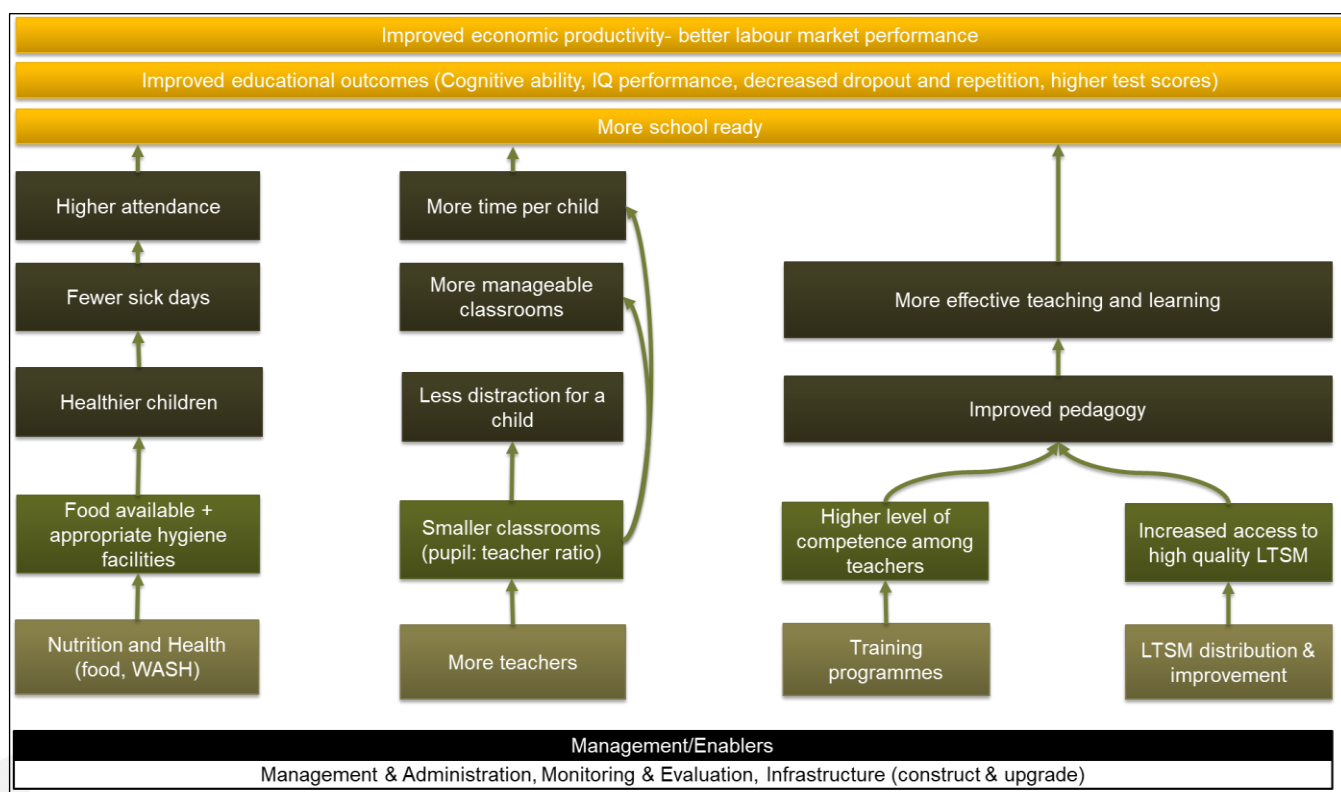
4. Methodology

The methodology section provides an overview of the study's framework. It outlines the theory of change, along with the list of interventions proposed. The section also explains the methods used for calculating costs and benefits, highlighting the data sources. Additionally, the potential limitations and main assumptions underpinning the study's approach are presented.

Theory of change

A theory of change (ToC) was developed to identify the potential impacts of different elements of an ECE Programme. Figure 9 presents ToC, illustrating the key interventions aimed at enhancing access and quality in ECE. The elements of the theory of change are described below and the ToC was used to guide both cost and benefit estimation.

Figure 9: Theory of change



1. **Nutrition and health:** This intervention ensures that children have access to nutritious food and appropriate hygiene facilities. By reducing the number of sick days among ECE students, it enhances their overall health and well-being, resulting in improved attendance and greater readiness for school, thus driving higher educational outcomes and, ultimately, increased economic productivity.
2. **More teachers:** Focusing on reducing teacher-to-child ratios, this intervention creates an environment with fewer distractions for each child and more manageable classrooms. This, in turn, allows teachers to provide more individualized attention, contributing to the readiness of ECE students and fostering improved educational outcomes.

3. **Teacher training programmes:** Teacher competence is a cornerstone of quality ECE. Comprehensive training programs are designed to enhance teachers' skills and knowledge. As educators become more proficient in their roles, they can implement improved pedagogical approaches, leading to more effective teaching and learning experiences, thereby preparing students for school, and contributing to enhanced educational outcomes.
4. **Learning teaching and support materials (LTSM) distribution and improvement:** To guarantee high-quality ECE experiences, this intervention focuses on increasing access to high-quality LTSM. Access to quality materials enhances pedagogy and teaching effectiveness, fostering school readiness, improved educational outcomes, and, consequently, increased economic productivity.

Additionally, essential **enablers**, such as effective management and administration, a robust monitoring and evaluation system, and the development and maintenance of necessary infrastructure, provide the critical support structure needed to ensure the success of these interventions.

Data

The population aged 3-6 years¹³ was identified as a main cost driver of the ECE programme. The estimated number of enrolments was derived from the projected mid-year population provided by the Zambia Statistics Agency and the number of children in the different schooling cohort, e.g., children turning 6, was calculated.

Most of the data used for costing the ECE programme were sourced from various divisions within the Directorate of ECE, Ministry of Education Zambia. Key contributors to costing data included divisions such as Human Resources, the Education Project Implementation Unit and Teacher Education Specialised Services within MoE. Zambia's National Budget and Budget Speeches from the MoFNP were also used to further refine the cost estimations. In addition to costing infrastructure, the research team also utilised the data from the UNICEF-ChildFund costing data¹⁴. Additionally, the research team incorporated data from baseline and endline reports provided by USAID, as well as standards outlined in reports from UNICEF.¹⁵

In addition to the secondary data from the ECE Directorate, the research team conducted in-person consultations with various divisions within the ECE Directorate and other NGOs, which are key role players within the ECE sector. These comprehensive discussions with these major stakeholders enriched the research team's understanding of various facets of ECE services in Zambia, such as policy changes in ECE, collaborative efforts among stakeholders, sector-specific challenges, funding, and initiatives aimed at enhancing pre-primary education. These stakeholder engagements were instrumental in helping the research team to have a deeper understanding of the local context in Zambia. This understanding allowed the research team to make assumptions that are highly relevant to Zambia's specific circumstances. These assumptions are summarised in Table 10 below.

Limitations

While the MoE was able to provide most of the costing data, challenges were encountered in obtaining norms, standards, and cost information for LTSM. In this case, we made assumptions and used unit costs from South Africa and a report by USAID on LTSM costs. Furthermore, it is important to note that although the country's

¹³ Referred to as enrolments.

¹⁴ For the UNICEF hub-satellite Models (full and light)

¹⁵ All reports referenced where relevant.

standard is to have three staff members in each ECE centre, including a teacher, a teacher assistant, and a caregiver, the public services in Zambia do not currently employ teacher assistants and caregivers and as such salary cost data for these positions were not available.¹⁶ Consequently, we assumed that the basic salary package for these roles would be 50% and 40% of the qualified ECE teachers, respectively. It is crucial to acknowledge that these assumptions and costs may not align with the specific context in Zambia.

While a cost-benefit approach is adopted, benefits were not monetised as they would in traditional CBA, thus allowing fewer assumptions to be made. While most benefits were calculated using impact sizes from studies in low-and-middle-income countries (expect Bütikofer et al. (2018) and Temple et al. (2000) conducted in Norway and Chicago, respectively) there always remains a risk of no benefits being forthcoming when a programme is implemented widely. Additionally, the benefits might not also be the same in the context of Zambia.

Interventions proposed

The interventions chosen are a result of awareness of the various elements needed to deliver ECE and considering their known effectiveness.

The proposed intervention package encompasses a holistic approach to addressing the challenges in the education sector. The package consists of a comprehensive set of ECE services aimed at improving management and administration, nutrition, and quality early learning.

Figure 10 lists the components of the interventions that constitute the programme and form the basis for estimating costs and benefits. These interventions are classified into three categories. The management/enablers interventions are activities that must be done to create an environment in which the programme can be effective, including infrastructure interventions such as building and maintaining ECE centres (infrastructure on its own will not generate learning impacts or outcomes). The nutrition/health interventions aim to create a healthy environment, and the quality early learning (consisting of more teachers, teacher training and LTSM distribution and improvement) interventions help children develop holistically.

Figure 10: Interventions

Management/Enablers	Nutrition/Health	Quality early learning
• Management & Administration • Monitoring & Evaluation • Infrastructure (construct & upgrade)	• Supply of nutritious food • Appropriate sanitation facilities at schools • Potable water • Provision of cooking utensils	• Teacher/assistant/caregiver training • Increase the number of teachers within a school/ECE center • Provision of LTSM materials to both teachers and learners

To calculate the costs and benefits of this intervention package, two main scenarios were used:

¹⁶ As confirmed by the ECE Directorate – Human Resources Division

1. Coverage of all children aged 3 to 6 through the provision of high-quality compulsory ECE services (universal access for children aged 3-6).
2. Coverage of children turning 6 (aged 5 and 6) through a compulsory year of pre-school education (universal access for children in the year of turning 6).

For both scenarios, the aim is to achieve full coverage, but the second scenario offers a less expensive overall programme. A compulsory year of preschool could be considered a first step in scaling up ECE services.

Calculation of costs

The costing model for the ECE programme was developed to estimate the programme's cost under varying assumptions. These assumptions include factors like coverage, infrastructure design (specifically the hub-satellite model), the mode of ECE centre construction, training expenses, and the basic ECE staff package. The development of this costing model adhered to the principles of *activity-based costing*, wherein the cost of the programme is driven by the specific activities or functions that need to be carried out.

Enrolments (number of children accessing ECE services on a full-time basis) were identified as the primary cost determinant for the ECE programme. To calculate the necessary resources for the programme, we applied a teacher-to-child ratio to the number of enrolments. We assumed a teacher-to-child ratio of 1:15 for children aged 3-6 years and 1:20 for children aged 5-6 years. These ratios serve as denominators in our calculations to determine the quantity of resources needed, including the number of ECE centres and staff required. We then multiply this number by the unit cost per item to arrive at the overall cost.

Calculation of benefits

The literature review identified the benefits associated with the required interventions. From these studies, we considered the interventions relevant to Zambia and for which we have detailed baseline data. **These were then used to construct a theory of change (shown in Figure 9 above), which provides a framework to understand how programmes can lead to impact and is used in this context to justify the estimation of benefits.**

The following studies from the literature were used to calculate the benefits:

Bütikofer et al. (2018) is used to estimate the additional children that will complete high school (Grade 12). This is done by using the current enrolment and completion rate (to Grade 12) to estimate how many students would complete Grade 12 in 2023, and the new number of students that would complete Grade 12 post-intervention in 2030. It is estimated that 32% of children currently complete Grade 12 and that the intervention will increase the likelihood of finishing high school by 1.7 percentage points. This translates to 33.7% of children completing Grade 12 post-intervention (for Scenario 1).

Temple et al. (2000) is used to estimate the reduction in high school dropout rates. The cumulative high school dropout rate is approximately 18%. Using the coefficient from Temple et al. (2000) it is estimated that high school dropout rates will decrease by 24%. This translates to a dropout rate of 13.7% post-intervention.

Ahmed (2004) is used to estimate the increase in enrolment of primary school students and the reduction in the number of children dropping out of primary school. This is done by using current enrolment and dropout rates for primary school students and what they would be post-intervention. It is estimated that net enrolment will increase by 9.6 percentage points (translating into 91.2% of students enrolling into primary school at the

appropriate age) and primary school dropout rates will decrease by 7.5 percentage points (translating into a dropout rate of 4%) post-intervention (for Scenario 1).

Martinez et al. (2012) is used to estimate the number of preschool children that will enrol not primary school at the appropriate age. This is done in the same manner as the study described above. The current primary school enrolment rate is 81.8%, the intervention will increase the likelihood of enrolling in school at the appropriate age by 10.2 percentage points. This translates to 90.8% of children entering primary school at the appropriate age (for Scenario 1).

Whilst Ahmed (2004) and Martinez et al. (2012) both look at primary school enrolment, the difference is from the impact of different interventions. The studies look at the impact of a schooling feeding programme and a comprehensive ECE programme on primary school enrolment, respectively.

Assumptions

Table 10 provides a summary of the primary assumptions used to estimate the costs and benefits associated with the programme's key identified interventions.

Table 10: Main assumptions

Item	Assumption	Note
Teacher-to-child ratio: 3-5 years	1:15	MoE ECE National Quality Standards
Teacher-to-child ratio: 5-6 years	1:20	MoE ECE National Quality Standards
School days	200	
Number of satellite centres in sub/satellite model	3	
Number of classrooms in hub-satellite model	5	
Qualified ECE teacher annual salary - Diploma	ZMW73 151	
Qualified ECE teacher annual salary - Degree	ZMW103 734	
Teacher assistant's annual salary	ZMW51 206	70% of qualified ECE teacher annual salary as there is currently no teacher salary data available for this type of position.
Caregiver annual salary	ZMW29 260	40% of qualified ECE teacher annual salary as there is currently no teacher salary data available for this type of position.
Staff housing allowance	20%	
Staff transport allowance	15%	
Inflation	0%	
Mark-up: Furniture and equipment	5%	
Prices	2023 prices	
Monitoring and Evaluation as a % of total cost	10%	
% of 5–6-year-old enrolments of total enrolments	33.3%	
% of children captured as part of any ECE exposure (enrolments) receiving a full year of ECE before entering grade 1.	20%	
Number of hubs (1 x 2 classroom)	1	
Number of satellites (1 x 2 classroom)	2	
1 x 2 classroom model: Number of children in classroom (3-6 years)	30	
1 x 2 classroom model: Number of children in classroom (5-6 years)	20	
Number of double Ventilated Improved Pit (VIP) latrines per classroom (1x2 classroom)	1	

Item	Assumption	Note
Average monthly salary of an individual without high school	ZMW2 270	From Zambia Labour Force Survey (2021): Proxy for non-high school: Average salary of Skilled agriculture and forestry workers, Elementary occupation, Service, and sales workers
Average monthly salary of an individual with high school completion	ZMW4 345	From Zambia Labour Force Survey (2021): Proxy for high school. Average salary of Plant and machine operators and assemblers, Craft and related trade workers and Clerical support workers
LTSM for teachers	Purchased every 3 years	
Nutritious meal (maize, pulses, vegetables, and cooking)	ZMW33.46 per meal per child	
Home-grown food (ECE garden)		
Labour	Free	
Planting frequency per annum	2	
Average annual home-grown food seeds per classroom per year	ZMW14 660	

Source: Author's own

5. Results

5.1 Associated costs of the interventions

This section presents the findings of the study, providing a detailed breakdown of the costs associated with implementing the defined interventions. These cost estimates are derived from the main implementation assumptions outlined in Table 10 above.

