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Southern perspectives. Global debates.

Is Nigeria on track to achieving quality education for all? Drivers and implications

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Preface

Southern Voice's flagship initiative on the State of the Sustainable Development Goals (SVSS) has generated country-level, evidence-based analysis to enrich the global dialogue on the 2030 Agenda. SVSS is neither a typical data-driven analysis of progress nor a traditional monitoring exercise of Sustainable Development Goals (SDGs). Instead, through this research initiative, we seek to identify the 'second-generation' challenges of the global agenda along with the policy responses to address them.

Our cross-country and regional analyses show that, on the one hand, national governments have made discernible progress in designing policy frameworks aligned with the Agenda. The governments have recognised the importance of not leaving the most vulnerable behind. On the other hand, weak coordination among relevant stakeholders and lack of horizontal coherence remain as challenges in achieving the Goals. Silo approaches continue to undermine national governments' ability to address systemic problems and create the necessary conditions to end poverty for all. Paucity of financial resources, along with no changes in the allocative priorities, are symptomatic of most of the developing countries' drive towards SDGs.

With these challenges in mind, the SVSS report identifies three layers of critical action and analysis. First, we explore who is potentially excluded from deriving the benefits of SDG delivery within the country's contextual realities. Second, we recognise that the Goals are not necessarily additive (even within a holistic agenda), and delve into the links between Goals and their interconnections, so as to maximise their synergies and protect against the trade-offs. Third, we explore the implications of the current conduct of the global institutions and policies for the national efforts to implement SDGs.

This study examines the dimensions and drivers of exclusion in basic education in Nigeria using the Demographic Health Surveys of 2008 and 2013.

We hope that this piece of Southern Voice's research will enlighten the thought process of the policy community and development practitioners in their efforts towards a fuller realisation of the 2030 Agenda.

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Acknowledgement

Abstract

This study examines the dimensions and drivers of exclusion from primary education in Nigeria using the Demographic Health Surveys of 2008 and 2013. It also maps the synergies and trade-offs between education and other relevant Sustainable Development Goals (SDGs) and assesses global systemic issues that are relevant to achieving quality education goals in the Nigerian context. The measure of quality education is constructed following Pritchett and Sandefur's approach (2017). The study finds that only 24% of Nigerians aged 15–24 with primary education have competent literacy skills.

Further, the findings show disparities across gender, with 19% of females able to read complete sentences compared to 32% for males; region, with the south (27%) performing better than the north (22%); and locality, as 31% of youth in urban areas meet the literacy benchmark compared to 21% in rural areas. Analysis of synergies and trade-offs reveals that achieving quality education in Nigeria also supports efforts to end poverty (SDG 1), ensure good health (SDG 3), gender equality (SDG 5), and access to decent work (SDG 8). Among the dominant global systemic issues influencing quality education outcomes in Nigeria, both technology and development assistance have the potential to enhance delivery. However, technology could also widen existing gaps depending on the existence and effectiveness of pro-poor public policies.

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Acronyms and abbreviations

DHS	Demographic House Survey
LNOB	Leave No One Behind
MDG	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MoI	Means of Implementation
PISA	Programme for International Student Assessment
SDG	Sustainable Development Goals
TIMSS	Trends in International Mathematics and Science Study
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
UNREC	United Nations Regional Centre for Peace and Disarmament in Africa
WAEC	West African Examination Council

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Introduction

Quality education is a key enabler for sustainable growth and development across countries. The 2030 Agenda rightly recognises this with the ambitious goal to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all – Sustainable Development Goal (SDG) 4. This objective moves beyond the Millennium Development Goals, which focused on improving quantity through broadening access to education. According to the Institute for Statistics of the United Nations Educational, Scientific and Cultural Organization (2017), 56% of children enrolled in primary schools globally are not acquiring the basics of reading, writing, and mathematics skills. The problem is even more pronounced in sub-Saharan Africa (SSA), where about 90% of primary schoolchildren are not learning (UNESCO Institute for Statistics, 2017). Despite global efforts, a significant proportion of people are being left behind in terms of accessing quality education, and are thereby lacking the cognitive and non-cognitive skills needed for effective transition to the labour market. There is also a human rights perspective in ensuring access to quality education for all, as education could engender peaceful cohesion within society and enhance human capabilities (Lee, 2013).

In Nigeria, educational performance is abysmally low in terms of quality and quantity. Poor performance with regards to quantity is illustrated by the fact that there were more than 10.5 million out-of-school children in 2018, which is the highest globally (UNICEF, 2018). The situation is even more worrying in terms of quality. According to the World Economic Forum (2017), Nigeria ranks 124th out of 137 countries in terms of quality of primary education. Similarly, Fleet, Watkins, & Greubel (2012) found that 58.3% of schoolchildren in Nigeria are not learning basic literacy and numeracy skills.

To achieve the ambitious targets set under SDG 4, it is essential to assess the quality of education in Nigeria. Therefore, this study examines the dimensions and key drivers of exclusion from quality education at the primary level in Nigeria. Specifically, we focus

on three areas of analysis crucial to understanding the extent to which individuals and groups are left behind and the role of national and global actors in designing appropriate policy interventions.

The first component of the research focuses on the identification of groups that are excluded from quality education and identifies the main drivers of exclusion. At present, there is a lack of empirical evidence on those who are not receiving quality education in Nigeria. This is partly due to the absence of properly-disaggregated and nationally representative data on learning outcomes. Therefore, a starting point for this study is to generate a measure of quality education based on available household data. Following Pritchett and Sandefur (2017), we used the Demographic Health

58.3% of schoolchildren in Nigeria are not learning basic literacy and numeracy skills.

Survey (DHS) to construct a quality measure to assess basic literacy skills (the ability to read a short statement about everyday life) among people between 15 and 24 years old who have completed primary education. While this sets a low bar, it provides preliminary insights into the depth of the learning crisis.

The second component of the research examines the connections between SDG 4 and other Goals. Achieving SDG 4 could have trade-offs or synergies with other Goals. Synergies imply that the achievement of a goal can result in improved outcomes in other areas; trade-offs point to possibly conflicting outcomes. For example, Oye, Pritchett, and Sandefur (2016) found that an additional year of primary school for girls is associated with a reduction of about six deaths per 1,000 live births. Understanding possible synergies and trade-offs between various SDGs might help shape policy direction in terms of setting priorities or eliminating redundancy. For Nigeria, with an estimated financing requirement of about USD 34 billion to meet SDG 4 (UNESCO, 2015), identifying the most effective and efficient strategy is crucial.

The third component of the study delves into key global systemic issues and how they influence the quality of education in Nigeria. Finance, teacher training, and technology have been identified as key enablers to achieve SDG 4. There are global challenges that can shape the effective implementation of education policy. The Nigerian education system has been disrupted by violent conflict and targeted attacks over the years, a trend

that reflects global concerns around the proliferation of arms among non-state actors. In essence, it is important to map out the connections between positive and negative global systemic issues and education performance in Nigeria. This will indicate the key policy gaps and the critical role for multilateral institutions and other global actors in delivering an inclusive and quality education for all.

In line with the aforementioned components of the study, the objectives of the study are as follows:

- To examine the dimensions of exclusion in quality education as well as the key drivers in the Nigerian context.
- To examine the intersectionality among SDGs and identify areas of synergies and trade-offs between SDG 4 and other Goals.
- Assessing the key global systemic issues affecting education in Nigeria and exploring the state and adequacy of various means of implementation (MoIs) to meet SDG 4.
- Section 2 discusses the methodology. Section 3 presents and discusses the main findings. Finally, section 4 summarises key findings and policy recommendations.

