

Costing Study on Early Childhood Education and Development (ECED) in Nepal: A Case for Investment in ECED



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Contents

1. Why Invest in ECED?	5
Long-term Impacts of ECED Investment	6
Economic Aspect	6
Social Aspect	7
Dynamic Complementarity of ECED Investment	7
Does the Impact of ECED Fade-out?	8
2. Status of ECED in Nepal	9
Access to ECED	9
ECED Enrolment Pattern	10
Inequality in Access to ECED	11
Gender	11
Wealth	11
Geography	12
Role of Private ECED Providers	13
Non-registered Private ECED Providers	13
Quality of ECED	14
Early Childhood Development Index	14
Enabling Environment - Minimum Standards	15
Class Size	15
ECED Facilitators	16
ECED Financing	17

3. How Much Additional Cost is Required to Improve the Quality of ECED Service?	19
Enrolment Projection	19
Base Model	20
Cost of Improving the Quality of ECED Services	21
Option 1: Higher Facilitator Salary	20
Option 2: Provision of Principle Elements of Minimum Standards	22
Option 3: Provision of Supervisors	23
Feasibility of the Different Options	24
Increase in the Share of ECED Budget by the MoEST	25
Cost Recovery	26
Demographic Change	26
Cost Sharing Between Local and Federal Government	26
4. Conclusion	27
References	29
Annex 1: Population Projection	31

List of Tables

Table 1: ECED Attendance Rate by Gender and Caste	11
Table 2: ECED Attendance Rate by Gender and Wealth Quintile	12
Table 3: Number of Children in ECED Facility by Age	14
Table 4: ECDI Score and Literacy and Numeracy Domain by Wealth and by Gender	14
Table 5: Percentage of Education Budget Allocation to ECED Sub-sector, 2014/15-2019/20	17
Table 6: ECED Budget Requirement under Scenario 1	25
Table 7: ECED Budget Requirement under Scenario 2	25
Table 8: Trend in Education Budget, 2014/15–2019/20	26

List of Figures

Figure 1: Human Brain Development	6
Figure 2: Expansion of ECED Access	10
Figure 3: Over and Under Age ECED Attendance	10
Figure 4: Provincial Gap in ECED Access	12
Figure 5: Private ECED Centres in Nepal	13
Figure 6: Enrolment in ECED Centres	16
Figure 7: ECED Enrolment Prediction	20
Figure 8: ECED Cost Estimates under the Base Model (2019–2030) (NPR, millions)	21
Figure 9: Expected ECED Cost for the Next Decade with Increased Salary (NPR, millions)	22
Figure 10: Expected ECED Cost for the Minimum Standards (NPR, millions)	23
Figure 11: Expected ECED Cost of Deploying Supervisors to Every Municipality (NPR, millions)	24
Figure 12: Percentage of ECED Budget in the Total National Education Budget to Realize the Different Options	24

List of abbreviations

ECD	Early Childhood Development
ECDI	Early Childhood Development Index
ECE	Early Childhood Education
ECED	Early Childhood Education and Development
ERO	Education Review Office
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
GoN	Government of Nepal
LGs	Local Governments
LMICs	Low- and Middle-Income Countries
MICS	Multiple Indicator Cluster Survey
MoEST	Ministry of Education, Science, and Technology
PPE	Pre-Primary Education
SDGs	Sustainable Development Goals
SSDP	School Sector Development Program
STR	Student Teacher Ratio
TLMs	Teaching-Learning Materials
UNICEF	United Nations Children's Fund



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Why Invest in ECED?

Skill formation and human capital accumulation are a lifetime process, and quality early childhood education and development (ECED) is critical for ensuring that children get a head start in this process. Robust quality ECED helps children build a strong foundation to acquire key cognitive and socio-emotional skills (Camilli et al. 2010; Nores and Barnett 2010). It helps launch children on higher learning trajectories, making them more adaptable, resilient, and productive (World Bank 2018). Quality ECED is also indispensable to realize the goals of poverty reduction and shared prosperity. First, provision of high-quality ECED to disadvantaged children yields a high rate of return (Heckman 2006). This result holds even in a low- and middle-income context (Grantham-McGregor and Smith 2016). Second, this investment has the potential to reduce the socioeconomic gap in society. The positive impacts of expanding access to high-quality, public ECED on learning achievements are concentrated on low-income children, and ECED only substitutes high-quality, public preschool for expensive private care and do not bring significant impacts on children with a wealthier background (Cascio and Schanzenbach 2013). Third, such high-quality interventions have dynamic complementarity and increase the rate of return to interventions in subsequent education levels (Johnson and Jackson 2017).

Recognizing the importance of ECED, the Sustainable Development Goals (SDGs) include an early childhood development (ECD) target (Target 4.2) which aims to increase the percentage of children under 5 years of age who are developmentally on track in health, learning, and psychosocial well-being. Nepal has strived to achieve this target over the past decades, but significant disparities remain.

Long-term Impacts of ECED Investment

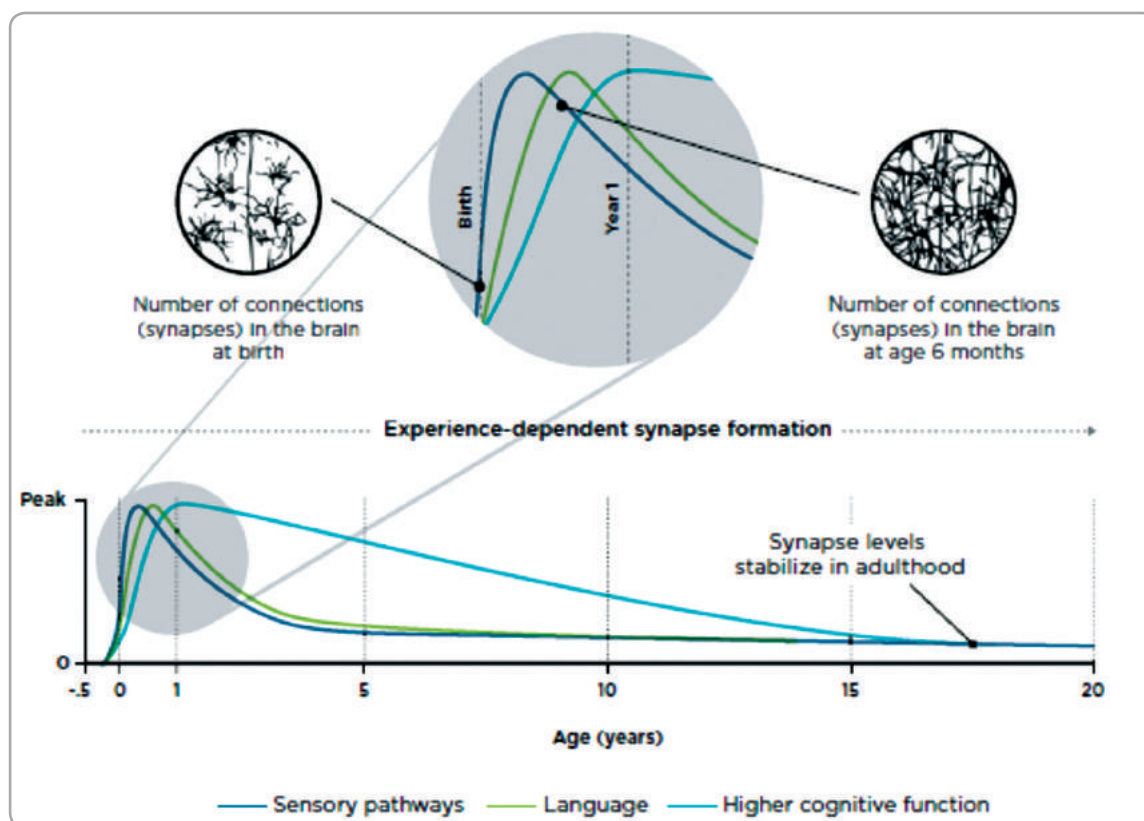
Economic Aspect

Various experiments in both high-income countries and low- and middle-income countries (LMICs) exemplify ECED for marginalized children as the most critical step for human capital accumulation in a country. In the case of high-income countries, three well-known studies, the Abecedarian Early Intervention Project, the Chicago Child-Parent Centres, and the Perry Preschool Program, are often referred to as excellent investment cases. These cases uncover long-term impacts of ECED investment, such as better health conditions, better family planning, less criminal activities, and better employment. Some projects estimate 16 percent to 17 percent return on investment (Belfield et al. 2006; Rolnick and Grunewald 2003), while others estimate 7 percent to 10 percent return (Heckman et al. 2010).