The associated costs of interventions rely on three broad models of constructing ECE centres:

A. Current Government (MoE) construction approach:

- (i) The Government (MoE) hub-satellite community mode of construction (cost) method,
- (ii) The Government hub-satellite contractor procurement mode of construction (contract) method
- (iii) The Government hub-satellite hybrid model

B. The UNICEF-ChildFund construction approach:

- (iv) The UNICEF-ChildFund hub-satellite (full model),
- (v) The UNICEF-ChildFund hub-satellite (light model);

C. The lower-cost infrastructure community-led approach

More details on each of these models and more specific versions of the mode are provided below.

Current Government (MoE) construction model

The community method of construction, **referred to as the cost model**, involves active community participation in project management, instilling a sense of ownership among community members, and thereby potentially lowering construction costs. In contrast, the contractor procurement method of construction, **referred to as the contract model**, involves awarding a contract to a construction company, which includes the costs for the contractor's overheads and profit margins¹⁷. Both approaches are currently used by the Ministry of Education and both present unique opportunities to positively impact local communities.

Utilising the contract model presents a unique opportunity to empower local communities. Prioritising the award of contracts to local skilled bricklayers may not only ensure that the work is carried out by individuals deeply rooted in the community but also stimulate local entrepreneurship and job creation. Additionally, considering the expertise of local Technical, Entrepreneurial, and Vocational Education and Training Authority (TEVETA) graduates for contract awards may not only promote their skills but also bolster the local workforce. Moreover, by empowering skilled bricklayers within the community, we foster a sustainable construction approach, improving local talent and knowledge while promoting investment in the local economy.

On the other hand, utilising the cost model presents an opportunity to positively impact households' income levels and foster community collaboration. This collaborative approach may not only create avenues for employment opportunities but also create a sense of ownership and pride in the community's development. Furthermore, engaging community members in the construction of ECE centres ensures that these facilities

¹⁷ As per the MoE – Education Project Implementation Unit

are tailored to the specific needs and preferences of the local population, promoting inclusivity and sustainability.

While the community-based model offers certain cost benefits, its applicability may vary across different settings, particularly in urban and peri-urban areas. This is due to the requirement of active community participation in construction management, which would pose challenges in mobilising community involvement in urban settings. In these circumstances, it would be advisable for the government to consider a cost for rural regions and a contract model for urban regions, **referred to as a hybrid model**. This model integrates the strengths of both options while ensuring improvement to quality standards. Currently, there is a total of 810 ECE centres in urban areas, equivalent to **15% of the total number of ECE centres in the country**, while there is a total of 4 540 centres in rural areas, equivalent to **85% of the total number of ECE centres** in the country.

UNICEF-ChildFund model

Additionally, the UNICEF-ChildFund model is also used to estimate the costs of constructing ECE centres. This model comprises two variants: one involves building ECE centres with comprehensive facilities, **referred to as UNICEF ChildFund hub-satellite (full model)**, while the other involves building ECE centres without solar, water system and biogas services, **referred to as UNICEF ChildFund hub-satellite (light model)**.

Lower-cost infrastructure community-led model

The lower-cost infrastructure community-led model was identified at the report validation workshop as a practical, lower-cost alternative to the two above-mentioned models for constructing ECE centres. The lower-cost infrastructure community-led model relies on a simple 1x2 classroom layout, leading to savings on construction costs. Similar to the other three models, this model also relies on a hub-satellite approach to ECE infrastructure. These ECE centres are equipped with VIP latrines, addressing both cost concerns and water accessibility challenges, especially in rural areas. To support the provision of nutritious meals (maize, ground nuts, soya beans, and fruit trees) at a reasonable cost, this model requires a once-off investment in home-grown food gardens at ECE centres, assuming that labour costs are not incurred. This community-led approach will assist in creating a sense of ownership and pride in the community's development and ensure that ECE facilities are tailored to the specific needs and preferences of the local population, promoting inclusivity and sustainability. In addition, it is assumed that three staff members per classroom are not necessary for 5-6-year-olds, therefore, each classroom will be staffed with one teacher and a caregiver. The model therefore as a slightly lower-cost approach to required staff.

Given the limited education budget, the MoE has a critical role in supervising the building of ECE centres. The MoE possesses a valuable resource in its team of engineers and building officers, who must be held accountable for ensuring the success of construction projects and optimising costs within the constraints of the education budget. To maximise the efficiency of resources, building officers and engineers within MoE should take proactive measures such as conducting regular monitoring visits to ensure the quality standards of constructed buildings are met.

5.1.1 Scenario 1: Coverage for all children aged 3-6 years

In this section, the estimated costs for Scenario 1, comprehensive ECE provision for all children aged 3-6 years, are shared.

Estimated total cost

The proposed budget allocation for the ECE programme in 2024 falls significantly short of the estimated total cost. Achieving universal access to quality ECE services for children aged 3-6 years between 2024 and 2030 requires an estimated annual expenditure ranging between **ZMW36.4 billion and ZMW96.2 billion**, depending on the method of construction chosen by the government. In contrast, the government of Zambia has proposed a **total budget of ZMW529 million for the ECE programme for the fiscal year 2024**. Table 11 summarises the estimated total required to achieve universal access to quality ECE services by model of construction. The detailed breakdown of these costs is presented later in this section.

Table 11: Summary of estimated costs by different models of construction, Billion, 2024 - 2030

Estimated total cost by construction model	2024	2025	2026	2027	2028	2029	2030
Government hub-satellite model:							
Contract model	91.4	92.1	92.9	93.7	94.5	95.3	96.2
Hybrid model	76.5	77.3	78	78.8	79.7	80.5	81.3
Cost model	73.9	74.6	75.4	76.2	77	77.8	78.7
UNICEF-ChildFund hub-satellite model:							
Hub-satellite full model	56.9	57.6	58.4	59.2	60	60.8	61.7
Hub-satellite light model	55.1	55.9	56.7	57.5	58.3	59.1	60
Lower-cost infrastructure community-led model:							
	36.4	37	37.6	38.2	38.8	39.4	40.1

Source: Author's own

The estimated cost remains well below the resources allocated to the ECE programme. For the fiscal year 2024, the government has proposed a total national budget of ZMW177.9 billion, with ZMW23.2 billion allocated towards education spending. Within this education budget, ZMW529 million, equivalent to 2.3% of the total education budget, is set aside for ECE. Comparatively, the estimated total cost for Scenario 1 between 2024 and 2030 ranges between ZMW36.4 billion and ZMW96.2 billion. **This indicates that the ECE budget would need to significantly increase by approximately ZMW6 billion to ZMW15.9 billion per year over six years to meet the estimated total cost.**

Zambia's domestic revenue is anticipated to grow to a minimum of 22% of GDP in 2024, and the overall economy is projected to experience moderate acceleration, reaching around 5% over the medium-term. **With this favourable economic outlook, there is potential to allocate a portion of the necessary additional resources for ECE.** However, this funding source alone is unlikely to be sufficient.

Furthermore, **additional funding for ECE can also be obtained through the process of reprioritisation and increased expenditure efficiency.** This involves a comprehensive analysis of the country's national budget to assess the allocation of funds to different functions and identify opportunities for reallocating resources to other key sectors such as ECE.

Considering Zambia's current state of defaulting on its sovereign debt, debt financing may not be a sustainable source of funding. However, **the combined efforts of the government and collaborative partnerships with**

NGOs in improving the quality of ECE create an investment case that may attract additional funding from donors.

Table 12 provides an overview of the estimated total cost per child per annum.

Table 12: Estimated total cost per child per annum, 2024 - 2030

Estimated total cost per child per annum	2024	2025	2026	2027	2028	2029	2030
Government hub-satellite model:							
Contract model	48 546	47 94	47 430	46 907	46 380	45 865	45 358
Hybrid model	40 648	40 234	39 842	39 466	39 085	38 713	38 350
Cost model	39 234	38 853	38 488	38 139	37 783	37 438	37 100
UNICEF-ChildFund hub-satellite model:							
Hub-satellite full model	30 209	30 004	29 813	29 633	29 444	29 263	29 089
Hub-satellite light model	29 286	29 099	28 925	28 762	28 590	28 426	28 269
Lower-cost infrastructure community-led model:							
1x2 classroom	19 342	19 257	19 181	19 114	19 036	18 965	18 901

Source: Author's own

Construction of ECE centres

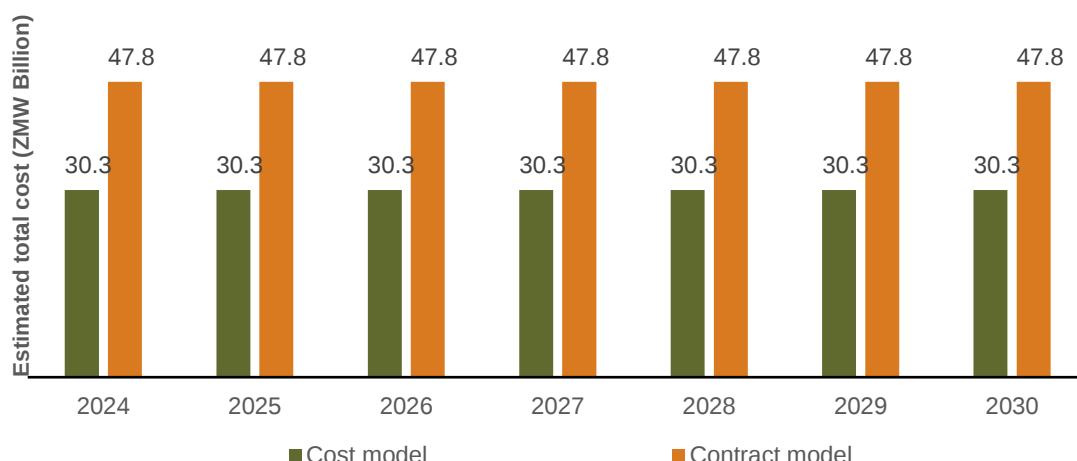
Using the government hub-satellite model, a total number of 99 658 ECE centres will have to be built by 2030 to enable universal ECE coverage. An overview of the average number of ECE centres that the government must construct annually to ensure that it reaches the targeted number of ECE centres required to achieve scenario 1 is shown in Table 13 below. If the government is to expand ECE services using its current infrastructure approach, an average of 3 559 hub centres and 10 678 satellite centres must be built each year. This cumulative effort will need to result in an annual total of 14 237 new ECE centres.

Table 13: Number of ECE centres to be built per year: Government hub-satellite design, 2024 - 2030

	2024	2025	2026	2027	2028	2029	2030
Existing ECE centres	5 350	23 146	40 942	58 738	76 534	94 330	112 126
ECE centres to be built	17 796	17 796	17 796	17 796	17 796	17 796	17 796
Hub-satellite centres to be built p/y	3 559	3 559	3 559	3 559	3 559	3 559	3 559
Hub-centre to be built per year	3 559	3 559	3 559	3 559	3 559	3 559	3 559
Satellite-centre to be built p/y	10 678	10 678	10 678	10 678	10 678	10 678	10 678
Number of centres to be built p/y	14 237	14 237	14 237	14 237	14 237	14 237	14 237

The comparison of costs between the two construction methods is presented in Figure 11. If the government opts for the cost model, the annual expenditure will average **ZMW30.3 billion to build 14 273 centres**. In contrast, choosing a contract model will result in an annual expenditure of **ZMW47.8 billion** for the same number of centres with an additional annual allocation of **ZMW1.9 billion to procure the essential furniture and equipment for these centres**, ensuring that they are fully equipped to provide a conducive learning environment. **This comparison highlights the budgetary implications of choosing one construction model over the other.**

Figure 11: Estimated cost of constructing ECE centres: Government cost vs contract model, 2024 - 2030,

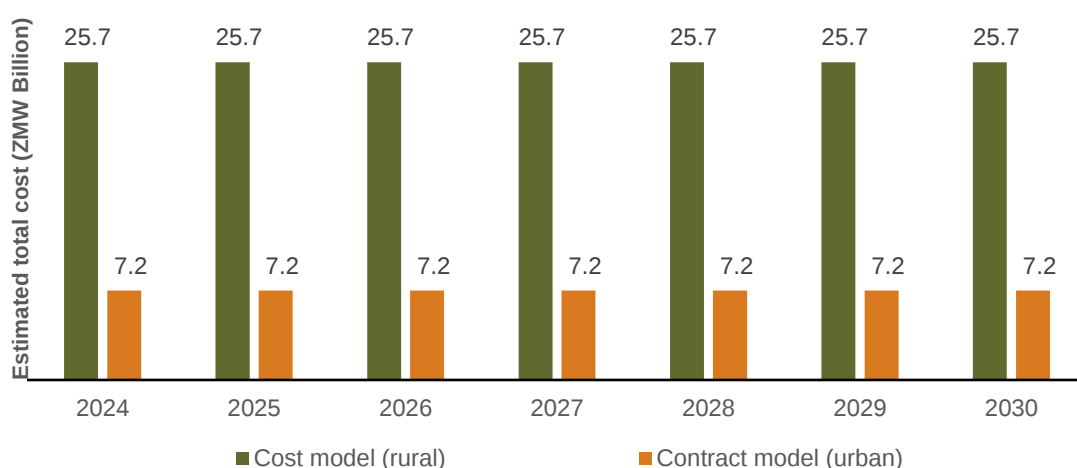


Source: Author's own

If the government is to expand ECE services using the hybrid model, an average of 3 020 hub centres and 9 061 satellite centres in rural areas, while 539 hub centres and 1 617 satellite centres in urban areas must be built each year. This cumulative effort will need to result in an annual total of 14 237 new ECE centres.

