



EARLY CHILDHOOD EDUCATION IN IRAQ

Investment Case

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ABBREVIATIONS

BCR	Benefit-Cost Ratio
CBA	Cost-Benefit Analysis
ECD	Early Childhood Development
ECDI	Early Childhood Development Index
ECE	Early Childhood Education
GDP	Gross Domestic Product
IBCR	Incremental Benefit-Cost Ratio
ICER	Incremental Cost-Effectiveness Ratio
ILO	International Labour Organisation
LAY	Learning-Adjusted Year
MICS	Multiple Indicator Cluster Survey
NPV	Net Present Value
SDGs	Sustainable Development Goals
VAT	Value-Added Tax

1. INTRODUCTION

1.1. OVERVIEW

The purpose of this investment case is to support the evidence-based advocacy for improved financing into early childhood education (ECE) in Iraq. The Iraq National Education Strategy (INES) for the period 2022 to 2031 focusses on all grades from kindergarten to grade 12 (K-12), and outlines specific targets and associated costs, including provisions for two years of ECE (KG 1 and 2).

Building upon the success of placing ECE on the government's agenda in nationwide commitments, this investment case aims to feed into targeted advocacy efforts directed at key decision-makers in the education sector. The decentralization process in Iraq has entailed a devolution of budgeting and service delivery functions for K-12 education from the central Ministry of Education (MOE) to governorate authorities' General Directorates of Education (GDOE). With decentralization, a larger share of decision-making

authority in education service delivery in general, and specifically ECE, is at governorate-level.

This investment case models the scale-up of multiple ECE provision types to inform the implementation choices of decision-makers. The modelled provision types reflect ECE policy options that are being actively discussed by education stakeholders in Iraq, as delineated by UNICEF's Education Section. Each provision type reflects a different combination of financing sources and ECE design, expanded upon below. The investment case has the following specific aims:

- Generate empirical evidence to inform decision-making processes and investments in ECE,
- Advocate for the design and expansion of high-quality and equitable ECE services,
- Enable optimization and strategic reallocation of available resources towards children's early education.

1.2. THE STUDY

This investment case is based on a series of cost-benefit analyses investigating the return-on-investment for various ECE provision types. This investment case focuses on Kirkuk governorate. It draws on data from Kirkuk, where available, to enhance the relevance of the model and results to the local reality. In demonstrating the benefits of ECE and providing the early groundwork for costing of multiple ECE provision types, this study aims to contribute to ECE scale-up in a way that can be replicated in each governorate in Iraq.

The evidence that has been produced aims to demonstrate and compare the benefit-cost ratio of expanding ECE across five provision types. While modelled separately, this investment case does not purport to identify an optimal policy option. The provision types are not mutually exclusive, with ECE often provided through a mixed system of providers from the public sector, private sector and communities. This is also the case in Iraq, including within Kirkuk governorate. Findings presented here are intended for use by stakeholders to motivate for enhanced investment in the ECE policy option, or a combination of options, offering a high return on investment, both in monetary and non-monetary terms.

2. CONTEXT

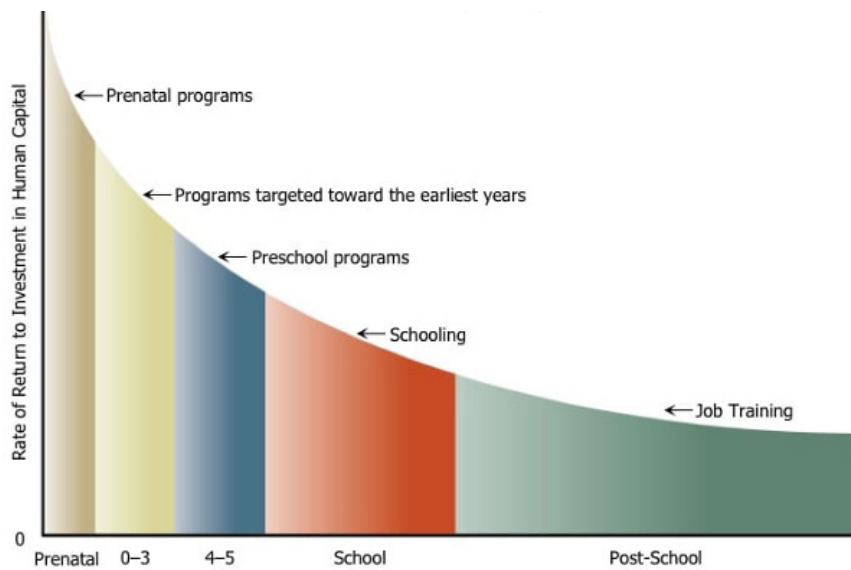
2.1. THE VALUE OF QUALITY EARLY CHILDHOOD EDUCATION

Extensive research underscores the critical significance of a child's early developmental years. The human brain develops most rapidly during the period of early childhood, with more than 1 million new neural connections made per second in the first few years of life.¹ This is the period where children will acquire physical and motor skills, expand their cognitive capacity, and develop their socio-emotional behaviours and their personalities, as well as their social skills. It is imperative for policymakers and stakeholders vested in the realisation of child rights and pursuit of human development to pay close attention, and act accordingly.

Quality early childhood education programmes play a pivotal role in stimulating cognitive development, helping children to acquire crucial foundational learning skills later in life. ECE refers to intervention(s) designed to promote development in children prior to their entry to primary school, most often provided in preschool institutions. Evidence suggests that children who attend ECE programmes are twice as likely to show progress in early literacy and numeracy, compared to only 20 per cent among children not attending any ECE programmes.² Quality ECE has also been found to be associated with starting primary school at the right age and progressing through the educational system, making it one of the strongest predictors of a child's readiness for school.³ This multitude of positive impacts of ECE are carried into later stages of the life course and can have a dramatic effect on lifelong socio-economic outcomes in areas including, health, wealth, and the formation of relationships. In recent years, studies from across the globe have tracked the impact that investments in aspects of early childhood can have in later life. One estimate suggests that increasing enrolment in pre-primary education to 50 per cent coverage in low- and middle-income countries could result in lifetime earnings gains of USD15 to 34 billion.⁴

Investments in quality early childhood education do not only benefit the individual, but society more broadly too. High quality early education access and outcomes constitute a major human capital resource to propel the economic development of a country. In fact, research shows that expenditure in early childhood education has the highest return on investment of any education-related human capital intervention.⁵ This is clear in Figure 1 below, the Heckman curve.

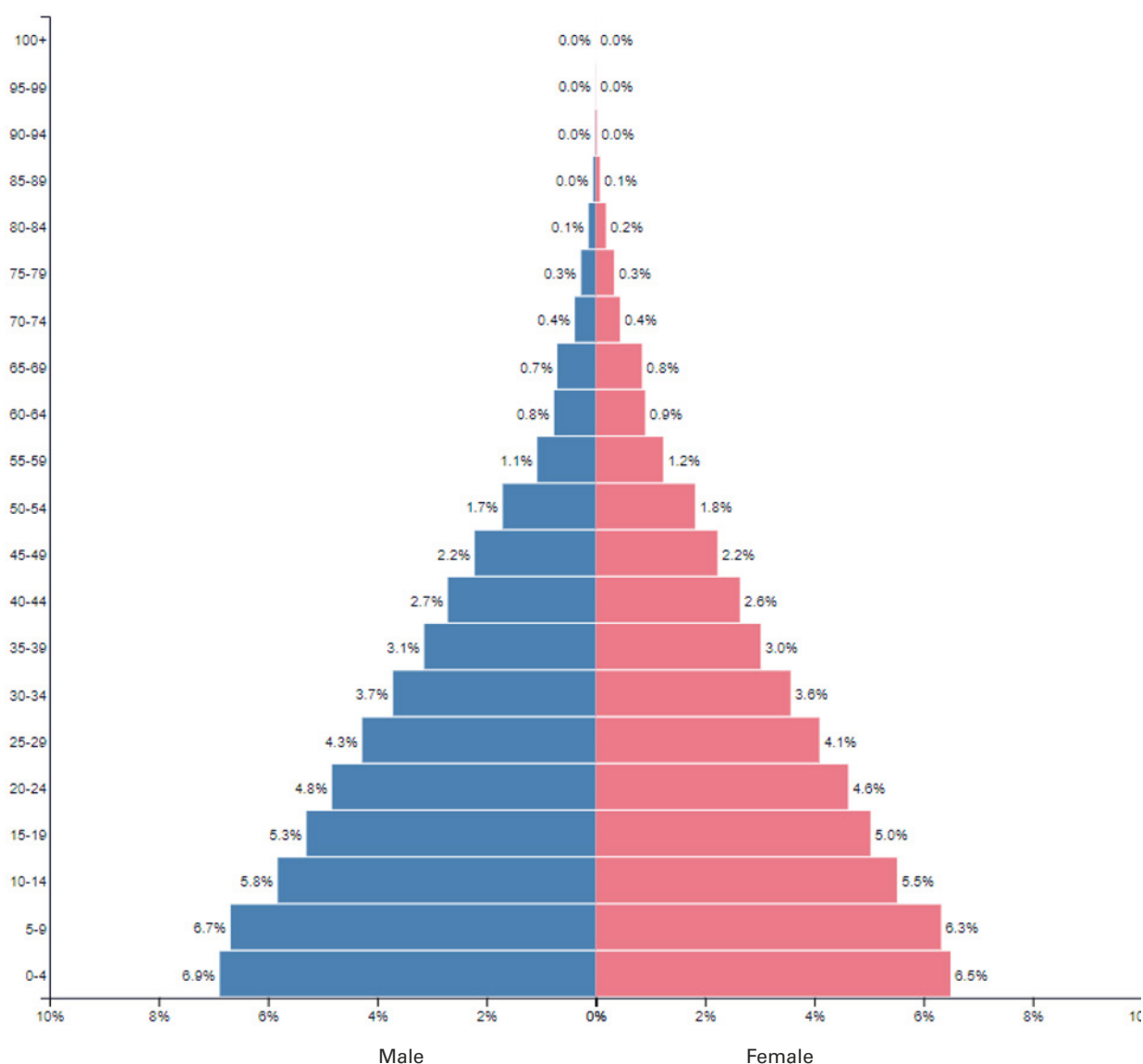
Figure 1: The Heckman Curve.⁶



2.2. THE STATUS OF ECE IN IRAQ

Iraq has one of the youngest, and fastest-growing, populations in the world.⁷ Based on international comparisons, Iraq ranks 40th of 237 countries in terms of the speed of its population growth,⁸ with Figure 2 below highlighting the high proportion of young people in the country (a youth bulge). With a population of 45.53 million people⁹, 38 per cent¹⁰ are under the age of 14, and over 60 per cent are under 25 years of age¹¹. This high proportion of young people is only set to expand in the upcoming years. For Iraq to optimize on this youth bulge and reap a

demographic dividend¹² in the coming years, investments need to be made in quality early childhood education. The provision of high quality early childhood education is strongly correlated with enhanced grade attainment, job attainment and improved lifetime earnings.¹³ Capitalizing on this demographic dividend through enhanced access to high quality ECE, known as the most impactful human capital investment, is critical for the Government to upskill the population¹⁴ and help them in finding work.