Methodology

Identifying groups excluded from accessing quality education in Nigeria, and the reasons behind their exclusion, requires a disaggregated analysis of educational performance. However, drawing on specific aspects of educational achievement to measure quality education is challenging, given the multidimensional nature of quality education, which encompasses educational inputs, processes, and outcomes. The study focuses on outcome-based measures of quality education based on the global indicator 4.1.1. While outcome-based measures are best constructed with internationally comparative assessments such as PISA or TIMSS[1], these are not available for Nigeria. To address these gaps, Pritchett and Sandefur (2017) and Oye et al. (2016) suggest an innovative approach to constructing an outcome-based measure of quality education using Demographic Health Surveys (DHS). Following their approach, a quality education indicator was constructed for this study using the 2008 and 2013 DHS in Nigeria, focusing on the population between 15 and 24 years old, who have completed primary education and acquired basic literacy skills.

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1 PISA refers to the Programme for International Student Assessment, while TIMSS refers to Trends in International Mathematics and Science Study. They are both international assessments of educational systems and students' knowledge around the world.

Based on the quality measure developed, quantitative techniques were applied to identify the specific groups with the least attainment in quality education. Based on existing literature, we explored markers of exclusion in Nigeria such as gender, location/place of residence (rural or urban), religion, wealth, geopolitical region, duration of residence in an area, education attainment of the head of the household, sector of occupation, gender of the head of the household, age cohort, and religion. A binary regression analysis was used to estimate cross-group differences and identify key aspects of exclusion. Due to the limitations of survey data in identifying all possible facets of exclusion, the analysis of leave no one behind (LNOB) was complemented with stakeholder interviews.

The study also seeks to explain the disparities in educational achievement across groups using mediation analysis. This aims to explain the link between an independent variable (quality of education) and the main variable of interest (for example, gender gap) through a number of intervening variables, known as mediators (household and community characteristics). For example, the analysis quantifies the proportion of the differences in the quality of education between male and female that can be accounted for by the mediators. We included 14 mediators, grouped into six: (1) household characteristics (size, proportion of expenditure on education, gender, and education level of the head of the household); (2) district/community characteristics (number of students per class in the state, percentage of qualified female teachers[2], energy used by household, distance to school, distance to major health facilities and main motorways); (3) wealth index (household's income bracket); (4) occupation of the head of the household; (5) religion of the head of the household; and (6) student's age of sexual debut[3].

The framework developed by Nilsson, Chisholm, Griggs, Howden-Chapman, McCollum, Messerli, and Stafford-Smith (2018) and the International Council for Science (2017) was adopted for the analysis of synergies and trade-offs between SDG 4 and other Goals. The framework provides a systemic approach to identify causality and intersectionality, which could point to areas of coherence or conflict among various SDGs. The framework is illustrated in Figure 1, and involves categorisation of interactions between Goals on a seven-point cardinal scale. Positive interactions are assigned scores of +1 (if enabling), +2 (if reinforcing) or +3 (if indivisible), while interactions characterised by trade-offs are scored with -1 (constraining), -2 (counteracting), or -3 (cancelling); neutral interactions between SDGs are assigned 0. The scores were assigned through an extensive qualitative

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2 This is to account for possible aspirational effect on girls from being taught by female teachers. Also, this could account in part for the gender sensitivity of the education system.

3 In the absence of data on child marriages and early pregnancy, we include this variable to account for the possible effect of early sexual activities.

peer-review by the authors. The analysis focuses on interactions between SDG 4 and SDGs 1, 3, 5, 8, 13, and 16.

Figure 1. Seven types of interactions between SDG targets

Interaction labels and meanings

+3	**Indivisible**	
	Progress of one target effects progress on another simultaneously	
+2	**Reinforcing**	
	Progress of one target effects progress on another simultaneously	
+1	**Enabling**	
	Progress of one target provides enabling condition for progress on another	
±0	**Consistent**	
	No relevant link exists between progresses of two targets	
-1	**Constraining**	
	Delivering on one target is constrained by progress on one target	
-2	**Counteracting**	
	Progress on one target makes it more difficult to make progress on another	
-3	**Cancelling**	
	Progress on one target automatically leads to a negative impact on another	

Source: Nilsson et al. (2018).

We developed a conceptual framework to analyse the global systemic issues affecting educational performance in Nigeria. This exercise highlighted the implications of global forces on education outcomes at the national and subnational levels by tracing the transmission mechanisms through which their effect propagates within the education system. The analysis focused on three systemic concerns: technology, arms proliferation, and development finance.

Findings

The unifying theme in this section is LNOB. We present the key dimensions along which the most excluded from quality education cluster, and identify the underlying factors that drive these outcomes. An empirical approach allows us to trace the interlinkages (synergies and trade-offs) between SDG 4 and other SDGs, as well as a factor in the global systemic issues that influence local education outcomes.

Dimensions of exclusion in quality education

Following our definition of quality education, as measured by individuals that have completed primary education and can read a complete sentence, according to DHS data, only 24% of the population demonstrate literacy competence. Based on this measure, we exploit the disaggregated data to narrow in on the dimensions of exclusion.

Table 1. Polychoric correlation matrix

	Wealth	Gender	Duration of residency	Occupation	Gender head of household	Region	Religion	Location of residence	Head education attainment	Age cohort education attainment
Wealth	1									
Gender	0.0480	1								
Duration of residency	-0.1364	0.3401	1							
Occupation	-0.0701	0.1917	-0.0497	1						
Gender head	-0.1462	0.1415	0.0271	0.0563	1					
Region	0.3407	0.0013	-0.1050	-0.0467	-0.2183	1				
Religion	0.3600	0.0128	-0.0288	-0.1167	-0.4089	0.2988	1			
Location of residence	-0.7049	-0.0309	0.1276	0.0101	0.1229	-0.2171	-0.0868	1		
Head education attainment	0.5854	0.1526	-0.0362	-0.0854	-0.3284	0.2713	0.6229	-0.4012	1	
Age cohort	0.0257	-0.0166	-0.0652	0.2881	0.0521	-0.0197	-0.0419	-0.0338	0.0958	1

Source: Authors' calculation using DHS survey data.

First, we used the correlation matrix with 10 exclusion criteria to identify similar groups (Table 1). High correlation among vulnerability criteria suggests that the same factors are driving both criteria, or one of the criteria is driving the other. Based on this analysis, we swapped 'wealth' for 'location of residence', and swapped 'education level

of the head of the household' for 'religion'. These choices are arbitrary. However, we would expect a high relationship between place of residence and wealth due to the concentration of economic opportunities in urban areas. This will suggest wealth as the covariate. A further robustness analysis, in which we included all 10 vulnerability criteria in the same logistic regression, indicates that 'location of residence' and 'education level of the head of the household' are sensitive to inclusion of 'wealth' and 'religion' respectively. This means that either one variable is influencing the other or that there is a third factor affecting the two variables.

