



# Estimating the cost of achieving basic literacy and numeracy targets in the context of SDG4.6 in GAL countries

## Revised Technical Note

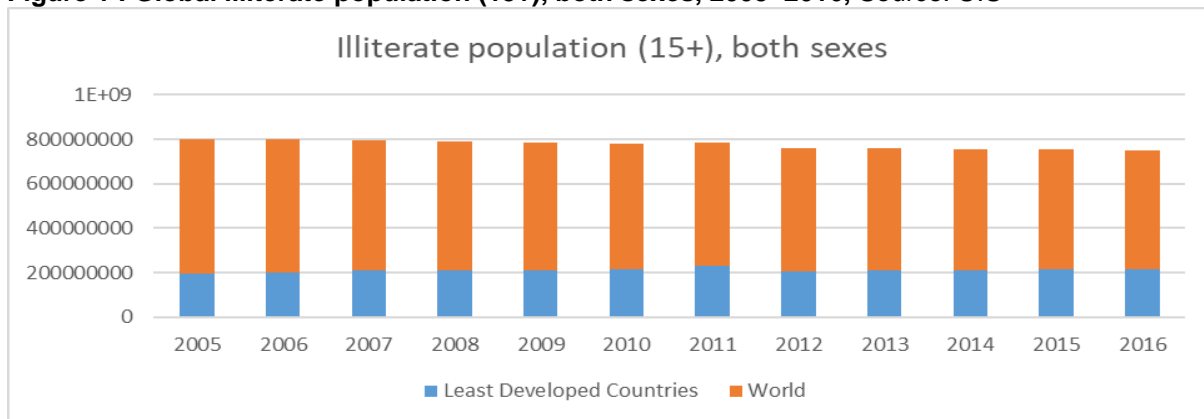
*This document presents the details of UNESCO’s exercise on estimating the financial cost of achieving the basic literacy and numeracy target in the context of SDG4.6 in the 29 countries which are members of the Global Alliance for Literacy within the Framework of Lifelong Learning (GAL). The document begins with a) a presentation of the background/context of the exercise and b) a brief review of the existing research and costing exercises. The document then c) introduces the details of UNESCO’s new simulation model for literacy costing, d) followed by the presentations and discussions of the initial simulation results.*

### 1. Background

In 2015, the global community agreed on the Agenda for Sustainable Development, committing to achieving 17 Sustainable Development Goals (SDGs). The SDGs include a global goal on education (SDG 4), which is to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”.

Youth and adult literacy is one of the 7 targets under SDG 4, reflecting the persistent literacy challenges despite the progress seen in the expansion of access to education, particularly at the primary level, in the past decades. The literacy target (SDG Target 4.6) aims to ensure that “by 2030, all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy”.

**Figure 1 : Global illiterate population (15+), both sexes, 2005–2016, Source: UIS**





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Globally, the adult literacy rate is improving and the total number of illiterate adults is decreasing over time (Figure 1). When we look at the least developed countries (LDCs), however, very limited changes can be observed. While the adult literacy rate in the LDCs improved from 55.4% in 2005 to 63% in 2016, the actual size of the illiterate population increased from 194 million to 218 million due to population growth.

While there have been efforts to estimate the financial implications of achieving school- and youth-related SDG 4 targets (e.g. Wils, 2015),<sup>1</sup> the cost of achieving youth and adult literacy under SDG 4 remains unclear. In this context, UNESCO aims to estimate the cost of achieving basic literacy and numeracy within the context of SDG Target 4.6 in the 29 member countries<sup>2</sup> of the Global Alliance for Literacy (GAL), including the 20 countries with adult literacy rates below 50% as well as the E-9 countries where the majority of the youth and adults with low literacy levels live. This exercise aims to shed light on the financial requirement of meeting SDG Target 4.6 and facilitate a discussion on the importance of investing in literacy as the foundation and integral part of lifelong learning. For this purpose, UNESCO developed an Excel-based simulation model to estimate the number of illiterate population up to 2030 and the cost associated with increasing their level of literacy.

## 2. Prior Costing Exercises and their Limitations

There have been several attempts to calculate unit costs of literacy programmes, especially between 2005 and 2010 following the launch of the United Nations Literacy Decade in 2003. Ravens and Aggio (2005)<sup>3</sup> used two different types of unit cost. The “standard variant” is based on: (1) instructional time needed to acquire a basic level of mastery; (2) instructors’ annual salary; (3) working hours per year; (4) number of courses an instructor can deliver per year; (5) % of salary on total cost; and (6) group size. The standard costs were expressed in terms of GNP/capita and it were estimated to be 5.3% of GNP/capita for South West Asia, East Asia and Pacific, and the Arab States. In sub-Saharan Africa and Latin America, they were estimated to be 8.9% and 4.4% of GNP/capita respectively. This methodology produced the total cost of USD 26 billion to ensure 558 million people will complete 400 hours of literacy programmes for all developing countries (including 24 “LIFE”<sup>4</sup> countries). The “budget variant” focuses on cost-

<sup>1</sup> Wils, A. (2015). Reaching education targets in low and lower middle income countries: Costs and finance gaps to 2030 for pre-primary, primary, lower- and upper secondary schooling.

<sup>2</sup> Global Alliance of Literacy (GAL) countries: Afghanistan, Benin, Burkina Faso, Central African Republic, Chad, Comoros, Côte d’Ivoire, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Iraq, Liberia, Mali, Mauritania, Niger, Senegal, Sierra Leone, and South Sudan and E-9 countries: Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Nigeria, and Pakistan.

<sup>3</sup> Ravens, J. and Aggio, C. (2005). The cost of Dakar goal 4 for developing and “LIFE” countries. Background paper prepared for the Education for All Global Monitoring Report 2006. Paris: UNESCO. <http://unesdoc.unesco.org/images/0014/001463/146330e.pdf>

<sup>4</sup> LIFE (Literacy Initiative for Empowerment) countries included: (A) literacy rate below 50% Bangladesh, Benin, Burkina Faso, Central African Republic, Chad, Ethiopia, Mali, Mozambique, Nepal, Niger, Pakistan, Senegal, Sierra Leone. (B) countries with > 10 million illiterates (in absolute numbers) Bangladesh, Brazil, China, Democratic Rep. of the Congo, Egypt, Ethiopia, Indonesia, Iran, Islamic Republic of, Madagascar, Mauritania, Morocco, Nigeria, Pakistan, Papua New Guinea (UNESCO, 2004a). Please note that Bangladesh, Ethiopia and Pakistan meet both criteria (a



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efficiency of the literacy programmes, often extensively utilizing technology. Using this variant, the average unit cost was USD 20, which resulted in an estimate of USD 11 billion as the total cost. Ravens and Aggio also considered the “advanced variants” including the cost of creating a literate environment, taking into consideration the opportunity cost of the learners, and cost of acquisition of life skills. The estimated total unit cost using the advanced variables ranged between USD 100–200 for a two year programme and USD 150–300 for a three year programme. Based on this methodology, but adding the premium cost for female learners as well as extending the course duration to ensure acquisition of life skills beyond basic literacy, Raya (2012)<sup>5</sup> estimated the cost of achieving the EFA literacy goals in the Asia-Pacific region (260 million illiterates) to be USD 45 billion over 5 years (2010–2014).

The Global Campaign for Education (GCE) and Action Aid International (2005)<sup>6</sup> contributed significantly to the knowledge of cost of literacy projects/programmes. Analysing 67 adult literacy programmes from 35 countries, it concluded that a good quality literacy programme is likely to cost between USD 50 to USD 100 per learner per year for at least three years. Carr-Hill & Roberts (2007),<sup>7</sup> analysing programmes implemented by both NGOs and governments in mostly African countries, estimated the minimum unit cost of quality literacy programme to be USD 100.

While significant efforts have been made to assess the cost of achieving literacy, a number of limitations still remain. More importantly, estimating the unit cost for literacy programmes is a challenging task. The existing studies as well as the analyses conducted for this exercise showed that there is a significant variation in the cost of literacy programmes across countries, often 5- to 10-fold differences. This is partly because the contents and delivery methods of literacy programmes vary significantly, ranging from very simple classroom style programmes run by volunteer teachers to a more comprehensive, possibly IT-enhanced, literacy-with-life-skills component organized by full-time teachers/trainers. Some programmes may target youth and some may target older populations, while others may target linguistic minorities. All these can have financial implications. However, at the time of the exercise, due to lack of data it was not possible to differentiate these programmes sufficiently to estimate different unit costs for different types the programme.

Furthermore, experts agree that “literate environment” (e.g. newspapers, books and libraries and, increasingly, access to digital devices and the Internet) is critically important to improve the acquisition and use of literacy skills. It is difficult to determine the cost of creating a literate environment and cannot be included in the estimation.

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literacy rate lower than 50% and more than 10 million illiterates). In order to avoid double counting these three countries have been taken out of group B.

<sup>5</sup> Raya, R. (2012). Pursuing Adult Literacy: The Cost of Achieving EFA Goal 4. <http://www.iiz-dvv.de/adult-education-and-development/ausgaben/number-78/benefits-of-adult-learning-and-social-inclusion/pursuing-adult-literacy-the-cost-of-achieving-efa-goal-4/>

<sup>6</sup> Global Campaign for Education & ActionAid International. (2005). Global Benchmarks for Adult Literacy. A Final Report Produced for the Education for All Global Monitoring Report 2006. Paris: UNESCO. <http://unesdoc.unesco.org/images/0014/001470/147085e.pdf>

<sup>7</sup> Carr-Hill, R. and Roberts, F. (2007). Approaches to Costing Adult Literacy Programmes, especially in Africa. Hamburg: UNESCO Institute for Lifelong Learning (UIL).



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### 3. UNESCO Literacy Model: Methodological Approach

#### a) Definition of literacy

This exercise used the literacy data produced by the UNESCO Institute for Statistics,<sup>8</sup> which measures literacy as a dichotomous variable. Most of the data are derived from censuses and surveys which use a conventional question on literacy that measures literacy as the ability to read and write, with understanding, a short, simple statement about one's everyday life. In most countries, the data are based on self-declaration either by each member of the household or by the head of the household. Very limited countries conduct direct literacy assessments and even when they do, they rarely assess the full range of literacy skills.

It is important to note, however, the conceptual gap between this dichotomous definition used for currently available literacy statistics and a recent understanding of literacy. Concepts of literacy are diverse, and the international definition of literacy has evolved over the past decades. In the current international discourse of literacy, it is agreed that literacy is a continuum of functional literacy and numeracy skills acquired throughout a lifetime, rather than the literate/illiterate dichotomy applied in the above definition. For monitoring SDG Target 4.6, therefore, the global indicator 4.6.1 is the proportion of population in a given age group achieving at least a fixed level of proficiency in functional (1) literacy and (b) numeracy skills, by sex.

At the same time, however, the availability of statistics that reflect this notion of literacy as a continuum of skills is still quite limited. An assessment and a reporting framework under this new definition are currently being developed by the taskforce 4.6 of the Global Alliance to Monitor Learning (GAML), and data are of limited availability especially for the countries covered by this exercise. Hence, this exercise uses the literacy data based on the dichotomous definition, which are compiled by UIS, as they remain the most widely available data. This, however, provides only a crude picture of the state of literacy in the world, and there is a risk of underestimating the magnitude of investment needed to address the literacy challenges. When more nuanced and accurate data are available for a significant number of countries, using a definition and a methodology that GAML will define, the simulation model can be updated.