In the context of LMICs, the Jamaican programme is one of the most cited experiment. This programme intervened in different types of high-risk children, such as severely malnourished, stunted, and low birth weight infants born at term. The study followed targeted children at different stages until 22 years of age and found positive impacts of the different interventions on cognitive skills at every stage (Gertler et al. 2014; Walker et al. 2011). They also found positive effects on wages, with children who received quality ECED earning about 25 percent more than their counterparts.

As such, both in high-income countries and LMICs, ECED investments yield a high return through various pathways, such as higher wage, stable employment, better health condition, less criminal activities, and better family planning.

Figure 1: Human Brain Development



Source: World Development Report, World Bank 2018.

ECED investment is indispensable because children's brains swiftly develop during this period, which becomes a foundation for further development, as summarized in figure 1. Even before early childhood education (ECE), disparities in brain development appear, and these disparities are strongly associated with the economic and social status of the child. Thus, if societies expect children to achieve academic success and advance society economically and democratically as citizens in the future, holistic and high-quality ECED interventions are crucial.

Social Aspect

The impacts of ECED investment are not limited to labour market outcomes. Instead, they have social returns and externalities as follows:

- **Gender equality:** The expansion of ECED coverage promotes labour force participation among mothers, where the labour force participation rate of women is not high (Berlinski and Galiani 2007; Nollenberger and Rodríguez-Planas 2015). Also, with some training, the expansion of ECED provides employment opportunities for women. However, in places where the female labour force participation rate and the availability of informal care are high, the expansion of ECED just replaces informal care, which results in no impact on female labour force participation rate (Fitzpatrick 2010; Havnes and Mogstad 2011). In the case of Nepal, the female labour force participation rate is at 26.8 percent with most of them engaged in the agricultural sector. In the agricultural sector, people work differently from the industry or service sector and are not tied to time. Thus, the expansion of ECED could enable women to move to the tied-to-time working sector.
- **Social equity:** The positive impacts of expanding high-quality, public ECED on learning achievement are largely concentrated on low-income children. However, while the impact is not significant on children coming from wealthier backgrounds, high-quality public ECED services could still offer an alternative to expensive private care (Cascio and Schanzenbach 2013). As such, the expansion of high-quality ECED shrinks the achievement gap based on household wealth.
- **Inclusion:** Children with disabilities are exposed to various risk factors which have severe negative impacts on their development and survival, such as poor caregiver interaction, abuse, and neglect. High-quality ECED has the potential to protect children with disabilities from these risk factors and catalyse their development (WHO and UNICEF 2012).

Dynamic Complementarity of ECED Investment

Investment in ECED should bring positive impacts on subsequent education levels. Cunha and Heckman (2007) theorize the spillover effects of ECED investment from the point of skill development. According to them, the impact of educational investment today differs for each individual. The impact is larger among those who have acquired more skills than those who have acquired less because skill development is an interactive and multi-stage process, and “skills produced at one stage raise the productivity of investment at subsequent stages” (Cunha and Heckman 2007).

Johnson and Jackson (2017) refer this synergy between human capital investments at different education levels as dynamic complementarity and analyse whether such complementarity exists between ECED (Head Start Program¹) and basic education in the United States. They find that

¹ The Head Start Program is comprehensive early childhood education, health, nutrition, and parent involvement services to low-income children and their families. The program started in 1965 and The Head Start Act of 1981 significantly expanded the coverage.

an increase in head start spending per four-year-old by roughly 25 percent (US\$1,000) leads to not only better education attainment (0.077 years) but also about 10 percent higher wages. An increase in basic education spending also has similar effects. Importantly, when ECED expenditure increases followed by a 10 percent increase in basic education expenditure, the incremental impact of ECED expenditure becomes more than twice as large as in a case that is followed by a 10 percent reduction in basic education expenditure. Also, the same applied to basic education expenditure increase. Compared to a case where basic education expenditure increases without ECED, the impact of the basic education expenditure increase with ECED is more than twofold. However, the effect of dynamic complementarity is mainly observed among poor children and not among children with a wealthier background.

Dynamic complementarity of ECED investment has three significant policy implications. First, the cost-benefit of increasing ECED investment tends to be underestimated due to a lack of consideration of dynamic complementarity. Second, the social aspect of ECED investment also tends to be undervalued for the same reason. Third, ECED investment should be followed by an improvement in the subsequent education level to further enhance and fully utilize the benefit of the investment.

Does the Impact of ECED Fade-out?

However, there is a counterargument on ECED investment. The argument is mainly based on fade-out of the impact of ECED investment in some studies. The critical concept to understand the results is a convergence of persistence effects (Yoshikawa et al. 2013), and this convergence takes place because of the following three factors. The first factor is catching up. Children who do not participate in ECED might have acquired knowledge and skills faster than those who do participate. It can be possible when teachers in basic education are attentive and provide additional support to students who are lagging. The second plausible factor is fade-out. If the quality of ECED is not good enough to build a foundation for learning or the quality of basic education is not sound enough to let children learn, fade-out might occur. The last plausible factor is sleeper effects. Although literature points out the labour market outcomes of ECED investment, its short-term impacts show confounding results. In other words, the effect might remain dormant when children are in school but is activated once they enter the labour market. If the impact of ECED investment is concentrated on non-cognitive skills rather than cognitive skills, sleeper effects might happen.

An important takeaway from the convergence of persistence effects is the necessity to carefully interpret the results of a short-term impact evaluation of ECED investment. Education stakeholders should consider the quality of ECED and basic education and characteristics of the ECED programme they evaluate, regardless of the result. Otherwise, the ECED sub-sector plan based on the short-term impact evaluation would misguide ECED policies.



2 Status of ECED in Nepal

The Government of Nepal (GoN) has increasingly emphasized ECED in its education policies. Improving equitable access to ECED services was one of the main goals of the GoN's national school education programmes of the previous decade.² The 8th amendment to the Education Act passed in 2016 formally recognized one year of early childhood education as a part of the basic education. In the current national programme, the School Sector Development Program (SSDP, 2016–2021), greater emphasis is placed on improving the quality of ECED service while also carrying the access agenda forward. Further, the Free and Compulsory Education Act passed in 2018 defines ECED as a year-long childhood development and education focused on holistic development. It stipulates that at least one-year long ECED should be provided to four-year (48 months) old children, and parents shall enrol their children in a convenient school (within 2km from residence). The Act also stipulates that an ECD Center shall be established within three years if no convenient school is there to provide ECED services.

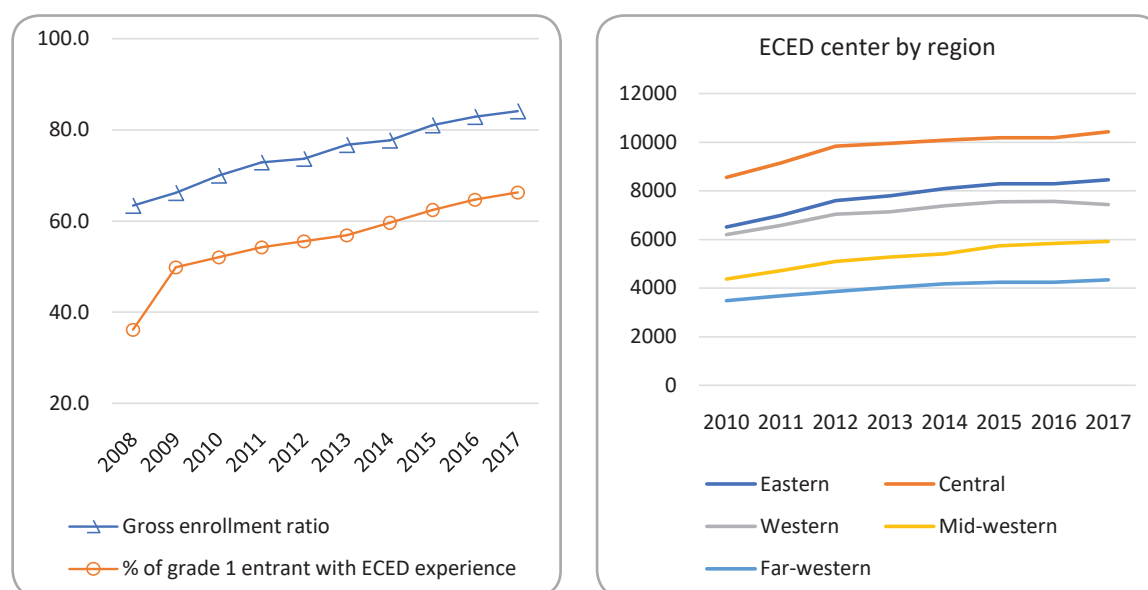
Access to ECED

In Nepal, ECED is provided by both public and private institutions through community schools and community-based centres, and private schools/facilities, respectively. Community schools provide a year of free ECED/pre-primary education (PPE) with the option of an additional year, if demanded by the local community, whereas most private schools provide three to four years

² Education for All 2004–2009; School Sector Reform Program 2009–2015.

of PPE classes for three-year-old to five-year-old (playgroup, nursery, lower kindergarten, and upper kindergarten). Nepal has significantly expanded access to ECED in the last decade. Administrative data show that the gross enrolment rate (GER) in ECED has reached 84 percent in 2017, an increase from about 60 percent in 2008. Correspondingly, there has been a significant increase in the percentage of new enrolments in Grade 1 with at least one year of ECED/PPE experience (figure 2). Increase in access is facilitated by the increase in the supply of ECED/PPE centres. From 2008 to 2017, the number of ECED facilities has grown from about 20,000 to about 36,000. Furthermore, all regions in Nepal successfully expanded this supply in the last decade (figure 2).