Figure 2: Population Pyramid, Iraq (per cent per five-year age group).¹⁵

In pursuit of the goals outlined above, the GOI has charted a course to achieve these goals by adopting the National Development Plan 2018–2022 (NDP).¹⁶

The NDP defines an ambitious strategy, based primarily on enhanced development of human capital, and a socially responsible economy that mobilizes and allocates resources to improve the quality of life for everyone in Iraq.¹⁷ Human capital refers to the knowledge, skills and health that people accumulate throughout their lives that enable them to reach their full potential and become productive members of society. Human development begins in the earliest stages of life and continues throughout it. For this reason, tailored interventions to support human capital accumulation are often highly cost-effective and instrumental in upholding fundamental human rights.

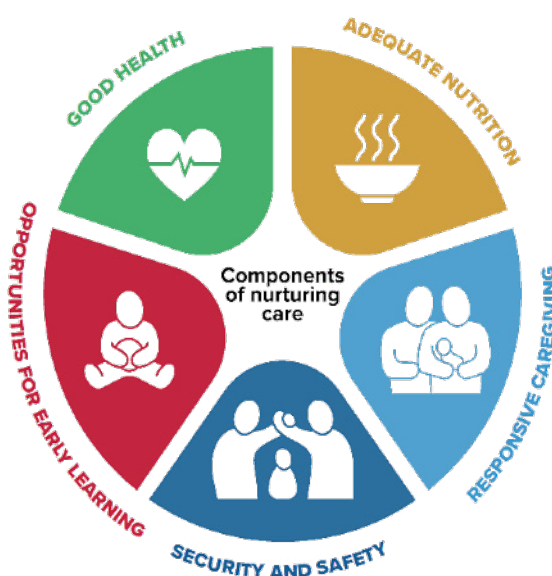
The Iraq National Education Strategy (INES 2022–2031)¹⁸ outlines key objectives aimed at enhancing the education in the country, from ECE to grade 12.

The major target relating to ECE, is to increase coverage to 30 per cent by 2031. In addition, targets are set around reducing the student-teacher ratio, and student-classroom ratio. Additionally, specific targets have been set for the proportional division of the ECE expenditure between capital and operational expenditure.

In 2022, the Government of Iraq, in partnership with UNICEF, launched the National Strategy on Early Childhood Development (ECD). This strategy is aligned with the global Nurturing Care Framework (see Figure 3 below), and outlines all of the components required for young children to thrive. Opportunities for Early Learning

constitute an essential component and receive much attention within Iraq's National Strategy on Early Learning. The strategy aligns with the goal in INES to increase ECE coverage to 30 per cent, and calls for ECE to receive a higher budget share in order to attain this goal.

Figure 3: The global Nurturing Care Framework¹⁹



Despite the commitment to developing human capital as per the recently published INES and ECD strategies, concerns remain on the situation of young children in Iraq. Children aged under six years of age represent almost 20 per cent of the population, meaning that there are approximately 8 million children of this age group in Iraq.²⁰ Yet less than 10 per cent of all four and five-year-olds in Iraq are enrolled in ECE. In less than 20 years, these children will come to be critical in influencing, shaping, and powering the future of the nation.

Thus, this report presents the results of a detailed study into the potential costs and benefits of investments in early childhood education. It seeks to support efforts to improve ECE in Iraq by the Government, UNICEF, as well as other stakeholders, by providing an evidence-based model for investing in ECE policy options as a way of improving the lives of young children, as well as the long-term future of the nation more broadly.

2.3. THE STATUS OF ECE IN KIRKUK

Kirkuk has been used as a case study for this investment case, with the hope that the findings prove beneficial to the General Directorate of Education (GDOE) of each governorate. It is assumed that the age breakdown of population in Iraq broadly applies to Kirkuk too, meaning that it is estimated to be an ECE schoolable population of 47,368 four-year-olds, and 46,853 five-year-olds at baseline, in 2023. Currently, ECE enrolment in Kirkuk stands at 10 per cent for four-year-olds and 17 per cent for five-year-olds.²¹

Regarding the provision mix of ECE in Kirkuk, there is a sharp distinction between public and private providers. As of the year 2019-2020, among the 61 public kindergartens, 56 are described as school buildings, whilst the remaining are non-school buildings. Conversely, of 32 private kindergartens, only five are in school buildings, with the remaining 27 in non-school buildings.²² The data provide no further information beyond this 'school' versus 'non-school' classification.

In terms of the share of enrolment between public and private providers of ECE, the former dominates in Kirkuk. At baseline, 10 per cent of four-year-olds are enrolled in ECE, the vast majority (87.9 per cent) are enrolled in publicly provided ECE facilities²³. Similarly, of the 17 per cent of five-year-olds enrolled in ECE, 86.6 per cent of these children are enrolled in publicly provided ECE.²⁴ The disproportion between the public and private split in ECE buildings and the public and private split in enrolment is explained by the much higher student-classroom ratios seen in public schools. In Kirkuk, the ratio in public ECE is 32.3 compared to just 7.9 in private ECE.

A disproportionately large percentage of ECE centres are located in urban areas as compared to rural areas.

Whilst 26 per cent of Kirkuk's general population resides in rural areas²⁵, these areas account for just 3 per cent of ECE buildings.²⁶ Further, there is no private provision of ECE in rural areas. It is important that stakeholders' decisions be informed by the distribution of ECE by provision and residence area types. These considerations are crucial in enabling ECE scale-up to contribute to improved equity in access to education and associated opportunities.

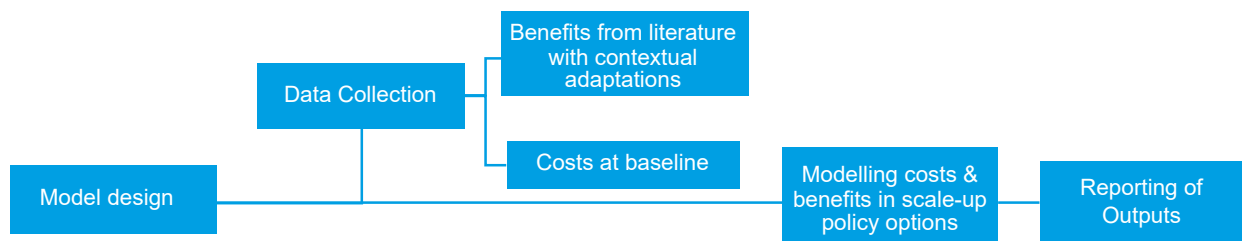
3. METHODOLOGY

3.1. STAGES

The investment case is developed over a number of stages (Figure 4). These are as follows and our approach

to each is described in more detail in subsequent sections.

Figure 4: Stages of Benefit-Cost Ratio Analysis



3.2. BASELINE AND SCALE-UP SCENARIOS

The investment case compares the costs and benefits of an intervention(s) – the scale-up of ECE to 2031 and maintaining the said coverage until 2050, with the baseline scenario. The baseline scenario, otherwise

referred to as the “business-as-usual” scenario, is where current ECE enrolment levels and resourcing ratios are maintained until 2050. Resourcing ratios here refers to the input combinations in Table 2.

Table 2: ECE resourcing ratios at baseline (in public and private ECE) and target levels²⁷

Resourcing type	Baseline in public ECE	Baseline in private ECE	INES Targets
Student-classroom ratio (SCR)	32.3	7.9	30
Classroom-teaching staff ratio (CTR)	1.01	1.45	1.1
The ratio of teaching staff to non-teaching staff	1.63	1.63	0.18

In both the baseline and scale-up scenarios, the consideration of population growth is paramount.

Herein, even during years where percentage enrolment levels are the same, such as between 2031 and 2050 in intervention scenarios, there are changes to the absolute number of students enrolled in ECE, and therefore changes in the resource allocation. It should be noted

that all costs and benefits in the scale-up scenarios are calculated according to the additional number of children enrolled in ECE, as compared to the enrolment figures at baseline.

The five scale-up scenarios are designed to reflect the ongoing dialogue in Iraq as stakeholders seek to identify policy options for ECE expansion. These options reflect alternative:

- Providers of ECE and related differences in financing sources;
- Years of ECE curriculum;
- Different enrolment targets according to years of ECE.

These policy options are summarized in Table 3. Further, whilst Policy Options A-D focus on both urban and rural residence area types, Policy Option E ('Home-based') focusses only on children in rural areas. This reflects the current obstacles in

establishing more formal ECE provision in rural areas in Kirkuk, and Iraq in general.

The design of the model for each policy option draws on the targets set by the INES 2023-2031. This extends beyond the enrolment target, including also targets pertaining to the resource ratios outlined in Table 2. In doing so, we are able to assume that the quality of instruction is uniform across Policy Options A-D, as they adhere to the same curriculum and teacher training standards. This assumption does not extend to Policy Option E, 'Home-based ECE', where ECE is delivered by community members rather than teachers. The following sections provide further detail on the modelling of benefits and associated assumptions.

Table 3: Modelled policy options for ECE scale-up to 2031, maintained until 2050.