#### b) Key elements of the model

The development of the new UNESCO simulation model owes much to the work of Ravens and Aggio (2005).<sup>9</sup> The cost structure as well as the key assumptions of their work has greatly informed the new model with some updating. The main difference from the previous model is the reflection of demographic and social/educational changes in projecting the size of illiterate population over time. The Ravens-Aggio model considers the illiterate population as "stock"

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<sup>8</sup> UNESCO Institute for Statistics (UIS) Data Center <http://data.uis.unesco.org/>

<sup>9</sup> Ravens, J. and Aggio, C. (2005). The cost of Dakar goal 4 for developing and "LIFE" countries. Background paper prepared for the Education for All Global Monitoring Report 2006. Paris: UNESCO. <http://unesdoc.unesco.org/images/0014/001463/146330e.pdf>



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rather than a “flow”. In this exercise, a flow-based simulation was applied in order to better reflect the impact of formal education expansion (SDG 4.1) as well as the changes in demographic patterns. In addition, the UNESCO model covers the population up to 100 years of age, and can differentiate literacy projections for youths (15–24 yrs), adults (25–64 yrs), and elderly people (65+)<sup>10</sup> to allow a projection more sensitive to the learning needs of different age groups.

### c) Model Structure and Data Sources

The model contains the following seven (7) sheets:

1. “Data1” contains the baseline data except population
  - GDP per capita (2017) is used to calculate the unit costs and for grouping countries in the results (Group sheet). Source: World Bank
  - Illiterate population is used to calculate the literacy rate. Source: UNESCO-UIS
2. “Data2” contains population projection by age and gender  
Source: World Population Prospects 2017, DESA/Population Division, United Nations<sup>11</sup>.
3. “Model” contains the core of the model where parameters can be set and results seeing for each country chosen in the combobox [a drop-down list or list box combined with a single-line editable textbox] located at the top left of the sheet.
4. “GroupPara” allows the users to set parameters for all countries for group simulation.
5. “Group” is for producing results by any group of countries.
6. “Calc” is a hidden sheet. It stores intermediate calculation results and not necessary for the users of the model to see.
7. “MemoPara” is also a hidden sheet. It is used for storing the parameters for each country.

The details of the parameters and calculation methods used in the model are described in Annex 1.

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<sup>10</sup> The UNESCO model covers the population up to 100 years old

<sup>11</sup> <https://population.un.org/wpp>



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## d) Scenarios and Assumptions

### Quantifying SDG4.6 commitments

Unlike EFA Goal 4, SDG Target 4.6 does not specify a quantitative goal. The first step of this exercise, therefore, is to quantify this internationally agreed commitment. The SDG Target 4.6 states that “all youth” and a “substantial portion of adults” achieve literacy and numeracy.

This can be interpreted as a youth literacy rate of 100% by 2030. For adult literacy rate, this exercise will apply the below three scenarios for simulation (Table 1). Under these scenarios, all 15-year-olds will be literate by 2030 due to the expansion of basic education, through formal or non-formal modalities of literacy provision (SDG4.1).

**Table 1: Scenarios used for projection**

Measurable targets	Scenario 1		Scenario 2		Scenario 3	
	Target value	Target year	Target value	Target year	Target value	Target year
1. % of 15 years old literate through formal education	100%	2030	100%	2030	100%	2030
2. Youth literacy rate (15 – 24 years old)	100%	2030	100%	2030	100%	2030
3. Adult literacy rate (15+) gap filled	SSA: 50% ARB: 60% LA: 60% AP: 60% 20 GAL countries: 50% E-9 countries: 60%	2030	SSA: 70% ARB: 75% LA: 75% AP: 75% 20 GAL countries: 70% E-9 countries: 75%	2030	100% for all regions and groups	2030





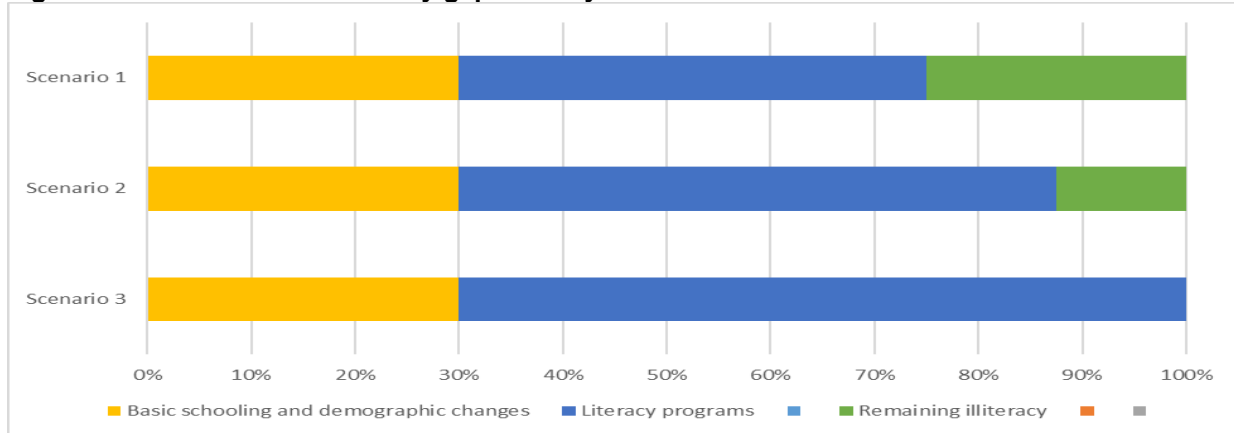
The countries included in the simulation is as follows (Table 2).

**Table 2: List of the countries by region and group**

Sub-Saharan Africa, SSA (18)	Arab region, ARB (2)	Latin America and Caribbean, LA (3)	Asia and Pacific, AP (6)	20 GAL countries (not including E-9)	E-9 countries (9)
Benin Burkina Faso Central African Republic Chad Côte d'Ivoire Comoros Ethiopia Gambia Guinea Guinea-Bissau Liberia Mali Mauritania Niger Nigeria Senegal Sierra Leone South Sudan	Iraq Egypt	Brazil Haiti Mexico	Afghanistan Bangladesh China India Indonesia Pakistan	Afghanistan Benin Burkina Faso Central African Republic Chad Comoros Côte d'Ivoire Ethiopia Gambia Guinea Guinea-Bissau Haïti Iraq Liberia Mali Mauritania Niger Senegal Sierra Leone South Sudan	Bangladesh Brazil China Egypt India Indonesia Mexico Nigeria Pakistan

“The adult literacy gap filled” represents the percentage of the progress made towards 100% literacy rate. For instance, the adult literacy rate in 2017 is 50%, 50% of the gap filled means that by 2030, the adult literacy rate should reach 75% (50% + 50\*50%) for Scenario 1 (SSA region). Similarly, the adult literacy rates in 2030 will be 87.5% (50% + 50\*70%) in Scenario 2, and 100% (50% + 50\*100%) in Scenario 3. Some of the improvement of the literacy rate can be attributed to the expansion of basic education as well as the demographic changes. The model takes these factors into consideration in order to calculate the number of people who need to be covered by literacy programmes (Figure 2).

**Figure 2: A model of adult literacy gap filled by source**



**Unit cost assumptions**

Hanemann (2015)<sup>12</sup> reviewed large-scale national literacy programmes conducted between 2000-2014 in 31 countries. The author found a wide variation across programmes, especially in terms of the duration and the unit costs. The duration of literacy course cycles varies from 3 months to 3 years. The contact hours also vary. The unit costs per learner of the reviewed programmes show much wider variation. They range from USD 5 in Saakshar Bharat Mission (India) to USD 1035 for Misión Robinson (Venezuela).

While understanding the challenges to agree on what consists of “good” literacy programme, for this exercise, we used the same approach taken by Ravens & Aggio (2005),<sup>13</sup> estimating Standard Variant to estimate the total cost of the literacy programmes as shown in Table 3 below.

**Table 3: Standard variant assumptions used in Ravens & Aggio (2005)**

Instructional time needed to acquire a basic level of mastery	400 hours
Instructor’s annual salary (IAS) in sub-Saharan Africa (SSA), Asia, Arab States and Latin America (LA)	5.3 (and 2.5 times average GNP per capita)
Working hours per year	1800
Maximum number of courses an instructor can deliver per year (NC)	4
% of salary on total cost (WC/TC)	70%
Group size (GS)	20

The assumptions and underlying data were updated for the 29 GAL countries where possible. Additional information was collected through the review of the applications submitted to

<sup>12</sup> Hanemann, U. (2015). The Evolution and Impact of Literacy Campaigns and Programmes 2000-2014. UIL Research Series: No.1. Hamburg: UIL, <https://files.eric.ed.gov/fulltext/ED564035.pdf>

<sup>13</sup> Ravens, J. and Aggio, C. (2005). The cost of Dakar goal 4 for developing and “LIFE” countries. Background paper prepared for the Education for All Global Monitoring Report 2006. Paris: UNESCO. <http://unesdoc.unesco.org/images/0014/001463/146330e.pdf>





UNESCO’s International Literacy Prizes (see Annex 3). In addition, the UNESCO Institute for Lifelong Learning (UIL) organized an expert meeting on 27 May 2019 to review the methodology, parameters, and assumptions of this costing exercise. The salary data were updated with the data and the methodology used Wils (2015 and 2018).<sup>14 15</sup> The assumptions regarding the contact hours were updated with the data from Hanemann (2015) as well as the data provided during and after the UIL Expert Meeting.

Several important changes to the assumptions used in Ravens & Aggio (2005)<sup>16</sup> were made. First, two different assumptions were made in terms of contact hours. First, the recent review of the literacy programmes suggest that the minimum contact hours for acquiring the basic literacy and numeracy may be around 200–250 hours, while 450–500 hours may be needed if the literacy programmes include additional skills training, which is usually the case in a large number of programmes (Table 4).

**Table 4: Examples of the literacy programme contact hours**

200-250h	400-500h
<ul style="list-style-type: none"> <li>• 210 hours: National Literacy Programme (Pakistan)</li> <li>• 240 hours: South African Kha Ri Gude mass literacy campaign</li> <li>• 240 hours: Namibian adult basic education programme (basic level)</li> </ul>	<ul style="list-style-type: none"> <li>• 458 hours: Afghanistan National Association for Adult Education (ANAF AE)</li> </ul>
Source: Hanemann (2015)	Source: Data provided at the UIL Expert meeting (May 2019)

Second, instructor’s annual salary and working hours were also reviewed and updated. Ravens & Aggio (2005)<sup>17</sup> assumed the salary of literacy instructors to be equivalent to primary teachers’ salaries and they work 1800 hours per year. The information from the experts suggest that the literacy instructors are often paid less and tend to work part-time. Hence the assumptions were made that the literacy instructors are paid 50% of the primary teachers’ salaries and work significant less hours than the assumption used in Ravens & Aggio (2005).<sup>18</sup> The primary teacher salary was projected for each country linked to the GDP per capita based on the work

<sup>14</sup> Wils, A. (2015). Reaching education targets in low and lower middle income countries: Costs and finance gaps to 2030 for pre-primary, primary, lower- and upper secondary schooling.

<sup>15</sup> Wils, A. (2018). Addendum to “Reaching education targets in low and lower middle-income countries: Costs and finance gaps to 2030 for pre-primary, primary, lower- and upper secondary”.

<https://www.unescap.org/sites/default/files/Background-note--education-costing-model.pdf>

<sup>16</sup> Ravens, J. and Aggio, C. (2005). The cost of Dakar goal 4 for developing and “LIFE” countries. Background paper prepared for the Education for All Global Monitoring Report 2006. Paris: UNESCO.

<http://unesdoc.unesco.org/images/0014/001463/146330e.pdf>

<sup>17</sup> Ravens, J. and Aggio, C. (2005). The cost of Dakar goal 4 for developing and “LIFE” countries. Background paper prepared for the Education for All Global Monitoring Report 2006. Paris: UNESCO.