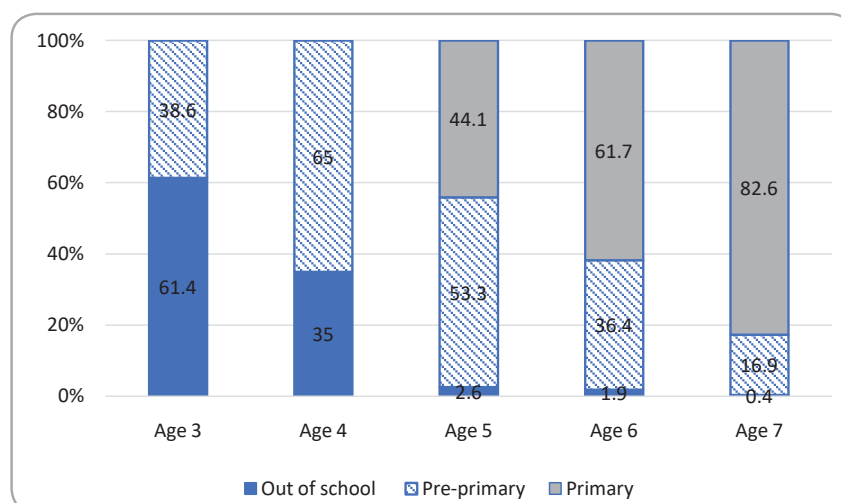
Figure 2: Expansion of ECED Access



Source: GoN Flash Report from various years.

ECED Enrolment Pattern

Figure 3: Over and Under Age ECED Attendance



Source: Calculation made by the author based on Multiple Indicator Cluster Survey (MICS) 2014.

According to MICS 2014, a sizable portion of children enrolled in ECED/PPE were overaged children. More than half of age 5 children were attending ECED as opposed to attending primary school. The Nepalese school calendar starts in April while the MICS data collection took place from January 2014 to June 2014. Thus, some portion of these children may follow the enrolment age rule. However, as the enrolment pattern of age 6 children suggests, the portion should not be so large. More than one-third of age 6 and one-sixth of age 7 children, who should not be affected by the date of data collection, were attending ECED. There was also a small portion of children from an older age group (8–12 years) attending ECED/PPE classes.³ Administrative data show that over and under age enrolment still persists but has been declining.

Inequality in Access to ECED

Despite the increased enrolment and number of ECED centres, disparities remain. Girls and children from disadvantaged background have disproportionately low access to ECED. In addition, socioeconomic and spatial inequities remain in accessing ECED services.

Gender

While Nepal has achieved gender parity in basic and secondary school enrolment, the ratio of girls to boys in ECED has averaged 0.90 in the last decade.⁴ In addition, the combination of gender and socioeconomic status compound the heterogeneous negative impact of being a girl. MICS 2014 shows that children from disadvantaged backgrounds are less likely to attend ECED programmes. Compared to about 69 percent of children from the Brahmin/Chhetri caste only around 45 percent of children from dalit and non-Brahmin/Chhetri castes were attending ECED. In addition, gender disparity in access was also found to be higher among these latter groups (table 1).

Table 1: ECED Attendance Rate by Gender and Caste

	Total	Boys	Girls
Non-Dalit Non-Brahman/Chhetri	45.0%	48.9%	40.9%
Dalit	44.4%	45.9%	42.7%
Brahman/Chhetri	69.1%	65.1%	73.0%

Source: Author's calculation based on MICS 2014.

Wealth

There is a stark difference in enrolment between the poorest and richest households. MICS 2014 shows that 83.5 percent of children age 36–59 months from households of the wealthiest quintile attend ECED, while the rate is only about 41 percent for the poorest quintile. Moreover, the impact of wealth on access is not linear. While the gap in access between children from households in the middle quintile and those from the bottom two quintiles is relatively small. The gap between children from households in the middle quintile and children from wealthier households (top two quintiles) is enormous. Accordingly, in addition to focusing on improving access for the most marginalized group (socially and economically), there is also a need to pay special attention to the children from average-/middle-income households.

³ 3.4 percent of children from the 8–12 age group were attending ECED in 2014.

⁴ Based on Flash Report of different years.

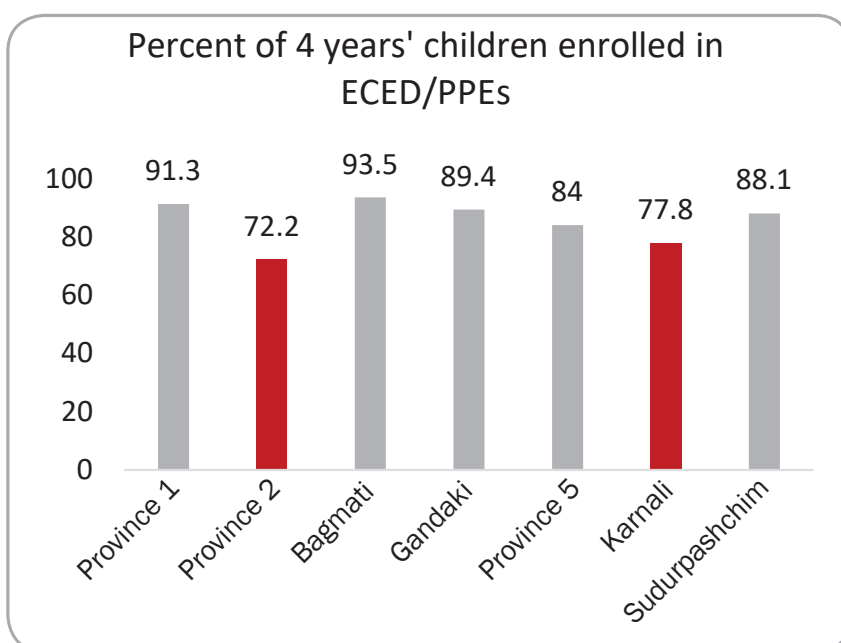
Table 2: ECED Attendance Rate by Wealth Quintile

Wealth Index Quintiles	Total
Poorest	41.2%
Second	39.1%
Middle	38.8%
Fourth	62.7%
Richest	83.5%

Source: MICS 2014.

Geography

Improvement in access to ECED has also been spatially uneven. ECED enrolment rates differ significantly by geography. Provinces 2 and Karnali are disproportionately behind in access to ECED compared to others (figure 4). The urban-rural gap is also significant (ECED attendance rate was at 78.4 percent in urban areas compared to 47.2 percent in rural areas).⁵

Figure 4: Provincial Gap in ECED Access

Source: Flash Report (2017–2018).

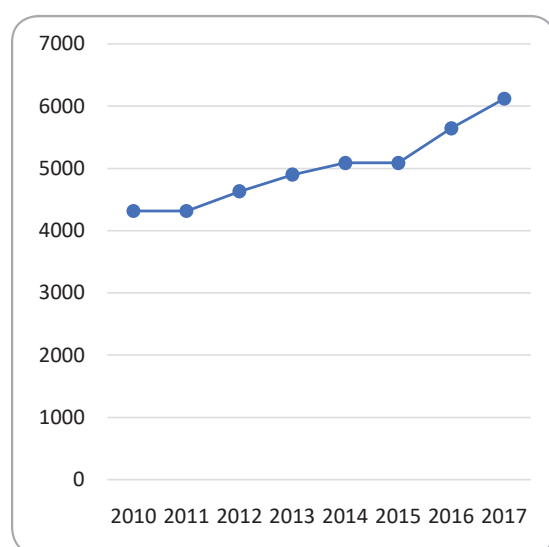
⁵ MICS 2014.

