



Government of the Republic of Zambia

THE SUB-NATIONAL CARRYING CAPACITY ASSESSMENT



2023





Government of the Republic of Zambia

THE SUB-NATIONAL CARRYING CAPACITY ASSESSMENT REPORT

**Ministry of Finance and National Planning
Population and Development Department**

Lusaka, Zambia

2023



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FOREWORD

The Government of the Republic of Zambia (GRZ) is committed to promoting the generation and use of a wide range of relevant, timely, quality, and reliable data to achieve inclusive sustainable development. These data are critical for monitoring and evaluating various sub-national, national, regional, and international plans and frameworks. The Statistical data are also vital in decision-making and allocation of national resources. In ensuring that the country remains on track in actualising the vision of the 2019 National Population Policy as well as the objectives of the Eighth National Development Plan (8NDP), it was essential to examine the population carrying capacities up to the district level to assess the districts' abilities to provide services to their growing populations at an optimum level. The Carrying Capacity Assessment, therefore, focused on the physical, environmental, social, and economic carrying capacities of the selected districts.

If inclusive, sustainable socio-economic development is to be achieved as outlined in Vision 2030; strategic investments must be prioritised to ensure the various facets of carrying capacity are balanced. The assessment helped to identify factors, opportunities, and challenges affecting the country's ability to achieve inclusive socio-economic development and measures that need to be undertaken to realise human-centred development as enshrined in Vision 2030 and other Government policies, plans, and programmes.

It is envisaged that the information in this report will significantly contribute towards the improvement in the planning, decision-making, resource allocation, and provision of services. Therefore, all relevant stakeholders are urged to utilise the information generated accordingly.



Lois Mulube

Acting Permanent Secretary - Planning and Administration

MINISTRY OF FINANCE AND NATIONAL PLANNING

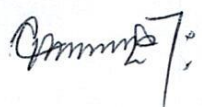
ACKNOWLEDGEMENT

The Ministry of Finance and National Planning wishes to express its appreciation to all stakeholders who were involved in the undertaking of the Sub-National Carrying Capacity Assessment (CCA). The CCA would not have been possible without the good work and dedication of the programme staff at various levels.

The Ministry would like to recognise the efforts of the technical working group comprising staff from the Ministry of Finance and National Planning, Ministry of Local Government and Rural Development, Ministry of Health, Ministry of Education, Ministry of Water Development and Sanitation, the University of Zambia, Zambia Statistics Agency, Zambia Institute for Policy Analysis and Research and Tec Analytics particularly Dr. Bernard Tembo.

The Ministry further acknowledges the pivotal role played by the United Nations Population Fund (UNFPA), Zambia Country Office, in providing financial support for key CCA activities. Additionally, the role played by the Provincial and District Administrations in contributing to this work is also recognised.

Above all, the Ministry appreciates the cooperation of all the respondents from the various target institutions who made the CCA a success.



Charles Banda

Director - Population and Development

MINISTRY OF FINANCE AND NATIONAL PLANNING

ABBREVIATIONS AND ACRONYMS

8NDP	Eighth National Development Plan
CCA	Carrying Capacity Assessment
ECE	Early Childhood Education
GRZ	Government of the Republic of Zambia
LCMS	Living Conditions and Monitoring Survey
MoFNP	Ministry of Finance National Planning
REMP	Rural Electrification Master Plan
UNFPA	United Nations Population Fund
WHO	World Health Organisation
ZDHS	Zambia Demographic and Health Survey

EXECUTIVE SUMMARY

The Sub-National Carrying Capacity Assessment (CCA) covered 23 out of the 116 districts across the ten provinces of Zambia. The overall objective of the CCA was to assess the districts' abilities to provide services to their growing populations at an optimum level. It reviewed plans, reports, policies, and documents that informed the development of primary data collection tools used to collect district-level data.

Data was collected from forestry, agriculture, livestock and fisheries, wildlife, health, education, water supply, electricity, community development, social welfare, and the physical environment. The CCA model was set up in R, a free and open-source software.

The key findings of the assessment include:

Social Welfare

- Social Cash Transfer was the most accessed programme in all the districts at 95 per cent.
- The other programmes accessed included Education Support, Health Support, Prisons Welfare, Repatriation, and Juvenile justice.
- The majority of the beneficiaries across all social welfare programmes were female at 66 per cent.

Agriculture

- There was an increase in the number of farmers resulting in high farmer-to-extension officer ratios across all districts.
- Chipata District had the highest ratio of 2,965 farmers to 1 extension officer, while Senanga District had the lowest ratio of 555 farmers to 1 extension officer.
- The high farmer-to-extension officer ratios, which fall below the recommended standards of 400 farmers to 1 extension officer, have stretched the capacity of extension officers to deliver effective extension services mainly to small-scale farmers.