<http://unesdoc.unesco.org/images/0014/001463/146330e.pdf>

<sup>18</sup> Ravens, J. and Aggio, C. (2005). The cost of Dakar goal 4 for developing and “LIFE” countries. Background paper prepared for the Education for All Global Monitoring Report 2006. Paris: UNESCO.

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done by ESCAP (2018).<sup>19</sup> The primary teacher salary was projected using  $Y_i=36.6X_i^{-0.305}$  where Y is the teacher salary in multiple of GDP/capita and X is GDP/capita in year i. It is also controlled that the teacher salary in absolute term will not decrease over time. It must be noted, however, that such assumptions are difficult to apply across countries as the country contexts as well as the literacy situations vary significantly. The profiles of literacy instructors vary across countries (and within countries as well), some of them are trained teachers, while others are untrained volunteers. For more specific projection and analysis of at the country level will require more detailed country data.

The share of instructors' salary in the total cost was also reviewed. While the share of teacher salary of the total cost was set at 70% in the Ravens & Aggio model in 2005, the recent data suggest that the share of the salary may be around 40-50%. For instance, 40% of the total cost was used for the facilitators and educators for Ibero-American Plan for Literacy and Basic Education of Youth and Adults (PIA) in 2006.<sup>20</sup> In Afghanistan National Association for Adult Education (ANAF AE), costs related to literacy facilitators and local administrators was approximately 44% of the total expenditures in 2018.<sup>21</sup> In this exercise, it is set as 45% in 2017 based on the available information and the feedback provided during the UIL expert meeting in May 2019. Over time, this share will increase to 65% by 2029. This is on the assumption that as the total coverage of the literacy programs expand, the non-teaching cost as share of total cost (e.g. programme design, curriculum development, material development, evaluation etc.) will decrease because of the possible economies of scale.<sup>22</sup>

In the above context, while fully acknowledging the significant variation across literacy programmes, the below two unit cost scenarios were used for this costing exercise (Table 5).

**Table 5: Standard variant scenarios**

Scenarios	250h	500h
Number of contact hours	250	500
Annual salary for instructors	50% primary school teacher salaries in multiple of GDP per capita	
Annual working hours per year	900	900
Number of courses delivered by an instructor/year (NC)	3.6	1.8
% of salary of total cost (WC/TC)	45% in 2017, 65% in 2030	45% in 2017, 65% in 2030
Group size (GS)	20	20
Pass rate	15-24 yrs: 80% 25-64 yrs: 70% 65+ yrs: 60%	15-24 yrs: 80% 25-64 yrs: 70% 65+ yrs: 60%

<sup>19</sup> ESCAP (2019). Economic and Social Survey of Asia and the Pacific 2019: Ambitions beyond growth [https://www.unescap.org/sites/default/files/publications/Economic\\_Social\\_Survey%202019.pdf](https://www.unescap.org/sites/default/files/publications/Economic_Social_Survey%202019.pdf)

<sup>20</sup> In Hanemann, U. (2015). The Evolution and Impact of Literacy Campaigns and Programmes 2000–2014. UIL Research Series: No.1. Hamburg: UIL, <https://files.eric.ed.gov/fulltext/ED564035.pdf>, P28

<sup>21</sup> Data provided at the UIL Expert meeting, May 2019

<sup>22</sup> While actual data are scarce to estimate the % of instructors' salaries, in case of primary education, it is considered 70–75%. Given that literacy programmes often cover disadvantaged/marginalized populations, a slightly lower share of instructors' salary (65%) was used in this exercise.

The unit costs estimated for each of the scenarios are presented in Table 6 below.

**Table 6: Unit costs per learner, 2017 and 2029 (USD, 2017 price)**

	2017		2029	
	250h	500h	250h	500h
All GAL countries	94	189	93	186
E-9 countries	175	349	174	349
Others	58	116	56	112

Source: UNESCO Literacy model

In total, 9 patterns of scenario combination were used for this exercise as shown below in Table 7 below.

**Table 7: Combinations of scenarios**

Scenario 1: 50% of literacy gap filled in SSA and 20 GAL countries, 60% filled in ARB, LA, AP, and E-9 countries	Scenario 2: 70% of literacy gap filled in SSA and 20 GAL countries, 75% filled in ARB, LA, AP, and E-9 countries	Scenario 3: Universal adult literacy for all regions and groups
1. 250h	2. 250h	7. 250h
3. 500h	4. 500h	8. 500h

### e) Limitations of the model

In addition to the limitation related to the definition of literacy and challenges of applying the same assumptions across the diverse countries, most of the challenges faced by Ravens & Aggio (2005)<sup>23</sup> remained same for this exercise. They include: (1) problems of literacy data; (2) narrow empirical basis regarding literacy practice; (3) omission of some key factors such as cost of literacy environment, opportunity cost from the equation due to data limitation; (4) assumptions that are based on weak/limited evidence; and (5) limited knowledge on effectiveness of literacy programmes. It is also important to reiterate that the coverage, design, and costs of literacy programmes vary significantly across countries. Applying a common set of parameters using the same assumptions is not ideal. Given the lack of real data from countries, however, the model applied number of assumptions based on the existing data and studies. A separate data collection and simulation exercise needs to be undertaken to more accurately project the cost for each of the specific countries.

Hence, the main purpose of this exercise is not to calculate the precise figure for achieving SDG4.6. Rather, it is to facilitate the dialogue on the magnitude of financial commitments

<sup>23</sup> Ravens, J. and Aggio, C. (2005). The cost of Dakar goal 4 for developing and “LIFE” countries. Background paper prepared for the Education for All Global Monitoring Report 2006. Paris: UNESCO.  
<http://unesdoc.unesco.org/images/0014/001463/146330e.pdf>

required and advocate for increased investment in literacy by understanding the magnitude of the financial requirement that can be expected.

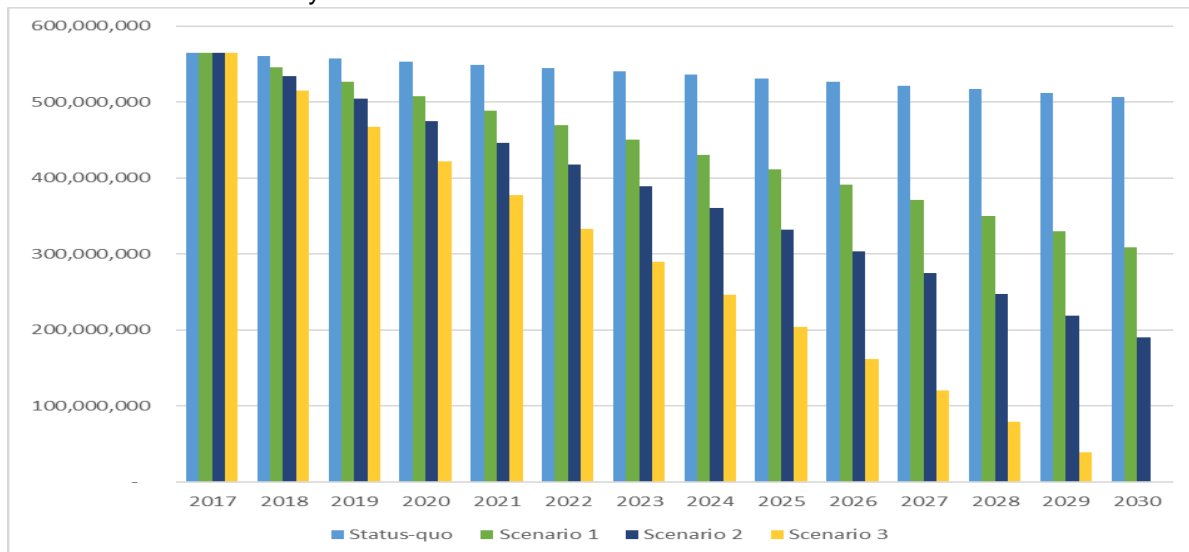
## f) Simulation Results

- **Projection of illiterate population in GAL countries**

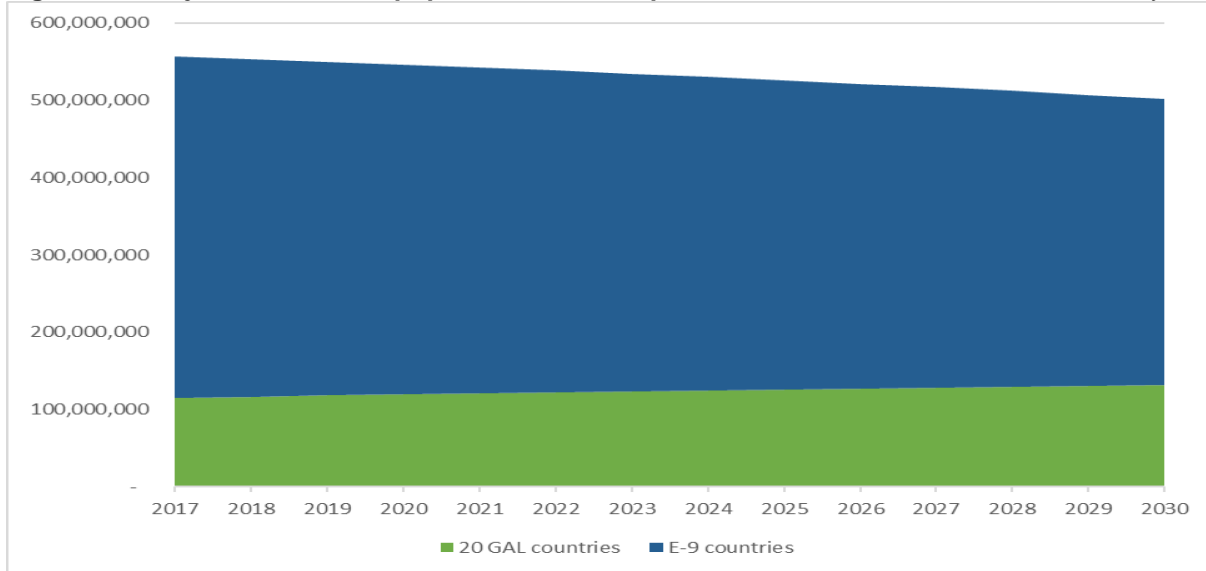
As seen in Figure 3 below, significant reduction can be expected between 2017 and 2030. Even without any additional literacy programme (status-quo), the total number of illiterate adults in GAL countries is expected to be reduced to approximately 500 million by 2030, purely due to expanded schooling and demographic shift. Under Scenario 1 (50% of the literacy gap filled in SSA, 60% for other regions), the absolute number of illiterate adults will decline by 256 million, from 565 million in 2017 to 309 million in 2030. Under Scenarios 2 and 3, the reduction will be 375 million (190 million in 2030) and 565 million. As a result, youth and adult literacy rates can improve significantly (Tables 8–11). It is important to note, however, that universal youth literacy cannot be achieved under the status-quo scenario. In addition, in the status-quo scenario, the absolute number of illiterate population in 20 GAL countries will actually increase over the years (Figure 4) due to the population increase. Additional interventions therefore will be necessary.