Policy Options	Residence area type	Years of ECE	Description	Enrolment Target	Target share of enrollment by provider type
Policy Option A: 'Traditional ECE'	Urban & rural	Two (ages 4-6)	This refers to the stand-alone ECE centres that provide for both KG1 (age 4-5) and KG2 (age 5-6) year groups.	30 per cent	Public: 75 per cent Private: 25 per cent
Policy Option B: 'School-based ECE'	Urban & rural	One (ages 5-6)	This refers to the provision of preschool classes within the physical setting of a primary school, for children aged 5 only (aged one-year before beginning primary school). This entails the repurposing of existing classroom space in primary schools, as opposed to constructing entirely new facilities.	30 per cent	Public: 75 per cent Private: 25 per cent
Policy Option C: 'Compulsory Grade Zero'	Urban & rural	One (ages 5-6)	As with Policy Option B, this policy option refers to the provision of preschool classes within the physical premises of a primary school, catering exclusively to children aged five. However, under this scenario, attendance of ECE would become compulsory as part of an extended primary school curriculum. Regarding the need for new classrooms, it is assumed the same proportion of classrooms can be repurposed, as per Policy Option B to accommodate 30 per cent enrolment. The remaining classrooms needed for this policy option would need to be newly constructed.	84.4 per cent*	Public: 91 per cent Private: 9 per cent**
Policy Option D: 'Community-based ECE'	Urban & rural	Two (ages 4-6)	In this policy option, the scale-up of ECE is provided by the community, through the repurposing of an existing community-owned facility. Public funding would be used to subsidize the costs of teaching staff (including remuneration and training) in addition to a share of learning supplies (activity books). The relevant community would fund all other costs.	30 per cent	Public: 51 per cent Private: 7 per cent Community: 42 per cent***

Policy Options	Residence area type	Years of ECE	Description	Enrolment Target	Target share of enrollment by provider type
Policy Option E: 'Home-based ECE'	Rural only	Two (ages 4-6)	ECE to be provided in homes of community members. The costs of continuous teacher training and teaching and learning supplies would be covered in part by the Government, and in part by the community.	30 per cent	Public: 4 per cent Private: 0 per cent Community: 96 per cent****

*Despite being compulsory, this scenario would unlikely achieve 100 per cent ECE enrolment by the target year. This assumption is informed by the latest data from Kirkuk primary schools that net enrolment in Grade One is 84.4 per cent of children aged 6 (the age by which it is compulsory to attend Grade One). Herein, we assume the same proportion of children aged five would attend Grade Zero, if made compulsory.

**As part of the 30 per cent ECE enrolment target set by INES, it is aimed that the private sector will account for one-quarter of ECE provision. This equates to 7.5 per cent of all children of ECE-age attending a private ECE facility. Herein, we assume the same absolute level of private ECE contribution as a maximum in any scale-up scenario. Given the above-described enrolment target of 84.4 per cent, the allocation would therefore be split in a ratio of 91 to 9 between public and private provision, respectively.

***It is assumed that community provision amounts to the gap between baseline and target enrolment. Baseline here refers to the 17.4 per cent of children currently completing ECE aged 5 across public and private facilities. Therefore, the community is required to provide ECE to the remaining 12.6 per cent of children needed to meet the ECE enrolment target set by INES. As a percentage of total enrolment, this translates to the community accounting for 42 per cent of ECE provision.

****It is assumed that community provision amounts to the gap between baseline and target enrolment. Baseline here refers to the 1.2 per cent of children currently completing ECE aged 5 across *rural* facilities (public only). Therefore, the community is required to provide ECE to the remaining 28.8 per cent of children needed to meet the ECE enrolment target set by INES. As a percentage of total enrolment, this translates to the community accounting for 96 per cent of ECE provision.

3.3. TIME HORIZON

The time horizon is the time over which the costs and benefits are measured. The selection of the time horizon is a relevant factor to the results and conclusions of the analysis. In order to capture all intended and unintended consequences of the interventions, we use a long-term evaluation time frame. There is a short-term time horizon

from 2023 to 2031 (8 years) to cover the period of scale-up of ECE enrolment rates, in line with INES 2022-2031, followed by one long-term time horizon from 2032 to 2050 (28 years) that models the maintenance of ECE provision at target levels, with associated costs and benefits.

3.4. MODELLING APPROACH & TOOLS

The ECE Accelerator tool was utilized and adapted for the assessment of costs for the education interventions under study. Four modelling tools were considered for the analysis. These were UNESCO SimuEd, Brookings Standardized Early Childhood Development Costing Tool, the Childhood Cost Calculator C3 (Centre for Universal Education), and the ECE Accelerator tool developed by the Global Partnership for Education and UNICEF. After evaluating these tools, the ECE Accelerator tool was chosen for the following reasons:

1. The ECE Accelerator is an interactive, customizable and objective-based tool that allows users to estimate the scale up of ECE.
2. To support users, the ECE Accelerator tool offers checklists²⁸, templates, and questions to guide the process, as well as illustrative country case studies and examples. Moreover, additional resources are provided to support users with costing early childhood development.
3. There are two projection types offered under the ECE Accelerator: namely needs-based projections and intervention-based projections. This case applied a need-based projection, where projections are driven by a target in terms of the gross enrolment rate at pre-primary and transition rate to primary school. Thereafter, all financial projections were based on this target enrolment rate, and the costs were calculated in accordance with how much it costs to provide these services.

4. The information put into the tool-included education costs, including recurrent and capital costs, country macroeconomic indicators, population projections and baseline enrolment rates. The high degree of customization of education indicators made this tool useful for this analysis.

Relevant sources and estimates of costs were obtained from national sources and calculated over time using the ECE Accelerator tool. The principle of this modelling process is built on baseline year costs: which is the most recent year for which necessary data is available. There are broadly three types of costs included, namely costs that change as a direct result of policy changes (such as teacher remuneration and training and construction costs), costs that evolve indirectly (such as maintenance costs) and costs that evolve externally (such as population changes).²⁹ The modelling process to estimate costs broadly followed the steps below:

- Population projections, sourced from a combination of the World Population Prospects and those data provided by Iraq's CSO, were entered;
- Enrolment rates and target rates/years were entered;
- Targets related to ECE resource inputs were entered, including the SCR, CTR and ratio of non-teaching to teaching staff (see INES targets in Table 2).
- Various baseline cost data were imputed for annual operational and capital expenditures, with estimations described in Cost Assessments section below. All costs are dynamic, fluctuating year-on-year in accordance with the corresponding inputs. For instance, teaching staff salaries are determined based on the total number of required teachers, while capital expenditures are influenced by annual requirement of additional classrooms.

3.5. COST ASSESSMENTS

The cost assessment focused on ECE resource inputs pertaining to targets in the INES and suggested cost line in the ECE Accelerator template. These include the following costs:

- Remuneration for teaching staff
- Remuneration for non-teaching staff
- Costs of teaching & learning supplies
- Costs of continuous (on-the-job) training for teaching staff³⁰
- All other recurrent costs – including classroom services & maintenance
- Capital costs for classroom construction and/or repurposing

For each cost type, the estimation of unit costs is made using multiple sources on Iraqi expenditures on ECE. The estimation of operational (i.e., recurrent) unit costs draw on two data sources: (a) expenditures modelled in INES for Iraq nationally, and (b) actual expenditures made by the Kirkuk GDOE in 2021 as per data shared by the GOI Ministry of Finance.³¹ For capital expenditures, the cost per additional ECE classroom was made using INES data and verified using actual expenditures on classroom construction as per data shared by GOI Ministry of Planning. As per available literature, it is assumed that the cost of classroom refurbishment, as required in Policy Options B, D and

E, would amount to 50 per cent the cost of classroom construction.³²

Without available data on private ECE costs/ expenditures in Iraq, it is assumed that the unit costs accrued by all providers are equal. However, given the underlying incentive of the private sector to attain profit through the provision of service, we apply a 10 per cent increase to overall unit costs in private ECE. Costs accrued through community provision (including those from civil society organizations) are assumed to reflect the unit costs of public provision, given the lack of profit incentive.

Each policy option for ECE expansion entails a different combination of financing sources per cost. In Policy Options A-C, all costs are accrued by the respective public or private provider. In Policy Options D and E, this is not the case. In Policy Option D, the community accrues the full cost of repurposing an existing facility that belongs to the community for the purpose of ECE, in addition to 47 per cent of the 'cost of teaching & learning supplies'³³ and the full cost of 'All other recurrent costs, including classroom services & maintenance'. For Policy Option E, the community also accrues the full cost of 'teacher' remuneration, though these persons are community members and not formally qualified teachers. Nonetheless, the Government contributes to half the cost of annual continuous training for said persons.

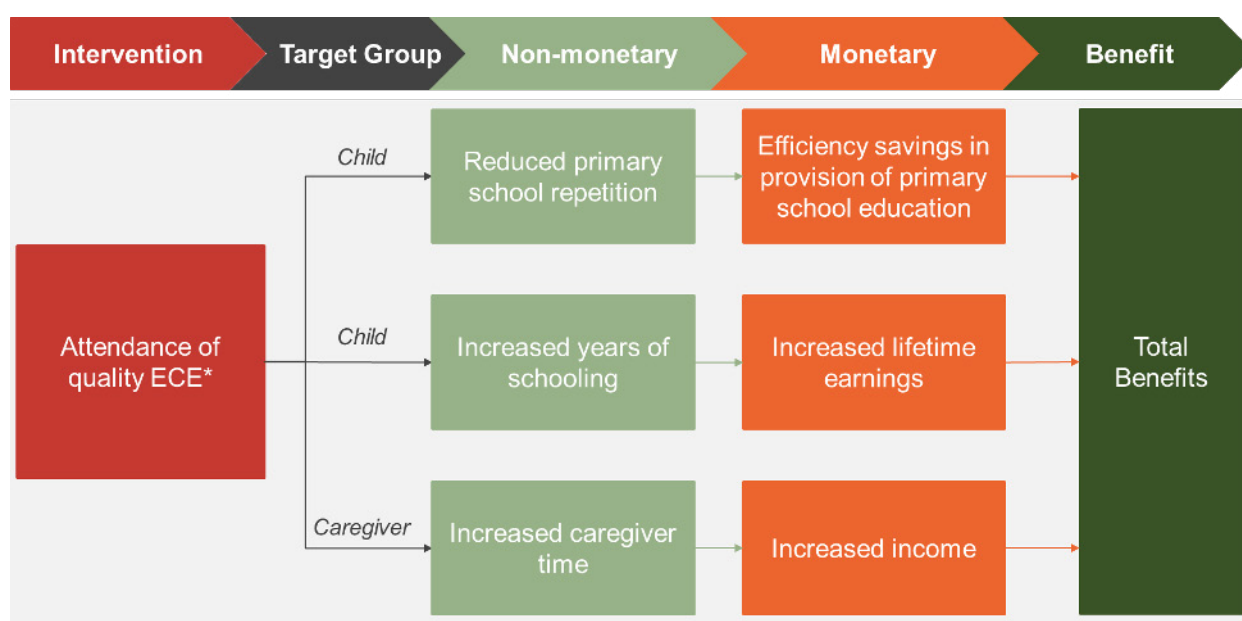
3.6. ESTIMATING BENEFITS

A thorough literature review has been carried out to identify appropriate tools and relevant methodologies to use to model non-monetary and monetary benefits of ECE. This has included reviewing the “Economic Implications of Investing in Early Childhood Care and Education in Jordan,” a working paper published in 2017 by the Queen Rania Foundation.³⁴ This comprehensive study quantified the benefits associated with ECE, including the cost savings of reduced repetition, increased labour force participation of carers, and increased lifetime earnings. In a 2011 study of 73 low-and middle-income countries undertaken by Engle et al., the impact of pre-primary enrolment on the gap between the schooling attainment of the wealthiest quintile of individuals age 15 to 19 years in a country and others in the same age range was estimated. Results suggested that for every percentage point increase in pre-primary enrolment, the schooling

gap for 15 to 19-year-olds declines 0.026 grades.³⁵ This benefit is then monetized by estimating the impact of adult productivity and lifelong earning by using studies on the rate of return on education in Iraq. A similar approach, using updated estimates and studies carried out in the ten years since this study was published, has been used to inform our own approach to the estimation of benefits.