Climate Change and Variability

- In the last ten years, 91 per cent of the districts reported prolonged dry spells, 87 per cent reported increased seasonal temperatures, and 87 per cent reported an increased frequency of dry spells.
- The rural poor experienced crop failures and high mortality rates of their livestock, which has caused them to turn to other natural resources like forests for survival.

Health Services

- The doctor capacity indices showed that Ndola District had the lowest doctor capacity index of 0.35, suggesting a surplus of doctors servicing the population in the district.
- Chilanga District had a doctor capacity index of 15.73 and a nurse capacity index of 2.97 suggesting deficits in doctors and nurses servicing the district.
- Rural districts generally showed human resource deficits compared to urban districts indicating an unequal distribution of nurses and doctors in the sampled districts.

Education Services

- At the primary school level, Livingstone District had the highest deficit of teachers with an index of 2.85, while Chilanga District had a surplus with an index of 0.49.
- At the secondary school level, Chingola District had the highest deficit with an index of 2.09 while Livingstone had a surplus with an index of 0.44.
- In terms of classrooms, Lundazi District had the highest deficit of primary school classrooms with an index of 3.52, while Chinsali District had a surplus with an index of 0.53.
- All districts assessed had deficits in classrooms for secondary school with Ndola recording the highest deficit with an index of 14.17.
- Results indicate that on average, the issue of classroom deficits is more pronounced than that of teacher deficits.

Electricity Services

- Livingstone District had the highest electricity connectivity, with 3 in every 4 people having a power connection.
- Zimba District had the lowest connectivity, with 97 in every 100 people having no power connection.

Water Supply

- Kabwe District had the highest water supply accessibility with 9 out of every 10 persons in the district having piped water.
- Mwinilunga District had the lowest water supply accessibility with 99 per cent of the population not connected to piped water.
- Kalumbila District had no piped water for the general population.

The results across all sampled districts showed significant disparities between rural and urban areas in the distribution of and access to services. The low access to basic social and economic facilities and services by the rural population required enhanced investments in the provision of essential services such as health, education, water supply, and electricity. Further, the results also indicated an urgent need to promote the participation of the local communities, the private sector, and civil society organisations in the provision of social and economic services.

I BACKGROUND

One of the key conditions for the country to achieve socio-economic development is that population growth must be commensurate with socio-economic growth. Zambia has one of the fastest-growing populations in the world, with an annual population growth rate estimated at 3.4 per cent per annum. The rapid population growth has posed various physical, environmental, social, and economic challenges. The challenges have been exacerbated by rapid urbanisation. Specifically, rapid population growth has contributed to inadequacies in the provision of essential services such as water supply, electricity, health, and education. In addition, climate change and variability have affected critical sectors of the economy, including the country's water resources, agriculture production, energy production, social services provision, and overall economic productivity.

Based on this background, the Ministry of Finance and National Planning (MoFNP), through the Population and Development Department (PDD), undertook a Sub-National Carrying Capacity Assessment of 23 purposively sampled districts across the ten provinces of the country. The assessment focused on the physical, environmental, social, and economic carrying capacities of the sampled districts.

1.1 Overall Objective

To assess the districts' abilities to provide services to their growing populations at an optimum level.

1.2 Specific Objectives:

- a) to collect and collate primary and secondary data to provide an integrated appraisal of the physical, environmental, social, and economic carrying capacities of selected districts;
- b) to analyse primary and secondary district-level data on the growing population visa-a-vis water supply, electricity, health, agriculture, and education; and
- c) to provide strategic recommendations necessary to meet the developmental needs of the growing population.

2 METHODOLOGY

2.1 introduction

The assessment was based on a multi-sectoral review, collection, collation, and analysis of data relating to population, education, health, community development, social welfare, water supply, electricity, and agriculture. The assessment focused on four (4) thematic areas namely; Physical, Environmental, Social, and Economic. These aided the development of district-level carrying capacity profiles. The key steps undertaken include; data collection and desk reviews, multi-sectoral meetings, model design, and data analysis.

2.2.1 Data Collection and Desk Reviews

Key documents were reviewed, which had indicators based on the four thematic areas and related sectors. The review of reports, policies, and documents informed the development of primary data collection tools used to collect district-level data (interview guides, checklists, and questionnaires). Data was collected on the following:

- Forestry
- Agriculture
- Livestock and Fisheries
- Wildlife
- Social services (health, education, water supply, electricity supply, social welfare)
- Land use, physical infrastructure, and natural resources

2.2.2 District Multi-sectoral Meetings

Multi-sectoral meetings were conducted in each district to solicit contextual data. Key institutions that were part of the meetings are as follows:

- Ministry of Health
- Ministry of Education
- Ministry Community Development and Social Services
- Ministry of Fisheries and Livestock
- Ministry of Agriculture
- Ministry of Lands and Natural Resources - Department of Forestry
- Ministry of Tourism – Department of National Parks
- Power and Water Utility Companies
- The Local Authorities
- Ministry of Water Development and Sanitation – Department of Water Resources Development

2.2.3 Data Analysis

The CCA data was analysed in a phased approach. Firstly, quantitative data was analysed using descriptive methods to produce patterns and prepare the data for model building of district-level carrying capacity profiles. Additionally, qualitative data was analysed using thematic analysis to provide an in-depth context of the districts. Based on these data, a CCA model was set up in R, which is free and open-source software.