**Figure 3: Projected illiterate population in the GAL countries, 2017–2030**

Source: UNESCO Literacy model

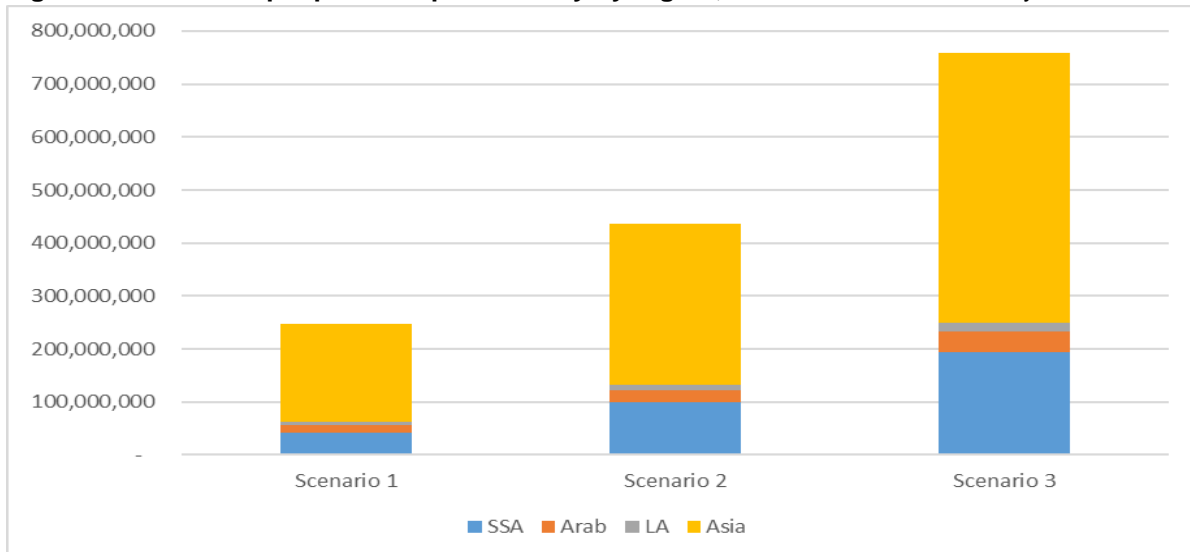


**Figure 4: Projected illiterate population, status-quo scenario, Source: UNESCO Literacy model**



The total number of people to acquire literacy<sup>24</sup> between 2017 and 2030 will be around 240 million people for Scenario 1, 440 million people for Scenario 2, and 760 million people for Scenario 3. The majority of the people to acquire literacy will be from the Asia-Pacific region and approximately 80% of them will be in E-9 countries (Figures 5 and 6).

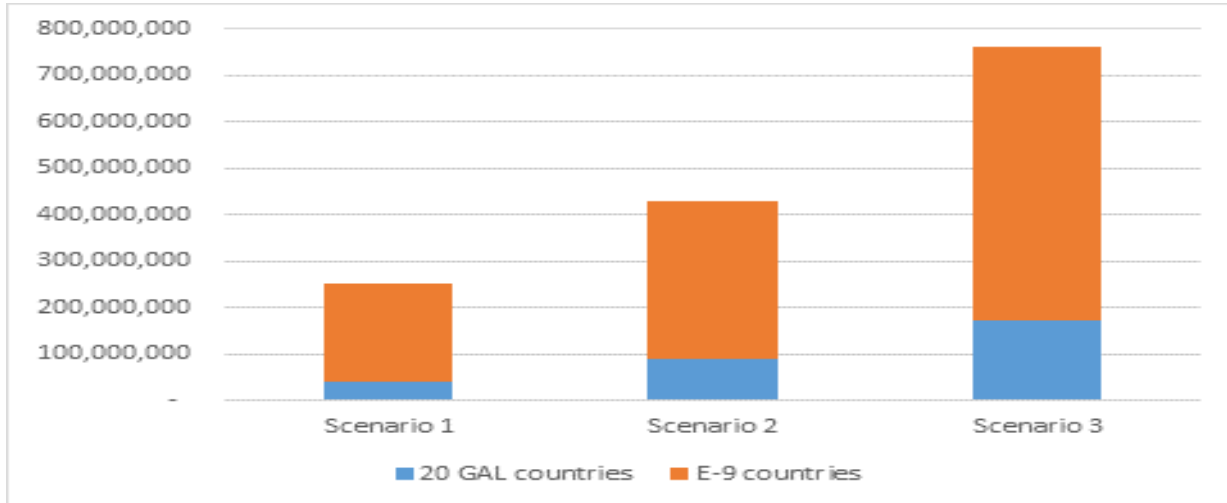
**Figure 5: Number of people to acquire literacy by region, Source: UNESCO literacy model**



<sup>24</sup> The “number of people to acquire literacy” is higher than the projected illiterate population shown in Figure 3 due to the fact that the pass rates of the programmes are not 100% (some people will need to be trained several times). Furthermore, this number also includes the new illiterates who reached the age of 15 during this period.



Figure 6: Number of people to acquire literacy by group, Source: UNESCO literacy model







**Table 8: Youth literacy rate (Male) by region and group**

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Status-quo</b>														
<b>SSA</b>	72%	72%	73%	74%	74%	74%	75%	75%	76%	76%	77%	78%	78%	79%
<b>Arab</b>	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	84%	85%	85%	86%
<b>LA</b>	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
<b>Asia</b>	95%	95%	95%	95%	96%	96%	96%	96%	96%	96%	96%	97%	97%	97%
<b>20 GAL</b>	67%	67%	68%	69%	69%	69%	70%	70%	71%	72%	72%	73%	73%	74%
<b>E-9</b>	95%	95%	95%	95%	95%	95%	95%	96%	96%	96%	96%	96%	96%	96%
<b>Scenario 1</b>														
<b>SSA</b>	72%	75%	77%	79%	82%	84%	85%	87%	89%	91%	93%	95%	97%	98%
<b>Arab</b>	84%	87%	89%	91%	93%	94%	95%	96%	98%	99%	99%	100%	100%	100%
<b>LA</b>	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Asia</b>	95%	96%	97%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%
<b>20 GAL</b>	67%	70%	73%	76%	78%	81%	83%	85%	88%	90%	92%	94%	97%	98%
<b>E-9</b>	95%	96%	97%	98%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%
<b>Scenario 2</b>														
<b>SSA</b>	72%	77%	82%	86%	90%	93%	96%	97%	98%	99%	99%	99%	100%	100%
<b>Arab</b>	84%	88%	91%	93%	95%	97%	98%	99%	99%	99%	99%	100%	100%	100%
<b>LA</b>	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Asia</b>	95%	97%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>20 GAL</b>	67%	73%	78%	83%	88%	91%	94%	96%	97%	98%	99%	99%	100%	100%
<b>E-9</b>	95%	97%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Scenario 3</b>														
<b>SSA</b>	72%	82%	90%	95%	97%	98%	98%	98%	98%	99%	99%	99%	100%	100%
<b>Arab</b>	84%	90%	94%	97%	98%	98%	99%	99%	99%	99%	99%	100%	100%	100%
<b>LA</b>	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Asia</b>	95%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>20 GAL</b>	67%	78%	87%	94%	96%	97%	98%	98%	98%	99%	99%	99%	100%	100%
<b>E-9</b>	95%	98%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: UNESCO literacy model



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**Table 9: Youth literacy rate (Female) by region and group**

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Status-quo</b>														
<b>SSA</b>	63%	64%	65%	66%	67%	68%	68%	69%	70%	71%	72%	74%	75%	76%
<b>Arab</b>	81%	82%	82%	82%	82%	81%	81%	82%	82%	82%	83%	83%	84%	84%
<b>LA</b>	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%
<b>Asia</b>	93%	96%	98%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%
<b>20 GAL</b>	59%	61%	62%	63%	65%	65%	66%	67%	68%	69%	71%	72%	73%	74%
<b>E-9</b>	92%	93%	93%	93%	94%	94%	94%	94%	95%	95%	95%	95%	96%	96%
<b>Scenario 1</b>														
<b>SSA</b>	63%	67%	71%	74%	77%	80%	83%	85%	88%	90%	93%	95%	97%	99%
<b>Arab</b>	81%	86%	89%	91%	92%	94%	95%	97%	98%	99%	99%	99%	100%	100%
<b>LA</b>	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Asia</b>	93%	96%	98%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%
<b>20 GAL</b>	59%	64%	69%	72%	76%	79%	82%	85%	88%	90%	93%	95%	97%	99%
<b>E-9</b>	92%	95%	97%	98%	98%	99%	99%	99%	99%	100%	100%	100%	100%	100%
<b>Scenario 2</b>														
<b>SSA</b>	63%	71%	78%	84%	89%	93%	95%	97%	98%	98%	99%	99%	100%	100%
<b>Arab</b>	81%	87%	91%	93%	96%	98%	98%	99%	99%	99%	99%	99%	100%	100%
<b>LA</b>	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Asia</b>	93%	97%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%
<b>20 GAL</b>	59%	68%	76%	83%	88%	92%	95%	96%	97%	98%	99%	99%	99%	100%
<b>E-9</b>	92%	96%	98%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%
<b>Scenario 3</b>														
<b>SSA</b>	63%	77%	89%	94%	96%	97%	97%	98%	98%	98%	99%	99%	100%	100%
<b>Arab</b>	81%	89%	94%	97%	98%	98%	98%	99%	99%	99%	99%	99%	100%	100%
<b>LA</b>	99%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Asia</b>	93%	98%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%	100%
<b>20 GAL</b>	59%	75%	87%	94%	96%	97%	97%	97%	98%	98%	99%	99%	99%	100%
<b>E-9</b>	92%	97%	99%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%	100%

Source: UNESCO literacy model



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**Table 10: Adult literacy rate (Male) by region and group**

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Status-quo</b>														
SSA	59%	60%	61%	62%	62%	63%	64%	64%	65%	66%	67%	67%	68%	68%
Arab	75%	75%	75%	76%	76%	76%	77%	77%	77%	78%	78%	79%	79%	79%
LA	95%	95%	95%	96%	96%	96%	96%	96%	96%	96%	97%	97%	97%	97%
Asia	90%	90%	90%	90%	91%	91%	91%	91%	91%	92%	92%	92%	92%	92%
20 GAL	54%	55%	55%	56%	57%	58%	58%	59%	60%	60%	61%	62%	62%	63%
E-9	90%	90%	90%	90%	91%	91%	91%	91%	91%	92%	92%	92%	92%	92%
<b>Scenario 1</b>														
SSA	59%	61%	63%	64%	66%	67%	69%	70%	72%	73%	75%	77%	78%	80%
Arab	75%	76%	77%	78%	79%	81%	82%	83%	84%	85%	86%	87%	89%	90%
LA	95%	95%	96%	96%	96%	96%	97%	97%	97%	97%	98%	98%	98%	98%
Asia	90%	90%	91%	91%	92%	92%	93%	93%	94%	94%	94%	95%	95%	96%
20 GAL	54%	56%	57%	59%	61%	63%	64%	66%	68%	70%	72%	73%	75%	77%
E-9	90%	90%	91%	91%	92%	92%	93%	93%	93%	94%	94%	95%	95%	96%
<b>Scenario 2</b>														
SSA	59%	62%	65%	67%	69%	72%	74%	76%	78%	80%	82%	84%	86%	88%
Arab	75%	76%	78%	80%	81%	83%	84%	86%	87%	88%	90%	91%	92%	93%
LA	95%	96%	96%	96%	97%	97%	97%	97%	98%	98%	98%	98%	99%	99%
Asia	90%	90%	91%	92%	92%	93%	94%	94%	95%	95%	96%	96%	97%	97%
20 GAL	54%	57%	60%	62%	65%	68%	70%	73%	75%	78%	80%	82%	84%	86%
E-9	90%	90%	91%	92%	92%	93%	94%	94%	95%	95%	96%	96%	97%	97%
<b>Scenario 3</b>														
SSA	59%	64%	68%	72%	75%	79%	82%	85%	88%	91%	93%	96%	98%	100%
Arab	75%	77%	80%	82%	84%	86%	88%	90%	92%	94%	95%	97%	99%	100%
LA	95%	96%	96%	97%	97%	97%	98%	98%	98%	99%	99%	99%	100%	100%
Asia	90%	91%	92%	93%	94%	94%	95%	96%	97%	97%	98%	99%	99%	100%
20 GAL	54%	59%	63%	68%	72%	76%	79%	83%	86%	89%	92%	95%	98%	100%
E-9	90%	91%	92%	93%	93%	94%	95%	96%	97%	97%	98%	99%	99%	100%
<b>Source: UNESCO literacy model</b>														