Table 2. Binary logistic regression of quality education

Dependent variable: Quality of education is a dichotomous variable which is 1 if an individual can read a complete sentence and 0 otherwise		
Group	Sub-group	Coefficient
Sex (female as reference group)	Male	1.0465*** (0.1799)
Resident (new resident as reference group)	Old resident	0.2436 (0.1652)
Occupation (agriculture sector as reference group)	Unemployed	0.4188 (0.222)
	Non-agricultural sector	0.1022 (0.2298)
	Male	0.1022 (0.2218)
Gender of household head (female as reference group)	North-central	0.6496** (0.2965)
Region (North-east as reference group)	North-west	0.7091** (0.2947)
	South-east	0.8872** (0.3513)
	South-south	0.2635 (0.3595)
	South-west	1.062** (0.3296)
Religion (Islam as reference group)	Christian	0.25 (0.2161)
Location of residence (Urban as reference group)	Rural	-0.4684** (0.1673)
Age Cohort (Cohort 15-19 years as reference group)	20-24 years	-0.2296 (0.1533)
Constant		-2.0842*** (0.4772)
Pseudo R-Square		0.08
Wald		138.4***

Source: Authors' calculation using DHS survey data.

*** 1% level of significance; ** 5% level of significance

Second, following Hirschman and Lee (2005), we use a binary logistic regression to test the significance of cross-group differences in outcomes (Table 2). We do not include any criteria that is not statistically significant at 5% for at least one of the sub-groups[4].

The two procedures applied above yield three unique vulnerability criteria in quality education in Nigeria's case: gender, geopolitical region, and place of residence.

Learning outcomes across groups in Nigeria

Nigeria's population as a whole faces exclusion from quality education. Only 24% of the population with primary education meet the competencies in literacy, based on DHS assessment (Figure 2). However, while exclusion is prevalent, disaggregated analysis of the data reveals notable disparity across groups.

Figure 2. Percentage of primary school leavers with required literacy competency
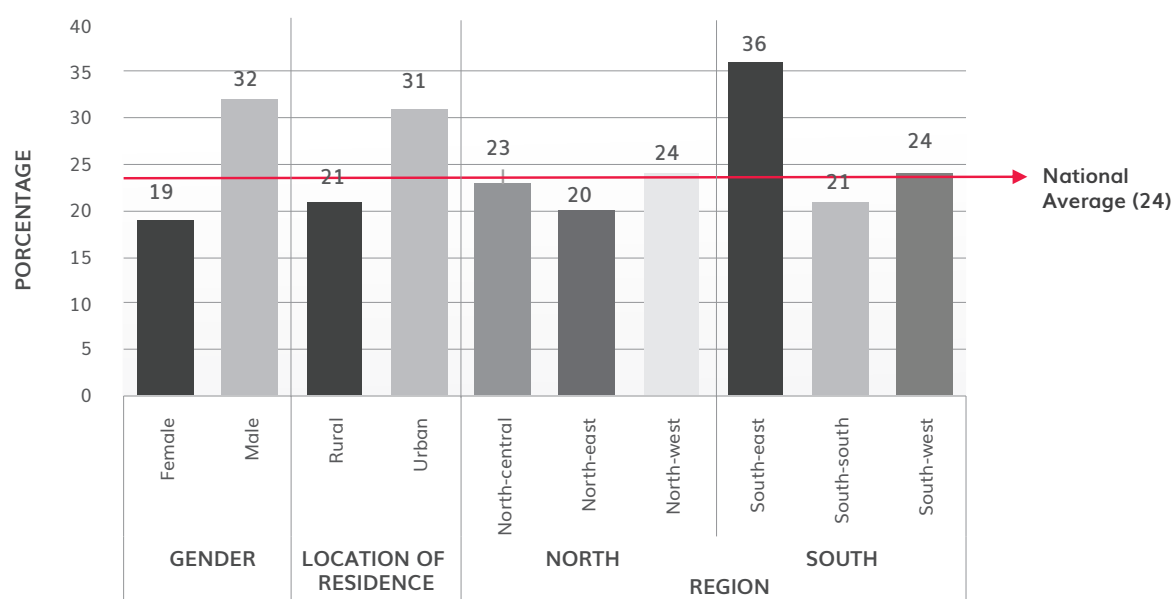
Source: Authors' calculation from DHS survey.

Gender

We found that women are excluded from quality education in Nigeria. The percentage of women who can read is 19%, compared to 32% for men (see Figure 2).

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4 This does not mean that they have no effect on quality of education, but that no significant gap exists between sub-groups.

A further disaggregation of gender disparity in quality of education (Figure 3) shows that the gender gap is more pronounced in the northern regions.

There is a link between gender and regional differences in quality education. Plausible reasons for the observed gender gap, especially in northern Nigeria include high poverty levels and negative attitudes towards female education. The Oxford Poverty and Human Development Initiative (2018) shows that 67% of the population in the north are poor, compared to 24% in the south. In many

" The persistent exclusion of women from quality education will limit Nigeria's overall pursuit of the 2030 Agenda.

instances, children from poor households divide their time between school and work, which negatively impacts school attendance and learning. While poverty and gender inequality could explain the poor literacy performance of girls, there is also a bi-directional relationship between the identified explanations and education (access and quality) (see Table 3). Existing literature on Nigeria shows that progress in quality education is fundamental to poverty eradication since it raises people's productivity and creativity, thus promoting entrepreneurship and technological advances (Ogundele, Akingbade, and Akinlabi, 2012). The literature also links access to quality education to gender equality through providing women with higher levels of autonomy and decision-making power (Wusu, 2012). This synergistic relationship between education and these SDGs (poverty and gender equality) implies that improvements in access to and quality of education will lead to greater outcomes for girls relative to boys.

Also, in a study of girls' achievement in northern Nigeria, Udoko, Fatima, and Umar (2017) noted factors that negatively affect girls' ability to access education, such as early marriage and courtship and the limited participation of women in decision making. The absence of gender-sensitive school facilities, particularly in the southern part of Nigeria, also contribute to women's exclusion from education (UNICEF, 2016). In addition, women are often more distracted from learning than men are, given that they are disproportionately burdened with household chores like fetching water and firewood for cooking.

The foregoing analysis depicts a bleak picture of women's access to quality education in Nigeria. Yet, our analysis of interlinkages between SDGs highlights strong synergies between SDG 4 targets and other targets (Table 3). Particularly, we found that literate

females are less likely to be poor, more likely to access healthcare facilities for pre- and post-natal care, and are more likely to be employed. In addition, a more literate population results in a reduction in sexual violence against women. The persistent exclusion of women from quality education will limit Nigeria's overall pursuit of the 2030 Agenda. However, addressing the issue of female exclusion in quality education is instrumental in meeting other development aspirations.