2.2.4 Model Design

I. Carrying Capacity Model

The pivot of the CCA model was to evaluate the district's abilities to deliver services to their growing populations at an optimum level. It is against this background that six proxy indices were selected. The indices focused on services that districts deliver to their population namely; electricity, water supply, education, and health. The key assumptions, indices, and service standards are highlighted below:

a) Key Assumptions

The assumptions for the CCA model are:

- i. The projected district populations were the main drivers of the model.
- ii. Per capita use intensities of water and electricity were static over the time horizon of the analysis.
- iii. The Rural Electrification Master Plan (REMP) aggregated targets for rural and urban areas were used to measure the rate of access to electricity over the time horizon.
- iv. The Eighth National Development Plan (8NDP) and Vision 2030 provided targets for assessing water supply services over the time horizon.

b) Key Indices

The key indices for the CCA model are:

- i. School Capacity Index: The number of classroom spaces required to support primary/secondary education for all children of school-going age as guided by the GRZ pupil classroom ratios.
- ii. Teachers Capacity Index: The number of school teachers required to support primary and secondary education as guided by the GRZ pupil-teacher ratios.
- iii. Doctor Capacity Index: The number of doctors required as guided by the WHO doctor-to-population ratio.
- iv. Nurse Capacity Index: The number of nurses required as guided by the WHO nurse-to-population ratio.
- v. Electricity capacity index: The electricity distribution capacity required to support the residential and social categories based on the electrification targets (rural/urban).
- vi. Water Capacity Index: Water utilisation for different purposes based on the available water and access to water supply targets (rural/urban).

c) Interpretation of Key Indices

The key indices for the CCA are interpreted:

- i. Number, $x > 1$ = deficit
- ii. Number, $0.8 < x \leq 1$ = Stress Scenario
- iii. Number, $0.6 < x \leq 0.8$ = Comfortable Scenario
- iv. Number, $0 < x \leq 0.6$ = Surplus Scenario
- v. Negative value under gap - surplus (excessive capacity).

2. Service Standards and targets

The model utilised the service standards in table I in analysing the Indices for education and health. In addition, the model used the REMF targets for electrification targets, while the water supply targets were drawn from Vision 2030 and the 8NDP.

Table 1: Education and Health Service Standards

Indicators	Standards	Source/Authority
Doctor-Population ratio	1:5000	World Health Organisation
Nurse-Population ratio	1:500	World Health Organisation
Pupil-Teacher ratio		
Pupil-Teacher ratio (Primary)	1:40	Standard Evaluation Guidelines
Pupil-Teacher ratio (Secondary)	1:35	Standard Evaluation Guidelines
Pupil-Classroom ratio		
Pupil-Classroom ratio (Primary)	1:40	Standard Evaluation Guidelines
Pupil-Classroom ratio (Secondary)	1:35	Standard Evaluation Guidelines

2.2.5 District Classification

To the extent possible, the districts were classified as rural or urban to facilitate the analysis of electricity and water variables. Specifically, out of all the 23 districts assessed, all Provincial Capitals were classified as urban, while the other districts were classified as urban or rural based on where the majority of the population resides and the level of economic activities.

2.2.6 Limitations

The major challenge experienced in the assessment was poor documentation of district-level data in some key sectors and a lack of specific data for certain key indicators. Further, the challenge of data paucity and lack of desegregation for some indicators also limited the analysis. The specific challenges encountered during the data collection process included:

- Information gaps in some sectors due to poor data documentation;
- Some key data elements were outdated; and
- Late submission of data and reports from some key institutions delayed the process of completing the analysis and the report.

3 DISTRICT CARRYING CAPACITY ASSESSMENTS

3.1 Overview of Districts

Table 2 gives an overview of the 23 districts assessed as part of the Sub-National Carrying Capacity..