Figure 12 shows that if the government adopts the hybrid model, the annual expenditure will average **ZMW32.9 billion to build 14 237 centres**. In contrast, opting for the cost model for the same number of centres will result in an annual expenditure of **ZMW30.3 billion**, while choosing a contract model will result in an annual expenditure of **ZMW47.8 billion** for the same number of centres. Furthermore, **an additional annual allocation of ZMW1.9 billion will be required to procure the essential furniture and equipment** for these centres, ensuring that they are fully equipped to provide a conducive learning environment.

Figure 12: Estimated cost of constructing ECE centres: Government hybrid model, 2024 -2030

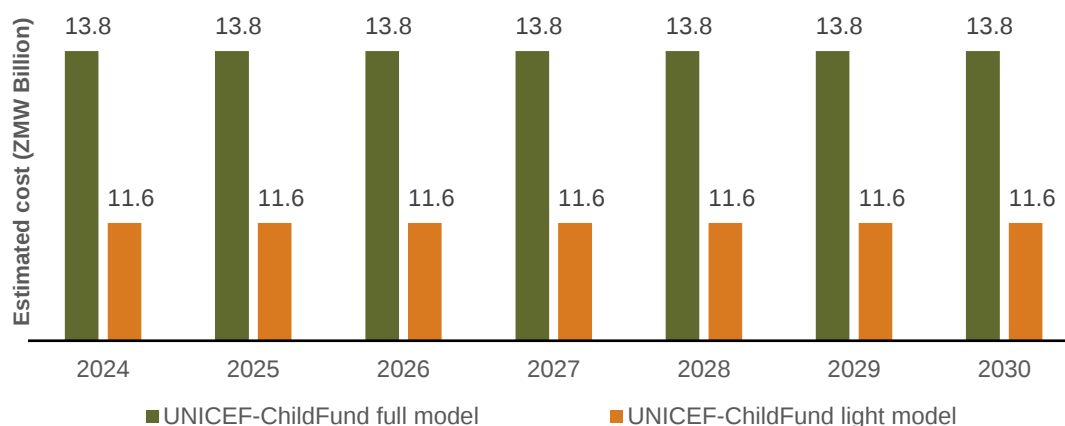


Source: Author's own

In addition to the above-mentioned model, another option involves constructing ECE centres using the UNICEF-ChildFund hub-satellite lower-cost model; (i) building ECE centres with comprehensive facilities and (ii) building ECE centres without solar, water systems and biogas services. Figure 13 shows using the **UNICEF-ChildFund hub-satellite (full model)** would result in an annual expenditure of **ZMW13.8 billion** to build

14 237 hub-satellite centres each year, while the **UNICEF-ChildFund hub-satellite (light model)** would incur an average annual expenditure of **ZMW11.6 billion**.

Figure 13: Estimated cost of constructing ECE centres: UNICEF-ChildFund hub-satellite full vs light model, 2024 -2030



Source: Author's own

Considering the cost implications and the need for efficient resource allocation, if the government opts for the hub-satellite approach, **the UNICEF- ChildFund hub-satellite (full model)** emerges as a favourable option. It strikes a balance between **cost-effectiveness and quality**.

An alternative to the government hub-satellite and the UNICEF-ChildFund hub-satellite models would be the lower-cost infrastructure community-led model. The lower-cost infrastructure community-led model may be more appropriate for a low-income country because it requires more limited financial resources compared to the other two hub-satellite models (all three models rely on the hub-satellite approach to ECE delivery). This model draws on lower-cost building approaches and even greater community involvement (and therefore community resources) than the other models.

An overview of the average number of ECE centres that the government must construct annually to ensure that it reaches the targeted number of ECE centres required to accommodate all children aged 3-6 years is shown in Table 14 below. If the government is to expand ECE services using the lower-infrastructure community-led model, an average of 5 932 1x2 classroom blocks must be built each year. The table also presents a summary of the annual costs for constructing classrooms equipped with VIP latrines.

Table 14: Average 1x2 classrooms to be built and cost per year, 2024 - 2030

	2024	2025	2026	2027	2028	2029	2030
1x2 classroom block model							
Average 1x2 classrooms to be built per year	5 932	5 932	5 932	5 932	5 932	5 932	5 932
Building Cost including VIP latrine (Billion)							
Average cost per year	5.3	5.3	5.5	5.5	5.5	5.6	5.6

Source: Author's own

If the government decides to use the simple 1x2 classroom block model, it will incur an average annual expenditure of **ZMW5.5 billion to build 5 932 1x2 classroom blocks**. By 2030, the total cost is estimated to reach **ZMW38.2 billion** for constructing 41 524 1x2 classroom blocks. In addition, furniture expenses, which

consist of a simple selection of furniture (two-seater desks for learners, teacher desks and chairs), are expected to total ZMW24.4 billion by 2030.

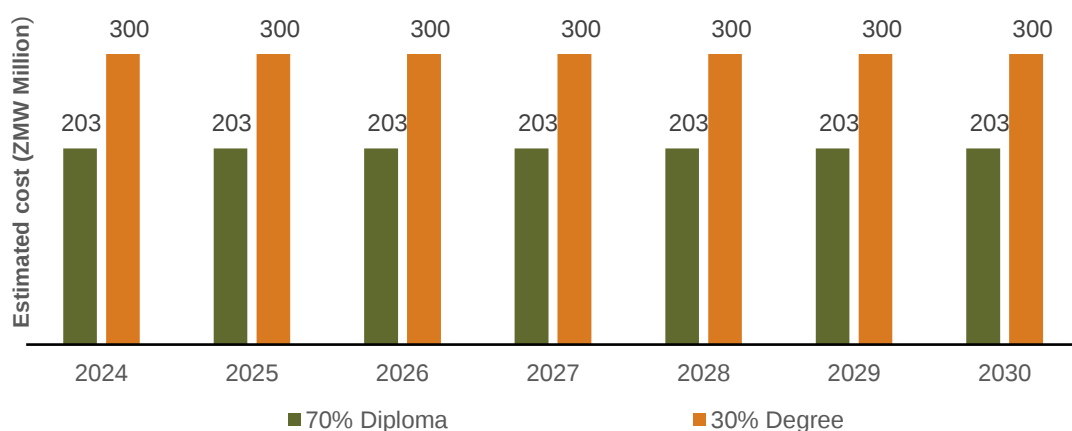
Training

For scenario 1, Zambia will need a total of 129 919 qualified teachers. This translates to an annual training target of 17 871 teachers. The estimated annual cost associated with training these teachers is presented in Figure 14. **These costs assume that 70% of teachers will attain qualification with a diploma, while the remaining 30% will achieve a degree.** Those qualified with a degree will play a significant role by being placed in hub centres, serving as quality assurers within the satellite centres.

The total minimum cost of training 129 919 teachers is projected to reach ZMW3.5 billion by the year 2030. Teachers pursuing an ECE Diploma are projected to incur an average total cost of ZMW203 million while those pursuing an ECE Degree are projected to incur an average total cost of ZMW300 million each year. To ensure that the ECE sector has an adequate number of qualified teachers, it may be necessary for the government to provide subsidies for these qualifications.

It is worth noting that there are only three institutions in the country offering ECE qualifications, which may be unfeasible to train all 24 436 ECE teachers annually. In light of these challenges, the government should consider implementing a career motivation initiative for ECE centres to encourage and retain skilled teachers.

Figure 14: Estimated training costs, Diploma vs Degree, 2024 - 2030

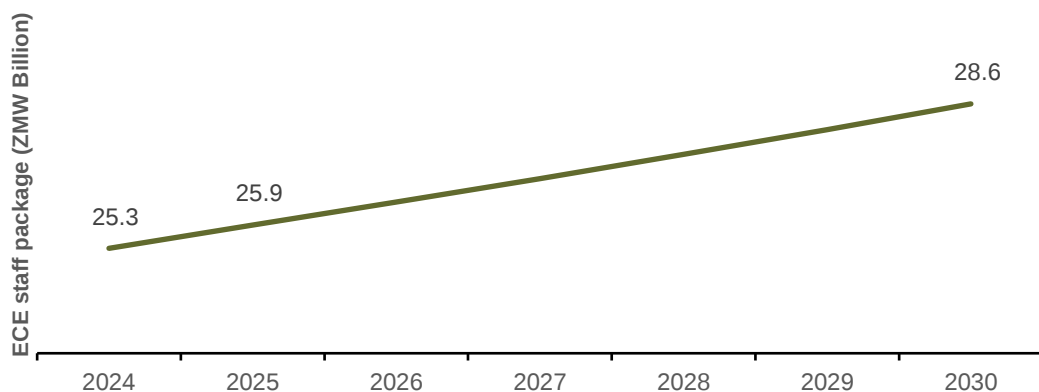


Source: Author's own

Staff Package

The estimated total staff package is based on two main assumptions: (i) each ECE centre is staffed with three members and (ii) each of these members is entitled to housing and transport allowances. To ensure the delivery of high-quality ECE services, **an estimated total amount of ZMW157 billion will be required for the staff package by the year 2030.** This funding is for a total of 129 919 teachers, teacher assistants, and caregivers. Figure 15 illustrates the estimated annual basic staff package throughout the specified period. In 2024, the staff package for scenario 1 is expected to amount to **ZMW25.3 billion**, eventually reaching an **average annual cost of ZMW28.6 billion** in 2030.

Figure 15: Estimated annual basic staff package, 2024 - 2030



Source: Author's own

Other Components

In addition to the above-mentioned components, other factors contribute to the estimated total cost of comprehensive ECE services. These components include nutrition and LTSM for both teachers and learners. Current nutritious meals provided include maize, pulses, vegetables, and cooking, amounting to ZMW33.46 per meal per child (MoE). Achieving universal access to nutritious meals is estimated to cost between ZMW12.6 billion and ZMW14.2 billion annually, leading to an estimated total cost of ZMW93.7 billion by 2030. Additionally, LTSM for teachers is estimated to reach a total cost of ZMW36 million, with those for learners estimated at ZMW1.6 billion by 2030. Using self-made LTSM could help reduce the estimated costs for learners.

To facilitate the provision of nutritious meals (maize, groundnuts, soya beans and fruit trees) at a reasonable cost, the lower-cost infrastructure community-led model proposes a once-off investment in home-grown food gardens at ECE centres, under the assumption that land and labour costs are not incurred. Assuming one food garden per classroom and two planting cycles annually, this initiative is estimated to require an average annual expenditure of ZMW1.7 billion, amounting to a total spending of ZMW12 billion by 2030.

Children with Disabilities

The MoE has indicated that there are 4 400 ECE children with disabilities. The estimated annual additional cost to serve children with disabilities amounts to ZMW14 000 per disabled child. These costs include items such as wheelchairs, magnifying glasses, hearing aids and embossed picture books. Additionally, as part of ECE teacher training, it is crucial for ECE teachers to be equipped with the skills to identify learners with special educational needs. Training teachers in special education will enable them to recognise and address the challenges faced by students in the early grades.

5.1.2 Scenario 2: Coverage for all children aged 5-6 years only

Based on the same assumptions applied in Scenario 1, this section provides the estimated costs for Scenario 2, which focuses on comprehensive ECE provision for all children in the year they turn 6 (aged 5-6 years) only, offering a one-year pre-primary education exposure.

Estimated total cost

Targeting one-year pre-primary education exposure emerges as a more viable option in response to budget constraints. Focusing on providing comprehensive, high-quality ECE services for children aged 5–6 years only, results in a substantial reduction in ECE programme costs, ranging between an annual expenditure of **ZMW7.6 billion and ZMW20.6 billion** as compared to the broader range of **ZMW36.4 billion and ZMW96.2 billion** under Scenario 1. Although the estimated cost remains well below the resources allocated to the ECE programme, this represents a significant cost reduction relative to Scenario 1. *The very large difference in costs between Scenarios 1 and 2 is explained by the number of children in the lower age groups (children turning 4 and children turning 5) being almost twice as large as the number of children turning 6.* The cost drivers are based on these numbers (number of classrooms and teachers needed) and the child-teacher ratio is also lower for the lower age groups, thereby generating significantly higher costs for Scenario 1.

Table 15: Summary of estimated costs by different models of construction, Billion, 2024 - 2030

Estimated total cost by construction model	2024	2025	2026	2027	2028	2029	2030
Government hub-satellite model:							
Contract model	17.8	18.1	18.3	18.5	18.7	19	19.2
Hybrid model	19.3	19.5	19.7	19.9	20.2	20.4	20.6
Cost model	15.6	15.8	16	16.2	16.5	16.7	16.9
UNICEF-ChildFund hub-satellite model:							
Hub-satellite full model	13.4	13.6	13.9	14.1	14.3	14.6	14.8
Hub-satellite light model	13.1	13.3	13.6	13.8	14	14.3	14.5
Lower-cost infrastructure community-led model:							
1x2 classroom	7.6	7.7	7.8	8	8.1	8.2	8.4

Source: Author's own

The estimated cost remains well below the resources allocated to the ECE programme. For the fiscal year 2024, the government has proposed a total national budget of ZMW177.9 billion, with ZMW23.2 billion allocated towards education spending. Within this education, ZMW529, equivalent to 2.3% of the total education budget, is set aside for ECE. Comparatively, the estimated total cost for Scenario 2 between 2024 and 2030 ranges between ZMW7.6 billion and ZMW20.6 billion. **This indicates that the ECE budget would need to increase by approximately ZMW1.2 billion to ZMW3.1 billion per year over six years to achieve universal access to quality ECE services for children aged 5-6 years only.** The financing options for securing the substantial additional funding would align with those previously discussed in Scenario 1.

Table 16 provides an overview of the estimated total cost per child per annum.