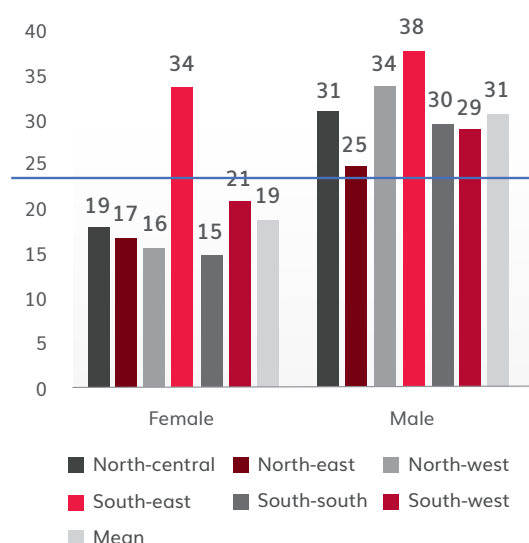*Figure 3.* Disaggregation of gender difference by region

Figure 4. Disaggregation of rural-urban difference by region
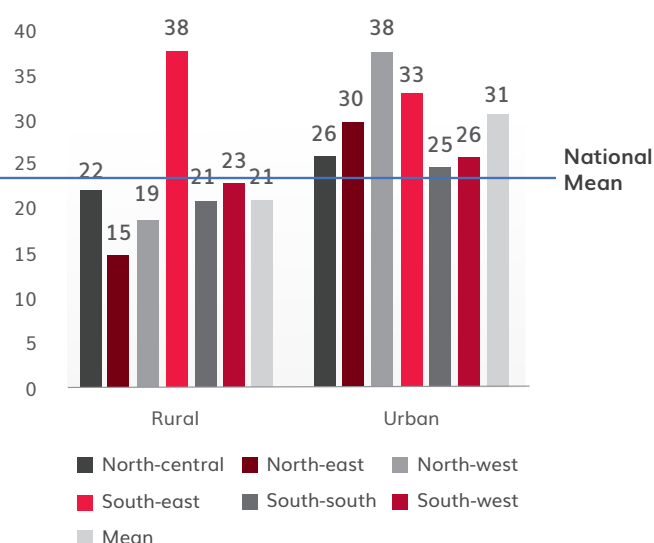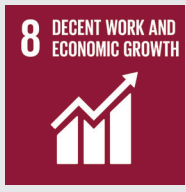
Table 3. Interactions between quality education and other SDGs and targets

SDG	Target category	Direction	Interactions	Score
1 NO POVERTY	Eradicate extreme poverty for all (1.1, 1.2, 1.3, 1.4)	1 → 4	Progress on the quality of education is indivisible from poverty reduction insofar as at low levels of income, rising incomes inevitably lead to better quality of education.	+3
3 GOOD HEALTH AND WELL-BEING	Better health (2.1, 2.2, 2.3)	4 → 3	Higher level of education for mothers reduces the rate of infant mortality in Nigeria. Education provides mothers with knowledge on the appropriate nutrition and care for their infant.	+2

5 GENDER EQUALITY	Women safety and worth (5.1, 5.2, 5.4)	4 → 5	Improving the quality of education is fundamental to improving women's rights in society. Education provides women with the knowledge, information, and control they need for their family and in society.	+3
8 DECENT WORK AND ECONOMIC GROWTH	Innovation and growth (8.1, 8.2, 8.4)	4 → 8	The quality of education influences the level of knowledge spillovers and entrepreneurship. This helps in boosting international competitiveness and attracts foreign direct investment.	+2
13 CLIMATE ACTION	Climate strategies and education (13.1, 13.2, 13.3)	4 → 13	Education is a primary process through which individuals are provided with skills and knowledge that equip them to mitigate the impacts and adapt to the consequences of climate change.	+2
16 PEACE, JUSTICE AND STRONG INSTITUTIONS	Peace, justice and institutions (16.1, 16.2, 16.3)	4 → 16	Education fosters peace and stability in a society by equipping individuals with knowledge and developing attitudes, skills, and behaviour that enhance oneness.	+2

Elaborated by the authors.

Urban-rural divide

Another excluded group identified from our disaggregation analysis are those in the rural areas. Specifically, 31% of youth in urban areas with primary education meets the literacy benchmark compared to 21% in rural areas (Figure 3). Figure 4 shows further disaggregation of education performance by region. The northern region performs worse than its southern counterpart, particularly in rural areas. In urban areas, all regions exceeded the national average, but when extended to the rural area, only the south-east exceeded this benchmark. The weak performance of rural residents is the result of several factors, including wealth gap, lack of economic opportunities, and lack of access to good social and economic amenities. These then manifest into poor learning environments and teacher absenteeism.

More worrying is the fact that technology, which should be a leveller (see Figure 5), could actually widen the rural-urban quality gap. Early adopters of innovative learning opportunities are mostly schools in urban areas and children from wealthier households (Hennessy, Harrison, & Wamakote, 2010). Even if private sector or donors step in to provide these technologies, adoption will be constrained by the lack of auxiliary infrastructure, such as electricity or human resources, in rural areas. This highlights the need for

pro-poor public policies to ensure technology enables the equitable attainment of quality education. Such public policy should consider critical issues of finance, appropriateness of technology to be deployed, and effectiveness of the chosen technology in meeting the needs.

Figure 5. Conceptual framework of the transmission mechanisms from global systemic issues to exclusion in quality education in Nigeria.
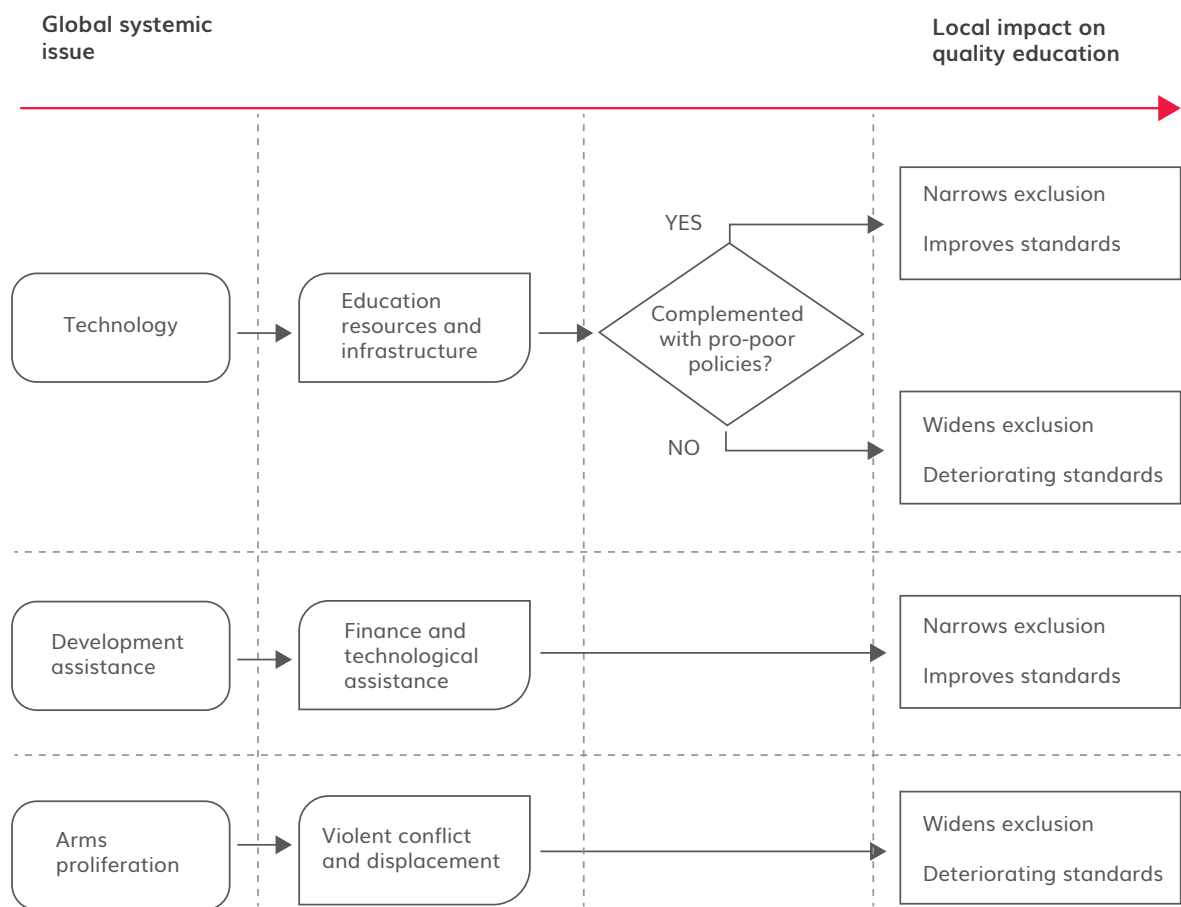
Elaborated by the authors.