The decision over which benefits, tools, and approaches to use has been determined based on an assessment of their utility for this project, and their contextual relevance. Based on this research, we built an Excel simulation model to estimate the benefits of expanding early childhood education. This model was used to quantify the benefits of expanding ECE and estimate them in monetary terms so that this can be compared to the costs of the various scale-up policy options.

Figure 5: ECE Impact Pathways



*Studies indicate that benefits of ECE on child development are only realized if ECE is of high quality and, usually for a duration of at least one year.³⁶ As per the Early Childhood Environment Rating Scale (ECERS-R; Harms et al., 1998³⁷), quality of ECE depends on the following: Space and furnishing; Personal care routines; Language-reasoning; Interaction; Programme structure; and Parents and staff. Whilst secondary data on ECE in Kirkuk does not permit assessment across all such quality dimensions, it is assumed that the delivery of quality ECE is achieved in Policy Options A – D according to the targets set in INES – i.e., the modelling of appropriate student-classroom ratios, adequate continuous teacher training, and sufficient provision of learning supplies. Benefits will only accrue after a child has experienced at least one year of ECE.

Below is a description of the selected benefit impact pathways:

- **Reduced primary school repetition:** studies show that access to high quality ECE can reduce the primary school repetition rate.³⁸ ECE is associated with improved school readiness, socialization, and

cognitive development, which contributes to children progressing better at later stages of education.³⁹ We drew on empirical findings a recent study of 109 developing countries⁴⁰ to model the impact of increasing access to high-quality ECE on the primary school repetition rate of the country, as well as the number of primary school years, which are repeated.

This non-monetary benefit was then monetized by estimating the cost per student of a year of primary school multiplied by the years of repeated primary school averted due to the intervention. This was in line with a number of other studies, which have successfully integrated this approach, including recent cost-benefit studies of ECE in Malawi⁴¹ and Jordan⁴².

- **Improved lifetime earnings from increased years of schooling:** as stated above, ECE is associated with improved child development outcomes, school readiness and socialization, all of which contribute to children being more likely to stay in school for longer. A systematic review of the literature on the effectiveness of interventions in ECD ran regressions on studies from 73 developing countries, that preschool enrolment is associated with 1.25-2.0 years of additional schooling or grade attainment.⁴³ Using this study, the low end of the estimate (1.25) was used in our model as the predicted boost that ECE completion gives to grade attainment of total schooling (1.25). In line with the literature, the rate of return of a year's education is estimated at a factor of 11⁴⁴, and remains the same across the time horizon of the study (with the assumption that the economy can provide jobs, which will have higher wages or a potential that is more productive). Taken together, we model that a child that completes ECE has 14 per cent higher lifetime earnings than the population average.
- **An important consideration when accounting for this benefit is the associated costs of delayed entry to the labour market.** The impact of ECE enrolment in increasing secondary school completion means for adolescents spending additional years in school as opposed to entering the labour market. Herein, the model deducts the opportunity cost associated with additional ECE students' delay in contributing to productive economic activity.

- **Increased caregiver time:** the provision of ECE services frees up time for caregivers (usually women).⁴⁵ Studies show that this 'freed up' time can be significant and, often, can instead be utilised as income-generating activities.⁴⁶ We modelled the potential increase in caregiver time as a result of scaled up ECE provision. This is calculated by estimating the number of hours saved annually (based on regional studies on time savings associated with ECE), which was then multiplied by the number of caregivers who would benefit.⁴⁷ We then modelled the potential increase in caregiver income as a result of scaled up ECE provision. This was calculated by estimating the number of hours saved annually which would be used instead for income-generating activities (based on literature). This figure is then multiplied by a conservative estimate of hourly wages and the number of caregivers who would benefit.⁴⁸ Using literature on female unpaid care work, we were also able to estimate the impact of increased ECE on the female labour force participation rate.⁴⁹ Whilst the previous two benefit pathways for reduced repetition and lifetime earnings are assumed to apply following the completion of one year of ECE, the benefits for caregiver time are sensitive to the length/dosage of ECE (i.e. these benefits apply to each year of ECE completed).

For Policy Options A – D, the monetized benefits from each of the three benefit pathways were then summed to create an estimate of the total benefits of scaling up ECE provision. However, for Policy Option E, 'Home-based ECE, the model accounts only for the 'increased caregiver time' pathway. The exclusion of the former two pathways owes to a reluctance to assume that ECE delivered by community members, as opposed to formally trained teachers, in a non-formal, unsupervised setting, will be delivered to the same quality of instruction. Herein, potential impacts of such ECE on school completion, lifetime earnings and delayed labour market entry are not accounted for in the modelling of Policy Option E.

3.7. SOCIAL DISCOUNTING RATE

Given that this study entails the application of a CBA over a long time horizon, it is necessary to apply a social discounting rate (SDR) to all costs and benefits. As costs and benefits occur during the intervention lifetime and then over several years when the benefits of ECE completion are accrued, a social discounting rate is

applied to obtain their net present value. This calculation aims to estimate the worth of future costs and benefits for stakeholders' planning investments in the present year. A social discounting rate of 6 per cent is used in line with global studies, including those from the MENA region.

3.8. DATA SOURCES

Data Category:	Indicator Type:	Data Source:
Population & ECE enrolment data	Population data	UN World Population Prospects
	ECE enrolment data	CSO data 2019/2020
	ECE enrolment targets	INES 2022-2031 & UNICEF Iraq inputs
Costs	Operational and capital expenditure on ECE in Iraq	Iraq Ministry of Finance annual budget and expenditure data (MOE & MOHESR)
	Proportion of expenditure on capital and operational costs within ECE	Iraq National Education Strategy (INES, 2022-2031)
	Relative contribution of the Government, private sector and community to ECE expenditure	Inputs from Iraq UNICEF office
Benefits (overall)	Macroeconomic indicators (e.g. GDP, GNI, general government revenue, inflation etc.)	IMF estimates for Iraq, World Economic Outlook Database, 2022-2027. For data after 2027, we assume the GNI per capita and inflation rate remains constant, as per 2027 value.
	Exchange rate (USD/LCU)	Google Finance, 2022
	Labour income share of GDP	ILO modelled estimates, 2019
	Labour force participation rate	
	Income tax	Deloitte Tax Handbook, Iraq, 2021
Benefits (reduced repetition)	Primary school repetition rate	CSO data 2019/2020 Brunette et al., 2017
	Government funding per primary student	INES (2022-2031) on operational expenditures in primary schools, divided by CSO data on primary school enrolment in 2019-2020.
Benefits (improved lifetime earnings)	Rate of return on a year of education	Pscharopoulos & Patrinos (2018)
	GNI per capita, Atlas method, (current LCU)	World Bank, 2021
	Probability to earn full GNI per capita	Hoddinott et al, 2013
	High school graduation (per cent)	Kirkuk figure- from UNICEF Iraq Education Fact Sheets, 2020
	Age entering & exiting labour force	Iraq Labour Force Survey, 2021
	Minimum wage & average wage	
	Years of schooling (average)	World Bank, 2022
	Impact of 10 per cent increase in ECE on primary school repetition rate	Muroga et al., 2020
	Impact of ECE on grade attainment (lower bound)	Engle et al. 2011
Benefits (caregiver time)	Labour force participation, women, Iraq	
	Productive time saved for caregivers when children in preschool	Larsen et al., 2021

3.9. BENEFIT-COST RATIO

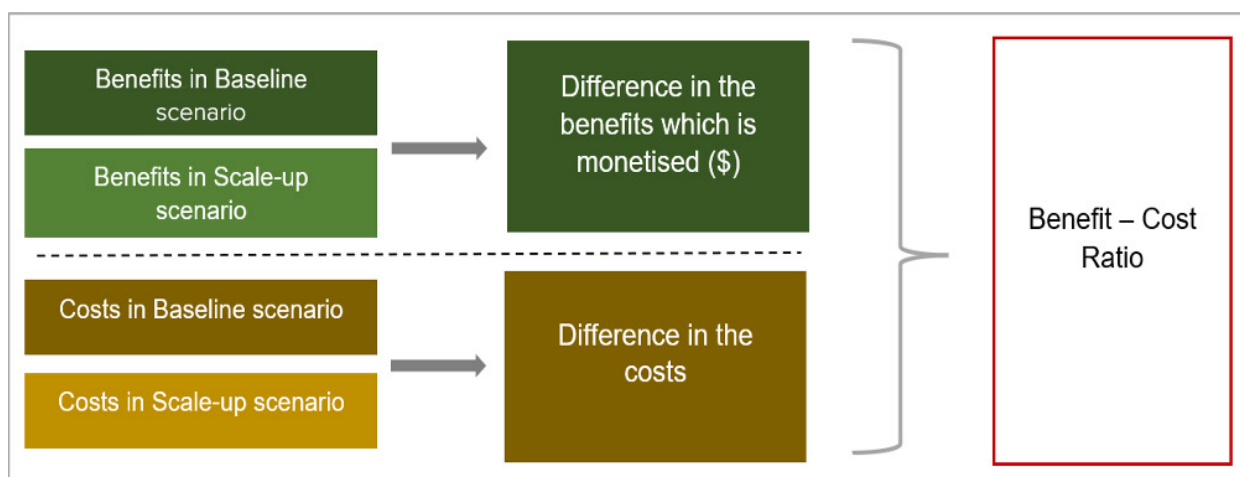
The incremental benefit-cost ratio (BCR) is the ratio between the incremental monetary benefits relative to the incremental costs of expanding ECE coverage, per policy option. A BCR reports the incremental dollar value gained per incremental dollar cost of expanding access to ECE in Kirkuk, and hence helps in determining

the margin by which the intervention is more beneficial or costly over the period of interest. If the benefit-cost ratio of the intervention is greater than one, this implies the intervention has positive net benefits whereas if it is less than one, it implies the intervention has negative net benefits. In providing a BCR for each of Policy Options

A – E, we are able to determine the margin by which an intervention is more beneficial or costly than another intervention. Whilst a BCR can inform decision making as to whether or not to proceed with an investment

(in presenting a net positive/negative benefit of the investment), the model adopted here does not claim to capture the myriad factor that influence the success or failure of an investment's implementation.