Table 16: Estimated total cost per child per annum, 2024 - 2030

Estimated total cost per child per annum	2024	2025	2026	2027	2028	2029	2030
Government hub-satellite model:							
Contract model	29 183	28 943	28 719	28 509	28 294	28 088	27 888
Hybrid model	31 506	31 220	30 951	30 697	30 440	30 193	29 952
Cost model	25 455	25 292	25 141	25 001	24 855	24 717	24 584
UNICEF-ChildFund hub-satellite model:							
Hub-satellite full model	21 943	21 853	21 772	21 699	21 618	21 543	21 474
Hub-satellite light model	21 467	21 387	21 316	21 252	21 180	21 114	21 053
Lower-cost infrastructure community-led model:							
1x2 classroom	12 400	12 354	12 297	12 256	12 206	12 162	12 123

Construction of ECE centres

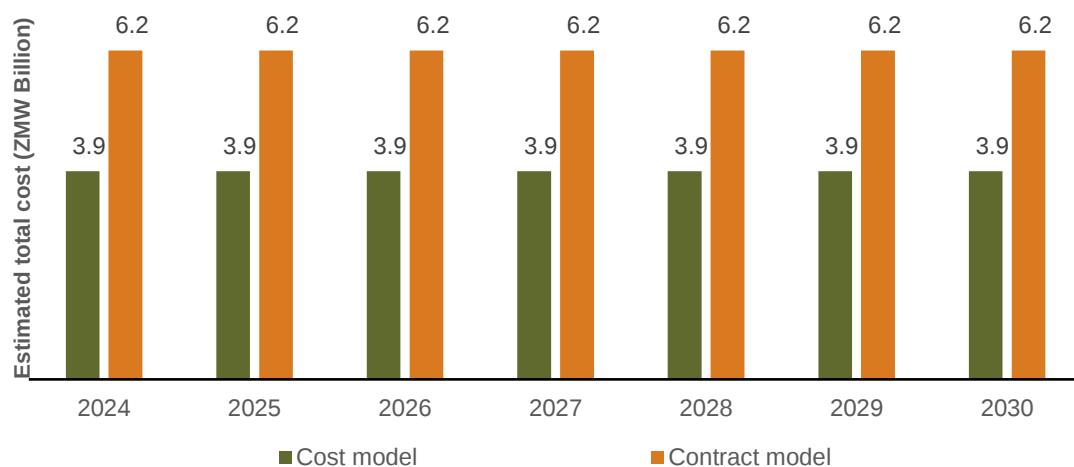
Using the government hub-satellite design, a total number of **12 675 ECE centres** will have to be built by 2030. Table 17 provides an overview of the average number of ECE centres that the government must construct annually to ensure that it reaches the targeted number of ECE centres required to achieve scenario 2. An average of **679 hub centres** and **1 132 satellite centres** must be built each year. While these are large numbers, they are much lower than the number of centres that would need to be built for Scenario 1. The cumulative effort will result in an annual total of 1 811 new ECE centres.

Table 17: Number of ECE centres to be built per year: Government hub-satellite design, 2024 - 2030

	2024	2025	2026	2027	2028	2029	2030
Existing ECE centre	5 350	8 745	12 140	15 535	18 930	22 325	25 720
ECE centres to be built	3 395	3 395	3 395	3 395	3 395	3 395	3 395
Hub-satellite centres to be built p/y	679	679	679	679	679	679	679
Hub-centre to be built per p/y	679	679	679	679	679	679	679
Satellite-centre to be built p/y	1 132	1 132	1 132	1 132	1 132	1 132	1 132
Number of centres to be built p/y	1 811	1 811	1 811	1 811	1 811	1 811	1 811

Figure 16 shows that if the government opts for the **cost model of construction**, the annual expenditure will average **ZMW4 billion to build 12 675 centres**. In contrast, choosing a **contract model of construction** will result in an annual expenditure of **ZMW6.2 billion** for the same number of centres with an **additional annual allocation of ZMW194 million to procure the essential furniture and equipment** for these centres, ensuring that they are fully equipped to provide a conducive learning environment.

Figure 16: Estimated cost of constructing ECE centres: Government cost vs contract model, 2024 - 2030

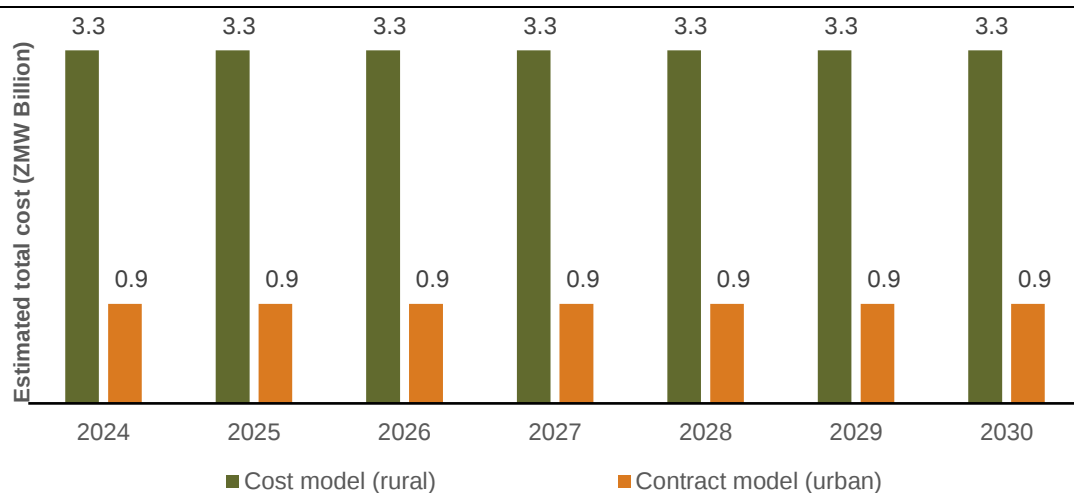


Source: Author's own

Compared to providing access as outlined in Scenario 1, achieving universal access for children aged 5-6 only will lead to a significant reduction in the number of ECE centres to be built, decreasing from 170 522 to 23 675. When employing the government hub-satellite design, this reduction will result in a decrease from 136 416 hub-satellite centres to 12 675 hub-satellite centres.

As previously mentioned in Scenario 1, the cost model of construction may not be suitable for urban areas, Figure 17 below shows the government's estimated cost for constructing an annual average of 1 811 ECE centres using the hybrid model. The estimated annual expenditure averages **ZMW4.2 billion to build 1 811 centres.**

Figure 17: Estimated cost of constructing ECE centres: Government hybrid model, 2024 - 2030

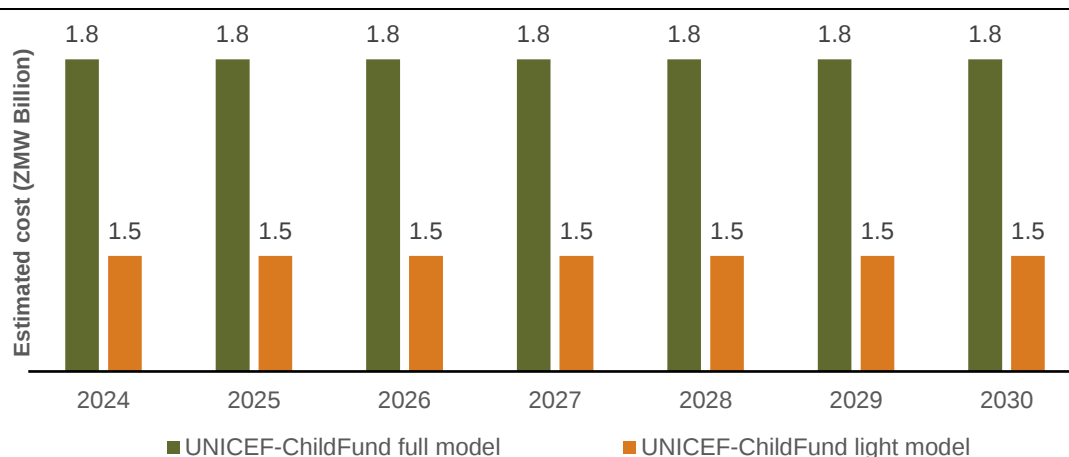


Source: Author's own

In contrast to Scenario 1, adopting a hybrid model to achieve universal access for children aged 5-6 will result in a substantial reduction in building costs. **This shift will reduce estimated annual building costs from ZMW32.9 billion to only ZMW4.2 billion, resulting in a substantial saving of ZMW28.7 billion.**

Using the UNICEF-ChildFund hub-satellite lower-cost model for constructing ECE centres, Figure 18 highlights the average cost to the government for annual construction. **According to this model, the expenditure would range between ZMW1.5 billion and ZMW1.8 billion to build 1 811 hub-satellite centres per year.**

Figure 18: Estimated cost of constructing ECE centres: UNICEF-ChildFund hub-satellite full vs light model, 2024 - 2030



Source: Author's own

As in the case of Scenario 1, the UNICEF-ChildFund hub-satellite (full model) emerges as an option that could optimise resource allocation and ensure the construction of high-quality ECE centres if the government opts for the hub-satellite approach.

Similar to scenario 1, Table 18 provides an overview of the average number of ECE centres that the government needs to construct annually to ensure that it reaches the targeted number of ECE centres required to accommodate all children aged 5-6 years using the 1x2 classroom block model approach. Using the lower-cost infrastructure community-led model, an average of 1 386 1x2 classroom blocks would need to be built each year. The table further presents a summary of the annual costs for constructing classrooms equipped with VIP latrines.

Table 18: Average 1x2 classrooms to be built and cost per year, 2024 - 2030

	2024	2025	2026	2027	2028	2029	2030
1x2 classroom block model							
Average 1x2 classrooms to be built per year	1 386	1 386	1 386	1 386	1 386	1 386	1 386
Building Cost including VIP latrine (Billion)							
Average cost per year	1.2	1.2	1.3	1.3	1.8	1.3	1.3

Source: Author's own

If the government decides to construct a 1x2 classroom block model, the annual expenditure is estimated to average **ZMW1.3 billion to build 1 386 1x2 classroom blocks**. By 2030, the total cost is expected to reach **ZMW8.9 billion to build 9 704 1x2 classroom blocks**. In addition, furniture expenses, including two-seater desks, teacher desks and chairs, are expected to total **ZMW4.1 billion**.

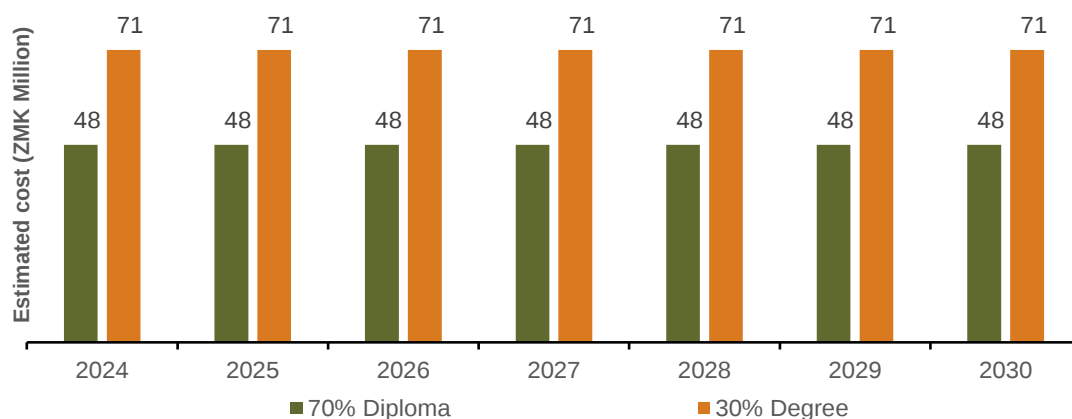
Training

Comprehensive universal ECE services for Scenario 2 will need a total of 34 465 qualified teachers. This translates to an annual training target of 4 234 teachers. The estimated annual cost associated with training these teachers is presented in Figure 19. **These costs assume that 70% of teachers will attain qualification**

with a diploma, while the remaining 30% will achieve a degree. Those qualified with a degree will play a significant role by being placed in hub centres, serving as quality assurance within the satellite centres.

The total cost of training 34 465 teachers is projected to reach ZMW834 million by the year 2030. Teachers enrolled in an ECE Diploma programme are expected to spend an average total cost of ZMW48 million annually, while those pursuing an ECE Degree are expected to spend an average total of ZMW71 million annually per year.

Figure 19: Estimated training cost, Diploma vs Degree, 2024 - 2030



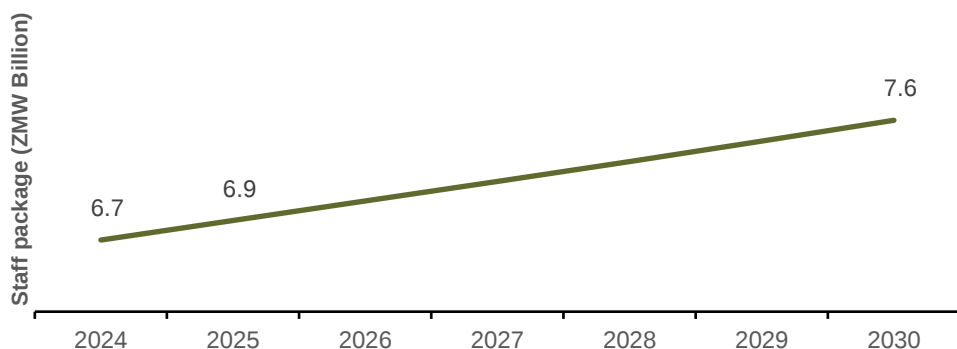
Source: Author's own

Scenario 2 requires 80% fewer teachers and results in teacher training costs of 83% lower. Achieving universal access for children aged 5-6 only will require a total of 34 465 qualified teachers, whereas a total of 175 872 will be required for Scenario 1. As a result, the total cost of training will decrease significantly from ZMW4.8 billion to ZMW834 million.

Staff Package

Based on the same staff package assumptions mentioned in Scenario 1, to ensure the delivery of high-quality ECE services, an estimated total amount of ZMW50 billion will be required by the year 2030. Figure 20 illustrates the estimated basic staff package each year. To achieve universal access to quality ECE services for all learners aged 5-6 years, **the budget for the staff package is expected to amount to ZMW6.7 billion in 2024, followed by a stable increase, reaching an estimated annual expenditure of ZMW6.9 billion in 2030.**

Figure 20: Estimated annual basic staff package, 2024 - 2030



Source: Author's own

Comprehensive access to universal ECE services for one-year pre-primary education will lead to a reduction in the number of ECE staff required, **consequently decreasing the estimated staff package from ZMW205 billion to ZMW43 billion.**

A further cost reduction is expected if the 5-6-year-old class is staffed with one teacher and a caregiver.