Role of Private ECED Providers

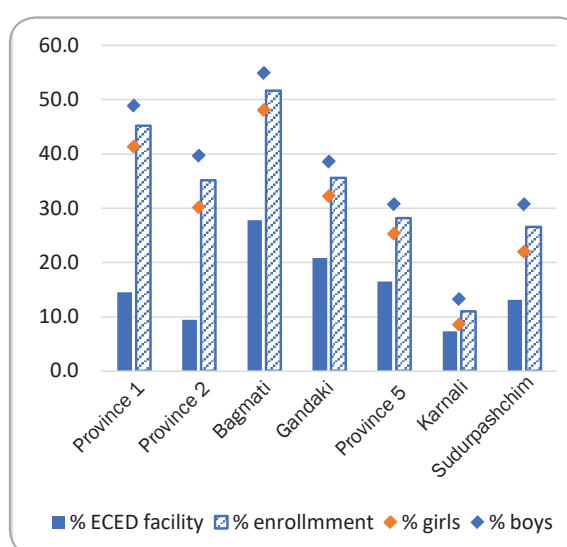
Private ECED service providers have played an important role in improving access to ECED. Ministry of Education, Science and Technology's (MoEST) administrative data show that while private ECED centres constitute about 17 percent of the total ECED centres, they account for more than one-third of the total enrolment (36.6 percent). The increase in private enrolment is supported by a rapid increase in private ECED facilities (figure 5, left panel). From 2010 to 2017, the number of ECED facilities has increased by 42 percent, growing from about 4,300 to about 6,100 facilities. As various studies point out, private education might be accessible only for the relatively privileged (Cameron 2011; Chudgar and Quin 2012; Härmä 2016; Humble and Dixon 2017; Oketch et al. 2010) and privatization might exacerbate inequality in Nepal. Private ECED centres are mostly concentrated in urban areas and are characterized by considerable gender disparity in access. At the national level, about 33 percent of the girls enrolled in ECED are enrolled in private ECED centres while 40 percent of the boys are enrolled in private ECED centres. While there is gender parity in enrolment in public ECED centres, gender parity in private ECED centres stands at 0.7. Gender disparity in access to private ECED centres holds across regions.

Figure 5: Private ECED Centres in Nepal

Increase in Private ECED Centres



Figures for Private ECED Centres, by Province



Source: Left - Flash Report various years; Right - Flash Report 2017–2018.

Non-registered Private ECED Providers

It should be noted that MoEST's administrative data does not fully capture the presence of private ECED providers in the country. There are number of private ECED providers that are not registered in the Education Management Information System (EMIS) which generates MoEST's administrative data. While the exact number of these non-EMIS registered private ECED providers is not known, it is not negligible. For example, according to the 2014 Flash report, the number of ECED enrolment in 2014 was 1,014,339. However, the age-specific ECED attendance rates from MICS 2014 applied to the 2014 single age population estimates by UN population division show that the number of ECED enrolment should be about 1.3 million (table 3), about 28 percent higher than the enrolment presented in administrative data. While part of the difference might be explained by the inaccuracy of the population estimation⁶, part of the difference could be due to the present of non-registered private ECED providers.

⁶ The last census was carried out in 2011.

Table 3: Number of Children in ECED Facility by Age

Age	UN population projection for 2014	Percentage of children attending ECED (MICS 2014)	Projected number of children in ECED facility
3	560,153	38.6	216,219
4	570,683	65.0	370,944
5	578,244	53.3	308,204
6	588,306	36.4	214,143
7	600,179	16.9	101,430
8	613,173	9.5	58,251
9	626,347	4.0	25,054
Total			1,294,246

Source: Projection based on MICS 2014 and UN population estimate for 2014.

Quality of ECED

Early Childhood Development Index

Compared to the improvement in access, quality is far from commensurate. The early childhood development index (ECDI) shows that only about 64 percent of children age 36–59 months were developmentally on track.⁷ While 86 percent of children in the wealthiest quintile achieve the composite ECDI milestones, only about 60 percent of children in the poorest quintile do so. A similar disparity is found along the urban-rural and geographical divides.

Table 4: ECDI Score and Literacy and Numeracy Domain by Wealth and by Gender

Wealth Index Quintiles	ECDI Score		Literacy and Numeracy Domain	
	Boys	Girls	Boys	Girls
Poorest	57.8%	64.3%	10.5%	14.2%
Second	54.1%	59.0%	17.0%	21.6%
Middle	53.2%	62.0%	19.1%	24.0%
Fourth	68.1%	72.2%	36.7%	42.5%
Richest	88.8%	86.9%	64.7%	68.6%

Source: Author's calculation based on MICS 2014.

Overall, girls show better ECDI scores than boys across the wealth quintiles. Children from the most deprived quintile are not significantly behind children from the second and middle wealth quintiles. However, children from the fourth and the wealthiest quintile are substantially more advanced than the rest of children.

⁷ ECDI assesses children age 36–59 months in four domains: language/literacy and numeracy, physical, socio-emotional, and cognitive development. These four domains are measured through instruments based on observation. The MICS calculates an overall index score as the percentage of children who are on track in at least three of the four domains.

Disaggregation of the ECDI shows that children are severely lacking in the literacy and numeracy domains. On average, only about 28.8 percent of the children are developmentally on track on literacy and numeracy skills. Even for children attending ECED/PPE, the number stands at 53.1 percent. Overall, girls perform better than boys, and children from the bottom 60 percent of households show significant delay compared to children from the top 40 percent of households, indicating both overall low levels of learning and inequities in the children's learning and development outcomes.

Enabling Environment - Minimum Standards

National Minimum Standards for ECD centre was developed by the GoN in 2010 to ensure uniformity in management and operation of the different types of ECED centres operating in the country. It includes standards under eight dimensions: physical infrastructure; health nutrition, and safety; minimum required materials; outdoor environment; ECD management committee and governance; human resource quality; parents, children and community; and drinking water and sanitation. While the standards have been developed, it has not been followed by either adequate funding or monitoring to ensure that the standards are met and maintained. Further, data on minimum standards is not collected regularly to allow for appropriate planning and monitoring. A 2011 study by Save the Children international found that most of the ECED centres did not have satisfactory physical infrastructure. In fact, only 12 percent of the centres met more than half of the national minimum standards. A 2017 study carried out by Education Review Office (ERO) found that more than 40 percent of the ECED centres do not satisfy the infrastructure standards. In addition, less than 15 percent of ECED centres met the management standards related to health check up, management of compound area and management of learning and play materials.⁸ While these studies show improvement over time, much needs to be done to bring all ECED centres up to the national standards.

Class Size

An appropriate student teacher ratio (STR) is an important factor for ensuring the delivery of quality ECED. In Nepal, while data is collected on the number of ECED centres and number of children enrolled, data on number of ECED classes offered in each of the ECED centres is not captured to allow for calculation of the STR. While there has been a decrease in ratio of students per ECED centre in community ECED centres, the trend is increasing in private ECED centres (figure 6, left panel). In 2018, 59 percent of community ECED centres had fewer than 20 students, 29 percent had 21 to 40 students, and about 12 percent had more than 40 students. The trend is opposite for the private institutions with more than 80 percent of ECED centres have more than 40 students (figure 6, right panel). In private ECED centres, although the enrolment numbers are high, the centres also often run different levels of ECED classes (playgroup, nursery, lower kindergarten, and upper kindergarten). For the community ECED centres, the government provides support for one ECED facilitator per ECED centre which implies that about 40 percent of the community ECED centres with more than 20 students either have a higher than recommended STR⁹ or have to hire ECED facilitators on their own, which in turn might translate to parents sharing some of the cost.