Table 2: Summary of Districts					
SN	Province	District	Land Area (km ²)	2022 Population	Population Density
1.	Central	Kabwe	1,569.6	299,206	190.6
2.	Central	Kapiri Mposhi	9,688.2	371,068	38.3
3.	Copperbelt	Chingola	1,743.9	299,936	172.0
4.	Copperbelt	Ndola	958.6	624,579	651.5
5.	Eastern	Chipata	1,691.1	327,059	193.4
6.	Eastern	Lundazi	1,375.6	154,908	112.6
7.	Luapula	Mansa	7,775.7	327,063	42.1
8.	Luapula	Samfya	3,323.7	147,189	44.3
9.	Lusaka	Chilanga	1,354.0	225,276	166.4
10.	Lusaka	Chongwe	2,431.0	313,389	128.9
11.	Lusaka	Kafue	4,471.0	219,574	49.1
12.	Muchinga	Chinsali	6,341.7	148,997	23.5
13.	Muchinga	Mpika	17,409.1	149,063	8.6
14.	Northern	Kasama	10,584.1	348,552	32.9
15.	Northern	Mbala	3,346.3	161,595	48.3
16.	Northwestern	Solwezi	3,335.8	332,623	99.7
17.	Northwestern	Mwinilunga	18,830.2	136,770	7.3
18.	Northwestern	Kalumbila	16,456.2	177,067	10.8
19.	Southern	Choma	5,146.4	266,916	51.9
20.	Southern	Livingstone	689.5	177,393	257.3
21.	Southern	Zimba	5,480.1	108,316	19.8
22.	Western	Mongu	5,959.8	197,816	33.2
23.	Western	Senanga	10,565.8	112,040	10.6

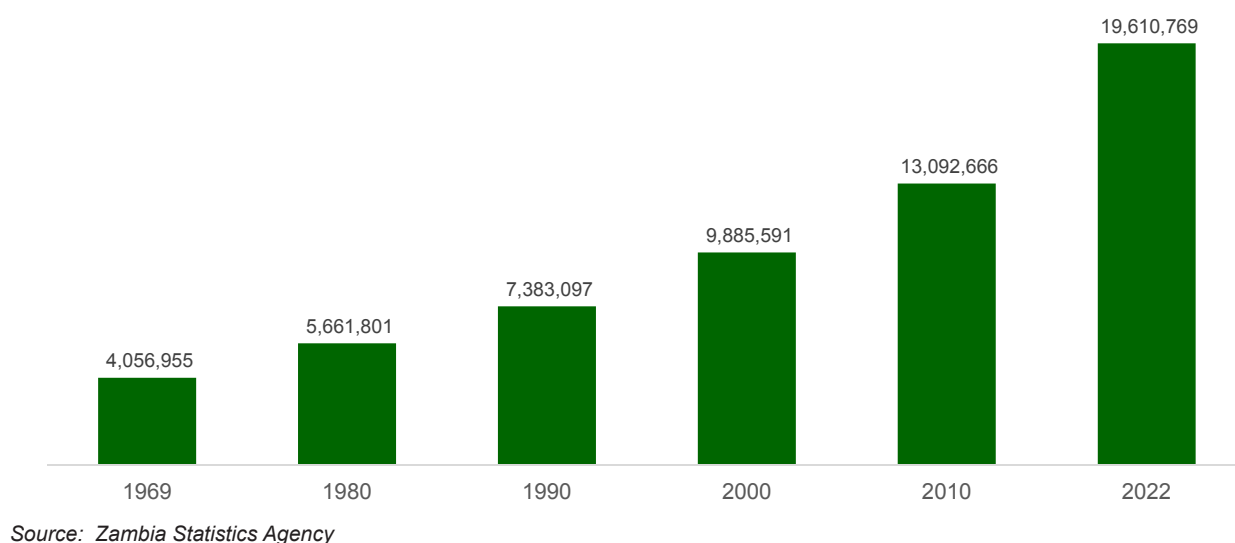
Source: 2022 Census of Population and Housing, Preliminary Report

3.2 Population Overview

Zambia has one of the fastest-growing populations in the world. The country's population grew by 3.4 percent annually, between 2010 and 2022 as shown in Figure 1. According to the preliminary 2022 Census of Population and Housing report, Zambia's population stood at 19.6 million from 13.1 million in 2010. With a 3.4 annual growth rate, Zambia's population is estimated to double in twenty years' time. The high population growth rate is due to the persistent high fertility and declining mortality which has resulted in a very youthful population (about 79% under 35 years), coupled with high youth unemployment (19%) and poverty levels (54%).

Zambia's youthful population is expected to drive population growth and threaten the provision of essential services. Evidence has shown that there is an intrinsic relationship between population growth and the demand for housing, health, education, water and sanitation, food, energy, and employment.

Figure 1: Trends in Population Size, Zambia 1969-2022



Rapid population growth impacts the physical environment in several ways, including the extraction of resources to meet human demand for food, energy, and housing and also to meet the increased consumption needs. Rapid population growth has also been associated with various aspects of natural resource degradation, including deforestation, soil erosion, and soil nutrient depletion (Ray & Ray, 2011). As population size increases rapidly, the demand for land continues to rise. The immediate threat has been seen in the encroachment of protected forestry due to increased demand for agricultural land, residential land, and woodfuel. For example, woodfuel (firewood and charcoal) accounts for an estimated 70 per cent of Zambia's total national energy demand (NEP, 2019). This predisposes protected forestry reserves to the risk of deforestation, which is exacerbated by increasing demand for residential and arable land.

a) Urbanisation and Spatial Dynamics

Zambia is one of the most rapidly urbanising sub-Saharan African countries with an urban population annual growth rate estimated at 3.6 per cent. In 2022, the proportion of the population in urban areas was estimated at 40.0 percent while the population in rural was estimated at 60.0 percent. Further, most of Zambia's urban centres continue to be along the rail line, spanning the north-to-south development axis. Furthermore, spatial dynamics show two main urban poles, Lusaka and Copperbelt Provinces, which are steadily establishing metropolitan regions.