The lower-cost infrastructure community-led model argues that three staff members per classroom are not necessary for 5–6-year-olds. Therefore, each classroom will be staffed with only one teacher and a caregiver. The rationale behind staffing adjustments for the 5-6 years only emphasises the perspective that the standard staffing model with three staff members per classroom is excessive for this age group. This adjustment is expected to reduce staff package costs to approximately ZMW4.8 billion per annum. While all models aim to optimise resource allocation in ECE, the lower-infrastructure community-led model offers additional cost efficiencies by reevaluating staffing needs for specific age groups while maintaining the quality of education delivery.

Other Components

Similar to scenario 1, other factors contribute to the estimated total cost of comprehensive ECE services. These components include nutrition and LTSM for both teachers and learners. The current nutritious meal provided includes maize, pulses, vegetables, and cooking oil, amounting to ZMW33.46 per meal per child (MoE). Achieving universal access to a nutritious meal is estimated to cost between ZMW20.4 million and ZMW23.1 million annually, leading to an estimated total cost of ZMW152.2 million by 2030. Additionally, LTSM for teachers is estimated to reach a total cost of ZMW22.8 million, with those for learners estimated at ZMW460 million by 2030. Using self-made LTSM could help reduce the estimated costs for learners. Similar to Scenario 1, the home-grown initiative is estimated to require an average annual expenditure of ZMW3.7 million, amounting to a total spending of ZMW2.8 billion by 2030.

5.1.3 Summary

In summary, given the fiscal constraints faced by the country, prioritising the initial expansion of universal access to comprehensive ECE services for children aged 5-6 years only (one year of compulsory preschool education) appears to be the most feasible option within the current economic landscape.

Should the Zambian government choose to adopt the hub-satellite approach, the UNICEF-ChildFund hub-satellite (full model) emerges as a favourable approach. This approach holds the potential to optimise resource

allocation effectively while ensuring the construction of high-quality ECE centres that meet the standards of accessibility, affordability, and quality of education.

However, as an alternative to the hub-satellite approach, the lower-cost infrastructure community-led model presents a compelling option due to its innovative approach to infrastructure development, nutrition provision and staffing adjustments. This model leverages local community resources and involvement to minimise costs while maximising the utilisation of existing facilities. The inclusion of the VIP latrines addresses sanitation needs as well as water accessibility challenges. In addition, it emphasises sustainable nutrition solutions by incorporating home-grown food initiatives, such as gardens at ECE centres, to support nutritious meals at a lower cost. Furthermore, adjusting staffing requirements to two staff members further reduces operational costs without compromising the quality of learning provided.

5.2 Associated benefits of the interventions

The study results for the benefits associated with scenarios 1 and 2 are shared in this section. Given an extensive literature review earlier in the report, only a summary of the relevant empirical findings for ECD impacts informing benefit estimation is presented.

Using selected empirical literature, the estimated benefits of a nutrition/schooling feeding programme and a comprehensive (universal) pre and primary-school programme are then shared. The benefits of a school feeding programme are estimated separately from the benefits of a comprehensive ECE programme (which includes a school feeding programme) to emphasise the importance of the implementation of a national school feeding programme in ECE centres.

The theory of change (shown in Figure 9 above), provides a framework to understand how programmes can lead to impact and is used in this context to justify the estimation of benefits.

Note: for all the figures presented below, the 2030 population is applied for both the baseline and intervention scenarios. However, for the baseline scenario, the current rates of completion, dropout, and high school completion are applied. In contrast, the intervention scenario assumes full implementation of the programme by 2030, incorporating improved rates informed by existing literature. Estimates are based on current enrolments. For ECE enrolments there is no official enrolment data available. The EMIS system captures any ECE exposure. It is therefore assumed that 20% of children captured as part of any ECE exposure received a full year of ECE before entering Grade 1.

5.2.1 Benefits from a school feeding programme

Primary school enrolment and dropout

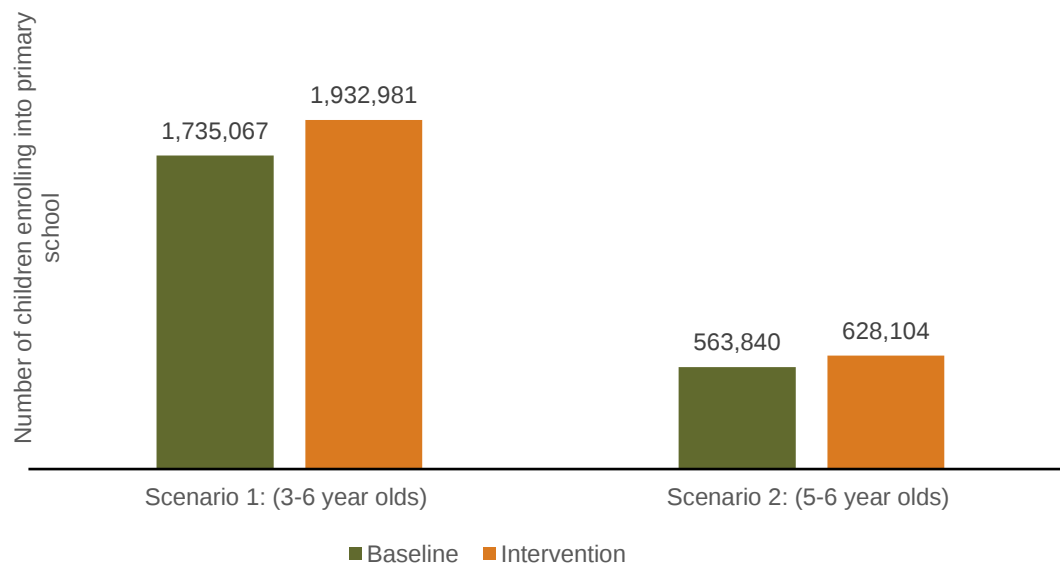
The impact of a school feeding programme (providing students with a nutritious meal¹⁸) on primary school enrolment and dropout are shown in Figure 21 and Figure 22, respectively. It is estimated that the school feeding programme will increase primary school enrolment (at the appropriate age) by 9.6 percentage points. This translates to 197 913 and 64 264 additional children enrolling into primary school under scenarios 1 and 2, respectively. There are currently 3 415 770 primary school students, the additional children enrolling into

¹⁸ A nutritious meal consists of a well-rounded combination of protein sources such as lean meats or plant-based alternatives, carbohydrates from whole grains and starchy vegetables, a variety of fruits and vegetables rich in vitamins and minerals, dairy or dairy alternatives for calcium and protein, healthy fats from sources like avocados and nuts, and hydration primarily from water.

primary school results in a 5.8% and 1.9% increase in primary school enrolments by 2030 for scenarios 1 and 2, respectively.

The impact of a school feeding programme, if fully implemented will result in fewer dropouts. Currently, it is estimated that approximately 11.3%¹⁹ of students drop out of primary school. After achieving full coverage in 2030, **the programme would decrease the number of children dropping out of primary school by 7.5 percentage points.** This translates into 154 620 and 50 207 fewer children dropping out of high school in scenarios 1 and 2, respectively.

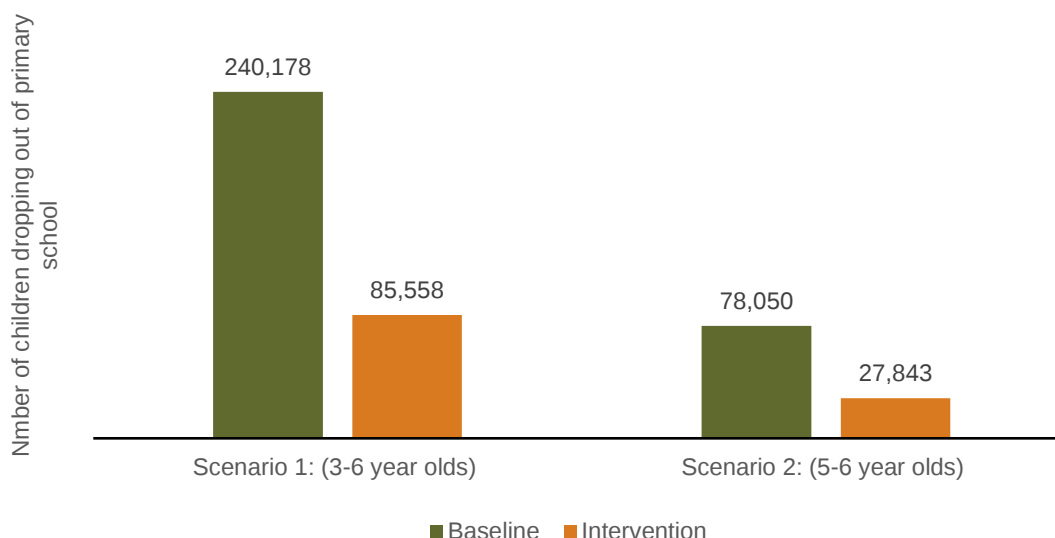
Figure 21: Impact of a school feeding programme on primary school enrolment



Source: Author's own

¹⁹ This calculation is a cumulative calculation based off the dropout rates from Grade 1-7 as reported in the Education Statistics Bulletin 2020

Figure 22: Impact of a school feeding programme on primary school dropout



Source: Author's own

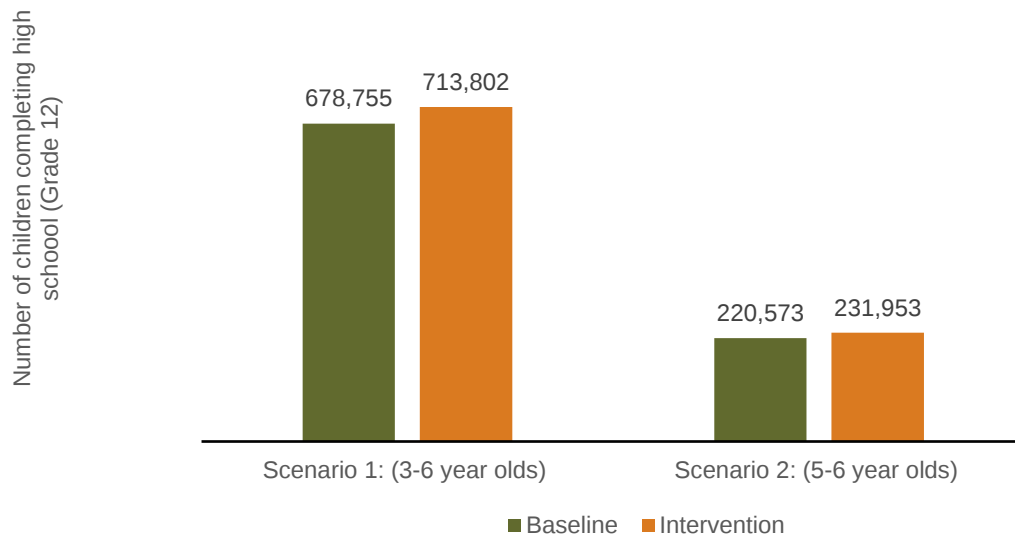
Completing high school (Grade 12)

The impact of a school feeding programme on completing high school for scenarios 1 and 2, respectively are shown in Figure 23 below. Currently, it is estimated that only 32% of high school children complete Grade 12 (Zambia Statistics Agency, 2020). If the full ECE programme is implemented, many additional children will complete high school. After achieving full coverage in 2030, the programme would increase the percentage of children completing high school by 1.7 percentage points. This translates into 35 047 additional children completing high school for scenario 1. The additional number of students completing Grade 12 reflects a 12.3% increase from the current number of high school students completing Grade 12 by 2030.

In scenario 2, which covers only 5–6-year-olds (i.e., children turning 6), 11 380 additional children will complete high school (a 4% increase from the current number of high school students completing Grade 12 by 2030). The relatively small effect on high school completion (1.7 percentage points) may be due to the breakfast programme primarily benefiting younger children. While it effectively addresses early childhood nutrition needs, its impact on high school outcomes may be limited as older students are influenced by a very broader range of factors beyond only basic nutritional support, such as curriculum quality, peer influence, and socioeconomic conditions.

In 2022, 125 145 students sat for the Grade 12 examination. Out of the total number of candidates who sat for the examination, 86 732 (69.31%) obtained the School Certificate (Minister of Education, 2023). Considering the additional children who will complete high school by 2030, this translates into 83.1% and 66.9% of children obtaining a school certificate in scenarios 1 and 2, respectively, in 2030. **This is based on the following assumptions:** the same number of students obtain a certificate in 2030; the number of students sitting for the examination increases by 2% each year; and obtaining a school certificate is an indicator of finishing high school.

Figure 23: Impact of nutrition programme on completing high school (Grade 12)



Source: Authors own

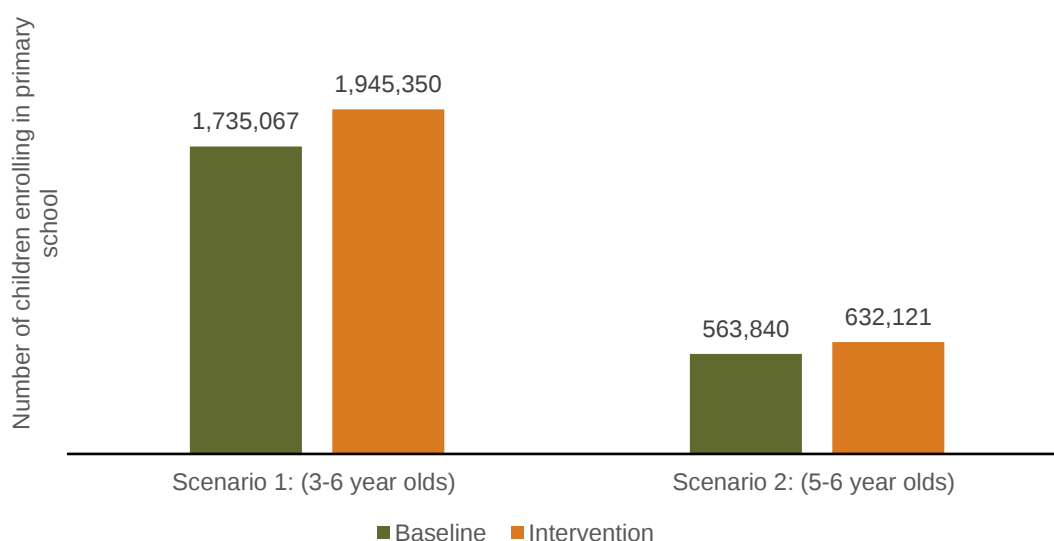
The additional learners completing high school would result in additional total lifetime earnings of **ZMW14 billion** and **ZMW43 billion** for scenarios 2 and 1, respectively. This can be seen as their economic contribution to society.