Figure 6: Schematic Representation of Benefit-Cost Ratio



$$BCR = (\sum \beta_1 - \beta_2) / (\sum C_1 - C_2)$$

Where, β_1 = total benefits for scale-up scenario
 β_2 = total benefits for baseline scenario
 C_1 = total costs for scale-up scenario
 C_2 = total costs for baseline scenario

The BCR results presented in the next section do not reflect mutually exclusive policy options. This is demonstrated by the inclusion of Policy Option E, the

'Home-based ECE' policy option, whereby the costs and benefits of the intervention are compared to a separate (rural-only) baseline scenario. As is the case in Kirkuk and Iraq more generally, ECE is provided through a mixed system of providers. Findings presented here are intended for use by stakeholders to motivate for enhanced investment in the ECE policy option, or combination of options, offering a high return on investment (both in monetary and non-monetary terms).

3.10. REPORTING OF OUTPUTS

The outputs of this analysis are reported in this Investment Case. These outputs include a statement of the impacts (benefits) according to each scale-up scenario, in both monetary (discounted using SDR) and non-monetary terms, as well as a statement of the costs for each scale-up scenario. It should be noted that all of these outputs are incrementally reported (or additional terms)

– in other words, they are the difference between the baseline scenario and the scale-up scenario / ECE Policy Option under study. Further, these impacts and costs will be compared and expressed as terms of incremental benefit-cost ratios and incremental cost-of-inaction. The calculations for incremental benefit-cost ratios and incremental cost-of-inaction are presented below.

$$\text{Incremental benefit-cost ratio} = \frac{\text{Additional benefit (monetary)}}{\text{Additional costs (monetary)}}$$

$$\text{Incremental cost of inaction} = \text{Additional benefit (monetary)} - \text{additional costs (monetary)}$$

4. RESULTS OF COST-BENEFIT ANALYSES

4.1. COSTS

Modelled costs of ECE scale-up in each policy option are presented according to the time period, the financing source, and the cost type. Financing sources are disaggregated by public, private and community contributions – public contributions to Policy Options D and E are not indicative of scale-up of enrolment in public ECE centres, but instead the Government subsidization of costs for community- and home-based ECE scale-up. Cost types are disaggregated by recurrent and capital expenditures, where recurrent expenditures accrued through private sector scale-up include the 10 per cent private sector profit margin.

As expected, the direct costs of ECE provision for each policy option peak in first period extending from 2023 to 2031. This period constitutes the scale-up of ECE coverage, whereby large sums of capital expenditures are required to construct and/or refurbish classrooms

for the purpose of ECE. Nonetheless, such costs do not shrink dramatically in the subsequent years, even after applying the social discounting rate. This is attributed to the increase in recurrent expenditures from 2032 to 2040 as compared to the previous period, owing to the maintenance at the peak ECE enrolment target for the duration of this period, for each respective policy option.

Over the complete intervention time horizon, the descending order of expense for each policy option is as follows: Grade Zero, Traditional, Community-based, Home-based then School-based ECE. This is reflective of the additional number of children (four and five-year olds) enrolled in ECE in each respective policy option. Total direct costs, to be incurred by public, private and/or community providers, range from IQD 34 trillion to IQD 255 trillion (discounted).

Table 4: Additional costs associated with the scale-up of ECE in each policy option

	A: Traditional [ages 4 and 5]	B: School-based [age 5]	C: Grade Zero [age 5]	D: Community-based [ages 4 and 5]	E: Home-based [ages 4 and 5] (rural only)
Direct costs of ECE provision (recurrent and capital), IQD millions (discounted)					
2023-2050	106,022	33,700	205,731	65,598	41,658
2023-2031	52,191	13,571	99,517	26,790	16,616
2032-2040	29,992	11,056	58,974	21,362	13,769
2041-2050	23,839	9,072	47,241	17,446	11,274
Share of costs by financing source (public per cent / private per cent / community per cent)					
2023-2050	62 per cent / 38 per cent / 0 per cent	55 per cent / 45 per cent / 0 per cent	92 per cent / 8 per cent / 0 per cent	74 per cent / 0 per cent / 26 per cent	1 per cent / 0 per cent / 99 per cent
	Publ. / Priv. / Comm.	Publ. / Priv. / Comm.	Publ. / Priv. / Comm.	Publ. / Priv. / Comm.	Publ. / Priv. / Comm.
Share of costs by cost type (recurrent per cent / capital per cent)					
2023-2050	76 per cent / 24 per cent	87 per cent / 13 per cent	77 per cent / 23 per cent	86 per cent / 14 per cent	87 per cent / 13 per cent
	Rec. / Cap..	Rec. / Cap..	Rec. / Cap..	Rec. / Cap..	Rec. / Cap..

The mix of financing sources shows high variation per policy option. For Policy Option A, Traditional ECE scale-up, the Government contributes around three-quarters

of total costs. Under Policy Option B, School-based ECE, there is near parity between public and private financing sources, with the former constituting 55 per cent of the

scale-up. The discrepancy between these figures for Policy Options A and B can be attributed to the inclusion of four-year-olds in the ECE scale-up for Policy Option A, and their exclusion from Policy Option B. Notably, baseline enrolment for four-year-olds is far lower at 9.9 per cent than that of five-year-olds at 17.4 per cent. Thus, this calls for a more substantial proportional scale-up in public centres than in private centres. Turning to Policy Option C, Grade Zero ECE, which focusses on five-year old scale-up only, we see 92 per cent of the cost accrued through public finance. This is due to the assumption that private sector provision of ECE will peak at 7.5 per cent of the five-year-old population, as per the target set in INES 2023-2031, with the remainder of enrolment achieved through provision in compulsory Grade Zero of public primary schools. The financing sources of the remaining Policy Option D and E are divided amongst public and community resources. Policy Option D, Community-based ECE, documents a three-quarter contribution of public finances, owing to the subsidization of teacher remuneration, continuous teacher training and a majority share of learning supplies. Conversely, in Policy Option E, Home-based ECE, the absence of government subsidization for teacher remuneration leads to 99 per cent community financing of the scale-up.

4.2. BENEFITS

Below benefits from ECE expansion until 2031, maintaining coverage levels until 2050 are presented in monetary and non-monetary values per policy option. As per explanations in preceding sections, each of the three benefits impact pathways are modelled for Policy Options A – D, whilst only increased caregiver time is modelled for Policy Option E.

Results are impacted by the assumption that one year of high-quality ECE is sufficient to deliver benefits

4.2.1. Benefits of reduced primary school repetition

Currently, repetition rates in Kirkuk's primary schools (all providers) are 6.7 per cent⁵⁰, constituting a key source of inefficiency that places pressure on an already resource-strapped sector. In 2019-2020, this figure amounted to 17,166 children requiring a repeated years of primary school tuition – costing the GDOE in Kirkuk an estimated IQD 14 billion.⁵¹ Given project population growth until 2050⁵², the number of repeated years is set to rise to 20,848 annually under the business-as-usual scenario.

Regarding the modelled financing sources, further studies should investigate the feasibility of the private sector and community contribution to an ECE scale-up. A feasibility study would focus on the regulatory framework for private and community provision of ECE, and how this could be adapted with the aim to scale-up high-quality ECE provision. Further, it may identify the available resources for such a scale-up amongst businesses, communities, civil society organizations and parents in Kirkuk, in addition to the interest (or scepticism) amongst such stakeholders in expanding ECE provision.

The distinction between recurrent and capital costs is seen to fall within two policy-option camps. First, those policy options which include the construction of new classroom facilities (Policy Option A and C) document a 76-77 per cent share of recurrent expenditures. Second, those policy options, which entail the repurposing of existing facilities for use as an ECE classroom (Policy Option B, D and E), document an 86-87 per cent share of recurrent expenditures. This is expected as per the modelling, whereby the cost of repurposing is half that of constructing new facilities.

in terms of reduced primary school repetition and lifetime earnings. Specifically, it leads to Policy Options A, B and D entailing similar benefit levels. This is due to the design of each policy option, whereby enrolment of five-year-olds is scaled-up from the baseline 17.4 per cent to 30 per cent by 2031 and maintained until 2050. Further, despite Policy Options A and D including scale-up of ECE services for four-year-olds, this is not reflected in these two benefit pathways.

As reported in Table 4 below, a significant number of repeated years of primary school would be averted through the scale-up of ECE. In Policy Options A, B and D, where target coverage is 30 per cent, this figure is estimated at 6,838 years between 2023 and 2050, corresponding to IQD 2,342 million (discounted). For Policy Option C, compulsory 'Grade Zero' ECE in which 84 per cent of five-year-olds attend ECE by 2031, 36,361 repeated years are averted in the same period, monetized

at IQD 12,421 million (discounted). The monetary value of the benefit in Policy Option C is a factor of 5.3 times greater than those for other policy options. This is directly reflective of the difference in the size of ECE coverage expansion, in percentage point terms: 12.6 increase for Policy Options A, B and E, compared to 67 increase in Policy Option C.

The model estimates the averted years of primary school repetition on an annual basis, with insights on the potential benefits by 2050. Accounting for

population growth, if scale-up targets are achieved and maintained until 2050, Policy Options A, B and D

will deliver 306 averted years of primary school repetition in 2050 alone, as compared to baseline. For Policy Option C, this figure stands at 1,624 averted years in 2050, equal to 8 per cent of the 20,848 repeated years that are projected for 2050. Considering these figures on an annual basis provides a more tangible insight into the potential impact on the education system and broader economy if ECE is expanded in Kirkuk.

Table 5: Savings from reduced primary school repetition, IQD millions (discounted)

	A: Traditional [ages 4 and 5]	B: School-based [age 5]	C: Grade Zero [age 5]	D: Community-based [ages 4 and 5]	E: Home-based [ages 4 and 5] (rural only)
Repeated years of primary school averted					
2023-2050	6838	6838	36261	6838	N/A
Savings from reduced primary school repetition, IQD millions (discounted)					
2023-2050	2,342	2,342	12,421	2,342	N/A

4.2.2. Benefits of improved lifetime earnings

Data presented here are net benefits from improved lifetime earnings. This represents the increased earnings associated with the impact of ECE on grade attainment and school completion, minus the cost associated with said students' delayed labour force participation.