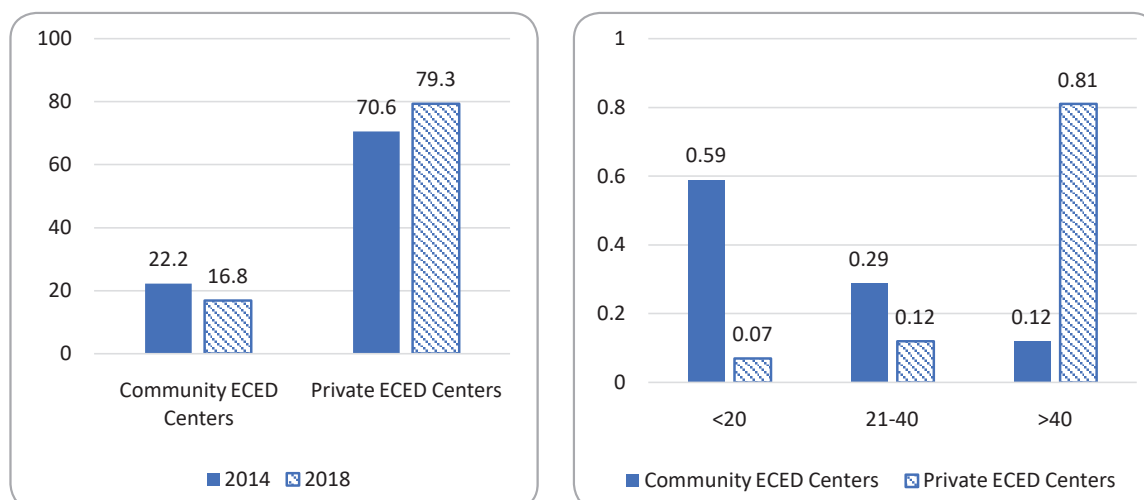
⁸ A report on ECD Assessment in Nepal 2017, Education Review Office.

⁹ The global Standard for ECED/pre-primary STR recommended by the UNICEF is up to 20 pupils for 1 teacher.

Figure 6: Enrolment in ECED Centres

Ratio of enrolled children to ECED Centres

Percentage of ECED centres by number of enrolled children



Source: Flash Report 2017–2018.

ECED Facilitators

Qualification and Training

As per the new requirement introduced under the SSDP (2016–2021), new ECED facilitators must have at a minimum grade 10 qualification. According to the 2017–2018 Flash Report, 38.6 percent of facilitators have beyond minimum qualification, 54.9 percent have minimum qualification and only 6.4 percent are under minimum qualification. In addition to increasing the qualification threshold, the facilitators must be properly trained to ensure teaching quality. Accordingly, one of the key quality interventions introduced under the SSDP is to provide one-month intensive training and refresher training to ECED/PPE facilitators.¹⁰ While 88 percent of the ECED/PPE facilitators have received the 15-day basic training, only 10.4 percent of facilitators have received the full one-month training.¹¹ Delay in implementation of the training programme has left a large number of ECED facilitators, particularly the new recruits, without training on the ECED curriculum. Without proper and adequate training, facilitators will not be equipped with appropriate pedagogy to deliver on the curriculum and the established Early Learning and Development Standards.

Remuneration and Retention

The current level of remuneration of ECED facilitators is low.¹² Cognizant of the need to increase their pay to both attract and retain more qualified facilitators, the SSDP has envisioned increasing ECED facilitators' remuneration to align with grade 10 level government employees as one of its goals. However, the result is yet to be seen. While some local governments (LGs) are reported to have supplemented official salaries of facilitators with their own resources, not all of them have done so, and the increase is not uniform across the LGs. Furthermore, there is no provision in place to ensure the continuity of the provision from the LGs. Linked to the low remuneration and lack of career development opportunities, retention is a problem, as facilitators tend to look for

¹⁰ Refresher trainings are for the existing ECED/PPE facilitators who have already received 15 days of related training.

¹¹ Data for basic training is from Flash Report 2016–2017 and for the one-month training is from Flash Report 2018–2019.

¹² ECED facilitators salary is NPR 6,000 per month (equivalent to US\$52.6 at the exchange rate of US\$1 = NPR 114).

better opportunities. While data on the ECED retention rate is not available, anecdotal evidence suggest an average annual turnover rate of about 20 percent. More qualified facilitators also tend to teach higher grades at the same school with an aspiration of being promoted to teach at a higher grade.

ECED Financing

Public Financing in ECED

In Nepal, investment in ECED represents a small portion of the national education budget. In the last five years, the share of the ECED budget in the national education budget was on average about 1.9 percent. This roughly translates to about 0.08 percent of the gross domestic product (GDP). Consequently, per-child financing for ECED has also been low. At NPR 5,500 (US\$48), per-child spending in ECED is less than half of that of spending on primary schooling at NPR 13,100 (US\$115).¹³

Table 5: Percentage of Education Budget Allocation to ECED Sub-sector, 2014/15-2019/20

	2014/15	2015/16	2016/17	2017/18	2019/20
ECED	1.78%	1.47%	2.33%	2.03%	1.67%

Sources: MOEST (2017) for FY 2014/15 to FY 2017/18; ASIP/AWPB (2018-19) for FY 2019/20

The majority of the government's budget on ECED is allocated for ECED facilitators salary accounting for about 87 percent of the total ECED budget. The remaining budgets are allocated for per-child funding for teaching-learning materials (TLMs), facilitators' training and other activities. The current level of allocation is grossly inadequate and poses significant challenges to improving the quality of ECED services.

¹³ UNESCO/IIEP-UIS 2016.



3

How Much Additional Cost is Required to Improve the Quality of ECED Service?

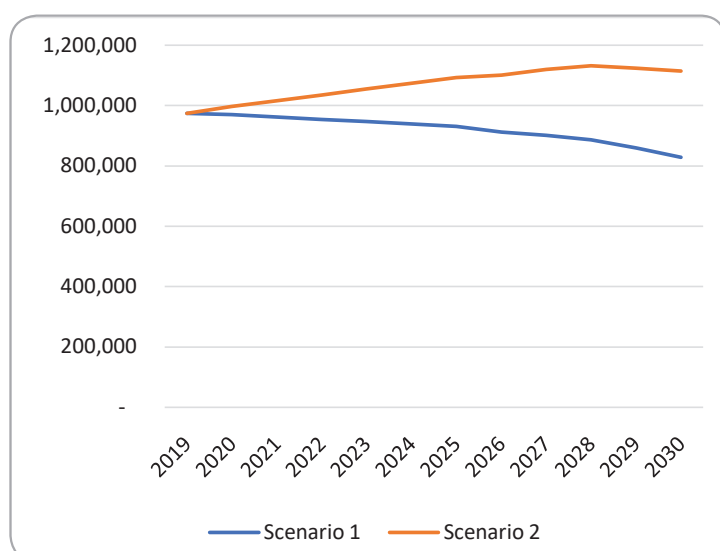
Enrolment Projection

Administrative data shows that 973,900 children were enrolled in ECED in academic year 2018/19. As discussed in the earlier section, a substantial percentage of children enrolled in ECED are overage enrolment. At the same time, more than one-third of age 3 children are also attending ECED. Thus, the future ECED/PPE enrolment trend will depend on the improvement in intake of age 4 children, the reduction in overage enrolment, and the trend in age 3 enrolment over time. In this analysis, cost estimates for the next 10 years (up to 2030) are presented under two scenarios. The first scenario considers the recent trends in ECED enrolment and assumes improvement in age 4 enrolment and reduction in overage enrolment over time while keeping the age 3 enrolment constant at 40 percent. This projection aligns with the GoN's current commitment which stipulates that children should be provided with at least one year of free-of-cost ECED after 4 years of age before they enter Grade 1. The second scenario considers the cost of expanding the service to include both age 3 and age 4 children over time. Both scenarios assume that there is no repetition in ECED and there is a linear improvement in the enrolment trend.¹⁴ Single-age population projection by the United Nations Population Division is used to estimate the enrolment projection.¹⁵

¹⁴ Age 3 enrolment increases by 5 percentage points annually reaching 95 percent by 2030 (for the first scenario); age 4 enrollment improves by 2 percentage points annually reaching 99 percent in 2026; overage enrollment (ages 5–7) decreased by 1 percentage point annually reaching 6 percent by 2030 (applicable to both first and second scenarios).

¹⁵ United Nations population estimation data can be downloaded from the following link: <https://population.un.org/wpp/Download/> (accessed December 2019).

Figure 7: ECED Enrolment Prediction



Source: Calculation based on United Nations Population Division population estimation.

Under the first scenario, the enrolment will decrease over time reaching around 0.83 million children by 2030, lower than the current enrolment by around 11 percent. Under the second scenario, the ECED enrolment will increase over time and will peak at 1.12 million, which is higher than the current enrolment by around 15 percent.