Rapid urbanisation has been accompanied by complex urban development challenges. This has hampered the socio-economic development of Zambian districts and their efficient and effective functioning as engines of national and regional development and as centres of social development. This situation has posed various physical, environmental, social, and economic challenges, such as inadequate access to basic infrastructure, social services, and decent housing, increased informal and illicit activities, urban sprawl, and habitat loss.

b) Demand for Social Services

Access to clean and safe water, adequate sanitation, and hygiene facilities is unequal in Zambia. Ninety per cent of households in urban areas and 53 per cent in rural areas have access to clean water. Limited access to water, sanitation, and hygiene (WASH) services and facilities is the leading cause of diarrheal diseases in Zambia and continues to be the leading cause of morbidity and death in children under five (ZDHS, 2018). The increase in population will continue to exert pressure on the provision of water, sanitation, and hygiene services. Further, the healthcare systems supporting the growing population will also be strained as more health issues arise.

Similarly, as the population of Zambia is predominantly youthful, the demand for school places has also increased with the increasing population of the schooling age. Despite Zambia attaining universal primary schooling, statistics indicate completion rates are still very low, especially at the secondary school level. Therefore, education services will need to expand to cater to the growing population.

c) Social welfare services

Zambia ranks among the countries with high incidences of poverty and inequality in Africa, as well as globally. Poverty levels were estimated at 54.4 per cent in 2015 (LCMS, 2015). To reduce poverty and vulnerability, and improve the quality of life, the Government of Zambia has continued providing and facilitating the provision of equitable social welfare programmes to communities. For example, in 2020, various social welfare programmes were implemented across the 23 sampled districts, as highlighted in table 3. Social cash transfer was the most accessed programme at 95 percent. Further, the majority of the beneficiaries were female at 66 per cent.

Table 3: Summary of social welfare programmes in 2020

Programmes	Male	Female	Total
Social Cash Transfer	63,089	125,367	188,456
Education Support	1,972	1,827	3,799
Health Support	110	112	222
Prisons Welfare	258	20	278
Repatriation	194	236	430
Juvenile justice	858	43	901
Other programs	452	4650	5102
Total Number of Beneficiaries	66,933	132,255	199,188
Percentage of services provided	33.6%	66.39%	100%

Source: Departments of Social Welfare

3.3 Main Economic Activities

Crop, livestock, and fish farming was the major economic activity in most of the districts assessed. Other prominent economic activities included tourism, mining and quarrying, manufacturing, and trading of consumer goods. Because smallholder agriculture is labour-intensive, it is the major employer in most of the districts. However, some population and development challenges were identified in the agriculture sector, as highlighted below:

a) Inadequate Agriculture Extension Services

The country has seen an increase in the farmer population and demand for agricultural extension services in all districts. This has not been matched by an increase in the number of extension workers at the field level. Table 4 shows that the increase in the number of farmers has resulted in a higher farmer-extension officer ratio across the sampled districts.

Of the 23 districts assessed, Chipata District had the highest ratio of 2,965 farmers to one extension officer, while Senanga District had the lowest ratio of 555 farmers to one extension officer. These ratios, which fall below the international recommended standards of 400:1, have stretched the capacity of extension officers to deliver effective extension services mainly to small-scale farmers. This has negatively affected the Government's efforts to enhance agricultural production and productivity and improve the livelihoods of the population, especially in rural areas.