5.2.1 Benefits from a comprehensive ECE programme

Primary school enrolment

The net enrolment rate for primary school is 81.8% (USAID, 2023). It is estimated that the programme will increase primary school enrolment (at the appropriate age) by 10.2 percentage points. This translates to 210 283 and 68 281 additional children enrolling into primary school under scenarios 1 and 2, respectively (Figure 24). There are currently 3 415 770 primary school students, the additional children enrolling into primary school results in a 6.2% and 2% increase in primary school enrolments by 2030 for scenarios 1 and 2, respectively.

Figure 24: Impact of a comprehensive ECE programme on primary school enrolment



Source: Author's own

Additional years of schooling

A study done by Andrew et al. (2019) investigates the impact of preschool quality on children's development. The study however reports the effect size in standard deviations (0.15 SD). Using the work of Evans and Yuan (2019); where "one standard deviation gain in literacy skill is associated with between 4.7 and 6.8 additional years of schooling, depending on the estimation method" the standard deviation is translated into additional years of schooling. The estimated impact of LTSM and teaching training results in approximately an additional year (0.9 years) of schooling. This finding suggests that improving the quality of preschool education can significantly lengthen the time children spend in formal schooling, potentially influencing their future prospects and economic outcomes.

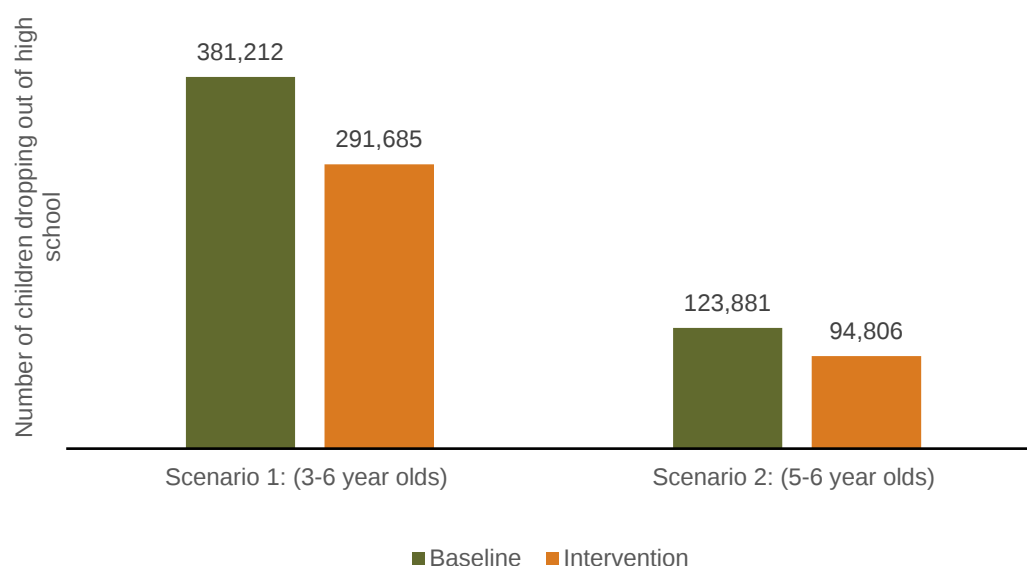
High school dropout

The estimates for the number of dropouts under both baseline (2023) and intervention (2030) for scenarios 1 and 2, respectively are shown in Figure 25 below. The impact of a comprehensive preschool programme, if fully implemented will result in fewer dropouts. Currently, it is estimated that approximately 18%²⁰ of students drop out of high school. After achieving full coverage in 2030, **the programme would decrease the percentage of children dropping out of high school by 24%**. This translates into 89 527 and 29 076 fewer children dropping out of high school in scenarios 1 and 2, respectively.²¹

²⁰ This calculation is a cumulative calculation based off the dropout rates from Grade 1-11 as reported in the Education Statistics Bulletin 2020

²¹ Dropout here refers to dropping out in the last year of high school, i.e., Grade 12

Figure 25: Impact of comprehensive ECE programme on high school dropout



Source: Author's own

Qualitative benefits

In addition to the quantifiable improvements in educational outcomes, ECE offers a range of qualitative benefits that positively impact both individuals and society at large. Mothers benefit from increased economic opportunities and personal development when they can confidently enter the workforce, resulting in improved family well-being. ECE programmes can also contribute to reducing crime rates by addressing the root causes of delinquency through enhanced social skills and early intervention. ECE programmes not only support the educational success of children but also the broader welfare of the communities they are a part of (Desmond et al., 2016).

5.3 Cost of inaction

The cost of inaction is defined as the benefits foregone from the proposed set of interventions (a school feeding programme and a comprehensive ECE programme).²² The failure to implement the school feeding programme would result in the foregone opportunity for 197 913 *additional children* to enrol in primary school, 154 620 fewer children dropping out of primary school, and 35 047 additional children completing high school by 2030. Moreover, the additional learners completing high school would result in additional total lifetime earnings of **ZMW14 billion and ZMW 43 billion** for scenarios 2 and 1, respectively. This can be seen as their economic contribution to society. These figures represent significant opportunities to strengthen Zambia's educational system and, ultimately, workforce.

The absence of a comprehensive ECE programme could lead to significant losses. **Without a comprehensive ECE programme, 210,283 additional children may not enrol in primary school, each child could potentially lose an extra year of schooling, and 89,527 are at risk of dropping out of high school by 2030.** These numbers highlight the potential losses if a comprehensive ECE programme is not implemented.

²² The benefits reflected here relate to Scenario 1

In summary, this report highlights the tangible benefits of these programs while also emphasising the missed opportunities as the cost of inaction. These opportunities encompass the development of human capital, progress in education, and the potential for economic growth. To make informed policy decisions, it is imperative to weigh the costs and benefits carefully.

Figure 26: Costs and Benefits by 2030 (Scenario 1)

Scenario 1

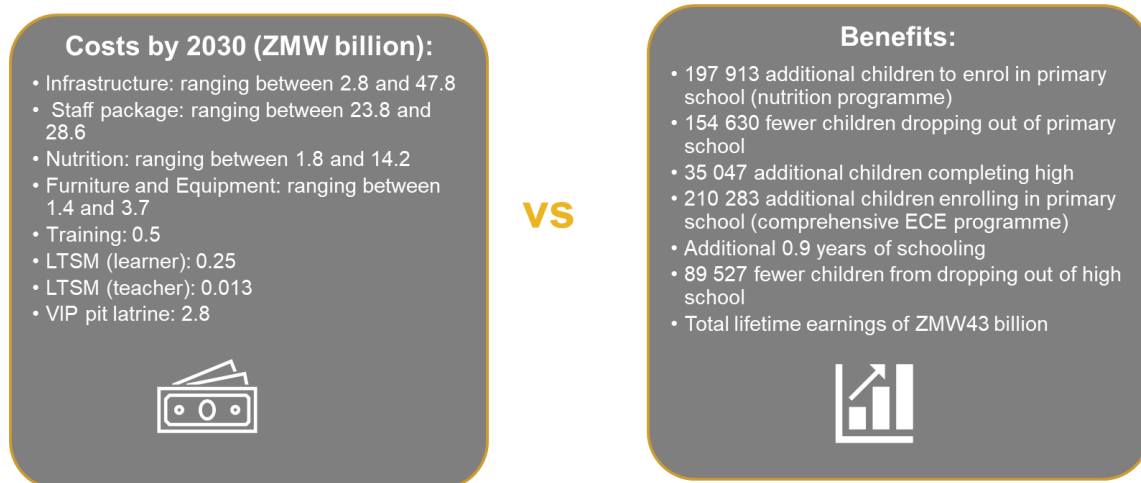
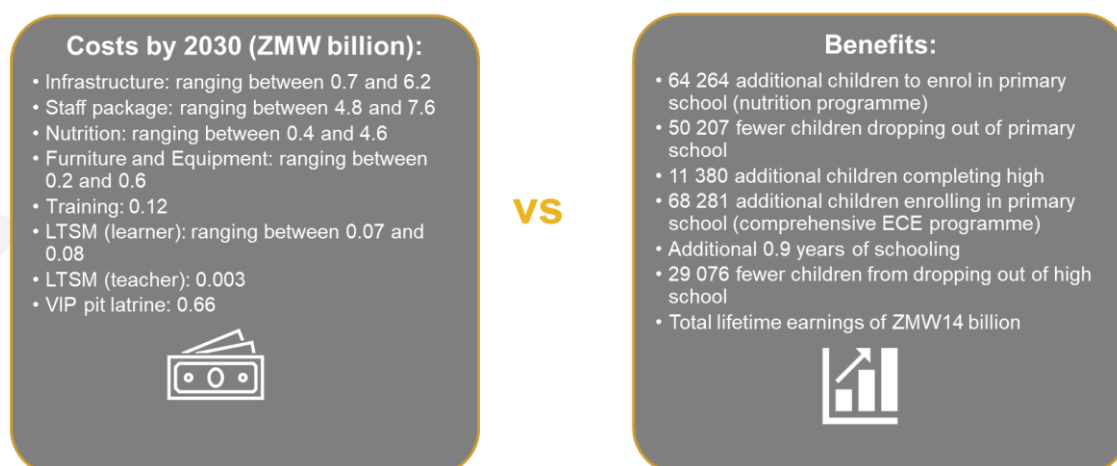


Figure 27: Costs and Benefits by 2030 (Scenario 2)

Scenario 2



5.4 Sensitivity Analysis

Costs

The estimated comprehensive ECE programme costs are primarily driven by infrastructure building costs and the staff package, representing the two largest components. To assess the model's sensitivity to its main assumptions and variables, adjustments have been made specifically to staff costs as the overall costing already draws on five different infrastructure costing models and the potential for large variation has already been built into the analysis.

Varying classroom staff composition: Each classroom is staffed with three staff members: a teacher, a teacher assistant, and a caregiver. It is assumed that the caregiver's annual salary is 40% of the qualified ECE teacher's annual salary, which is ZMW29 620, as there is currently no available salary data for caregivers. However, considering that having three staff members for 20 5–6-year-olds in a classroom may not be necessary, removing a caregiver from the classroom would impact the cost of the ECE programme for 5-6-year-olds in the following ways:

- The estimated total staff package between 2024 and 2030 decreases from ZMW49 billion to ZMW41 billion, **equivalent to an 18% reduction.**

Varying the transport and housing allowances: The government hub-satellite design eliminates the need for teachers to travel, as they will be housed within the school premises. Therefore, assuming 0% transport allowance and reducing housing allowance to 10% of the total teacher package results in the following:

- The estimated total package for teachers between 2024 and 2030 decreases from **ZMW95.3 billion to ZMW84.3 billion for children aged 3-6 years** and **from ZMW25.3 billion to ZMW22.4 for children aged 5-6 years only.**

Benefits

Varying the benefit coefficient of primary school enrolment and high school dropout: The benefit coefficient used for the effect of a school feeding programme on primary school enrolment was taken from a study done in Bangladesh. In 2020 Zambia had a lower GDP than Bangladesh²³. Therefore, the percentage point increase of 9.6% might be smaller. **Decreasing this percentage to 7% points results in the following: 144 312 and 46 859 more (previously 197 913 and 64 264) children will enrol into primary school at the appropriate age for scenarios 1 and 2 respectively.** Applying a smaller percentage results in a decrease in the number of additional children enrolling into primary school at the appropriate age.

Similarly, the benefit coefficient used for the impact of a comprehensive ECE programme on high school dropout rates was from a study done in Chicago – which is a more developed country than Zambia. Decreasing the coefficient from 24% to 12% resulted in a smaller benefit, i.e. 44 612 fewer students drop out of high school compared to 89 527 students (when using the original coefficient) for scenario 1 and 14 487 fewer students dropping out of high school compared to 29 076 students (when using the original coefficient) for scenario 2.

²³ <https://countryrank.org/compare/zambia-vs-bangladesh/>

6. Conclusion and Recommendations

The purpose of this study was to estimate the costs and benefits of a universal ECE programme in Zambia. Several interventions were proposed focusing on nutrition and a comprehensive ECE programme (that consists of nutrition increasing the number and quality of teachers and providing LTSM to both learners and teachers).

The estimated total cost was reliant on five approaches for the construction of ECE centres: (i) the Government (MoE) hub-satellite community mode of construction (cost) method, (ii) the Government hub-satellite contractor procurement mode of construction (contract) method, (iii) the Government hub-satellite hybrid model, (iv) the UNICEF-ChildFund hub-satellite (full model) and (v) The UNICEF-ChildFund hub-satellite (light model). The community mode of construction involves active community participation in project management, instilling a sense of ownership among community members. In contrast, the contractor procurement mode of construction involves awarding a contract to a construction company, which includes the costs for the contractor's overheads and profit margins. The hybrid model is a combination of the cost and contract model of construction, where the cost model is followed in rural areas and the contract model is followed in urban areas. Additionally, the UNICEF-ChildFund lower-cost model which comprises two variants is also used. One involves building ECE centres with comprehensive facilities, UNICEF-ChildFund hub-satellite (full model), while the other involves building ECE centres without solar, water systems and biogas services, UNICEF-ChildFund hub-satellite (light model).

The study estimated the costs of a universal ECE programme for two scenarios: universal access to ECE for 3–6-year-olds and universal access to ECE for only children in the year they turn 6 (5–6-year-olds). For Scenario 1, the total cost increases from ZMW69.8 billion to ZMW74.6 billion (community model), ZMW87.3 billion to ZMW92.2 billion (contractor model), ZMW72.4 billion to ZMW77.3 billion (hybrid model), ZMW56.8 billion to ZMW61.7 (Hub-satellite full model) and ZMW54 billion to ZMW58.8 billion (Hub-satellite light model) from 2024 to 2030. The cost increases reflect the gradual scale-up of ECE coverage over time until 100% coverage is reached by 2030. **A significant portion of the estimated total cost is allocated to infrastructure.**

Focusing on providing comprehensive access to quality ECE services for children aged 5–6-year-olds only (pre-school, Scenario 2), results in a substantial reduction in ECE programme costs. Although the estimated cost is well below the resources allocated to the ECE programme, it represents a significant cost reduction. Therefore, this option may be a more affordable choice for a country facing budget constraints, such as Zambia.