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**Table 11: Adult literacy rate (Female) by region and group**

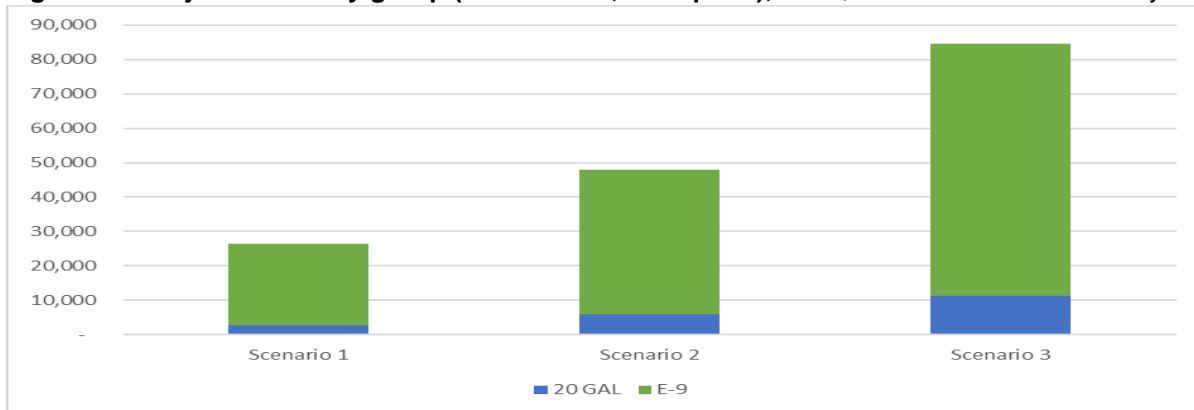
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Status-quo</b>														
<b>SSA</b>	42%	43%	44%	45%	46%	47%	49%	50%	51%	52%	53%	54%	55%	56%
<b>Arab</b>	64%	65%	65%	66%	67%	67%	68%	68%	69%	70%	70%	71%	72%	72%
<b>LA</b>	95%	95%	95%	95%	96%	96%	96%	96%	96%	96%	96%	97%	97%	97%
<b>Asia</b>	80%	81%	81%	82%	82%	83%	83%	84%	84%	84%	85%	85%	86%	86%
<b>20 GAL</b>	37%	38%	39%	41%	42%	43%	44%	46%	47%	48%	49%	50%	51%	52%
<b>E-9</b>	81%	81%	82%	82%	83%	83%	83%	84%	84%	85%	85%	85%	86%	86%
<b>Scenario 1</b>														
<b>SSA</b>	42%	44%	46%	48%	51%	53%	55%	57%	60%	62%	64%	66%	68%	71%
<b>Arab</b>	64%	66%	68%	69%	71%	73%	74%	76%	78%	79%	81%	82%	84%	85%
<b>LA</b>	95%	95%	95%	96%	96%	96%	96%	97%	97%	97%	97%	98%	98%	98%
<b>Asia</b>	80%	81%	82%	83%	84%	85%	86%	87%	88%	89%	89%	90%	91%	92%
<b>20 GAL</b>	37%	40%	42%	45%	47%	49%	52%	54%	57%	59%	61%	64%	66%	68%
<b>E-9</b>	81%	82%	83%	84%	85%	85%	86%	87%	88%	89%	90%	90%	91%	92%
<b>Scenario 2</b>														
<b>SSA</b>	42%	45%	49%	53%	56%	60%	63%	66%	69%	72%	74%	77%	80%	82%
<b>Arab</b>	64%	66%	69%	71%	73%	76%	78%	80%	82%	84%	86%	87%	89%	91%
<b>LA</b>	95%	95%	96%	96%	96%	97%	97%	97%	97%	98%	98%	98%	98%	99%
<b>Asia</b>	80%	82%	83%	84%	85%	87%	88%	89%	90%	91%	92%	93%	94%	95%
<b>20 GAL</b>	37%	41%	45%	49%	53%	56%	60%	63%	66%	70%	73%	75%	78%	81%
<b>E-9</b>	81%	82%	83%	85%	86%	87%	88%	89%	90%	91%	92%	93%	94%	95%
<b>Scenario 3</b>														
<b>SSA</b>	42%	48%	54%	59%	64%	69%	74%	78%	82%	86%	90%	94%	97%	100%
<b>Arab</b>	64%	68%	71%	74%	77%	80%	83%	86%	89%	91%	94%	96%	98%	100%
<b>LA</b>	95%	95%	96%	96%	97%	97%	98%	98%	98%	99%	99%	99%	100%	100%
<b>Asia</b>	80%	82%	84%	86%	88%	89%	91%	92%	94%	95%	96%	98%	99%	100%
<b>20 GAL</b>	37%	44%	50%	56%	62%	67%	72%	77%	81%	85%	89%	93%	97%	100%
<b>E-9</b>	81%	83%	84%	86%	88%	89%	91%	92%	94%	95%	96%	98%	99%	100%

Source: UNESCO literacy model

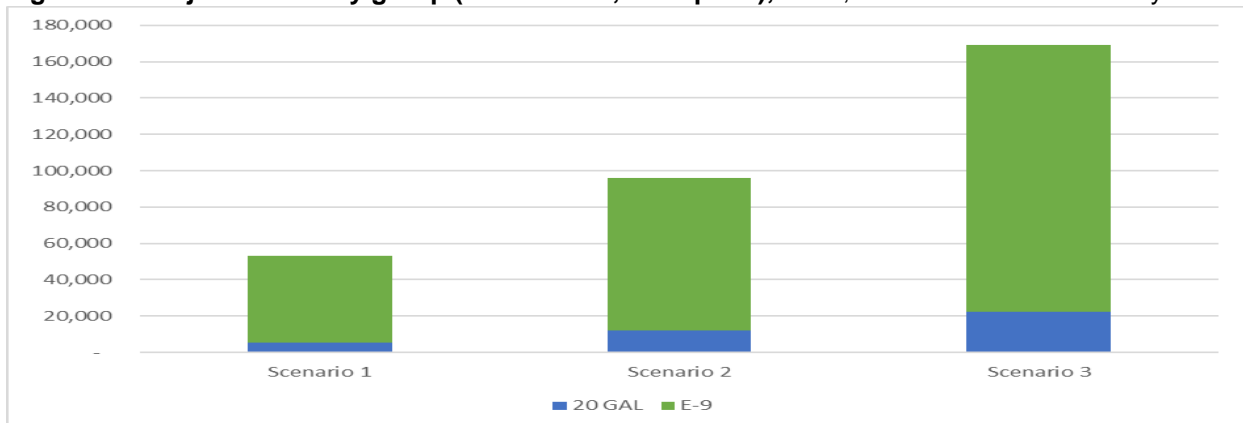
### g) Cost projection

Figures 6a and b show the breakdown of the projected costs by group. With the 250h scenario, the cost of filling 50–60% of the literacy gap (scenario 1) is 26.5 billion USD between 2017 and 2029 for all GAL countries, of which 23.7 billion USD is needed for E-9 countries. 47.9 billion USD (of which 41.9 billion USD for E-9 countries) is needed to achieve Scenario 2 (filling 70–75% of the literacy gap), and 84.6 billion USD (of which 73.3 billion USD for E-9 countries) is needed for Scenario 3 (achieving universal literacy). Under the 500h scenario, the costs are estimated at 52.9 billion USD for Scenario 1 (of which 47.4 billion USD for E-9 countries), 95.3 billion USD for Scenario 2 (of which 83.3 billion USD for E-9 countries), and 169.1 billion USD for Scenario 3 (of which 146.6 billion USD for E-9 countries). Despite the higher literacy rates in the E-9 countries, the cost is considerably higher for E-9 countries compared to the 20 GAL countries due to the high volume of the illiterate population as well as the higher GCP/capita which increased the cost of the literacy teachers/instructors.

**Figure 6a: Projected cost by group (million USD, 2017 price), 250h, Source: UNESCO literacy model**

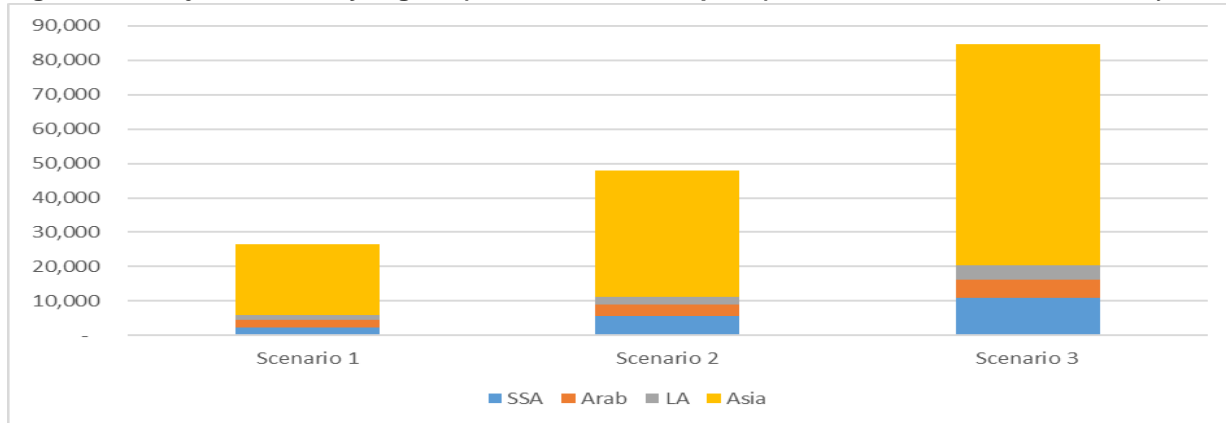


**Figure 6b: Projected cost by group (million USD, 2017 price), 500h, Source: UNESCO literacy model**

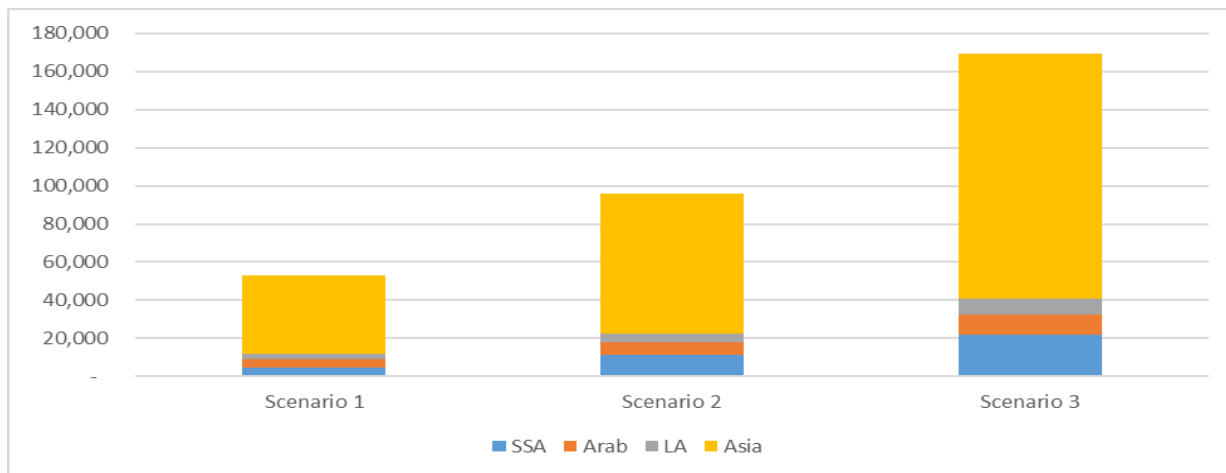


Among the 29 GAL countries, the cost is highest in the Asia-Pacific region (Figures 7a and b) because of the large size of the illiterate population (69% of the total illiterate population are in the Asia-Pacific region in 2017) and the countries' relatively high GDP per capita.