With pro-poor policies, technology-enabled education resources can provide significant learning opportunities for groups currently left behind in quality education in Nigeria (Aderinoye, Ojokheta, & Olojede, 2007). The education technology we consider relevant for rural areas are those that respond to supply-side challenges, such as inadequacy of qualified human resources, overcrowding, lack/inadequacy of gender—and disability-sensitive school infrastructure—limiting enrolment and attendance, and inefficiency of mechanisms to monitor efforts (e.g. teacher attendance)

(Odia & Omofonmwan, 2007; Boyi, 2014; Daura & Audu, 2015). For instance, interviewed stakeholders suggested that despite the nationwide shortage of qualified teachers, rural schools are disproportionally affected as many of the teachers posted there tend to not show up in the classrooms. Technology-enabled learning solutions that require limited teacher guidance exist, and if appropriately deployed to rural learners (see Trucano, 2014), rural children's learning outcomes will improve (Isiaka, 2007). Furthermore, although communities' use of technology to monitor teacher absenteeism is perceived as a lack of trust by some teachers, it is becoming more feasible for rural communities to hold teachers accountable given improved accessibility to digital devices (UNESCO, 2017) and such initiatives are yielding positive results (Duflo & Hanna, 2005).

On the global stage, a key policy issue is intellectual property rights, especially relating to provision of technology-enabled learning resources and infrastructure. The innovative software and hardware that make up the education technology landscape mostly fall under intellectual property protection, to allow the creators of that property to reap commercial benefits from their efforts (Saha & Bhattacharya, 2011). Therefore, there is considerable scope for global partnerships to improve access to technology-enabled education resources and infrastructure by tackling the barriers that keep costs prohibitive. Education stakeholders can take a cue from the global health architecture that effectively innovates and delivers healthcare products and services like vaccines worldwide, including to the remotest parts, often at little or no cost to the beneficiaries. Such efforts have not distorted incentives for innovation in health research and yet have yielded massive health benefits for the entire globe over the past few decades (Rosling, 2018). Moreover, the rising trend of open source licensing of products and services that are both resource and intellectually demanding to prove that improving access to education technology is possible.

Region
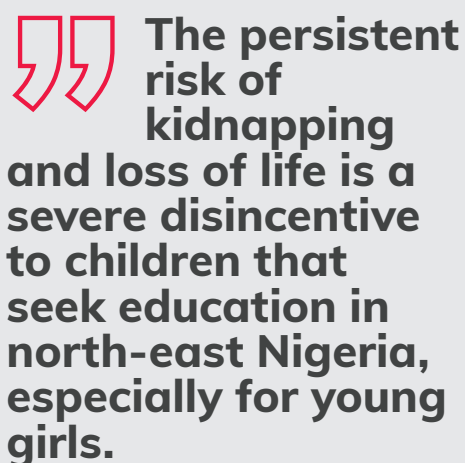
There is regional disparity in education quality in Nigeria (see Figure 3). The south-east has the highest number of primary school leavers with literacy competency at 36%, followed by south-west (24%), north-west (24%), north-central (23%), south-south (21%), and north-east (20%). On average, education performance is slightly better in the south than in the north. This corroborates findings in the extant literature, which documents that northern Nigeria has comparatively lower human development than the south (Adeniran & Okpanachi, 2018). Yet, it is still instructive to note that the gap in performance as it relates to the quantity of education is wider than the estimated gap in quality. For instance, the regional gap in primary school enrolment in 2017 between the north and south is about 20 percentage points compared to 13 percentage points in quality (National Bureau of Statistics & UNICEF, 2017).

While this might suggest the gaps are closing in quality education, other forces are at play. First, the small differences in quality across regions reinforce the point that education quality is broadly low in Nigeria, irrespective of region. Second, from DHS estimates, median years of schooling in the north is zero and six years in the south. Most of those with at least six years of schooling in the north are from middle-income and rich households. This means that the poorest households, which are the majority in northern Nigeria, are excluded from our sample, because they did not complete primary school. In essence, while the quality of education in the south is low, the north faces a deficit in both improving quantity and quality.

Since 2009, northern Nigeria has been disproportionately affected by violent conflicts that lead to the mass displacement of people. Such displacements interrupt the education of millions of children. Violent conflicts have persisted partly due to the global issue of arms proliferation and deficiencies in national security and border infrastructure. As a result, Nigeria hosts an estimated 350 million, or 70%, of the 500 million illegal arms in West Africa (United Nations Regional Centre for Peace and Disarmament in Africa, 2017). The outbreak of Islamic extremism and domestic terrorism carried out mainly by Boko Haram, as with other manifestations of both old and new threats, is powered by the use of small arms and light weapons (Uwa & Anthony, 2015). Previously latent and contained violence has now gained widespread impact because of the relative ease with which perpetrators acquire small arms and light weapons. This is a global systemic concern that is facilitated by other global systemic issues of illicit financial flows and the global criminal architecture that supports illegal arms dealing.

> **The persistent risk of kidnapping and loss of life is a severe disincentive to children that seek education in north-east Nigeria, especially for young girls.**

It is instructive to note that Boko Haram translates to "Western education is a sin" and is a direct threat to achieving SDG 4 and leaving no one behind in Nigeria. For instance, in north-east Nigeria, insurgents destroyed more than 1,500 schools between 2014 and 2017, with at least 1,280 casualties among teachers and students (United Nations Security Council, 2017). Yet, Boko Haram relies on a thriving global criminal network to carry out its activities. More concerning, the group's terrorist activities are concentrated in the north-east region of Nigeria, an area that had poor education outcomes even before the

insurgency. The persistent risk of kidnapping and loss of life is a severe disincentive to children that seek education in north-east Nigeria, especially for young girls. An effective approach to achieving quality education in Nigeria will address both the internal and external drivers of violent conflict and insecurity. Therefore, it is imperative that the government engages other international partners to develop a robust strategy for this threat so that no one is left behind in quality education.

Box 1. Persistence of regional disparity in educational performance

The regional differences in educational outcomes in Nigeria persist beyond primary education. This is demonstrated in the table below, which shows the pass rate in the post-secondary school examination conducted by West African Examination Council (WAEC). To proceed from secondary school to university and higher education, students must have a credit (that is, score at least 50%) in five subjects including Mathematics and English. In 2010, only 6.9% of students in the north-east meet this benchmark, 8.08% in the north-west, and 15% in the north-central. Comparatively, the south-east records 36.59%, followed by the south-south (31.61%), and the south-west Nigeria south-west (30.48%). In 2014, there was marked improvement in performance across the region (except in the south-west). Despite this progress, the regional differences remain and, in fact, the gap slightly increased. However, the gender difference is not evident, as female students perform slightly better than male students do both across regions and over time.