The annual cost per learner for Scenario 2 is considerably more affordable than that of Scenario 1. The very large difference in costs between Scenarios 1 and 2 is explained by the number of children in the lower age groups (children turning 4 and children turning 5) being almost twice as large as the number of children turning 6. The cost drivers are based on these numbers (number of classrooms and teachers needed) and the teacher-to-child ratio is also lower for the lower age groups, thereby generating significantly higher costs for Scenario 1.

In both Scenarios 1 and 2, the UNICEF-ChildFund hub-satellite (full model) emerges as an option that could optimise resource allocation and ensure the construction of high-quality ECE centres.

Employing the 1x2 classroom block model, universal access to ECE for 3–6-year-olds is estimated to cost between ZMW47.4 billion and ZMW52.5 billion, while it would cost ZMW11.3 billion and ZMW12.5 billion for 5-6-year-olds only.

The potential benefits of a nutrition programme and comprehensive ECE programme were also estimated. Several benefits could accrue to Zambia because of interventions in the childhood education sector (Note the range of benefits is based on the range from Scenarios 2 to 1):

- Providing children with a nutrition meal at school has the potential of **increasing primary school enrolment** (an additional 64 264- 197 913 children enrol at the appropriate age), **reducing primary school dropout rates** (50 207- 154 620 fewer kids drop out) and **high school completion rates** (additional children complete high school) 11 380-35 047). This translates into a 1.9%-5.8% increase in primary school enrolment, reducing primary school dropout rates by 7.5% points and a 4%-12.3% increase in the number of high school students completing Grade 12 by 2030.
- A comprehensive ECE programme has the potential of increasing primary school enrolment (an additional 68 281- 210 283 children enrol at the appropriate age), translating into a **2%-6.2% increase in the number of primary school students by 2030 and reducing high school dropouts by 24%**.
- The additional learners completing high school would result in additional total lifetime earnings of ZMW14 billion and ZMW43 billion for scenarios 2 and 1, respectively. This can be seen as their economic contribution to society.
- ECE yields not only measurable educational enhancements but also **qualitative benefits that extend to individuals and society**. Mothers gain economic opportunities and personal growth when they can join the workforce, leading to enhanced family well-being. ECE programmes play a role in lowering crime rates by addressing delinquency's underlying causes through improved social skills and early intervention. These programs have a profound impact not only on children's educational achievements but also on the overall welfare of the communities in which the ECE centres and children are integral parts

Thus, there is a compelling quantitative, not just moral, case for investing in ECE services in Zambia.

Caveats and considerations:

Dependencies in the results chain (theory of change): the full extent of benefits being realised are dependent on quality early childhood interventions (play groups and nutrition), quality primary schooling, and quality secondary schooling. If any of these elements are not in place, a much lower level of benefits is likely to be realised.

There are strong trade-offs between access (quantity) and quality: The reality in Zambia, especially given the implementation of universal access to education in 2022, could be that the quality of both primary and secondary school is not that high and may have deteriorated with the implementation of the new Free Education Policy. Policymakers will have to carefully manage these trade-offs in the expansion of ECE services to avoid further deterioration of quality at both ECE and primary school levels.

Costing for universal access to a year of preschool: The Zambian government may want to consider a gradual or staggered roll-out strategy to allow the educational system to adapt, both in terms of physical capital (infrastructure) and human capital (trained teachers). This measured approach will help ensure the effectiveness and sustainability of the expansion in ECE.

Additional study and policy recommendations:

The focus of this study was the cost of the expansion of ECE coverage in Zambia and the potential benefits to be realised from this, as well as the costs of inaction. However, while estimating the costs, benefits and cost of inaction, certain additional policy and implementation support were identified. Some of these policy recommendations were also voiced by stakeholder participants at a report validation workshop on 6 and 7 March 2024 in Lusaka, Zambia.

Allocate funding towards universal nutritious meals: While universal nutritional support is not yet a standard practice in ECE centres, well-nourished children will be more likely to reach their full potential. The Zambian government will need to allocate funds for the implementation of universal nutritious meals programmes in ECE centres. Such initiatives would play a crucial role in ensuring comprehensive and equitable access to quality education.

The need for norms and standards for LTSM: Furthermore, there is a lack of resources allocated to LTSM and an absence of well-defined norms and standards concerning the LTSM required for teachers and learners in a classroom. It is strongly recommended that the government channel increased efforts towards this aspect to improve the overall quality of education.

Community ownership and involvement in ECE centres are needed: During the report validation workshop, participants shared that there is a strong need for community involvement in ECE centres. Historically, the hub-satellite model of ECE provision grew from community involvement in ECE services for their children. More of this will be needed if ECE is to succeed in a sustainable way in Zambia.

Ensure innovation and sufficient quality control during ECE centre construction processes: Participants at the report validation workshop mentioned the potential lack of innovation around the government contract model. They mentioned the need for innovation and experimentation when it comes to the construction of ECE centres, for example, awarding smaller contracts to local bricklayers. There is also a need for close supervision and quality control during the building process. To maximise the efficiency of resources, building officers and engineers within MoE should take proactive measures such as conducting regular monitoring visits to ensure the quality standards of constructed buildings are met. The need for greater quality control during the building process applies to any of the infrastructure models, though it will be harder to achieve with the community-based ECD infrastructure approaches.

Substantively grow ECE teacher training capacity: There is currently a small number of formally trained ECE teachers in Zambia. At the report validation workshop, there was a recognition that the provision of more training subsidies by the Zambian government may not be possible in the current economic situation. While the study provided high-level indicative costs for teacher training, more work will be needed to determine how teacher training capacity can be expanded to meet the demand for ECE teachers which will accompany universal ECE provision.

Significantly expand the ECE budget: The Zambian government's introduction of a free education policy, starting from the ECE level, has opened opportunities for learners to access ECE services. However, this policy should be accompanied by a significant increase in the budget allocated to ECE. This step is essential to ensure an adequate number of qualified teachers and improved education facilities that can accommodate the growing number of enrolments. The Zambian government will have to think innovatively about potential sources of funding for ECE. During the report validation workshop, the Community Development Fund was mentioned as one possible source of funding.

Strongly consider only the initial expansion of universal ECE to 5–6-year-olds (one year of compulsory preschool education): Currently, the Zambian government allocates approximately 2% or less of its total education budget to ECE services. To improve access and quality of ECE services, there is an urgent need for a substantial increase in its budget allocation. In addition, for this budget to optimally benefit its intended beneficiaries, it is important to ensure transparent fund utilisation and establish well-designed accountability mechanisms. Considering fiscal constraints faced by the country, it may be more feasible to provide universal access to children aged 5-6 years only, at least initially. **To make this possible, the ECE budget would have to significantly increase by approximately ZMW8.1 billion to ZMW15.8 billion per year over six years to meet the estimated total cost.** A focus on only 5-6 years olds could substantially reduce the costs and require a budget increase of **approximately ZMW1.2 billion to ZMW2.3 billion per year over six years**, making it a more financially favourable option for Zambia in comparison to providing for all children aged 3-6 years.

REFERENCES

- Ahmed, A.U., 2004. Impact of Feeding Children In School: Evidence From Bangladesh. International Food Policy Research Institute.
- Allen, J., Gregory, A., Mikami, A., Lun, J., Hamre, B., Pianta, R., 2013. Observations of effective teacher-student interactions in secondary school classrooms: Predicting student achievement with the classroom assessment scoring system-secondary. *School Psychology Review* 42, 76.
- Almond, D., Currie, J., 2011. Chapter 15 - human capital development before age five, in: *Handbook of Labor Economics*, Part B. Elsevier, pp. 1315–1486.
- Andrew, A., Rubio Codina, M., Krutikova, S., Cardona Sosa, L., Bernal, R., Attanasio, O., 2019. Preschool quality and child development. *Econstor*. <https://doi.org/10.1920/wp.ifs.2019.1923>
- Araujo, M.C., Carneiro, P., Cruz-Aguayo, Y., Schady, N., 2016. Teacher quality and learning outcomes in kindergarten. *The Quarterly Journal of Economics* 131, 1415–1453.
- Banerji, R., Bhattacharjea, S., Wadhwa, W., 2013. The Annual Status of Education Report (ASER) (No. 3). Research in Comparative and International Education.
- Barker, D.J., 1992. The fetal and infant origins of adult disease 301, 1111. <https://doi.org/10.1136/bmj.301.6761.1111>
- Blau, D. M., 2000. The production of quality in child-care centers: Another look. *Applied Developmental Science*. 136–148.
- Bold, T., Filmer, D., Martin, G., Molina, E., Stacy, B., Rockmore, C., Svensson, J., Wane, W., 2017. Enrolment without learning: Teacher effort, knowledge, and skill in primary schools in africa. *Journal of Economic Perspectives* 31, 185–204.
- Bowne, J.B., Magnuson, K.A., Schindler, H.S., Duncan, G.J., Yoshikawa, H., 2017. A Meta-Analysis of Class Sizes and Ratios in Early Childhood Education Programs: Are Thresholds of Quality Associated With Greater Impacts on Cognitive, Achievement, and Socioemotional Outcomes? *Educational Evaluation and Policy Analysis* 39, 407–428. <https://doi.org/10.3102/0162373716689489>
- Britto, P.R., Yoshikawa, H., Boller, K., 2011. Quality of early child-hood development programs in global contexts: Rationale for invest-ment, conceptual framework and implications for equity. *Social Policy Report* 25, 1–31.
- Bütikofer, A., Mølland, E., Salvanes, K.G., 2018. Childhood nutrition and labor market outcomes: Evidence from a school breakfast program. *Journal of Public Economics* 168, 62–80. <https://doi.org/10.1016/j.jpubeco.2018.08.008>
- Chakwaba, L., Mukalula-Kalumbi, M., 2023. An Investigation on the Implementation of Early Childhood Education: A Case Study of Selected Schools in Petauke District. *International Journal of Social Science and Education Research Studies* 3, 653–659.
- Cilliers, J., Fleisch, B., Prinsloo, C., Taylor, S., 2018. How to Improve Teaching Practice? Experimental Comparison of Centralized Training and In-classroom Coaching. *Research on Improving Systems of Education (RISE)*. https://doi.org/10.35489/BSG-RISE-WP_2018/024
- Clotfelter, C.T., Ladd, H.F., Vigdor, J.L., 2010. Teacher Credentials and Student Achievement in High School: A Cross-Subject Analysis with Student Fixed Effects. *journal of human resources* 45, 655–681.
- Copenhagen Consensus Center, National Planning Commission (Malawi), African Institute for Development Policy (AFIDEP), 2021a. Cost-Benefit Analysis of Expanding and Improving Early Childhood Education in Malawi - Technical Report.
- Copenhagen Consensus Center, National Planning Commission (Malawi), African Institute for Development Policy (AFIDEP), 2021b. The costs and benefits of expanding and improving early childhood education in Malawi.
- Croninger, R.G., Rice, J.K., Rathbun, A., Nishio, M., 2007. Teacher qualifications and early learning: Effects of certification, degree, and experience on first-grade student achievement. *Economics of Education Review* 26, 312–324. <https://doi.org/10.1016/j.econedurev.2005.05.008>
- Currie, J., 2001. Early Childhood Education Programs 15, 213–238.
- Das, J., Habyarimana, J., Krishnan, P., 2007. Teacher Shocks and Student Learning: Evidence from Zambia. *The Journal of Human Resources* 42, 820–862. <https://doi.org/10.2307/40057331>
- de Kruif, R. E. L., McWilliam, R. A., Ridley, S. M, Wakely, M. B., 2000. Classification of teachers' interaction behaviors in early childhood classrooms. *Early Childhood Research Quarterly* 15, 247–268. [https://psycnet.apa.org/doi/10.1016/S0885-2006\(00\)00051-X](https://psycnet.apa.org/doi/10.1016/S0885-2006(00)00051-X)
- Desmond, C., Richter, L., Martin, P., 2016. Development of an investment case for early childhood development in South Africa: Prioritizing investments in early childhood development (study commissioned by UNICEF South Africa). UNICEF.
- Duncan, G.J., Ludwig, J., Magnuson, Katherine A., 2010. "Child Development." In *Targeting Investment in Children: Fighting Poverty When Resources Are Limited*. University of Chicago Press 27–58.