Table 4: Farmer-to-Extension Officer Ratio

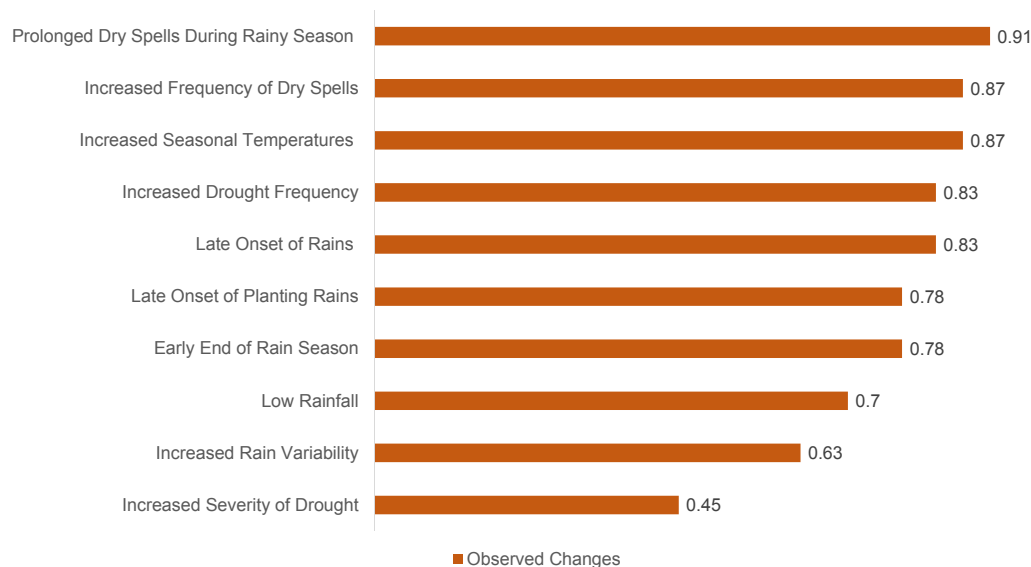
SN.	District	Agriculture Camps		No. of Camp/ Extension Officers	No. of farmers	Farmer-to-extension officer ratio	Standard	CCA Assessment
		No. of Camps	Camps Filled					
1	Chongwe	20	20	24	30,100	1,254:1	400:1	Deficit
2	Kafue	15	15	14	26,652	1,777:1	400:1	Deficit
3	Chilanga	15	15	15	17,473	1,165:1	400:1	Deficit
4	Kapiri Mposhi	54	46	53	63,956	1,207:1	400:1	Deficit
5	Kabwe	19	19	22	30,000	1,364:1	400:1	Deficit
6	Mpika	16	16	23	36,207	1,574:1	400:1	Deficit
7	Chinsali	28	23	25	38,128	1,525:1	400:1	Deficit
8	Choma	37	37	37	56,814	1,536:1	400:1	Deficit
9	Livingstone	4	4	4	2,527	632:1	400:1	Stress
10	Zimba	19	19	19	23,826	1,402:1	400:1	Deficit
11	Senanga	19	13	13	7,216	555:1	400:1	Stress
12	Mongu	33	17	17	28,720	1,689:1	400:1	Deficit
13	Kasama	47	36	36	64,250	1,785:1	400:1	Deficit
14	Mbala	18	16	15	12,140	759:1	400:1	Stress
15	Mansa	39	38	42	55,466	1,321:1	400:1	Deficit
16	Samfya	18	16	16	20,000	1,250:1	400:1	Deficit
17	Ndola	17	17	17	10,621	625:1	400:1	Stress
18	Chingola	15	12	16	23,904	1,494:1	400:1	Deficit
19	Chipata	29	27	27	80,066	2,965:1	400:1	Deficit
20	Lundazi	20	20	20	37,775	1,889:1	400:1	Deficit
21	Solwezi	26	26	26	23,144	890:1	400:1	Stress
22	Mwinilunga	39	21	21	33,693	1,604:1	400:1	Deficit
23	Kalumbila	32	32	32	24,635	770:1	400:1	Stress

b) Climate Change and Variability

Zambia continues to be adversely impacted by climate events such as droughts, flash and seasonal floods, and extreme temperatures, which threaten the socio-economic development agenda of the country. The extreme weather events have exacerbated poverty, particularly for the rural population who depend on rain-fed agriculture for their livelihoods. The rural poor have continued to experience crop failures and high mortality rates of their livestock, which has caused them to turn to other natural resources like

forests for survival. For example, figure 2 shows that in the last 10 years, 91 per cent of the districts reported prolonged dry spells, 87 per cent reported increased seasonal temperatures, and 87 per cent reported an increased frequency of dry spells. Other significant changes observed are also highlighted.

Figure 2: Observed significant changes over the last 10 years



Climate change has continued to pose different social, economic, physical, and environmental challenges for Zambian districts. Table 5 highlights the policy issues, implications, and possible strategic interventions related to climate change and agriculture.

Table 5: Key Policy Issues in Climate Change and Agriculture

Policy Issue	Implications	Strategic Interventions
Climate Change and Variability	i. Household and national food insecurity.	i. Increased utilisation of climate-smart agriculture technologies and practices, including;
	ii. Low crop yields.	• Conservation agriculture
	iii. An increased outbreak of crop and livestock, pests, and diseases due to extreme temperatures	• Rainwater harvesting
Climate Change and Variability	iv. Increase in unsustainable non-agriculture-based activities such as poaching and charcoal production.	• Crop rotation
	v. Crop loss due to heavy rainfall and flooding.	• Planting of early maturing crop varieties
	vi. Loss of animal habitat and species.	• Planting drought-tolerant crops
Climate Change and Variability	vii. Reduced water availability during the dry season for livestock and people living in rural areas.	• Enhanced research and development
	.	ii. Promotion of sustainable and environmentally friendly livelihood activities
	.	iii. Promotion of Agroforestry
High Farmer-Extension Service Ratios	i. Poor Service delivery to farmers	i. Recruitment of extension staff
	ii. Low adoption of climate smart agriculture practices	ii. Promotion of electronic extension services by leveraging on technology, such as mobile phone and internet-based services
	iii. Low production and productivity by farmers	iii. Strengthening of partnerships with non-government organizations (NGOs), private companies, and research institutions in the provision of extension services

4. SUB-NATIONAL CARRYING CAPACITY ASSESSMENT CASE STUDIES

This section presents carrying capacity assessment results from selected districts based on the performance in the four thematic areas.