**Figure 7a: Projected cost by region (million USD, 2017 price), 250h, Source: UNESCO literacy model**



**Figure 7b: Projected cost by region (million USD, 2017 price), 500h, Source: UNESCO literacy model**



### h) Funding gap

These financial requirements may look daunting for many countries. At the same time, when considering the recommended level of investment in literacy (i.e., 3% of the education budget), the picture becomes more promising (Table 12). If we assume that the countries will invest 0.15% of their GDP for literacy,<sup>25</sup> most of the countries may be able to finance their literacy programmes to achieve significant improvements in acquisition of the minimum level literacy and numeracy (250h). However, it is likely that in many countries 250-hour training may not be

<sup>25</sup> Assuming 5% of GDP is devoted to education and 3% of the education budget is invested in literacy programmes



sufficient for providing the basic skills that can be sustained and enable the learners to participate in the society. Using the 500h scenario, 20 GAL countries will face a funding gap of 64 million USD to fill 50–60% of the literacy gap (scenario 1), 1.7 billion USD to fill 70–75% of the literacy gap (scenario 2), and 10 billion USD to achieve full literacy (scenario 3).

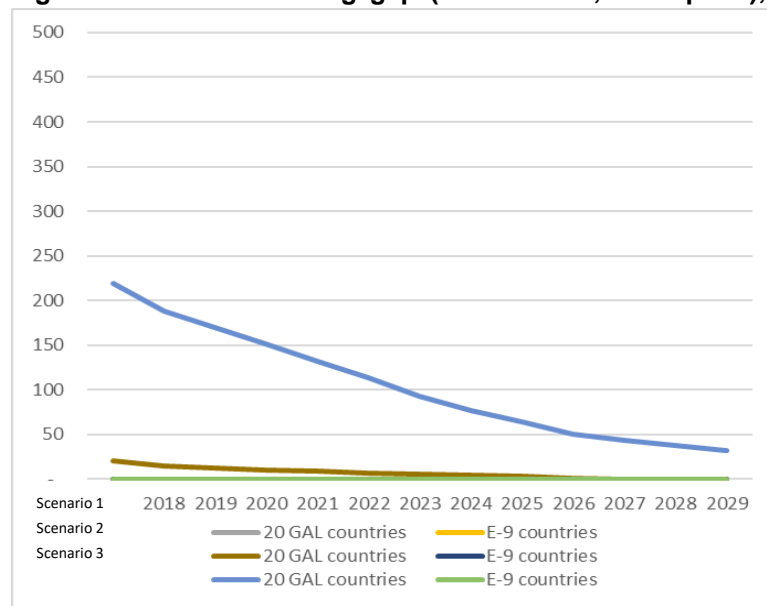
**Table 12: Total funding gap by group, 2017–2029 (million USD, 2017 price)**

	250h		500h	
	20 GAL	E-9	20 GAL	E-9
Scenario 1	-	-	64	-
Scenario 2	90	-	1,666	28
Scenario 3	1,372	-	10,488	4,181

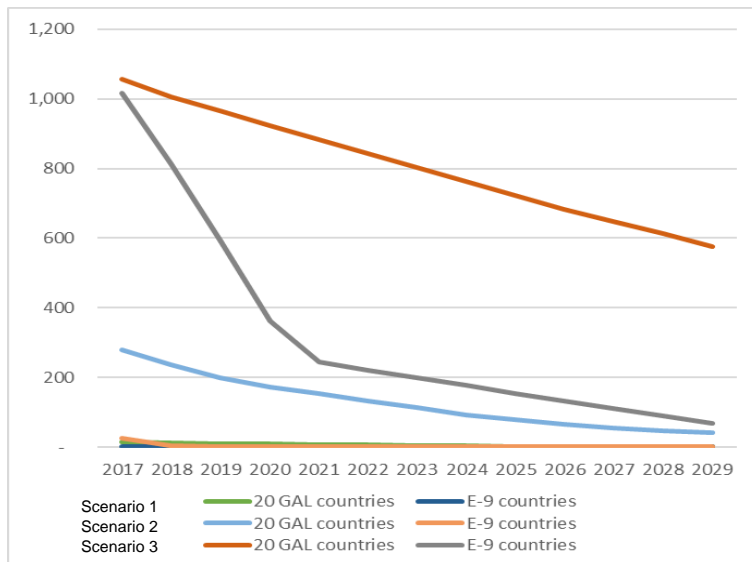
Source: UNESCO literacy model

The simulation results suggest that the funding gap is more significant in the early years of the expansion. As the efficiency gains are obtained through the economies of scale, the gap is expected to decrease over time (Figures 8a and b).

**Figure 8a: Annual funding gap (million USD, 2017 price), 250h, Source: UNESCO literacy model**



**Figure 8b: Annual funding gap (million USD, 2017 price), 500h, Source: UNESCO literacy model**

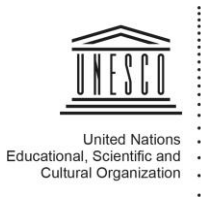


It is important to note, however, that most Ministries of Education in the GAL countries have limited fiscal space to ensure that 3% of the education budget is invested in literacy programmes. In those contexts, expecting them to increase their domestic investment significantly over the short period of time may not be realistic. At the same time, literacy programmes are often part of skills trainings undertaken by other ministries as well (e.g. Ministries of Social Affairs, Agriculture, Health, Women etc.). NGOs are also often playing an important role in delivering and sometimes financing literacy programmes. A cross-ministerial approach to financing literacy programmes, together with non-government partners, can be an effective option to address this major financial challenge collectively.

#### 4. Conclusion

The world has made significant progress towards improving literacy. With the expansion of basic education, the literacy rate is expected to continue to raise in most countries. However, the projection results show that additional efforts must be made in order to realize the commitment made in SDG4.6.

The projection results suggest that SDG4.6 is an ambitious target for the GAL countries, but not impossible if all partners work together. At the same time, the GAL countries will need significant external funding support, especially the non-E9 GAL countries even if they reach the recommended level of funding for literacy (3% of the education budget), which may be difficult for many of them.



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Challenges also remain to create and sustain the literate environments needed to retain literacy skills. Creation of a participating governance system which coordinates all stakeholders would facilitate such integrated approach.

Further commitment from both national governments and international partners will be needed both in terms of funding as well as enhancing the capacities of coordination, planning, management, and monitoring.

## Annex 1

### Literacy costing model parameters and calculations

#### % of 15-year-old youth who obtained literacy skills through formal schooling

	A	B	C	D	E	F	G	H	I
53		<b>Costs</b>							
54				First target (optional)		Final target		2017	2018
55				Target year	Target value	Target year	Target value		
56		GDP per capita growth rate				2030	2,0%	3%	3%
57		GDP per capita						\$642,0	\$660,8
58									
59		15-24	Cost parameters			Target year	Target value	2017	2018
60			Instructional time needed to acquire a basic level of mastery (hours)			2030	400	400	400
61		15-24 - Unit cost	Instructor's annual salary in GDP per capita			2030	4,14	4,14	4,14
62	Working hours per year			2030	1 800	1800	1 800		
63	% of salary on total cost (WC/TC)			2030	70,0%	70,0%	70,0%		
64	Group size			2030	20	20	20		
65			Total unit cost US\$					\$47,5	\$48,9
66			15-24 - Total cost million \$					3	3

The population concerned with literacy programme is the population aged 15 and over. Rather to use a completion rate (primary or secondary) or a gross intake ratio as a proxy of the percentage of 15 years old who are literate (through formal schooling), we prefer to use directly the % of 15-year-old obtained literacy skills through formal or non-formal schooling. Because for many countries there is a significant difference between completion rates or other achievement indicators and literacy rates.

#### % of Literacy Rate Gap filled

	B	C	D	E	F	G
8	% of LR gap filled	Male				51,0%
9		Female				64,0%

Here, the users set the % of the Literacy Rate (LR) gap to be filled. By default, the gap is the difference between 100% and the LR at start year (2017). For example, in Burkina Faso, the LR for males is 48%. So, the gap is 52%. If you fill 51% of this gap (27%), the LR in 2030 will be equal to 75% (48%+27%). The targets can be changed based on the scenario selected.

#### People Trained

	B	C	D	E	F	G	H	I	J	K
10	People trained (literacy program)		Up to	Growth rate	Up to	Growth rate	Automatic adjustment	Yes	If automatic adjustment is off, y by double click, so that 100% of	
11		Male	2025	0,0%	2029	0,0%	254 493	254 493	254 493	254 493
12		% illit.					10%	10%	11%	11%
13		Female	2023	3,0%	2029	4,0%	287 879	296 515	305 411	314 573
14		% illit.					8%	8%	9%	10%
15		Total					542 372	551 009	559 904	569 066

This block is the one where you fix the population trained each year. You can set the numbers you want in H11 and H13. If you do not want these numbers to change, put **No** in I10. The growth rate of these numbers will be determined in columns D and E for the first one (optional) and in columns F and G for the second or only one.

In the above example, the number for males (in H11) will remain the same (254 493), whereas the number for females (in H13) will increase by 3% per year between 2017 and 2023 and by 4% between 2023 and 2029.

It is not possible to put a date higher than the penultimate year of projection (2029). Because people trained in t will be literate in t+1.

If you switch the commutator I10 from No to **Yes**, the numbers H11 and H13 will be automatically adjusted so that the illiterate population (U33:U40) become null at the target year put in F11 and F13. If the commutator is on **Yes**, the numbers of trained will be adjusted automatically when a parameter of which the numbers of illiterate depend are changed. All the parameters in the people block are precedents of the numbers of illiterate.

If you want to adjust automatically, only one of the two numbers of trained (male or female), set the commutator on No, then double click on the number you want to adjust.

Under the numbers of trained, in rows 12 and 14, you find the % of illiterate that the numbers of trained represent.

### Distribution of people trained

	B	C	D	E	F	G	H	I	J	K	L
16						Max additional %					
17	Distribution of people trained	Male		15-24		0%	77 581	76 255	74 404	71 899	69 332
18				25-64		0%	162 406	163 480	165 051	167 226	169 324
19				65+			14 506	14 758	15 038	15 368	15 837
20		Female		15-24		0%	78 037	79 460	80 844	82 187	83 409
21				25-64		40%	209 842	217 055	224 567	232 386	240 601
22				65+			0	0	0	0	0

This block is designed to distribute the numbers of trained people by age group.

If the figures in G17:G18 (male) and G20:21 (female) are 0%, the numbers of trained are distributed proportionally to the number of illiterates. If you want to increase the share of younger population to be trained (15–24 rather 25+ and 25–64 rather 65+) put a positive % in yellow cells. For example, if you put 35% in G17, the number of 15–24 trained will be equal to the number determined by the overall proportion of trained (row 12) plus a maximum of 35% of that age group still to be trained (this additional number is, of course, limited by the total number to be trained).