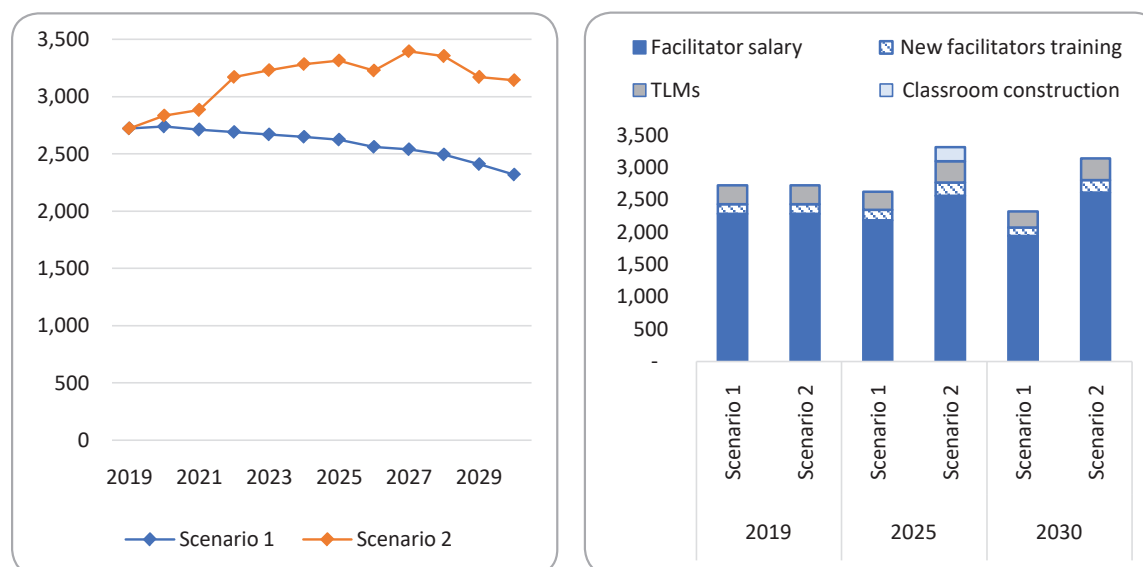
Base Model

The base model presents the cost estimates for maintaining the current input level, which mainly includes provision for facilitators' salary, TLMs, and training. The unit cost for each of the inputs are taken from the existing government norms. The following additional assumptions underpin the base model:

- (a) Pupil to facilitator ratio remains the same (20:1).
- (b) Facilitators' salary remains the same (US\$52.8 per month or NPR 6,000 per month) and their turnover rate is 20 percent.
- (c) Share of private enrolment remains at 40 percent.
- (d) Cost of the one-month standard training for ECED facilitators is NPR 30,000 per facilitator.
- (e) Per-child funding of NPR 500 is provided to each community ECED centre for TLMs.
- (f) A new classroom with furniture is necessary per additional 20 new students. Its cost is NPR 400,000 per classroom.

Maintaining the current level of input and allowing for the changes in enrolment under the two scenarios, the cost of providing ECED services (a) decreases from US\$24 million (NPR 2.7 billion) in 2019 to US\$20.4 million (NPR 2.32 billion) in 2030 under scenario 1 and (b) increases from US\$24 million (NPR 2.7 billion) in 2019 to US\$27.6 million (NPR 3.1 billion) in 2030, peaking at US\$29.9 million (NPR 3.4 billion) in 2027, under enrolment projection scenario 2 (figure 8).

Figure 8: ECED Cost Estimates under the Base Model (2019–2030) (NPR, millions)



The share of different inputs in the ECED budget mirrors the current level. Facilitators' salary will account for the majority of the ECED budget (83 percent). Salary will continue to account for the majority of the ECED cost. However, under enrolment projection scenario 2, the ratio of salary will decrease to 77 percent by 2022, owing to increase in age 3 and age 4 population and their enrolment. Thus, new classrooms construction will be needed, and it will account for 3 percent to 7 percent of ECED cost between 2020 and 2028. However, post 2028, the share of salary will bounce back to 83 percent. The main reason is the reduction in new classroom construction. Improvement in age 3 enrolment will be offset by reduction in overage enrolment.

New facilitators training will account for 6 percent of the ECED cost throughout the next 10 years. The decline in ECED age population will offset the high turnover rate, and the number of new facilitators needed to be trained will stay around 5,000 to 6,500 per year under the two scenarios. Further, the training cost (NPR 30,000) is less than half of the annual salary of a facilitator (NPR 78,000). Thus, the training cost will remain a small portion of the total ECED cost.

Cost of Improving the Quality of ECED Services

Improving the quality of ECED services from its current level will require raising the level of inputs or introducing new inputs, which will have cost implications. The improvements considered for the costing exercise are those envisioned in the existing policies but are not currently provisioned for or implemented.¹⁶

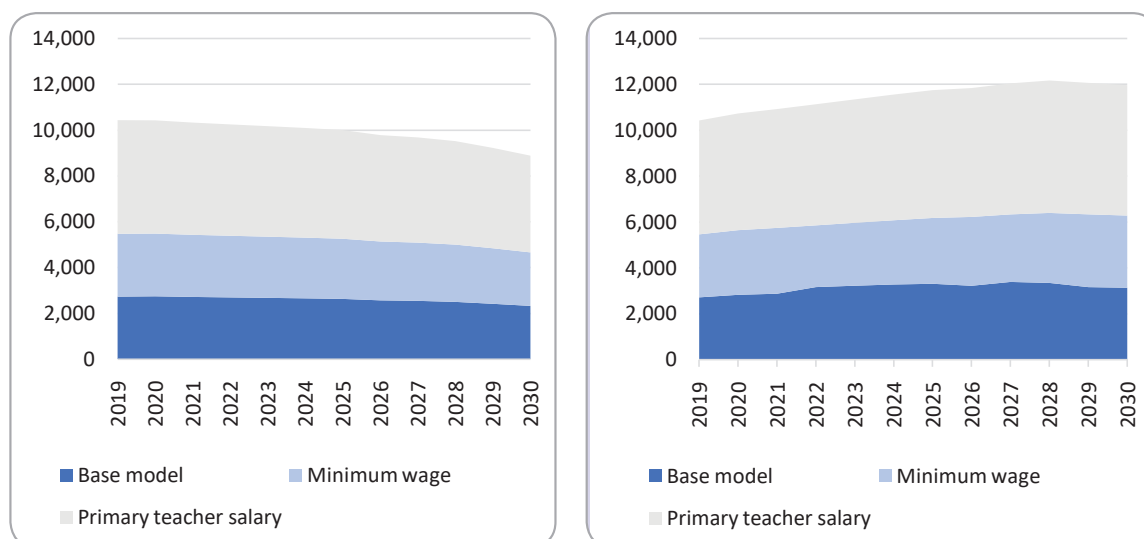
- Higher Facilitator Salary
- Provision of Principal Elements of Minimum Standards
- Provision of Supervisors

¹⁶ SSDP (2016–2021); Free and Compulsory Education Act (2018); Education Policy (2019).

Option 1: Higher Facilitator Salary

The SSDP envisioned increasing ECED facilitators' remuneration to align with grade 10 level government employees as one of its goals. Recently approved Education Policy (2019) also stipulates that provisions will be made to align ECED facilitators' salary with the prevailing minimum wage defined by the government.¹⁷ Cost estimates are presented for both cases, that is, increasing facilitator salary to the level of primary school teachers with grade 10 qualification and to the level of minimum wage.¹⁸ With the increase in salary, it is assumed that the facilitators' turnover rate will be lower. The turnover rate is set at 5 percent for a salary increase to primary teacher level and at 10 percent for the minimum wage.

Figure 9: Expected ECED Cost for the Next Decade with Increased Salary (NPR, millions)



Note: Left: scenario 1; right: scenario 2.

Under both enrolment projection scenarios, the cost of ECED will increase almost fourfold compared to the base model if the salary is increased to match the primary teacher's salary. The cost will be two times higher in the case of minimum wage. While there will be some savings through low turnover rate and consequently the need for fewer new facilitator's training, the savings is negligible compared to the increase in the overall cost (less than 2 percent of the total cost).

The strategy for increasing facilitator retention rate with a higher teacher salary is an expensive policy option. Even though this option is costlier, benefits of it, such as attracting more qualified facilitators, higher retention rate, better learning outcomes, and reduction in repetition in the subsequent education levels, might be substantial and the cost-benefit of this policy might be better than that of other policy options.¹⁹ Notably, a higher salary might nurture professionalism among facilitators, which can result in quality ECED. Also, since more than 90 percent of the facilitators are female, the salary issue should also be considered from the perspective of gender wage equality, women empowerment, and rights of the woman (ensuring the minimum wage).

¹⁷ Education Policy (2019) was approved by the Cabinet in November 2019.