Those who complete ECE attain an average 1.25 years more schooling, than those who do not attend ECE. The average rate of return on a year's education is a factor of 11.⁵³ Taken together, this suggests that completion of ECE is linked to a 14 per cent increase in potential lifetime earnings. These data are represented in monetary terms only.

Table 6: Net improvements to lifetime earnings

	A: Traditional [ages 4 and 5]	B: School-based [age 5]	C: Grade Zero [age 5]	D: Community-based [ages 4 and 5]	E: Home-based [ages 4 and 5] (rural only)
Net benefits from improved lifetime earnings, IQD millions (discounted)					
2023-2050	1,211,051	1,211,051	6,422,203	1,211,051	N/A
2023-2031	379,272	379,272	2,011,279	379,272	N/A
2032-2040	508,689	508,689	2,697,577	508,689	N/A
2041-2050	323,090	323,090	1,713,347	323,090	N/A

As with benefits related to reduce primary school repetition, Policy Option C demonstrates higher improved lifetime earnings by a factor of 5.3. Over the full time horizon (from 2023 to 2051) this equates to IQD 8,652,203 million or IQD 8.7 trillion (discounted). For Policy Options A, B and D, the figure is IQD 1.6 trillion (discounted). In each scenario, the benefits of improved lifetime earnings are seen to peak in the period extending from 2032 to 2040, in net present value terms. The

subsequent fall in benefits in the period extending 2041 to 2050 is due to the application of the 6 per cent SDR.

It is important to note that benefits to the economy will not be realized until 2037, when the first cohort of additional ECE children enter the labour market.

As per the literature, the benefits of improved lifetime earnings are accounted (and discounted) beginning from the moment of ECE completion.

4.2.3. Benefits of increased caregiver income from increased caregiver time

Results for caregiver time exhibit the most variegated across the ECE policy options modelled. Unlike the prior two benefit pathways, the benefits of increased time for caregivers are not limited to those five-year-olds completing one year of ECE. Instead, caregivers are seen to benefit for those children engaged in two years of ECE.

This implies that the benefits are realized when increasing the number of four-year-olds enrolled in ECE also. This leads to diverging results per policy option, given that some options entail a scale-up of ECE for both four- and five-year-olds, whilst others target five-year-olds only.

Table 7: Benefits of increased caregiver time

	A: Traditional [ages 4 and 5]	B: School-based [age 5]	C: Grade Zero [age 5]	D: Community-based [ages 4 and 5]	E: Home-based [ages 4 and 5] (rural only)
Hours of caregiver time saved (millions)					
2023-2050	140	54	285	108	64
2023-2031	26	10	54	20	12
2032-2040	52	20	105	40	24
2041-2050	62	24	126	48	28
Potential caregiver income from time saved, IQD millions (discounted)					
2023-2050	195,633	75,038	397,926	150,829	89,220
2023-2031	45,241	17,296	91,721	34,859	20,620
2032-2040	75,474	28,913	153,328	58,175	34,412
2041-2050	74,919	28,829	152,878	57,795	34,187

In modelling the largest increase in ECE coverage, Policy Option C provides the greatest savings in caregiver time at 285 million hours. This corresponds to IQD 398 trillion (discounted) over the full-time horizon. This is followed, in descending order, by: Traditional, Community-based, Home-based then School-based ECE. The placement of Policy Option E, Home-based ECE, ahead of School-based is noteworthy. Despite the former focusing only on Kirkuk's rural areas, it entails a larger absolute increase in enrolment, given the inclusion of four-year-old children in the scale-up, together with the low baseline coverage of ECE in rural areas (circa 1 per cent for four and five-year-olds).

Across all policy options, the number of caregiver hours saved owing to their child's ECE enrolment are seen to grow in each consecutive time period. The reason for growth in the period extending from 2041 to 2050 as compared to the one ranging from 2032 to 2040, despite ECE coverage maintaining across these two periods is attributable to population growth. Regarding the monetization of said hours, there is rapid growth in caregivers' potential contribution to productive economic activity in 2023-2031, and again between 2031 and 2040. This is seen to fall slightly in 2041-2050, but this is due only to the application of the social discounting rate to attain net present value.

4.3. BENEFIT-COST RATIO & COST OF INACTION

The model demonstrates positive return on investing in each ECE policy option, as per the benefit-cost ratios (BCRs) in Table 8. The range of BCRs for the full time horizon (2023-2050) is from 2 with Policy Option E (Home-based ECE) to 38 with Policy Option B (School-based). For stakeholders' interpretation, taking the example of Policy Option B, this result can be interpreted as follows: for every 1 IQD invested in scaling-up School-

based ECE to reach 30 per cent enrolment for five-year-olds by 2031, and maintaining this coverage until 2050, Kirkuk governorate will benefit by an estimated 38 IQD – a large return on investment. These figures do not discriminate between provider type (public, private and/or community) with regard to the financing source or beneficiary. Instead, the BCR represents the overall net positive gain to the local economy in Kirkuk.

Responsibility in financing and provision of the ECE scale-up varies as per the design of each policy option, and the

corresponding contribution to each unit cost.

Table 8: Benefit-cost ratios and the cost-of inaction, per policy option.

	A: Traditional [ages 4 and 5]	B: School-based [age 5]	C: Grade Zero [age 5]	D: Community-based [ages 4 and 5]	E: Home-based [ages 4 and 5] (rural only)
Total Benefits	1,409,026	1,288,431	6,832,550	1,364,222	89,220
Total Costs	106,022	33,700	205,731	65,598	41,658
BCR 2023-2050	13	38	33	21	2
Cost-of-inaction					
(IQD millions, discounted)	1,303,004	1,254,732	6,626,819	1,298,624	47,561

The cost-of-inaction is high, indicating the urgent need for ECE prioritization in Kirkuk. Amongst policy options focused on both the urban and rural population, the cost-of-inaction between 2023 and 2050 ranges from IQD 1.25 trillion to IQD 6.6 trillion in net present value terms. To put these figures into perspective, they amount to between 0.5-2 per cent of Iraq's total GDP. Whilst the BCR for Policy Option B is highest⁵⁴, the cost-of-inaction is highest for Policy Option C: compulsory Grade Zero ECE, attributable to the far larger scale-up in enrolment entailed in Policy Option C.

It notable that the two highest BCRs, Policy Options B and C are focused on scaling-up enrolment for five-year-olds only. This result is expected as per the model assumptions, whereby the duration of ECE beyond one year does not have an additional impact on educational performance, in line with international literature. Herein, the enrolment of additional four-year-olds entails costs without further benefits in terms of reduced primary school repetition or lifetime earnings. An assessment of the differential impact on learning between a student

completing one or two years of ECE in Kirkuk, or Iraq in general, may inform a revised approach to the policy options modelled. Despite the inclusion of four-year-olds in the scale-up for Policy Options A and D, each presents a high BCR.

Further, the cost-of inaction for Policy Options A and D is higher than that for Policy Option B. This is due to the relatively higher benefits to be gained from caregivers' additional labour market participation, owing to reduced childcare commitments.

The large impact of ECE on caregiver time is alone sufficient in achieving a positive BCR, as demonstrated by Policy Option E where other benefits are not assumed to apply. This is crucial for stakeholders, demonstrating evidence of a strong return to investment for ECE even where the quality of instruction may be up for debate. As per the data shown here, investments in the expansion of ECE can happen concurrent to efforts to ensure a high quality of instruction, all the while providing a positive economic return.

5. BUDGETARY ANALYSIS OF ECE

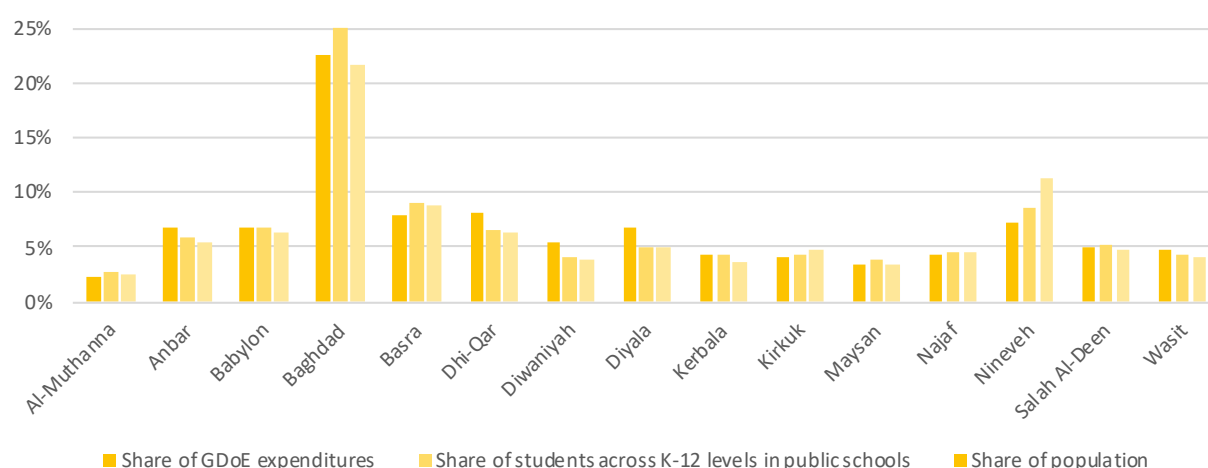
This section focusses on the role of public finance in the projected scale-up across the different ECE provision types. The above section outlined the modelled share of the private sector and community in the financing and provision of ECE services, per provision type. It is important to note that non-budgetary levers are available to the Government (GOI and Kirkuk governorate Authority) to incentivize and facilitate the scale-up of high-quality ECE by private and community stakeholders – explored further in recommendations below.

This budgetary analysis focusses on both operational and capital expenditures pertaining to education financing. The General Directorate of Education (GDOE) in Kirkuk is responsible for the management of operational expenditures for public education provision across K-12 schooling levels. For capital expenditures, there has been no such devolution of budgetary functions, which are managed by the central Ministry of Education (MOE). Whilst operational expenditures serve to support the existing student population, capital expenditures which are dominated by costs for construction and refurbishment can be proxied as the commitment to the expansion

of coverage for an education level. To understand the potential for such actors to contribute toward the modelled scale-up scenarios, it is necessary to calculate the existing commitment to ECE across each of these expenditure types.