4.1 Health Services

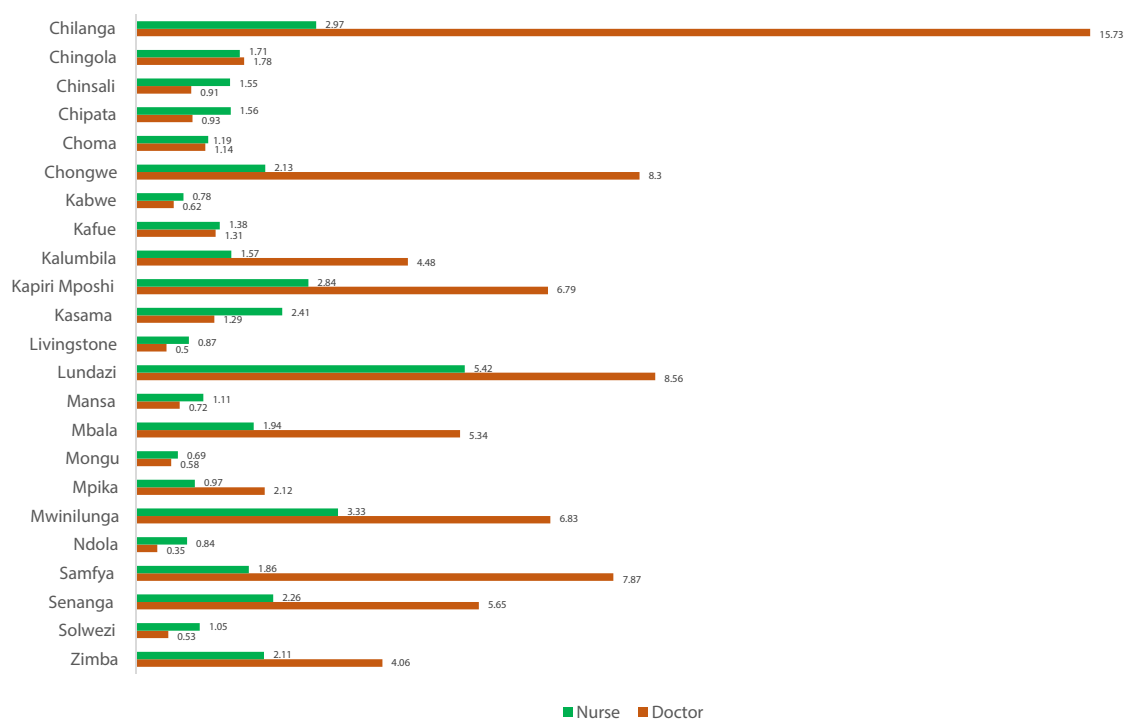
Health is an essential part of the social and human development process. Hence for its continuum of care, the size and other characteristics of the population have to be the basis for planning, budgeting, and delivery of service. Population consideration gives vital information on the type of service to be provided at any particular level. Rapid population growth is likely to stress the health system in any location. Zambia's health sector has been experiencing an uneven distribution and inadequacies in human resources as reflected in the high doctor-to-population and nurse-to-population ratios. As a result, most of the districts' health facilities do not operate optimally.

Doctor and Nurse Capacity Indices

Figure 3 shows the doctor and nurse capacity indices observed in the 23 districts. Ndola had the lowest doctor capacity index of 0.35, suggesting a surplus of doctors servicing the population in the district. Chilanga, on the other hand, had the highest doctor capacity index at 15.73 and a nurse capacity index of 2.97. Chilanga District's indices show a huge gap between the number of doctors and nurses as compared to WHO's recommended standards.

Further, it can also be observed from Figure 3 that rural districts have a higher human resource deficit as compared to urban districts. This implies that the recruitment of additional health workers must focus largely on the country's rural districts.

Figure 3: Nurse and Doctor Capacity Indices



a) Chilanga District

Chilanga District recorded a doctor capacity index of 15.73 and a nurse capacity index of 2.97 which were above 1 as reflected in table 6. This implies a deficit of doctors and nurses required to cater to the district's population.