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## Pass Rate

	B	C	D	E	F	G	H	I	J
23	Pass rate	Male		15-24	2025	100%	70%	74%	78%
24				25-64	2025	100%	60%	65%	70%
25				65+	2025	100%	50%	56%	63%
26		Female		15-24	2025	100%	70%	74%	78%
27				25-64	2025	100%	60%	65%	70%
28				65+	2025	100%	50%	56%	63%

This block is designed to fix the pass rate. Of course, if the pass rate is not equal to 100% before 2030, the eradication of illiteracy can never be achieved in 2030.

## Cost-related parameters

53	Costs											
54			First target (optional)	Final target	2017	2018	2019	2020	2021	2022	2023	
55		Target year	Target value	Target year	Target value							
56	GDP growth rate		2030	6.0%	6%	6%	6%	6%	6%	6%	6%	
57	GDP per capita				\$827.4	\$850.1	\$873.3	\$897.1	\$922.4	\$948.4	\$975.1	
58												
59	15-24	Cost parameters	Target year	Target value	2017	2018	2019	2020	2021	2022	2023	
60		Instructor's time needed to acquire a basic level of mastery (hours)	2030	400	400	400	400	400	400	400	400	
61		Instructor's annual salary in GDP per capita	2030	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	
62	15-24 - Unit cost	Working hours per year	2030	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	
63		% of salary on total cost (WC/TC)	2030	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	
64		Group size	2030	20	20	20	20	20	20	20	20	
65		Total unit cost US\$			\$61.2	\$62.8	\$64.6	\$66.3	\$68.2	\$70.1	\$72.1	
66	15-24 - Total cost million \$				5	5	5	5	5	5	5	
68	25+	Cost parameters	Target year	Target value	2017	2018	2019	2020	2021	2022	2023	
69		Instructor's time needed to acquire a basic level of mastery (hours)	2030	400	400	400	400	400	400	400	400	
70		Instructor's annual salary in GDP per capita	2030	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	
71	25+ - Unit cost	Working hours per year	2030	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	
72		% of salary on total cost (WC/TC)	2030	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	
73		Group size	2030	20	20	20	20	20	20	20	20	
74		Total unit cost US\$			\$61.2	\$62.8	\$64.6	\$66.3	\$68.2	\$70.1	\$72.1	
75	25+ - Total cost million \$				5	5	6	6	6	6	6	
76	15+ - Total cost million \$				10	10	10	11	11	11	12	
77												

The GDP growth rate is only devoted to calculate the instructor's annual salary which is expressed in terms of GDP per capita. Separate parameters/targets can be set for different age groups, reflecting the differences in cost needed for youth literacy and adult literacy programmes.

The total unit cost (row 66) is calculated from cost parameters according to the below formula:

GDPPC: Gross Domestic Product Per Capita (row 57)  
IAS: Instructor's Annual Salary in GDPPC (row 61)



WC/TC: % of salary on total cost (Wage Cost/Total Cost) (row 63)  
WHY: Working Hours per Year (for an instructor) (row 62)  
ITN: Instructional time needed to acquire a basic level of mastery (row 60)  
GS: Group Size (row 64)

$$Total\ unit\ cost = \frac{\frac{GDPPC \times IAS}{WC/TC}}{ROUNDDOWN\left(\frac{WHY}{ITN}, 0\right) \times GS}$$

### Calculation of the literacy rate by age

The illiterate population (15+) in year n is determined by three factors:

1. The % of 15-year-old obtained literacy skills through formal schooling
2. The illiterate population in t-1
3. The illiterate population in t-1 who received and passed training in t-1 and become literate in t.

In this model, we have to calculate illiterate population for three age groups: 15–24, 25–64 and 65+. Because of the wide variances of literacy rates among different age groups, it is preferable to calculate the illiterate population by age (from 15 to 100).

Without literacy programmes, the literacy rate (LR) of age a in time t is equal to LR of age -1 in t-1.

We have illiterate population or, it's the same thing, the literacy rate data only by age group. We deduce the literacy rate by age from the three literacy rates by age group.

To do that, we first assume that the literacy rate (LR) increases linearly between the two age group boundaries. For example,  $LR_{16} = 0.99 LR_{15}$ ,  $LR_{17} = 0.99 LR_{16}$ , and so on, where 0.99 is the **coefficient** for the 15-24 age group. It is not perfect, but it is more accurate than apply the age group literacy rate to each age of the group.

Hence, the problem is to find the three **coefficients** for the three age groups. To do that, we minimize the sum of the breaks between the slopes between two age groups. The LR applied to the population must give the exact number of the illiterate population for the three age groups.

Take the example of men for Senegal. The literacy rates are 76% for 15–24, 60% for 25–64 and 46% for 65+.

After minimizing slope breaks and respected the exact numbers of illiterate population by age group, we obtain the following LR by age.

The calculations are made with a formula for the first three LR of the three age groups (15 yrs, 25 yrs and 65 yrs) and the coefficients are adjusted via a macro named adjustLR.

### Calculation of LR at the base year if data are prior

The year of the latest available data on illiterate population from UIS varies across countries. Some data are from 2012.

Take the example of women for Benin. The data are from 2012. Because  $LR_{\alpha}^t = LR_{\alpha-1}^{t-1}$ , we need to determine  $LR_{15}$  for 2013-2017.

Female	2012	2013	2014	2015	2016	2017
15	41,09%	42,72%	44,40%	46,16%	47,98%	49,88%
16	41,06%	41,09%	42,72%	44,40%	46,16%	47,98%
17	41,02%	41,06%	41,09%	42,72%	44,40%	46,16%
18	40,98%	41,02%	41,06%	41,09%	42,72%	44,40%
19	40,95%	40,98%	41,02%	41,06%	41,09%	42,72%
20	40,91%	40,95%	40,98%	41,02%	41,06%	41,09%
21	40,87%	40,91%	40,95%	40,98%	41,02%	41,06%
22	40,84%	40,87%	40,91%	40,95%	40,98%	41,02%
23	40,80%	40,84%	40,87%	40,91%	40,95%	40,98%
24	40,76%	40,80%	40,84%	40,87%	40,91%	40,95%

To do that, we utilize the available data for completion rates, primary and secondary, gross intake ratio to the last grade of primary and gross enrolment ratio lower secondary. These data are very incomplete, especially for completion rates. Therefore, we use all information given by these data. If it is possible (if two or more data available), we calculate for each indicator the slope of the data, then we take the mean which we apply to the  $LR_{15}$ . The intermediate calculations are done in the Calc sheet, in the three tables with blue borders.

### Calculation of the number of people to be trained

When automatic adjustment is on, the calculation of the number of people to be trained is done by the macros valeurcibleM and valeurcibleF. These macros use the Excel goal seek tool, a function that identifies the figure that is most suitable for achieving a set result.



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## Annex 2

### Literacy costing existing studies

Author(s)	Year	Geographic coverage	Unit cost
Global Campaign for Education & Action Aid <sup>26</sup>	2005	67 adult literacy programmes from 35 countries, followed by feedback from 142 respondents in 47 countries	<ul style="list-style-type: none"> <li>• Good literacy programmes will have 600 hours of contact time over 2-3 years</li> <li>• Average cost per learner is USD 47 in Africa, USD 30 for Asia and USD 61 for Latin America</li> <li>• Average cost per “successful” learner is USD 68 in Africa, USD 32 for Asia and USD 83 for Latin America</li> </ul>
Ravens & Aggio <sup>27</sup>	2005	24 LIFE countries <sup>28</sup>	<ul style="list-style-type: none"> <li>• Standard Variant based on parameters such as number of contact hours, group size and instructors’ salaries. Unit costs expressed in % of GNP per capita (8.9% - SSA; 5.3% - South West Asia, East Asia and Pacific; 5.3% - Arab States; 4.4% - Latin America)</li> <li>• Budget Variant assumes high reliance on technology and volunteer teachers – USD 20 per learner</li> <li>• Advanced Variant includes costs of creating “desirable” literate environment beyond basic literacy programmes. Not included in the final cost projection.</li> </ul>
Carr-Hill & Roberts	2007 <sup>29</sup> & 2010 <sup>30</sup>	9 programmes from 8 countries <sup>31</sup>	Acknowledges the significant variance among literacy programmes in unit cost (five-fold range). Suggest that the minimum unit cost of literacy close to USD 100
Ravens & Aggio <sup>32</sup>	2007	Brazil, Burkina Faso and Uganda	<ul style="list-style-type: none"> <li>• Standard Variant: same as Ravens &amp; Aggio (2005)</li> <li>• Volunteering Variant: assumes engagement of volunteer instructors. 44% of the unit cost under the Standard Variant</li> <li>• Cross Sectoral Variant: covers life skills training as well. 120% of the unit cost under Standard Variant.</li> </ul>

<sup>26</sup> Global Campaign for Education & ActionAid International. (2005). Global Benchmarks for Adult Literacy. A Final Report Produced for the Education for All Global Monitoring Report 2006. Paris: UNESCO.

<http://unesdoc.unesco.org/images/0014/001470/147085e.pdf>

<sup>27</sup> Ravens, J. and Aggio, C. (2005). The cost of Dakar goal 4 for developing and “LIFE” countries. Background paper prepared for the Education for All Global Monitoring Report 2006. Paris: UNESCO.

<http://unesdoc.unesco.org/images/0014/001463/146330e.pdf>

<sup>28</sup> Bangladesh, Benin, Brazil, Burkina Faso, Central African Republic, Chad, China, Democratic Republic of Congo, Egypt, Ethiopia, Indonesia, Iran, Madagascar, Mali, Mauritania, Morocco, Mozambique, Nepal, Niger, Nigeria, Pakistan, Papua New Guinea, Senegal, Sierra Leone

<sup>29</sup> Carr-Hill, R. and Roberts, F (2007). Approaches to Costing Adult Literacy Programmes, especially in Africa. UNESCO UIL.

<sup>30</sup> Carr-Hill, R. and Roberts, F (2010). Approaches to costing adult literacy programmes, especially in Africa. International Journal of Education Development (30). P.428-437.

<sup>31</sup> Brazil, Burkina Faso, Ghana, Namibia, Senegal, Somalia, South Africa, Turkey

<sup>32</sup> Ravens, J., V., and Aggio, C. (2007). The Costs and the Funding of Non-Formal Literacy Programmes in Brazil, Burkina Faso and Uganda. <http://uil.unesco.org/literacy/costs-and-funding-non-formal-literacy-programmes-brazil-burkina-faso-and-uganda>



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Wils <sup>33</sup>	2015	82 low and lower middle income countries	<ul style="list-style-type: none"> <li>The exercise was conducted to estimate the cost of achieving SDG4 targets of pre-primary, primary, lower- and upper-secondary schooling</li> <li>The simulation model also includes the cost of literacy programmes, which is by default set as the same as the primary education unit cost</li> </ul>
The International Commission on Financing Global Education Opportunity <sup>34</sup>	2016	Low, lower-middle and upper-middle income countries	<ul style="list-style-type: none"> <li>Builds on the “UNESCO model” developed by Wils (2015)</li> <li>Unit cost of literacy training is estimated to be same as the unit cost of primary education</li> </ul>
Hanemann <sup>35</sup>	2015	National and regional literacy programmes from 32 countries	<ul style="list-style-type: none"> <li>Unit costs vary significant across literacy programmes, ranging from USD 5 (India) to USD 1035 (Venezuela)</li> </ul>
Unpublished analysis			
UNESCO	2018	14 literacy programmes from 13 countries <sup>36</sup>	<ul style="list-style-type: none"> <li>USD 150 for middle sized programmes</li> </ul>
UIL	2019	9 African countries <sup>37</sup>	<ul style="list-style-type: none"> <li>Programme duration ranges from 2-3 months to 1 year</li> <li>Unweighted average unit cost without equipment is FCFA 29,482 (Approximately USD 50), 6.8% of GDP per capita</li> </ul>

### Assumptions used in Ravens & Aggio (2005) for standard variant

Instructional time needed to acquire a basic level of mastery	400 hours <sup>38</sup>
Instructor's annual salary in SSA, Asia, Arab States and LA	5, 3, and 2.5 time average GNP per capita
Working hours per year	1800
Number of courses an instructor can deliver per year	4
% of salary on total cost	70%
Group size	20
Pass rates	75% <sup>39</sup>

<sup>33</sup> Wils, A. (2015). Reaching education targets in low and lower middle income countries: Costs and finance gaps to 2030 for pre-primary, primary, lower- and upper secondary schooling.