Data on total operational spending by Kirkuk's GDOE as compared the other locations provides a high-level insight on the relative prioritization to Kirkuk's K-12 education system. In absolute terms, Kirkuk's GDOE spent IQD 363 billion in 2021.⁵⁵ Comparing this with other governorates requires a conversion the share of overall spending. As seen in Figure 7, Kirkuk documented a 4.1 per cent share of spending by GDOE in 2021. Kirkuk is one of five governorates where this share falls below the governorate's share of students attending public K-12 education (a combination of children in kindergarten, primary and secondary schools) and the governorate's share of the population in South and Central Iraq. This suggests that, at a national level, spending at K-12 level in Kirkuk is being under-prioritized vis-à-vis other governorates, as compared to the needs of existing students and the local population in general.

Figure 7: Comparison of each governorate's share of (a) national spending by General Directorates of Education, (b) students attending public school across K-12 levels, and (c) the population of South/Central Iraq (per cent)⁵⁶



Under the existing budget classification, operational expenditures by a GDOE are not disaggregated by the relevant school level. In other words, there is no exact figure on the commitment to ECE services vis-à-vis finance for primary or secondary schools. The INES 2023-2031 includes a baseline calculation of the commitment to kindergartens (herein proxied as the commitment to ECE): in 2022, kindergarten accounts for 1.5 per cent of spending across kindergarten, primary, intermediate and preparatory academic schools. Applying this to the GDOE in Kirkuk, it is estimated that IQD 5.6 billion was spent on public ECE (kindergartens) in 2021. This amounts to an estimated IQD 475,000 per student in public ECE.

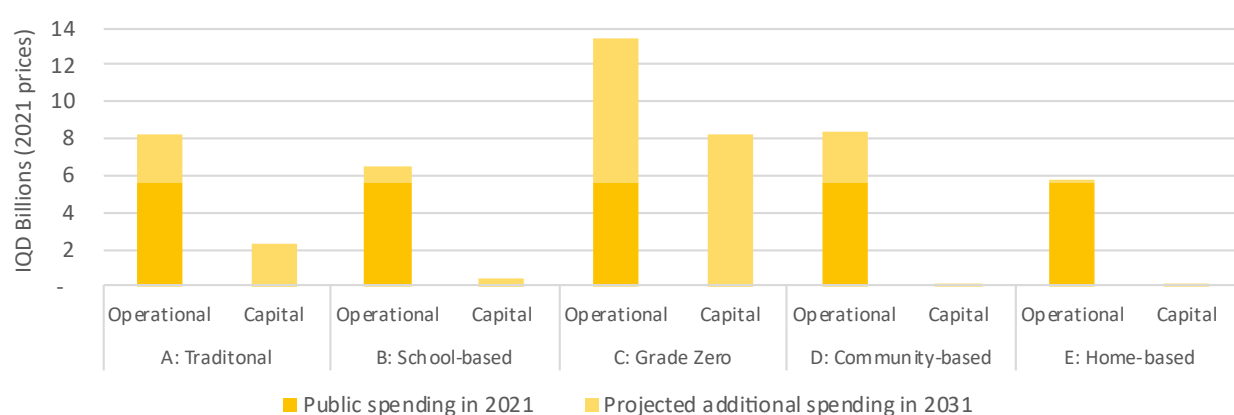
The budget classification for capital expenditures necessitates further estimations in order to calculate the baseline commitment to public ECE in Kirkuk.

In 2021, the Ministry of Education spent IQD 160 billion on capital expenditures.⁵⁷ Of this, 17 per cent of budget lines did not specify the governorate where spending took place. From the budget lines which did specify the location, expenditures in Kirkuk accounted to just 0.9 per cent. This figure is disproportionately low, referring again to data on Kirkuk's share of the student population and population in general. Regarding the commitment to public kindergarten, most budget lines do not specify the school level. Of those which do specify the school level,

kindergarten accounted for 4 per cent of spending over 2016-2021.⁵⁸ Taken together, capital expenditures for ECE in Kirkuk in 2021 was an estimated IQD 56 million. This is a very small commitment, just under the average cost of constructing a new ECE classroom in Iraq.⁵⁹

In light of these estimations on the baseline commitment to ECE expenditures in Kirkuk, we are able to identify the financing gap per ECE provision type modelled in this study. Figure 8 exhibits the financing gap for operational and capital expenditures for each ECE provision type, comparing public expenditures in 2021 to the projected annual financing needs in the year 2031 – the final year of scaling-up coverage in ECE. For stakeholders' interpretation, these figures do not represent the full costs required to achieve scale-up between 2023-2031. Instead, 'projected additional spending' represents the size of the budgetary commitment in 2031 only, the year in which ECE coverage targets will be reached. Additional operational expenditures gradually increase year-on-year in line with coverage, reaching the peak shown in Figure 8. Conversely, additional capital expenditures are generally consistent in size each year between 2022 and 2031 given that coverage is modelled to increase by the same percentage during each year of the scale-up phase.

Figure 8: Financing gap between baseline public expenditures on ECE and projected expenditures for 2031, per ECE provision-type (IQD billions, constant 2021 prices)⁶⁰



The financing gap for public contributions to operational expenditures shows high variation across each ECE provision type. Amongst Policy Options A – C, where public finance is used to fund scale-up in public ECE facilities only, the project additional operational spend in 2031 ranges from IQD 0.9 billion in Policy Option B (School-based ECE) to IQD 7.8 billion in Policy Option C (compulsory Grade Zero ECE). The former would amount to a 16 per cent increase in the baseline operational spend, whilst the latter requires a more than doubling (139 per cent increase) in baseline spending. For Policy Options D and E, public finance is used to subsidize ECE scale-up through community-provision as opposed to within public facilities. For Policy Option D, Community-based ECE, the sizeable Government contribution of an additional IQD 2.8 billion in operational expenditures would owe mostly to the Government's subsidization of all teacher remuneration. The absence of this contribution in Policy Option E, Home-based ECE, explains the very low additional public finance required to meet this scale-up.

Advocacy around an increased allocation to operational spending on ECE in Kirkuk can follow multiple avenues. Firstly, as demonstrated in Figure 7, the allocation to Kirkuk's GDOE could be increased in line with its needs. If the allocation was increased from 4.1 per cent to 4.3 per cent to reflect Kirkuk's share of students in public schools, this would amount to an additional IQD 16 billion per year. Further, if adjusted to Kirkuk's share of the school-age population (4.9 per cent), to reflect both the needs of existing students and those currently out-of-school, this would amount to an additional IQD 66 billion per year. Secondly, the government's commitments in INES – including the 30 per cent ECE enrolment target – detail projected operational expenditures at ECE level, rising from IQD 127 billion in 2022 to IQD 445 billion in 2031 (constant 2019 prices). Assuming Kirkuk maintains its existing share of operational expenditures, such an increase would be sufficient to cover all provision types modelled.

In addition to advocating for increased budget allocations, the existing resource envelope for operational expenditures could be freed up through efficiency savings and redirected to support ECE scale-up. Across Policy Options A – C, the operational

cost per student per year is IQD 248,000 (2021 constant prices). This is almost half the size of baseline cost per student (IQD 475,000), indicating a far more efficient use of funds under the modelled scale-ups. This is attributed to the different resource mix according to the targets set by INES 2023-2031, in particular the reduced numbers of non-teaching staff per additional student (from 1.63 non-teaching staff per teaching staff at baseline, to 0.18 as per the INES target). Herein, the gradual removal of superfluous non-teaching staff in existing public ECE facilities constitutes a source of efficiency savings. Such savings could be redirected to other ECE inputs, supporting the scale-up of public provision and reducing the size of additional budget required to scale-up operational expenditures.

The Government contributes to capital expenditures in Policy Options A – C only, with costs in Policy Option D and E covered by community finance. For the former, the size of capital expenditures required follows the same descending order as that seen in operational expenditures, from Policy Option C to A to B. The differentiation is explained by the number of additional students and the split between new/repurposed ECE classrooms modelled for each provision type. It is a priority that advocacy centres on the increase in the capital budget as a prerequisite to ECE scale-up in Kirkuk, given the very low baseline spend and budgetary constraints on any reallocation between the operational to capital budget. Kirkuk's low share of the capital budget for education in recent years⁶¹ may be used to advocate for such an increase, with a strategic priority for a sufficient sum of the increase to be targeted at ECE level. If the existing share of the capital budget used for ECE in Kirkuk is maintained, the commitments of the Government in INES 2023-2031 – projected increases in education capital expenditures of IQD 800 billion by 2031, would be insufficient for the financing of Policy Options A – C.

Across all expenditure types, advocacy for public ECE financing can draw on the BCRs documented in the previous section. These capture the financial case for ECE modelled, with investments serving to increase the government's available resource envelope in the mid- to long-term across multiple benefit pathways.

6. KEY FINDINGS

Investing in expanding access to ECE has been demonstrated as crucial for the long-term development of children, yielding substantial economic gains in the long run. This is in line with growing global evidence on the utility of ECE, extending such conclusions to Iraq in general and Kirkuk governorate in particular using national and local data. The modelled scale-up scenarios are seen to be within financial reach of public institutions responsible for investing in ECE, to be achieved through efficiency savings in current provision and considerable advocacy to direct additional funds to ECE. Across each provision type – the design of which are informed by ongoing discussions in Iraq – the anticipated costs of achieving and maintaining ECE coverage targets are far outweighed by significant long-term gains. Scaling up coverage of ECE creates economic benefits in terms of (i) costs savings from reduced grade repetition, (ii) additional years of schooling and associated improvements in lifetime earnings, and (iii) income from caregiver time saved.

Across Policy Options A – D, where all three benefits pathways are assumed to apply, the benefit-cost ratios range from 13 to 38. BCR figures do not discriminate between financing source or provider type (public, private and/or community). Instead, the BCR represents the overall net positive gain to the local economy in Kirkuk. For stakeholders' interpretation, this result can be interpreted as follows: for every 1 IQD invested in scaling-up ECE until 2030 and maintaining this coverage until 2050, Kirkuk governorate will benefit by between 13 and 38 IQD – a large return on investment – depending on the chosen provision type. The large impact of ECE on caregiver time is alone sufficient in achieving a positive BCR, as demonstrated by Policy Option E where other benefits are not assumed to apply and a BCR greater than 2 is achieved. This is crucial for stakeholders, demonstrating evidence of a strong return to investment for ECE even where the quality of instruction is undetermined and/or unreliable in its current form. Investments in the expansion of ECE can happen concurrent to efforts to ensure a high quality of instruction, all the while providing a positive economic return.