- Early, D.M., Maxwell, K.L., Burchinal, M., Alva, S., Bender, R.H., Bryant, D., Cai, K., Clifford, R.M., Ebanks, C., Griffin, J.A., Henry, G.T., Howes, C., Iriondo-Perez, J., Jeon, H., Mashburn, A.J., Peisner-Feinberg, E., Pianta, R.C., Vandergrift, N., Zill, N., 2007. Teachers' Education, Classroom Quality, and Young Children's Academic Skills: Results From Seven Studies of Preschool Programs. *Child Development* 78, 558–580. <https://doi.org/10.1111/j.1467-8624.2007.01014.x>
- Executive office of the President of the United States, 2014. The economics of early childhood investments.
- Gertler, P., Heckman, J., Pinto, R., Zanolini, A., Vermeersch, C., Walker, S., Chang, S.M., Grantham-McGregor, S., 2014. Labor market returns to an early childhood stimulation intervention in Jamaica. *Science* 344, 998–1001. <https://doi.org/10.1126/science.1251178>
- GGI Insights, 2023. What Is the Head Start Program? Understanding Early Education Impact [WWW Document]. Gray Group International. URL <https://www.graygroupintl.com/blog/what-is-the-head-start-program> (accessed 10.25.23).
- Heckman, J.J., Moon, S.H., Pinto, R., Savelyev, P.A., Yavitz, A., 2010. The Rate of Return to the High/Scope Perry Preschool Program. *Journal of Public Economics* 94, 114–128. <https://doi.org/10.1016/j.jpubeco.2009.11.001>
- Heller, P., 2005. Understanding Fiscal Space. IMF Policy Discussion Papers 2005, 1. <https://doi.org/10.5089/9781451975635.003>
- High Scope, 2023. Perry Preschool Study [WWW Document]. URL <https://highscope.org/perry-preschool-project/>
- Hoddinott, J., Maluccio, J.A., Behrman, J.R., Flores, R., Martorell, R., 2008. Effect of a nutrition intervention during early childhood on economic productivity in Guatemalan adults. *The Lancet* 371, 411–416. [https://doi.org/10.1016/S0140-6736\(08\)60205-6](https://doi.org/10.1016/S0140-6736(08)60205-6)
- Horton, S., 1999. Opportunities for Investments in Nutrition in Low-income Asia. *Asian Development Review* 17, 246–273. <https://doi.org/10.1142/S0116110599000081>
- Howes, C., Whitebook, M., Phillips, D., 1992. Teacher characteristics and effective teaching in child care: Findings from the National Child Care Staffing Study. *Child & Youth Care Forum* 21, 399–414. <https://doi.org/10.1007/BF00757371>
- IMF, 2023. IMF Executive Board Concludes the 2023 Article IV Consultation with Zambia and Completes the First Review Under the Extended Credit Facility Arrangement [WWW Document]. URL <https://www.imf.org/en/News/Articles/2023/07/13/pr23262-imf-executive-board-concludes-article-iv-consultation-with-zambia-and-review-under-ecf>
- Jukes, M., 2006. Early childhood health, nutrition and education. <https://doi.org/10.54676/XJUJ2512>
- Kalimaposo, K., Shikwesa, R., Mubita, K., Milupi, I., Phiri, C., Simalo, M., 2023. Assessing the Provision of Early Education in Government Primary Schools. A Case of Selected Schools in Kabompo District of North Western Zambia. *International Journal of Research and Innovation in Social Science* VII.
- Kalinde, B., Jere-Folotiya, J., Mwanza-Kabaghe, S., Malama, E., 2023. An Investigation of Nutrition in Selected Early Childhood Education Centres in Lusaka, Zambia. *Journal of Lexicography and Terminology* 7, 1–20.
- Lobman, C., Ryan, S., McLaughlin, J., 2005. Reconstructing Teacher Education to Prepare Qualified Preschool Teachers: Lessons from New Jersey 7.
- Maloney, K., 2022. Beyond Supply: Strategies to Promote Book Use in the Classroom and at Home. USAID.
- Maluccio, J.A., Hoddinott, J., Behrman, J.R., Martorell, R., Quisumbing, A.R., Stein, A.D., 2009. The impact of improving nutrition during early childhood on education among guatemalan adults. *The Economic Journal* 119, 734–763. <https://doi.org/10.1111/j.1468-0297.2009.02220.x>
- Martinez, S., Naudeau, S., Pereira, V., 2017. Preschool and Child Development under Extreme Poverty: Evidence from a Randomized Experiment in Rural Mozambique. World Bank, Washington, DC Working Paper. <http://hdl.handle.net/10986/29112>
- Martinez, S., Naudeau, S., Pereira, V., 2012. The Promise of Preschool in Africa: A Randomized Impact Evaluation of Early Childhood Development in Rural Mozambique.
- Mary's Meal. Mary's Meals reaches more than 400 000 children every school day in Zambia. Available: <https://www.marysmeals.org/what-we-do/where-we-work/zambia>
- McCoy, D.C., Zuilkowski, S.S., Yoshikawa, H., Fink, G., 2017. Early Childhood Care and Education and School Readiness in Zambia. *Journal of Research on Educational Effectiveness* 10, 482–506. <https://doi.org/10.1080/19345747.2016.1250850>
- Minister of Education, 2023. Minister of Education Announces the release of Grade 12 Results [WWW Document]. Lusaka Times. URL <https://www.lusakatimes.com/2023/01/20/minister-of-education-announces-the-release-of-grade-12-results/> (accessed 10.27.23).
- Minister of Education, 1996. Educating Our Future: National Policy on Education.
- Minister of Education Zambia, 2006. National School Health and Nutrition Policy. Available: <https://extranet.who.int/nutrition/gina/sites/default/filesstore/ZMB%202006%20School%20Health%20and%20Nutrition%20Policy%20%202006.pdf>

- Ministry of Education Zambia, About Ministry of Education. Available: https://www.edu.gov.zm/?page_id=802
- Ministry of Finance and National Planning, 2023. 2023 Mid-Year Economic Report.
- Ministry of General Education Zambia and Ministry of Higher Education. Education and Skills Sector Plan 2017 - 2021. Available: https://planipolis.iiep.unesco.org/sites/default/files/ressources/zambia_-_education-and-skills-sector-plan-2017-2021.pdf.
- Ministry of General Education Zambia, 2020. National Strategy: Home-Grown School Meals (2020-2024). Available: <https://www.edu.gov.zm/wp-content/uploads/2023/02/NATIONAL-STRATEGY-ON-HGSM-2020-2024-web-003.pdf>
- Ministry of General Education Zambia, 2020. Chapter 1: ECE in Zambia. Available: https://zambia.vvob.org/sites/zambia/files/01._ece_in_zambia_lf.pdf.
- Mullins, I., Martin, M., Foy, P., Hooper, M., 2017. PIRLS 2016 international results in reading. International Association for the Evaluation of Educational Achievement.
- Munthali, A.C., Mvula, P., Silo, L., 2014. Early childhood development: The role of community based childcare centres in Malawi. SpringerPlus 3, 305. <https://doi.org/DOI:10.1186/2193-1801-3-305>
- Republic of Zambia, 2022. Eighth National Development Plan (8NDP) 2022-2026: Socio-Economic Transformation for Improved Livelihood".
- Reynolds, A.J., Temple, J.A., 1998. Extended early childhood intervention and school achievement: age thirteen findings from the Chicago Longitudinal Study. Child Development 69, 231–246.
- Reynolds, A.J., Temple, J.A., Robertson, D.L., Mann, E.A., 2002. Age 21 Cost-Benefit Analysis of the Title I Chicago Child-Parent Centers 24, 267–303.
- Rivkin, S.G., Hanushek, E.A., Kain, J.F., 2005. Teachers, schools, and academic achievement. Econometrica 73, 417–458.
- Saunders, M.-M., Folotiya, J.J., Paredes, C., Miguel Nunez, 2021. Improving the Early Childhood Education Evidence Base in Zambia. DevTech.
- Scarr, S., Eisenberg, M., Deater-Deckard, K., 1994. Measurement of quality in child care centers. Early Childhood Research Quarterly 9, 131–151. [https://doi.org/10.1016/0885-2006\(94\)90002-7](https://doi.org/10.1016/0885-2006(94)90002-7)
- Schanzenbach, D.W., Bauer, L., 2016. The long-term impact of the Head Start program.
- Schweinhart, L.J., Barnes Helen V, Weikart David P, Barnett W. Steven, Epstein Ann S., 1993. Significant Benefits: The High/Scope Perry Preschool Study Through Age 27.
- Shafiq, M.N., Devercelli, A.E., Valerio, A., 2018. Are There Long-Term Benefits from Early Childhood Education in Low- and Middle-Income Countries? 43. <https://dx.doi.org/10.2139/ssrn.3270603>
- Staiger, D.O., Rockoff, J.E., 2010. Searching for effective teachers with imperfect information. The Journal of Economic Perspectives 24, 97–117.
- Temple, J.A., Reynolds, A.J., Miedel, W.T., 2000. Can Early Intervention Prevent High School Dropout?: Evidence from the Chicago Child-Parent Centers. Urban Education 35, 31–56. <https://doi.org/10.1177/0042085900351003>
- UNESCO, 2011. International Standard Classification of Education ISCED 2011. Available: <https://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf>
- UNESCO, 2016. Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4. Available: https://uis.unesco.org/sites/default/files/documents/education-2030-incheon-framework-for-action-implementation-of-sdg4-2016-en_2.pdf.
- UNICEF, 2023. Education Budget Brief: Dealing with the new demands emanating from the “education for all” policy.
- UNICEF, 2022. 2022 Education Budget Brief: Dealing with new demands emanating from the “education for all” policy.
- UNICEF, 2019. A World Ready to Learn: Prioritizing quality early childhood education - Advocacy Brief.
- USAID, 2023. Final USAID Zambia Education Fact Sheet.
- USAID, 2022. USAID Education Data Activity: Zambia Early Childhood Education Research study. 2022 Endline Report.
- USAID, 2020. USAID Education Data Activity: Early Childhood Education Research Study - 2020 Baseline Report.
- Van der Berg, S., Girdwood, E., Shepherd, D., van Wyk, C., Kruger, J., Viljoen, J., Ezeobi, O., Ntaka, P., 2013. The impact of the introduction of Grade R on learning outcomes. Stellenbosch University.
- Waita, K.J., Mulei, K.O., Mueni, K.B., Mutune, M.J., Kalai, Dr.J., 2016. Pupil-Teacher Ratio And Its Impact On Academic Performance In Public Primary Schools In Central Division, Machakos County, Kenya. European Journal of Education Studies 2. <https://doi.org/10.5281/ZENODO.54767>
- Walker, S., Grantham-Mcgregor, S., Powell, C., Himes, J., Simeon, D., 1992. Morbidity and the growth of stunted and nonstunted children, and the effect of supplementation. American Journal of Clinical Nutrition 56, 504–510. <https://doi.org/10.1093/ajcn/56.3.504>

- Walker, S., Powell, C., Grantham-McGregor, S., 1990. Dietary intakes and activity levels of stunted and non-stunted children in Kingston, Jamaica. *European Journal of Clinical Nutrition* 44, 527–534.
- Walker, S.P., Grantham-McGregor, S.M., Powell, C.A., Chang, S.M., 2000. Effects of growth restriction in early childhood on growth, IQ, and cognition at age 11 to 12 years and the benefits of nutritional supplementation and psychosocial stimulation. *The Journal of Pediatrics* 137, 36–41. <https://doi.org/10.1067/mpd.2000.106227>
- Wolf, S., Aber, J.L., Behrman, J.R., Peele, M., 2019. Longitudinal causal impacts of preschool teacher training on Ghanaian children's school readiness: Evidence for persistence and fade-out. *Developmental Science* 22. <https://doi.org/10.1111/desc.12878>
- World Bank, 2020. Concept Project Information Document (PID) - Zambia Early Childhood Learning Enhancement Project - P174012 (English).
- World Health Organization, UNICEF, World Bank Group, 2018. Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential. Available: <https://iris.who.int/bitstream/handle/10665/272603/9789241514064-eng.pdf?sequence=1>.
- Yoshikawa, H., Weiland, C., Brooks-Gunn, J., Burchinal, M.R., Espinosa, L.M., Gormley, W.T., Ludwig, J., Magnuson, K.A., Phillips, D., Zaslow, M.J., 2013. Investing in Our Future: The Evidence Base on Preschool Education. Society for Research in Child Development.
- Yoshikawa, H., Wuerml, A.J., Raikes, A., Kim, S., Kabay, S.B., 2018. Toward High-Quality Early Childhood Development Programs and Policies at National Scale: Directions for Research in Global Contexts. *SRCD Society for Research in Child Development* 31, 1–36. <https://doi.org/10.1002/j.2379-3988.2018.tb00091.x>
- Zambia Statistics Agency, 2020. Education Statistics Bulletin.
- Zambia Statistics Agency, 2018. Zambia Demographic and Health Survey 2018. Available: <https://dhsprogram.com/pubs/pdf/FR361/FR361.pdf>

APPENDIX A: HIGH-INCOME COUNTRY EVIDENCE ON THE IMPACT OF PRESCHOOL PROGRAMMES

HeadStart programme

The Head Start Program, implemented across the United States, is designed to support children from low-income families in getting ready for school. It accomplishes this by offering a comprehensive package of early childhood education, healthcare, nutrition, and social services, all of which work together to address the developmental needs of young children and increase their likelihood of success in both school and life (GGI Insights, 2023). Schanzenbach and Bauer (2016) investigated the impact of Head Start on long-term outcomes. **The authors found that attending the Head Start programme increased the likelihood of pursuing some higher education by between 4 and 12 percentage points.**

Perry Preschool Project

One of the most well-known early childhood interventions is the Perry Preschool Project in the United States. The Perry Project started as a research initiative to investigate whether providing high-quality education to preschool children could bring about beneficial effects on both the children and the communities they reside in (High Scope, 2023).

The project involved 58 children in the treatment group and 65 controls. The intervention involved a half-day preschool every weekday plus a weekly 90-minute home visit, both for eight months of the year and for two years. Teacher/student ratios were 1 to 6, and all teachers had master's degrees and training in child development (Schweinhart et al., 1993). The intervention had positive effects on achievement test scores, grades, high school graduation rates, and earnings, as well as negative effects on crime rates and welfare use (as of age 27) (Currie, 2001).

Heckman et al. (2010) estimated that for every dollar spent on the Perry Preschool program, the benefits totalled \$7 to \$10, with a baseline estimate of \$8.6. Participants' earnings, which were about 25% higher each year compared with nonparticipants generated a sizable return over individuals' lifetimes. Since participants were also less likely to end up in the criminal justice system, this led to further benefits in the form of reduced victimisation and lower spending on police, courts, and prisons (Heckman et al., 2010). The Heckman study argued that early education is one of the most cost-effective ways of reducing crime, and estimates that Perry saved an additional \$3 to \$8 in crime costs for every dollar spent (Executive Office of the President of the United States, 2014).

Table 19 shows the breakdown between earnings gains and other benefits for the Head Start and Perry preschool programme.

Table 19: Head Start and Perry preschool programme: earnings gains and benefits

	Head Start	Perry Preschool
Year children entered the programme	2002	1962
Value of earnings gains per child	\$14 459	\$92 020
Value of total benefits per child		\$180 257*
Cost of the programme per child	\$9 173	\$20 948
Net benefit per child	\$5 286	\$159 309*

	Head Start	Perry Preschool
Benefit to cost ratio (earnings only)	1.6	4.4
Benefit-to-cost ratio (all benefits)	-	8.6*
Study	(Duncan et al., 2010)	(Heckman et al., 2010)

Source: Executive Office of the President of the United States, (2014).

Note: All figures are in 2014 dollars. For the present value of earnings, all studies use a 3 per cent discount rate and assume no real productivity growth. Figures are middle estimates when studies present a range. *Includes benefits from earnings, reduced crime, reduced receipt of cash transfers, and educational savings.

Chicago Child-Parent Centre

The Chicago Child-Parent Centres began with an enriched preschool program, extended with a curriculum for school-aged children up to age nine. Reynolds and Temple, (1998) tracked children who participated in the program, with some joining after kindergarten (treatment group) and some not (control group). Those in the treatment group had significantly lower rates of grade retention, special education, and delinquency, along with higher reading scores. In another study by Temple et al. (2000), the programme reduced high school dropout rates by 24%, with the effect increasing with the duration of programme participation. (Reynolds et al. (2002) found positive effects on delinquency, crime, and skills test results, and a cost-benefit analysis indicated that each dollar spent on the programme saved \$3.69 in future government costs.

APPENDIX B- STAKEHOLDER LIST

Table 20: Participants interviewed/met during the stakeholder engagement process

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