<sup>34</sup> Learning Generation

<sup>35</sup> Hanemann, U. (2015). The Evolution and Impact of Literacy Campaigns and Programmes 2000-2014. UIL Research Series: No.1. Hamburg: UIL, <https://files.eric.ed.gov/fulltext/ED564035.pdf>

<sup>36</sup> Afghanistan, El Salvador, Guatemala, Hungary, India, Iran, Kenya, Mexico, Pakistan, Senegal, Spain, Yemen

<sup>37</sup> Benin, Burkina Faso, Cameroun, Coe d'Ivoire, Mali, Niger, Democratic Republic of Congo, Senegal, Togo

<sup>38</sup> Oxenham (2008) says 300-400 hours will be needed

<sup>39</sup> Oxenham (2008) also says 75–80% completion rate is a reasonable expectation for successful literacy programmes <https://unesdoc.unesco.org/ark:/48223/pf0000163607>



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### Proposed categories and distribution of the costs in Hill & Roberts (2007), reproduced from Oxenham (2004)

Component	Rough % to be allocated
Instructional materials	13
Training for literacy facilitators, business trainers and immediate supervisors	15
Remunerating facilitators, business trainers and field supervisors	30
Training and other forms of capacity building and institutional strengthening for public and private agencies	13
Operational and administrative expenses	15
Monitoring, evaluation, research	4
Savings, credit and enterprise development	10

### Unit cost per country, variant, localization and age (in USD, 2004 price) by Ravens & Aggio (2007)<sup>40</sup>

	Localization	Age	Brazil (3000, 2.5) <sup>41</sup>	Burkina Faso (350, 5)	Uganda (250, 5)
Standard	Urban	Below 45 years	120.5	28.1	20.1
		Above 45 years <sup>42</sup>	124.2	29.0	20.7
	Rural <sup>43</sup>	Below 45 years	147.3	34.4	24.6
		Above 45 years	151.7	35.4	25.3
Cross Sectoral	Urban	Below 45 years	144.6	33.8	24.1
		Above 45 years	149.0	34.8	24.8
	Rural	Below 45 years	176.8	41.3	29.5
		Above 45 years	182.1	42.5	30.3
Volunteering	Urban	Below 45 years	53.0	12.4	8.8

<sup>40</sup> Ravens, J., V., and Aggio, C. (2007). The Costs and the Funding of Non-Formal Literacy Programmes in Brazil, Burkina Faso and Uganda. <http://uil.unesco.org/literacy/costs-and-funding-non-formal-literacy-programmes-brazil-burkina-faso-and-uganda>

<sup>41</sup> GNP per capita (in USD 2014 price) and salary for literacy instructors as a proportion of GNP per capita

<sup>42</sup> 3% more expensive to train a person older than 45 years old

<sup>43</sup> 20% more expensive to train in a person in rural areas



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		years				
		Above 45 years	45	54.6	12.7	9.1
	Rural	Below 45 years	45	64.8	15.1	10.8
		Above 45 years	45	66.8	15.6	11.1

**Primary teacher salaries in proportion to GDP per capita: unweighted regional average  
(calculated by the author based on the data by Wils, 2015)**

Region	Primary teacher salaries, in proportion to GDP per capita
Asia-Pacific	2.29
Arab States	2.86
Eastern Europe	1.96
Latin America & Caribbean	2.49
sub-Saharan Africa	4.14

## Annex 3

### Unit Cost of Literacy Programmes: Analysis of the UNESCO 2018 International Literacy Prizes applications

#### Data

Since 1967, UNESCO has recognized and rewarded excellence and innovation in literacy. Currently, the below two International Prizes are given by UNESCO:

- The UNESCO King Sejong Literacy Prize; and
- The UNESCO Confucius Prize for Literacy.

In 2018, the application form for the above Prizes included the key information on hours and duration of the programme, annual budget, and number of learners. These applications were used to estimate the unit cost of literacy programmes.

Total of 50 applications were analysed, representing all UNESCO's regions (Table 1).

**Table 1:** Number of 2018 UNESCO ILP applications reviewed, by region

Regions	# of applications
Africa	10
Arab States	4
Asia and Pacific	18
Europe and North America	9
Latin America and the Caribbean	9
<b>Total</b>	<b>50</b>

Among them, the applications focusing on teacher training, material development, and school-level activities were excluded from the analysis. In addition, the applications without sufficient information on number of learners, contact hours and duration of the programmes, and annual budget were excluded. Finally, the programmes with less than 300 hours of the total contact hours were also excluded, as the previous studies indicate that minimum 300 hours will be required to obtain the basic level of literacy. As a result, the total number of applications used for the cost estimation was reduced to 14 (Table 2). The summary of the applications used for the estimation is provided in Annex 3.I.



**Table 2:** Number of 2018 UNESCO ILP applications analysed, by region

Regions	# of applications
Africa	2
Arab States	2
Asia and Pacific	4
Europe and North America	3
Latin America and the Caribbean	3
<b>Total</b>	<b>14</b>

The scale of the programmes vary across the applications. Some are large-scale government programmes, but the majority is NGO-funded small- to medium-scale programmes (Table 3).

**Table 3:** Number of learners, 2017

# of learners	# of applications
<500 (small)	6
500-5000 (medium)	5
5000< (large)	3
<b>Total</b>	<b>14</b>

Most of the programmes are less than 1,000 hours long (Table 4), majority of which is completed in less than 1 year (Table 5).

**Table 4:** Programme contact hours (literacy and other skills training)

Hours	# of applications
300-500	6
500-1000	6
1000<	2
<b>Total</b>	<b>14</b>

**Table 5:** Programme duration

Months	# of applications
Less than 12 (short)	8
12-36 (medium)	5
More than 36 (large)	1
<b>Total</b>	<b>14</b>

## Unit costs

As expected, the average cost per learner decreased as the number of learners increased (Table 6). The difference was extremely large, however, ranging from USD 34 per learner for the programmes with more than 5,000 learners to USD 1,386 for the programmes with less than 500 learners.

**Table 6:** Average annual cost per learner by size of the programmes in USD, 2017

# of learners	Average annual cost per learner
<500 (small)	1,386
500-5000 (medium)	168
5000< (large)	34

**Table 7:** Average annual cost per learner in USD by annual contact hours, 2017

Annual contact hours	# of applications
300-500	106
500-1000	140
1000<	771

Looking at the annual unit cost of the medium-size literacy programmes (unit cost of USD 168) and the programmes with annual contact hours between 300-500 (unit cost of USD 140) in the above table, the findings seem in line with the study conducted by the Global Campaign for Education and ActionAid in 2005, which shows the annual cost of a good quality literacy programme being USD 50 to USD 100. With average global inflation rate of 3.6% between 2005 and 2017,<sup>44</sup> USD 100 in 2005 is equivalent to USD 153 in 2017. Hence, **it may be assumed that, in 2017, the unit cost of a good quality literacy programme may be around USD 150 per learner.**

## Laminations and recommended next steps

The analysis was challenged by varying quality of the data in the applications. While many of the programmes are relevant to the exercise, many applications were excluded from the analysis due to the incomplete information provided. With 14 applications, the results were very susceptible to outliers and possible errors in the data, and it was extremely difficult to calculate the meaningful averages for different types of literacy programmes. For instance, there were not enough applications to estimate the annual unit cost based on the contact hours AND size of the programme. As a result, the estimation given in this document is very crude and needs more evidence to verify.

<sup>44</sup> <https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG>



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As the total number of the 2018 ILP applications (50) as well as their regional representation is comparable to the study conducted by the Global Campaign for Education and Action Aid International (2005), these applications can be a powerful tool to collect the key information on the existing literacy programmes. In the future, it may be recommended to use these applications for further analyses.



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### Annex 3.I: Summary of the applications used for the estimation

Country	Project country	Region	Type of Organization	Programme description	Main target population	Coverage (2017)	# of hours to literacy training	# of hours for skills training	Total contact hours	Programme duration (months)	# of staff (teacher)	# of administrative staff	# of technical staff	Total annual budget (2017 in USD)	Curriculum hours per year	Cost per learner per annual contact hour	Annual cost per learner	Cost per learner to complete the programme	GDP per capita (current, 2011)	Annual cost per learner (% of GDP/capita)	Cost per learner to complete the programme (% of GDP/capita)
Hungary	Hungary	Europe and North America	NPO	Mother tongue literacy and scho	Minority populations	58	400	74	474	45	51	6	2	250067	126	34.110	4311.500	16168	14224.85	30.31%	113.66%
Spain	Spain	Europe and North America	NPO	Literacy & skills training	Women	104	369	703	1072	8	11	4	6	139000	1072	1.247	1336.538	1337	28156.82	4.75%	4.75%
Spain	Spain	Europe and North America	NPO	Literacy & skills training for imn	Adult immigrants	175	352	131	483	10	9	1	1	49884.06	483	0.590	285.052	285	28156.82	1.01%	1.01%
Mexico	Mexico	Latin America	Government	Bilingual education	Youths and adults	235	336		336	14	235	2	21	40000	288	0.591	170.213	199	8902.83	1.91%	2.23%
Senegal	Senegal	Africa	Business	Literacy & skills training	Youths and adults	265	432		432	36	13	3	10	20000	144	0.524	75.472	226	1033.07	7.31%	21.92%
Canada	Kenya	Africa	NPO	Literacy & skills training	Children & youths	295	600		600	30	16	4	3	630000	240	8.898	2135.593	5339	1507.81	141.64%	354.09%
Yemen	Yemen	Arab states	NPO	Literacy & skills training	Youth (15-40 yrs)	538	300	280	580	12	17	6	11	100000	580	0.320	185.874	186	660.28	28.15%	28.15%
India	India	Asia-Pacific	NPO	Functional literacy and empowe	Rural women	1538	540		540	8	221	6	6	616000	540	0.742	400.520	401	1939.61	20.65%	20.65%
Guatemala	Guatemala	Latin America	NPO	Spanish literacy	Youths and adults	2044	343		343	12	6	3	4	37500	343	0.053	18.346	18	4470.99	0.41%	0.41%
Afghanistan	Afghanistan	Asia-Pacific	NPO	Accelerated primary & secondar	Young girls and women	3250	972	108	1080	9	162	7	8	665000	1080	0.189	204.615	205	585.85	34.93%	34.93%
Iran	Iran	Asia-Pacific	Government	Literacy & skills training	Youths and adults	4552	800		800	8	589	10	96	129732	800	0.036	28.500	29	5145.21	0.55%	0.55%
Yemen	Yemen	Arab states	Academia	Literacy & skills training	Adult women	10928	480	160	640	8	33	10	23	41990	640	0.006	3.842	4	660.28	0.58%	0.58%
El Salvador	El Salvador	Latin America	Government	Literacy and entrepreneurship	Youths and adults	29727	600		600	5	20309	21	80	2450004	600	0.137	82.417	82	3889.31	2.12%	2.12%
Pakistan	Pakistan	Asia-Pacific	Government	Training for literacy teachers	Literacy teachers	146196	195	129	324	5	19097	454	43	2190000	324	0.046	14.980	15	1547.85	0.97%	0.97%