Responsibility in the financing and provision of the ECE scale-up varies as per the design of each policy option, and the corresponding contribution to each unit cost. Efforts to improve the efficiency and adequacy of public financing for ECE must be combined with a focus on non-budgetary levers to mobilize private and/or community finance in the provision of high-quality ECE. A feasibility study which identifies the actions required to implement each ECE provision type modelled here, can be used to inform ECE scale-up in Kirkuk.

A strategy for ECE scale-up specific to Kirkuk governorate may opt to utilize multiple provision types modelled here. A carefully considered combination of provision type can assist in more broad and/or fast paces scale-up. For example, with education facilities lacking in parts of rural Kirkuk, it may be necessary to complement a School-based / Grade Zero scale-up with something akin to Home-based ECE in rural areas.

The case for investing in ECE is not one made solely on monetary terms; this study advocates strongly for the universal provision of ECE. Every child has the right to thrive: to avert repeated grades; to stay in school for longer, thereby enhancing their lifetime earning potential. Furthermore, every caregiver should have the opportunity to save time on unpaid care, and enter the labour force, should he wish so. Furthermore, while costly, benefits are seen to increase exponentially where high coverage of ECE is achieved. In considering the cost-of-inaction, achieving high ECE coverage is seen yield the greatest absolute benefit from investment.

7. POLICY RECOMMENDATIONS

Based on the results of this study, the following recommendations for the expansion of ECE are aimed toward stakeholders from national and subnational levels of the Government of Iraq (GOI). These include

7.1. SCALE UP INVESTMENT IN ECE

Iraq has a very young and fast-growing population.⁶²

Almost 40 per cent of the population in Iraq is made up of children under the age of 14⁶³. Therefore, the country faces a huge opportunity to reap the demographic dividend and achieve high degrees of development – if it enables its children to become productive members of the labour force. Early childhood education interventions are a key part of enabling children to reach their potential – international evidence is clear that by eight-years-old, we can very accurately predict which children will succeed, and that circumstances such as multidimensional poverty and toxic stress will have already done significant damage, including to future academic achievements and later lifetime earnings.⁶⁴ Data, however, shows that Iraq's Human Capital Index stands at approximately 40 per cent, indicating that with the current level of investment into early childhood, a child born in Iraq today will only be 40 per cent as productive as they could have been with adequate and quality education and health.⁶⁵ Given the positive correlation between the HCI and GDP, a country's HCI is an important predictor of its economic trajectory.⁶⁶

This investment case has confirmed that international experience holds true in Iraq – investment in ECE has a high rate of investment which can contribute to economic growth. Indeed, good BCRs exist for the scale-up of each policy option. With the recommended universal grade zero, every one IQD invested in in ECE could stimulate a return of 38 IQD over the period between 2023 and 2050. The findings presented in this study are too great to ignore, and signal a greater need for economic investment and political will towards ECE interventions.

Access to adequate and quality ECE is a human right. Iraq is amongst the UN member states, which have adopted the SDGs which are underpinned by the statement; "...no one will be left behind... and we will

the General Directorate of Education in Kirkuk and the central Ministry of Finance. The recommendations relate also to the broader set of stakeholders, spanning development partners, private actors and communities.

endeavour to reach the furthest behind first."⁶⁷ The SDGs are crosscutting and affect every aspect of a child's life across the life course, from good health and wellbeing to quality early learning, decent work and economic growth.⁶⁸ ECE is not a form of consumption that is expendable; it has long-lasting effects and is therefore the basis of this investment case.

It is clear that the Government of Iraq is underinvesting. Only 10 per cent of all four-year-olds in the country are enrolled in ECE at baseline, and 17 per cent of all five-year-olds.⁶⁹ Absolute spending is low, in part a consequence of low prioritisation, witnessed by suboptimal budget allocations to ECE as a proportion of the Government budget.

ECE has been systematically under-invested in. Whilst the total education budget is below target levels, the prioritisation of ECE within these budgets is of particular concern. Analysis suggests that a mere 1 per cent of the country's expenditure on education went to ECE, leading to falling enrolment rates and poor-quality teaching. If the impressive benefits of ECE to long-term productivity and life-long earnings modelled in this study are to be realized, therefore, a realignment of education financing is required.

It is clear that the early learning of young children could be better prioritised within current budgets, which would have powerful impacts on per capita spending on and, hopefully, outcomes in, human development. Investments in all ECE must be increased if the benefits of scaling up ECE policy options in this Investment Case are to be realised. These investments should not be seen as a cost or form of consumption but instead an investment in the long-term human capital of these young children, and of the nation.

7.2. BUDGET BETTER

Improved systems of budgeting and expenditure tracking need to be put in place to facilitate better financing for ECE. Current systems of public financial management make it difficult to precisely measure how much is being spent on the education of young children. It is, therefore, very difficult to indicate how more public funds can be channelled towards critical services for these groups or how to improve the efficiency, effectiveness or equity of this expenditure. Given the volatility of the oil market, and the lack of sufficient fiscal buffers in Iraq⁷⁰, better PFM systems are needed to inform decisions

which, maximize efforts in targeting towards ECE. In this regard, the following recommendations emerge:

The GOI needs to accelerate progress towards programme-based or objective-based budgeting.

The current system of public budgeting is still dominated by a line-item approach, despite efforts in reforming this. To this end, development partners and associated stakeholders must be strong advocates for such PFM reforms, providing technical and financial assistance to support efforts.

7.3. PRIORITIZE SPENDING ON YOUNG CHILDREN

The GOI may also need to consider how to prioritize expenditure amongst children and the interventions which affect them. Some of the considerations when making prioritization decisions include:

- **Population groups:** the GOI should think carefully about which groups of population benefit from Government funds. This Investment Case advocates for young children to be primary beneficiaries of the Government spending, owing to long-term value on human capital. However, the GOI may need to prioritize further, which could entail directing spending towards specific parts of the country with poor outcomes for young children or towards vulnerable population groups, such as children in hard-to-reach rural areas, displaced children, children with disability or those living in absolute poverty.
- **Interventions:** fiscal space is likely going to be too limited to allow the GOI to scale-up all policy options modelled in this. The data presented in this study should be used to guide the Government in deciding which policy options are likely to be the most beneficial, and for as many children as possible, hence our long-term recommendation for the roll-out of universal grade zero, as well as home-based ECE so that no child is left behind. However, the GOI might consider prioritizing spending on ‘interim’ interventions, such as the provision of school-based ECE to 30 per cent of five-year-old in Iraq, while the GOI is on the path to providing universal grade zero, and home-based ECE for rural-dwelling children. Since ECE in Iraq will require long-term, extensive investment to become high quality and universal, prioritizing interim mechanisms can be very effective at stimulating better learning outcomes for young children.

7.4. PLAN WISELY

Smart planning is key to realizing the gains explored in this Investment Case. For instance, challenges such as low enrolment rates, under capacity and understaffed schools have contributed perpetuated substandard educational conditions, disproportionately affecting the most vulnerable children, thus constraining their access to adequate resources and impeding their learning outcomes..⁷¹ To avoid a similar situation when adopting ECE reforms, it is therefore key that the GOI carefully plans how best to improve access and quality to ECE. Careful planning will also ensure that the most vulnerable children. For example, children in rural areas, poor children, displaced children and children with disabilities,

are considered as high priority in accessing ECE, and are therefore not left behind, as they often are by the existing education system.⁷²

There are a variety of elements to creating a clear, intelligent plan for ECE in Iraq. It is therefore crucial to establish a clear, actionable roadmap to coordinate the ECE strategy and interventions. An effective roadmap will include concrete steps and milestones for each of the goals laid out in the ECE strategy. This roadmap will include considerations on financing, staffing, infrastructure, data systems, service delivery, and monitoring and evaluation. Some key questions and

considerations under each of these subject areas are outlined in Table 9 below. Development partners can play a big role in many of these activities, particularly concerning training and capacity development. They can assist in

training local authorities in activities such as how to do costing and budgeting for ECE, and how to set up easily accessible data systems for ECE.

Table 9: Key Considerations for an ECE Roadmap



- An emerging lesson is this pressing need to work on long-term resource mobilisation for early childhood education services for young children, across all sub-sectors of ECD.
- Smart analysis will be needed to support better financing for children. It should include both an analysis of public financing (which will likely be the source of the majority of the resources for ECE), as well as how to mobilise private financing.
- Examples of the types of analysis which should be carried out to support the ECE Roadmap include:
 - Fiscal Space Analysis for ECE
 - Budget and Expenditure Tagging and Tracking for ECE
 - Priced Implementation Plans for ECE interventions
 - Dynamic projections of needs and demands on resources, and changes over time.



- Build on existing structures and strategies, which have been established to push forward the ECE agenda, including the National Strategy on ECD (2022).
- Create accountability mechanisms to ensure all ECE and ECD sectors are working in harmony towards joint goals for young children.



- Continue to support policy and legislative efforts in the sub-sectors related to ECE. Enshrining the Government commitments provides an excellent avenue to ensure continued action and an important accountability mechanism.
- It is also difficult to reverse legislative action, making it a change, which is more likely to be sustained.



- Capacity development needs to be a priority of efforts in all sub-sectors of ECE. For example, a real challenge in Iraq remains in ensuring staff to student ratios, which allow for good quality service provision.
- Actions to take to inform analysis and planning related to workforce include:
 - Capacity and workforce mapping for ECE to understand gaps and bottlenecks
 - Research innovative solutions to scale up staffing (community-based structures, local training institutions etc)



- Similarly, an ECE Roadmap also needs to think concretely about how to enable a rapid scale-up in infrastructure to provide ECE services for young children, including creating additional capacity pre-schools etc. Looking at countries at similar income levels might help to inform how to achieve this in a financially feasible way.
- Further, this might include utilising a deeper budget or expenditure analysis for ECE to ask whether budgets align with expansion – for example, what is the breakdown between capital and recurrent expenditure and how can it be expanded?
- This pillar of the roadmap should also account for demand and the need to eliminate barriers to accessing ECE. This might include engaging in socio-behavioural campaigns and community mobilisation efforts.



- M&E has not been systematically used to guide implementation of ECE – in future, it should be a frequent activity, allowing programmes to pivot towards the most sustainable and effective ways of making progress in ECE across the country.
- An ECE Roadmap would outline detailed plans for how monitoring ECE would be managed and support better coordination and programming.

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