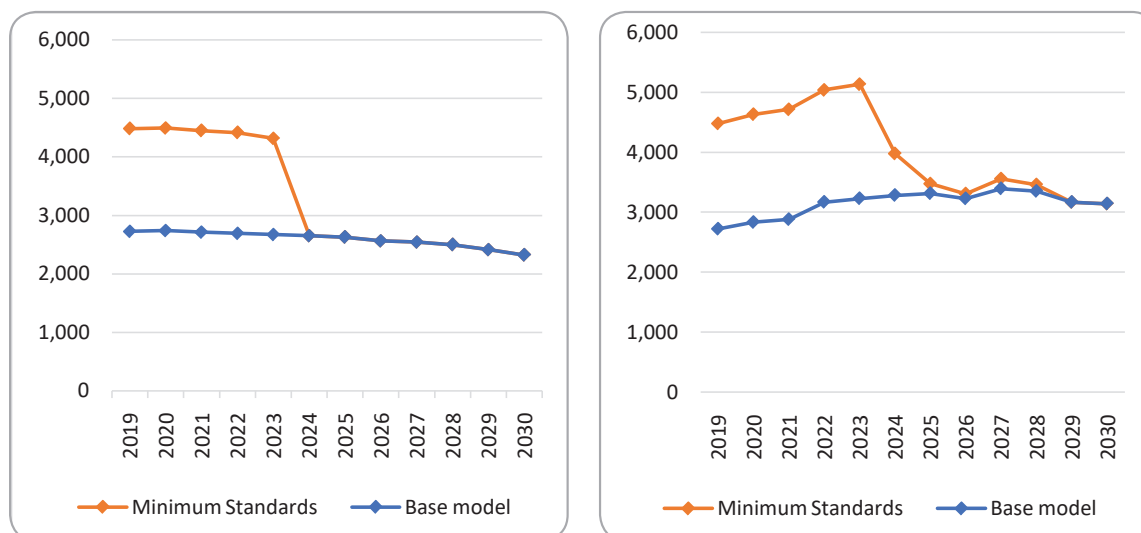
¹⁸ Primary teacher salary with grade 10 qualification is NPR 26,604 per month and the prevailing minimum wage is NPR 13,450.

¹⁹ The impact of teacher salary increase on student learning outcomes has not been extensively researched. Hanushek (2007) finds that a simple increase in K-12 teacher salary in the United States is ineffective and the increase in salary needs to be accompanied with a set of incentives and accountability. In the context of LMICs, Pugatch and Schroeder (2018) analyse the impact in the case of Gambia and find that the salary increase through a hardship allowance does not have a positive causal impact on average learning achievement. Accordingly, a simple salary increase without incentive or accountability may increase the retention rate but not learning outcomes.

Option 2: Provision of Principal Elements of Minimum Standards

The second estimation is with the provision of principal elements of the minimum standards. For the purpose of the cost estimation exercise, five prioritized minimum standards are selected: child-friendly seating arrangement, qualified and trained teacher, six learning areas, easy access to clean water, and accessible toilet with soap and water.²⁰ Among the five elements, the qualified and trained teacher is covered under the base model. The unit cost for the remaining four elements is provided by United Nations Children's Fund (UNICEF).²¹

Figure 10: Expected ECED Cost for the Minimum Standards (NPR, millions)



Note: Left: scenario 1; right: scenario 2.

Compared to the base model the initial cost of ensuring the minimum standards is relatively high. It is assumed that each year 20 percent of the ECED centres will get funding to fulfil the minimum standards, and thereafter budget is provided for new ECED centres. The overall cost required to ensure the minimum standards is higher than the base model by about 28 percent on average, requiring US\$6 million – US\$7 million (NPR 717 million to NPR 846 million) annually in additional cost. However, this is an upper bound estimate, as it assumes that none of the existing ECED centres have fulfilled any element of the minimum standards, which is not necessarily the case.

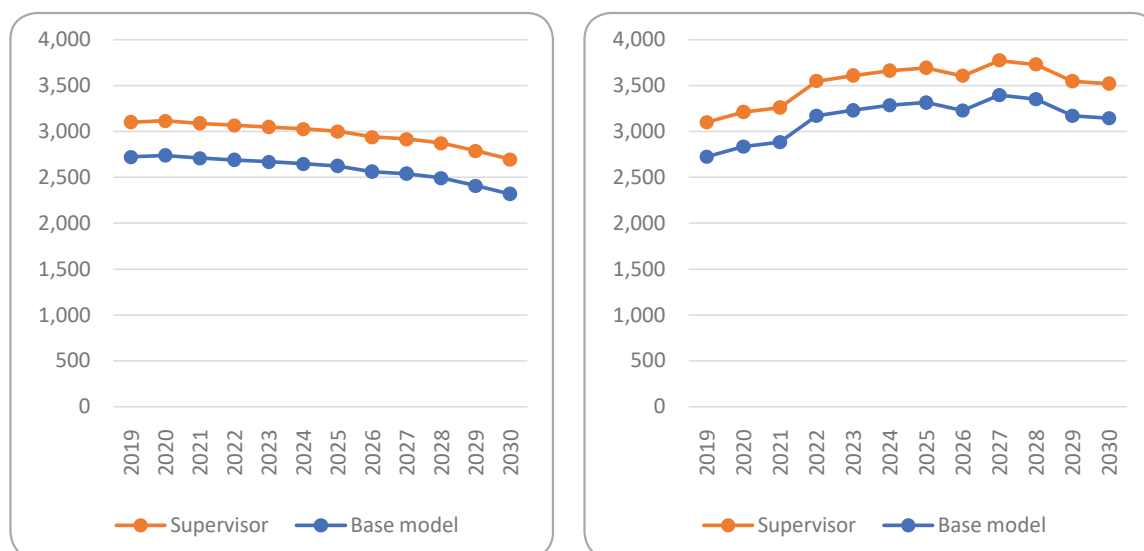
Option 3: Provision of Supervisors

Strengthening the role of local governments to supervise and monitor ECED/PPE is one of the strategies envisioned under SSDP to improve the quality and efficiency of the sub-sector. Building on this strategy, as a third option, this report provides a cost estimate for hiring a supervisor in every local government. The cost for a supervisor is assumed to be the lowest salary level of secondary school teachers. Supervisors will be responsible for the monitoring and evaluation of ECED facilities to ensure rules and regulations, and standards are complied. At the same time, they should assist and provide pedagogical support to facilitators. Effective supervisors should be able to supervise, mentor and coach ECED facilitators providing advice, pedagogical support and customized feedback to each facilitator. In other words, they must be experienced, skilled, and academically oriented personnel.

²⁰ These prioritized minimum enabling conditions are chosen based on recommendation from the SSDP ECED thematic working group.

²¹ Child-friendly seating arrangement - NPR 125,000 per centre; six learning areas - NPR 75,000 per centre; and water and toilet - NPR 100,000 per centre.

Figure 11: Expected ECED Cost of Deploying Supervisors to Every Municipality (NPR, millions)



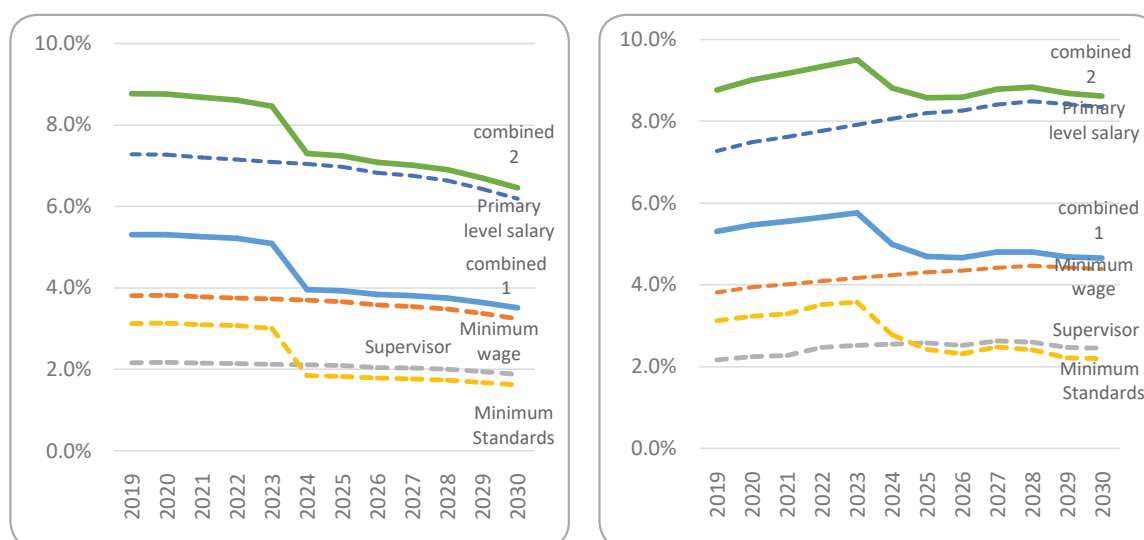
Note: Left: scenario 1; right: scenario 2.