Percentage of candidates with five credits including Mathematics and English

Regions	2010			2014		
	Male(%)	Female (%)	Total (%)	Male (%)	Female (%)	Total (%)
North-central	15.09	14.80	14.90	23.44	24.63	23.92
North-east	6.90	7.46	7.10	8.51	10.25	8.94
North-west	8.08	11.87	8.86	13.89	16.68	14.66
South-east	36.59	36.62	36.60	43.18	44.67	43.95
South-south	31.61	33.06	32.32	40.52	42.67	41.59
South-west	30.48	31.91	31.17	25.92	26.71	26.22
Source: West African Examination Council						

In general, the disaggregation of data reveals not only those who are being excluded, but also the links between various dimensions of exclusion. For instance, the regional disparity in quality is strongly influenced by gender and place of residence.

This means that the dimensions of exclusion cannot be treated as mutually exclusive. In as much as some individuals suffer from multiple dimensions of exclusion, policy intervention also cannot exclusively target a single dimension.

Other dimensions of exclusion not captured in the data

Quantitative data from household surveys like DHS, although broad enough to allow for disaggregation, remain significantly limited due to important dimensions that are difficult to measure or are not captured by the survey instrument. Therefore, this study complements the DHS data with qualitative information provided by key stakeholder interviews.

In addition to the key dimensions identified above, the stakeholders identified four other important groups that are excluded from quality education in Nigeria: nomadic groups, children living with disabilities, Almajiri students, and internally displaced children.

According to the World Report on Disability (World Health Organization, 2011), 25 million Nigerians had at least one form of disability, among which 3.6 million had functional difficulties. Pupils living with disabilities require specialised training and teaching procedures designed to meet their unique learning needs, such as sign language for the deaf or braille for the blind. Their learning outcomes are not accounted for in standard literacy assessments. The interviewed stakeholders indicated that the two key challenges facing special education in Nigeria are insufficient government funding, and the absence of qualified staff. In addition, they highlighted an absence of specialised facilities for children with autistic and learning disorders. This concurs with findings by Obiakor and Eleweke (2014) who indicate in their research that special education in Nigeria is faced with a plethora of challenges, including the absence of supporting laws, insufficient funding, lack of early identification and intervention services, poor personnel training programmes, inadequate facilities, and teaching aids.

Children from nomadic groups also face immense challenges. There are about 10.4 million nomadic people in Nigeria, comprising pastoralist and migrant fishing groups, with over half of the population consisting of children of school age (Usman, 2018). Tahir (2006) noted that less than 2% of the nomadic population in Nigeria are literate. The government has responded to the learning crisis among this group with special interventions such as the establishment of the National Nomadic Education Commission. In many respects, the interventions have improved student enrolment among nomadic populations from 19,769 in 1990 to 484,694 in 2010 and more recently to 578,000 in 2017. Despite this progress, 5.2 million nomadic children are still out of school. Regular mobility of this group is a key challenge, and this explains why they are being left behind.

There is also a policy dilemma, given that state and local governments are statutorily in charge of basic education. But with frequent migration across states, policy intervention at state and local government levels is ineffective. Meeting the unique educational needs of the nomadic population is, therefore, a significant challenge in SDG implementation in Nigeria.

Another important group identified by the stakeholders are students in the Almajiri education system in northern Nigeria. Estimates by the National Council for the Welfare of the Destitute (NCWD), as cited by Sebastine and Obeta (2015), put the population of Almajiri students at about 7 million in 2015. Historically, the Almajiri system was developed to train children and youth (from 5 to 22 years old) in Qur'anic literacy. However, failure to integrate it with the formal education system implies that numeracy and literacy skills are not offered, which is a barrier to quality education for children that are exclusively in the Almajiri system. The majority of out-of-school children are part of this group. In the absence of functional skills, the students end up in vulnerable and precarious employment as adults.

Since 2011, Nigeria has experienced persistent violent conflicts that have killed more than 37,500 people and led to more than 1.7 million being internally displaced (Internal Displacement Monitoring Center, 2017; Council of Foreign Relation, 2017). According to UNICEF (2016), 56% of the internally displaced persons are children. Displacement has significantly exacerbated the problem of access to education, especially in northern Nigeria where already 9.1 million children are out of school (UNICEF, 2018). Government, donors, and private sector have, however, addressed this challenge through providing makeshift classrooms in the Internally Displaced Persons (IDP) camps and using volunteers or educated adults within the camps as teachers. Furthermore, the literature on Nigeria shows that education shares a synergistic relationship with SDG 16 (see Table 3) by equipping individuals with knowledge and developing attitudes, skills, and behaviour that enhance oneness (Bertoni, Di Maio, Molini, & Nistico, 2018). While the interventions have reduced the access problem, the quality concern remains an issue. Given that the provision of a good learning environment is a key component of quality education, the IDP camps do not meet this basic standard. Conflicts also have psychological effects on children, thereby affecting their preparedness for school activities.

Drivers of exclusion in quality education

In identifying the drivers of exclusion, we employed mediation analysis. The results are presented in Tables 4 and 5. The mediators explain a significant proportion of the rural-urban and regional differences. Specifically, 75% of the rural-urban difference and 100% of regional differences (for north-east and north-west) are explained.

However, the mediators explain only 3.85% of the gender gap, and this is not statistically significant.

The gender gap is not strongly influenced by the mediators. This suggests that an important factor is missing among the mediators in our analysis and/or there is covert discrimination against women. While data unavailability makes testing for the right hypothesis impossible, we speculate that the combination of the two effects is present. For instance, only the age of sexual debut is statistically significant among the mediators in the gender gap equation. In cases where girls have no choice about the age at which they get married, exclusion from school becomes an example of covert

> **In cases where girls have no choice about the age at which they get married, exclusion from school becomes an example of covert discrimination.**

discrimination. This is because the lack of schooling is a consequence of early marriage. Also, household characteristics are not significant in the gender gap equation. This suggests exclusion is not down to individuals but may be the result of external and environmental factors. However, this does not eliminate the fact that key variables likely to influence the gender gap are not properly accounted for in our analysis. For example, the gender sensitiveness of classrooms and the general school environment are well-documented factors contributing to school performance of girls and women, but not accounted for in our analysis. In essence, the gender gap is quite sizeable, yet challenging to explain due to a combination of possible discriminatory factors and the lack of data.

For the rural-urban gap, wealth accounted for more than 50% of the differences, while district characteristics, occupation, and age of sexual debut accounted for the remaining gap. Due to lower economic opportunities and jobs in rural centres, out-of-pocket finances for education are also smaller. This leads to over-reliance on public sector financing. Yet, public education spending remains insufficient to meet investment needs owing to a shrinking fiscal space, with competing development priorities, and the changing landscape of development financing for lower-middle-income countries (LMICs). Specifically, as countries graduate to less concessionary financing terms from multilateral institutions like the World Bank, they face disincentives to borrow for social sectors, such as education (Rogerson & Schäferhoff, 2016). This is evident in Nigeria's recent borrowing pattern, which has mostly focused on infrastructure financing, crowding out desperately needed investments in the social sectors. Many LMICs still require financing windows

made available through traditional aid. Although developing countries like Nigeria have gained economic ground, tax revenues have not increased enough to enable them to make the necessary investments for building and upgrading their education system. LMICs, with about 700 million children and young people, will not achieve SDG 4 without innovation, reform, and new ways of financing education (Education Commission, 2018). Consequently, global actors need to commit to improving access to development financing for education investment in order to meet quality education goals.