Provision of supervisors will annually cost an additional US\$3.3 million (NPR 378 million) compared to the base model.

Feasibility of the Different Options

The current ECED expenditure level is realized at 10.23 percent of the national education budget in the total government budget and 1.9 percent of the ECED budget in the overall national education budget. The analysis in this section presents the level of investment in ECED by the government/ MoEST that is needed to realize the different policy options discussed above, under the assumption that the national education budget remains at the current level.

Figure 12: Percentage of ECED Budget in the Total National Education Budget to Realize the Different Options



Note: Left: scenario 1; right: scenario 2.

Combination 1: Minimum wage + supervisor + minimum standards; combination 2: primary teacher salary + supervisor + minimum standards.

As evident, increasing the salary of the facilitators to the level of primary teachers is the most expensive option and will require on average about 6.9 percent and 8 percent of the current education budget under the two enrolment scenarios. Combining all three options will require on average about 4.4 percent to 7.7 percent of the education budget under scenario 1 and about 5.1 percent to 8.9 percent under scenario 2.

Increase in the Share of ECED Budget by the MoEST

While the increase in cost compared to the base model is high, the increment relative to the overall education budget is modest. If the MoEST slightly increases the share of the ECED budget from its current level, most options are fiscally viable. Particularly, the options related to provision of supervisor and principal components of the minimum standards, which will require an increase of less than 1 percent of the current education budget. The combined option of increasing the facilitator salary to minimum wage, hiring supervisors, and providing principal components of a minimum standards (combination 1) is also feasible as it will require a modest increase in the ECED budget by 2.5 percent (under scenario 1) and by 3.2 percent (under scenario 2) from the base model, which translates to an average increase in annual cost by US\$29.4 million to US\$37.7 million (tables 6 and 7).

Table 6: ECED Budget Requirement under Scenario 1

Policy Options	% of ECED Budget in Education Budget (Average)	Increment Required from Base Model (%)	Increment (NPR, millions)	Increment (US\$, millions)	Required Education Budget as % of National Budget
Primary teacher salary	6.9	5.0	6728.41	59.20	10.74
Minimum wage	3.6	1.7	2319.20	20.41	10.40
Supervisor	2.1	0.2	233.65	2.06	10.25
Minimum standards	2.3	0.4	551.78	4.86	10.27
Combination 1 ^a	4.4	2.5	3341.87	29.40	10.48
Combination 2 ^b	7.7	5.8	7751.08	68.20	10.82

Note: ^aMinimum wage + supervisor + minimum standards; ^bprimary teacher salary + supervisor + minimum standards

Table 7: ECED Budget Requirement under Scenario 2

Policy options	% of ECED Budget in Education Budget (Average)	Increment Required from Base Model (%)	Increment (NPR, millions)	Increment (US\$, millions)	Required Education Budget as % of National Budget
Primary teacher salary	8.0	6.1	8233.3	72.4	10.85
Minimum wage	4.2	2.3	3118.3	27.4	10.46
Supervisor	2.5	0.6	749.6	6.6	10.28
Minimum standards	2.8	0.9	1205.8	10.6	10.32
Combination 1 ^a	5.1	3.2	4284.1	37.7	10.55
Combination 2 ^b	8.9	7.0	9399.1	82.7	10.94

Note: ^aMinimum wage + supervisor + minimum standards; ^bprimary teacher salary + supervisor + minimum standards

The education budget on average has increased by 12 percent in the last five years, which translates to an average nominal increase in budget by NPR 14,408 million annually. If it is assumed that the same trend will continue, allocating 25 percent to 30 percent of the annual increase in the education budget to ECED will be adequate to implement the combined policy of increasing the facilitator salary to minimum wage, hiring supervisors, and providing principal components of the minimum standards.

Table 8: Trend in Education Budget, 2014/15–2019/20

	National Education Budget (NPR, millions)	Increase in Education Budget (NPR, millions)
2014/15	91,714	
2015/16	98,643	6,929
2016/17	116,361	17,718
2017/18	126,642	10,281
2018/19	134,509	7,867
2019/20	163,756	29,247
Average	121,937	14,408

Source: MoEST's Annual Work Plan and Budget of various years.

Cost Recovery

While estimating the cost recovery of these policy options are beyond the scope of the analysis, it should be noted that ECED policies that address the quality issue and enhance school readiness among children will recover some of the cost through improvement in the internal efficiency and better learning outcomes in the subsequent education levels. If these policies do improve the quality of ECED, the fiscal burden derived from these policies will be much smaller than the estimates generated by the simple costing exercise presented here.

Demographic Change

It is estimated that the basic education age children's population (ages 5-12) in Nepal will shrink by 5 percent by 2030.²² Some portion of the fiscal space created by this population decrease can be used to increase financing for the ECED sub-sector.

Cost Sharing Between Local and Federal Government

Nepal's transition to a federal system provides a unique opportunity to increase funding for the school sector, including the ECED sub-sector.²³ Ensuring provision of basic services, including ECED, is the main mandate of the LGs.²⁴ While currently the LGs mostly rely on the budget allocated by the federal government for basic services, some LGs have allocated portion of their discretionary funds towards school education and ECED. However, the contribution varies significantly across LGs with not all LGs supplementing the federal school education budget. Most federated countries have cost sharing provision in place between its different tiers of government. For Nepal as well, cost sharing provisions can be included in the Federal Education Act or similar legal provision can be put in place to ensure minimum contribution from the LGs towards school education, including ECED.²⁵

²² Based on UN population estimates.

²³ The Constitution promulgated in 2015 introduced a three-tier federal system comprised of federal, provincial and local governments with funds, functions, and functionaries hitherto managed by the central, district and village authorities are moving to the seven new provinces and 753 LGs.

²⁴ The Local Government Operations Act 2017, which provides further details on the functions of the local government, specifies that the local government shall be responsible for formulation, implementation, monitoring, evaluation and regulation of policies, laws, standards and plans for early childhood development and education.

²⁵ Federal Education Act is in the making and is expected to be tabled to the Parliament for approval in the winter parliament session (December 2019 – February 2020)



4

Conclusion

While Nepal has improved access to ECED, the quality of these ECED services remains a concern. The study provides cost estimates of improving existing and introducing new inputs to improve the quality of ECED in Nepal. The analysis shows that while the cost of implementing different policy options can seem substantial compared to the current allocation, the increase required compared to the overall education budget is modest. Some of the policy options, particularly, related to provision of supervisor and principle components of the minimum standards can be achieved with increase of less than 1 percent of the current education budget. The combined option of increasing the facilitator salary to minimum wage, hiring supervisors, and providing principal components of the minimum standards can also be feasible as it will require a modest increase in the ECED budget by 2.5 percent (under scenario 1) and by 3.2 percent (under scenario 2) from the base model.

While additional investments are necessary, mobilizing additional resources alone, without due consideration to the quality of inputs, is no guarantee that ECED outcomes will improve. Increasing evidence suggests that low quality early childhood education programmes are not just ineffective, they can in fact lead to worse learning and behavioural outcomes – hence constituting a waste of resources. Therefore, quality, effectiveness and efficiency of the investment will need to be enhanced if ECED goals, both national and SDGs, are to be achieved. For this to happen, proper implementation of the policies needs to be ensured. Furthermore, a strong M&E system with required data and information on the sub-sector, including data on child development outcomes, needs to be collected on a regular basis to track performance and inform future policies and reforms.

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Annex 1: Population Projection

	United Nations Population Projection by Age				
	3	4	5	6	7
2018	548,276	546,778	547,876	551,285	556,720
2019	538,621	545,378	546,244	548,950	553,316
2020	539,629	540,533	542,649	545,906	550,237
2021	538,953	539,056	540,360	542,803	546,321
2022	538,774	538,139	538,715	540,418	543,188
2023	538,644	537,321	537,228	538,278	540,378
2024	538,654	536,240	535,524	535,976	537,499
2025	537,249	534,620	533,304	533,197	534,195
2026	542,374	539,182	536,877	535,374	534,591
2027	545,568	543,001	540,669	538,692	537,004
2028	544,610	544,188	543,130	541,663	540,014
2029	527,426	540,459	542,300	542,748	542,145
2030	519,480	529,209	535,896	539,991	541,941

Source: United Nations Population Division (accessed December 11, 2019).