Furthermore, we find age of sexual debut, which serves as proxy for factors such as early child marriage, to be significant, especially in rural areas. The results also demonstrate that district characteristics, such as access to health and energy infrastructure, are crucial. Mostly, transportation, energy, and health facilities, which are key enablers to achieve quality education, are absent in the rural areas.

Table 4. Mediation analysis for gender and location of residence

	Gender	Location of residence
Total difference	0.1377*** (0.0378)	0. 1527*** (0. 0163)
Total explained	0.0053 (0.0191)	0.1147*** (0.0114)
% (Total explained/Total difference) x 100	3.85	75.11
Household	-0.0114 (0.0085)	0.0005 (0. 0004)
District	-0.0000 (0.0060)	0. 0163 (0. 0091)
Age of sexual debut	0.0244*** (0.0120)	0.0057*** (0.0016)
Wealth	-0.0098 (0.0071)	0. 0800*** (0. 0092)
Occupation	-0.0003 (0.0049)	0. 0137*** (0. 0039)
Religion	0. 0025 (0. 0019)	-0. 0017 (0.0013)

Source: Authors' computation from DHS survey.

*** 1 % level of significance; ** 5 % level of significance

Table 5. Mediation analysis for regional differences

	North-east	North-west	North-central	South-south	South-west
Total difference	-0. 1769*** (0.0294)	-0. 2270*** (0. 0284)	-0.2189*** (0. 0258)	-0. 2039*** (0. 0263)	-0.0292 (0. 0259)
Total explained by mediators	-0.1880*** (0.0338)	-0.2294*** (0.0210)	-0.1178*** (0.0246)	0.0038 (0.0224)	0.0077 (0.0277)
% (Total explained / total difference)	106.27	101.06	53.8145	-1.86	-26.37
Household	-0.0043 (0.0043)	-0.0040 (0.0041)	-0.0015 (0.0019)	-0.0007 (0.0007)	-0.0008 (0.0018)
District	-0.0418 (0.0274)	-0.0866*** (0.0207)	-0. 0579 *** (0.0212)	0.0079 (0.0204)	-0.0054 (0.0254)
Age of sexual debut	-0.0198*** (0.0062)	-0.0239*** (0.0075)	-0.0094*** (0.0039)	-0.0119*** (0.0036)	-0.0043*** (0.0019)
Wealth	-0.0668*** (0.0098)	-0.0472*** (0.0086)	-0.0156*** (0.0039)	0.0131 (0.0068)	0.0364*** (0.0093)
Occupation	-0.0065*** (0.0031)	0.0009 (0.0057)	-0.0049*** (0.0023)	-0.0025*** (0.0019)	0.0127*** (0.0034)
Religion	-0.0487*** (0.0126)	-0.0686*** (0.0171)	-0.0284** (0.0077)	-0.0021 (0.0009)	-0.0325*** (0.0085)

Source: Authors' computation from DHS survey

*** 1 % level of significance; ** 5 % level of significance

For the regional gap, using south-east as the benchmark, the mediators could explain all the differences between north-east and north-west and about half of the gap for the north-central region. The result shows a number of factors contributing to poor performance in the north. Wealth is the most significant mediator, and this is expected given the high poverty level in northern Nigeria. Religion is another significant mediator and reflects the existence of cultural and customary practices that constrain access to quality education. For example, the Almajiri education system is prevalent in the north, and the failure to link the system with formal education limits access to quality education. We also found the age of sexual debut to be significant, which again draws attention to the issue of early child marriage. The effect of district characteristics is more significant in the north-west and north-central regions of the country, while occupation is a significant factor in the north-east and the north-central regions.

Conclusion and implications

Findings on LNOB indicate that there is a regional disparity in education quality in Nigeria. However, the quality gap observed at the regional level is much lower than the gaps in quantity (enrolment) reported in the literature. This implies several things. First, the small differences in quality across regions reinforce the point that education quality is broadly low, irrespective of the region. Second, from DHS estimates, median years of schooling in the north is zero and six years in the south. Most of those with at least six years of schooling in the north come from middle-income to wealthy households. This implies that children from poor households, which make up the majority in northern Nigeria, are not in school and are therefore excluded from the studied population. In essence, while the quality of education in the south is low, the north faces a deficit in both quantity and quality.

Women are also identified as being excluded from quality education. We found cultural factors to be the key driver for the exclusion of women; in particular, the age of sexual debut is a proxy to capture the effect of early marriage and courtship. This shows that harmful cultural practices and covert discrimination, in cases where girls have limited control over the age at which they get married, are causing girls to drop out of school.

The final excluded group identified is children in rural areas. The weak performance of rural residents can be explained by the wealth gap, lack of economic opportunities, and lack of access to good social and economic infrastructure. These conditions then translate into poor learning environments and teacher absenteeism, since the majority of teachers prefer to live in urban centres.

On synergies and trade-offs, positive interactions exist between SDG 4 and other SDGs. This implies that efforts to ensure inclusive and equitable quality education in Nigeria should also be translated to other areas of the 2030 Agenda. From a practical perspective, policymakers must take action towards creating an enabling environment that fosters integrated and holistic thinking towards meeting the SDGs in Nigeria. There is a need for policymakers to go beyond the simple acknowledgement of the existence of SDG interactions to mobilising additional resources, implementing new laws, and planning and evaluating methodologies that promote a broader sustainable development agenda.

With respect to educational policy, in particular, there is a need to carefully design and select policy instruments, so that the effects on other sustainability dimensions are as intended (e.g. policies on improving the quality of education should not be allowed to drive up the cost of education for the poor). Also, the promotion of policy coherence

and an integrated assessment is fundamental to addressing potential policy spillovers across sustainability domains and sectors. To this end, policymakers are tasked to ensure that institutions engage in inclusive practices and formulate policies that promote an integrated approach to the 2030 Agenda.

Technology, development assistance, and arms proliferation have been identified as the global systemic issues that affect local efforts towards achieving the SDGs in Nigeria. The impact of technology-enabled resources and infrastructure on quality of education is dependent on the existence of pro-poor public policy. Specifically, already vulnerable groups, including poor and rural residents, may be further left behind if necessary measures are not introduced to allow them access to technology-enabled educational resources and infrastructure. In addition, curtailing the underlying enabler of violent conflict—arms proliferation—that leads to displacement of people is of particular relevance. It requires urgent and collaborative efforts to control the threat and check its enablers, such as illicit financial flows. As international stakeholders collaborate to develop a robust strategy for containing and reducing the threat so that no one is left behind, development assistance, specifically finance and technical assistance, is also required from them. Development assistance is instrumental in developing countries' efforts to improve standards and narrow rates of exclusion from quality education.

Overall, the disaggregation of data and findings reveals that there are links between various facets of exclusion as well as interactions between SDG 4 and other SDGs. This means that aspects of exclusion cannot be treated as mutually exclusive. Some individuals may suffer multiple dimensions of exclusion. Therefore, policy interventions should not target a single dimension, but consider all aspects of exclusion to be effective. Also, in the attainment of equitable, quality education, an integrated and holistic approach is fundamental to achieving a broader sustainable development agenda. Nigeria needs to encourage global partnerships and motivate global actions to achieve SDG 4. Specifically, more local and donor resources are needed to get Nigeria on track to ensuring quality education for all.

Recommendations

The following specific policy recommendations will be crucial to delivering SDG 4 in Nigeria:

- Actionable intervention for priority groups. Based on the various facets of exclusion identified, the priority group will depend on the number of vulnerability

criteria an individual has. For example, women in rural areas and northern Nigeria will constitute a priority group. Interventions will need to focus on schools and communities. At the school level, adequate funding to the education sector, provision of gender-friendly school facilities, and the deployment of qualified teachers who are incentivised to stay within affected community areas will be crucial policy interventions. At the community level, providing adequate infrastructural facilities and improving economic opportunities in rural and northern Nigeria will be essential. Also, educating communities on harmful cultural practices and customs that affect education development within their areas is crucial. Key influencers such as community and religious leaders could play a significant role in this.

- Actionable response to state institutions. Building the capacity of SDG-related government agencies, such as the Office of the Senior Special Assistant to the President on SDGs (OSSAP-SDG) so that they are more active at the subnational level and participate in formulating education policies, is critical to ensure that SDG 4 is wholly integrated into development plans. Also, incentivising collaborations between OSSAP-SDG and other institutions with the core mandate of promoting basic education is key to achieving policy coherence.

- Policymakers need to create an enabling environment that fosters and integrates holistic thinking towards meeting SDG targets in Nigeria. Educational policies should be carefully designed so that the effects on other sustainability dimensions are as intended. In developing educational policies, policymakers should ensure interventions in the educational sectors are (i) standardised and straightforward; (ii) moderated and should take account of factors such as the environment children live in, existing curriculum, and finance; (iii) able to address the foundational problem of lack of quality early childhood education; and (iv) designed to improve accountability and pedagogy.

Considering the global systemic issues affecting education quality, national and international efforts should concentrate on:

- Technology
  - The government should complement the deployment of education technology with appropriate pro-poor public policies. Specifically, this needs to target those groups (like rural dwellers) that have been identified as at risk of being left behind. Infrastructure and a workforce to ensure effective use of these resources must also be provided.
  - Global education stakeholders should work towards creating alliances that

lower the barriers to accessing relevant educational resources that are currently protected under intellectual property rights. This effort can take a cue from the global public health architecture that delivers high-tech health interventions at low or no cost to beneficiaries worldwide.

- Arms proliferation
  - Arms proliferation is an enabler of violent conflict. Underlying motivations for violence, such as poverty and ethnic clashes, have to be squarely addressed by the Nigerian government, possibly with support from the international community.
  - States and multilateral agencies must enhance efforts to work collaboratively to curb the proliferation of arms, through better accounting of the arms trade as well as through the control of illicit arms trade enablers, such as illicit financial flows and porous borders.

- Foreign aid
  - It is necessary to put concessionary financing for low- and middle-income countries, especially for the social sectors, back on the global agenda. Initiatives already exist that are gaining momentum, such as the International Finance Facility for Education, but these need the buy-in of global actors, especially donor countries.

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Appendices

Appendix 1. Data description

Variables	Description	Source
Quality of education	Measure as a dummy variable with Can read complete sentence = 1 Can read part or cannot read a sentence = 0	DHS
Gender	Measure as a dummy variable with Female = 0 Male = 1	DHS
Location of residence	Measure as a dummy variable with Urban = 1 Rural = 2	DHS
Wealth index	Measure as a dummy variable with poorest = 1 Poorer = 2 Middle = 3 Richer = 4 Richest = 5	DHS
Religion	Measure as a dummy variable with Islam = 0 Christianity = 1	DHS
Region	Measure as a dummy variable with North-central = 1 North-east = 2 North-west = 3 South-south = 4 South-east = 5 South-west = 6	DHS
Duration of residency	Measure as a dummy variable with New residents = 0 Old residents = 1	DHS
Sector of occupation	Measure as a dummy variable with Not working = 0 Agricultural sector = 1 Non-agricultural sector = 2	DHS

Education attainment of head of family	Measure as a dummy variable with No education = 0 Primary = 1 Secondary = 2 Post-secondary = 3	DHS
Gender of head of family	Measure as a dummy variable with Female = 0 Male = 1	DHS
Age group	Measure as a dummy variable with 15 – 19 = 0 20 -- 24 = 1	DHS
Household size	Number of household members	DHS
Proportion of household expenditure on education within a state by rural and urban locations	This is out-of-pocket expenditure divided by total household expenditure	General Household Survey, 2012
Student per class	The average number of students per class for primary school within a state	National Bureau of Statistics (2016)
Distance to school	Time (in seconds) it takes a child within the household to reach the nearest primary school	DHS
Percentage of qualified female teachers in a state	Ratio of female teachers with qualification in teacher training to total number of female teachers within a state	National Bureau of Statistics (2016)
Source of energy	Time to it takes to fetch firewood	DHS
Distance to major health facilities	The distance of the community to nearest health institution	Authors' computation from google map geocoding
Distance to major motorways	The distance of the community to nearest Major Highway, Expressway and federal roads	Logistic Capacity Assessments (LCAs), 2018
Age of sexual debut	Age in years at first sex	DHS

The key demographic features of this group are shown in Table 2.1. Female and urban residents constitute about 58.4% and 28.2% of the sample, respectively. In terms of geopolitical representation, the north-east has 15.44%, followed by the north-west

(25.73%), north-center (20.1%), south-west (10.86%), south-south (15.48%), and the south-east (12.39%). Overall, the key population sub-groups are well represented, which provides a sufficient sample size for statistical analysis and drawing inferences.

Appendix 2. Distribution of the sample

	Male	(%)	Female	(%)	Total	(%)
Place of residence						
Urban Rural	230 642	10.98 30.61	374 851	17.85 40.56	605 1494	28.82 71.1
Total	**873**	**41.59**	**1226**	**58.41**	**2099**	**100**
Geopolitical region						
North-east North-west North-central South-south South-east South-west	207 304 257 175 149 138	9.87 14.50 12.25 8.37 7.13 6.61	116 235 164 149 110 89	5.57 11.23 7.85 7.12 5.26 4.25	324 540 422 325 260 228	15.44 25.73 20.10 15.48 12.39 10.86
Total	**1232**	**58.72**	**866**	**41.28**	**2099**	**100**

Source: Authors' computation from DHS survey.

Appendix 3. List of stakeholders interviewed

S/N	Name	Organisation
1.	Dr. Tunde Adekola	Senior Education Specialist, World Bank, Abuja
3.	Mr. David Agu	Senior Researcher, Development Strategy Centre, Enugu
4.	Dr. Folake Olatunji-David	Deputy Director, Federal Ministry of Education, Abuja
5.	Mr Chid Ezegwu	Education Partnership Centre (TEP Centre), Abuja

6.	Dr. Stella Adagiri	Director/Consultant, Portsbridge Educational Services, Abuja
7.	Dr. Hafsat Lawal Kontagora	Dean, School of Teacher Professional Development, Research and Exams, Abuja
10.	Mr. Olawale M. Samuel	Education Program Manager, USAID, Abuja
11.	Esohe Eigbike	Education Adviser, DFID, Abuja
17	Dr. Abdulrahaman Abu Hamisu	Presidential Committee on North-East Initiative, Abuja
18	Prof Ben Umar	University of Abuja
21	Ekundayo Arogundade	Senior Field Manager (NBD), Oxford Policy Management
22	Uchenna Nnamani	Development Strategy Centre, Enugu
25	Prof. Oladele Akogun	Federal University of Technology, Yola, Adamawa
26	Prof. Sule Tagi	University of Maiduguri
27	Prof. Mamman Musa	Amadu Bello University, Zaria, Kaduna State