Table 6: Doctor and Nurse Capacity Indices for Chilanga District

District	Variable	Year		
		2020	2026	2030
Chilanga	Baseline Capacity Index			
	Doctor	15.73		
	Nurse	2.97		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	525	675	767
	Gap of Nurses	419	569	661
	Required Doctors	53	68	77
	Gap of Doctors	51	66	75
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	394	506	575
	Gap of Nurses	288	400	469
	Required Doctors	40	51	58
	Gap of Doctors	38	49	56
	Stress Scenario	1	1	1
	Required Nurses	315	405	460
	Gap of Nurses	209	299	354
	Required Doctors	32	41	46
	Gap of Doctors	30	39	44
Source: Ministry of Health				

During the period under review, Chilanga District had two doctors. Under the Comfortable Scenario of achieving an index of 0.8, Chilanga would require a total of 51 and 58 doctors by 2026 and 2030 respectively. Further, under the Stress Scenario of achieving an index of 1, the district would require a total of 41 and 46 doctors by 2026 and 2030.

The District had 106 nurses, and this means that a total of 506 and 575 nurses would be required under the Comfortable Scenario in 2026 and 2030 respectively. Under the Stress Scenario, a total of 405 and 460 nurses, would be required in the district in 2026 and 2030 respectively.

b) Lundazi District

Lundazi District recorded a doctor capacity index of 8.56 and a nurse capacity index of 5.42 which were above 1 as reflected in table 7. This implies that there was a deficit of doctors and nurses to cater to the district's population.

Table 7: Doctor and Nurse Capacity Indices for Lundazi District

District	Variable	Year		
		2020	2026	2030
Lundazi	Baseline Capacity Index			
	Doctor	8.56		
	Nurse	5.42		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	714	616	680
	Gap of Nurses	635	616	680
	Required Doctors	72	62	68
	Gap of Doctors	67	62	68
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	535	462	510
	Gap of Nurses	456	462	510
	Required Doctors	54	47	51
	Gap of Doctors	49	47	51
	Stress Scenario	1	1	1
	Required Nurses	428	370	408
	Gap of Nurses	349	370	408
	Required Doctors	43	37	41
	Gap of Doctors	38	37	41

Source: Ministry of Health

During the period under review, Lundazi District had five doctors. Under the Comfortable Scenario of achieving an index of 0.8, Lundazi would require a total of 47 and 51 doctors by 2026 and 2030 respectively. Further, under the Stress Scenario of achieving an index of 1, the district would require a total of 37 and 41 doctors by 2026 and 2030, respectively.

The District had 79 nurses, and this means that a total of 462 and 510 nurses would be required under the Comfortable Scenario in 2026 and 2030 respectively. Under the Stress Scenario, a total of 370 and 408 nurses, would be required in the district in 2026 and 2030, respectively.

c) Mongu District

Mongu District recorded a doctor capacity index of 0.58 and a nurse capacity index of 0.69 which were below 1 as reflected in table 8. This implies that there were enough doctors and nurses to cater to the district's population health needs. This is the ideal CCA situation that all districts must attain.

Table 8: Doctor and Nurse Capacity Indices for Mongu District

District	Variable	Year		
		2020	2026	2030
Mongu	Baseline Capacity Index			
	Doctor	0.58		
	Nurse	0.69		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	514	569	613
	Gap of Nurses	67	282	316
	Required Doctors	52	57	62
	Gap of Doctors	-1	4	6
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	385	427	460
	Gap of Nurses	-62	140	163
	Required Doctors	39	43	46
	Gap of Doctors	-14	-10	-10
	Stress Scenario	1	1	1
	Required Nurses	308	341	368
	Gap of Nurses	-139	54	71
	Required Doctors	31	35	37
	Gap of Doctors	-22	-18	-19
Source: Ministry of Health				

During the period under review, Mongu District had a total of 53 doctors and 447 nurses. To ensure the district maintains its status under the Surplus Scenario, a total of 57 and 62 doctors would be required in 2026 and 2030, respectively. Further, a total of 569 and 613 nurses would be required by 2026 and 2030, respectively.

Whereas the results from the sampled districts reflect surpluses or deficits in doctors and nurses, it may be important to note that the results may be a reflection of the uneven distribution and inadequate numbers of the health personnel under discussion. Further, it must also be noted that the results also indicate that districts with second and third-level hospitals are more likely to be within comfortable range or have surpluses as compared to those which do not have higher-level health facilities.

Based on the assessment results highlighted above, table 9 shows the policy issues, implications, and possible interventions required to improve the population clinician ratios in the country.

Table 9: Key Policy Issues in Health

Policy Issues	Implications	Strategic Interventions
Low Clinician-Population Ratios	i. Poor service delivery due to inadequate human resources ii. Unequal access to quality health care.	i. Continuous recruitment of essential health workers. ii. Equitable distribution of the existing health workforce. iii. Enhanced training and deployment of clinical officers, medical doctors and medical licentiates.
		iv. Scaling up prevention and health promotion programmes to mitigate the disease burden
		v. Investments in other sectors that contribute to promotion of health such as safe water and clean air, healthy workplaces, safe houses, communities, roads, education etc.

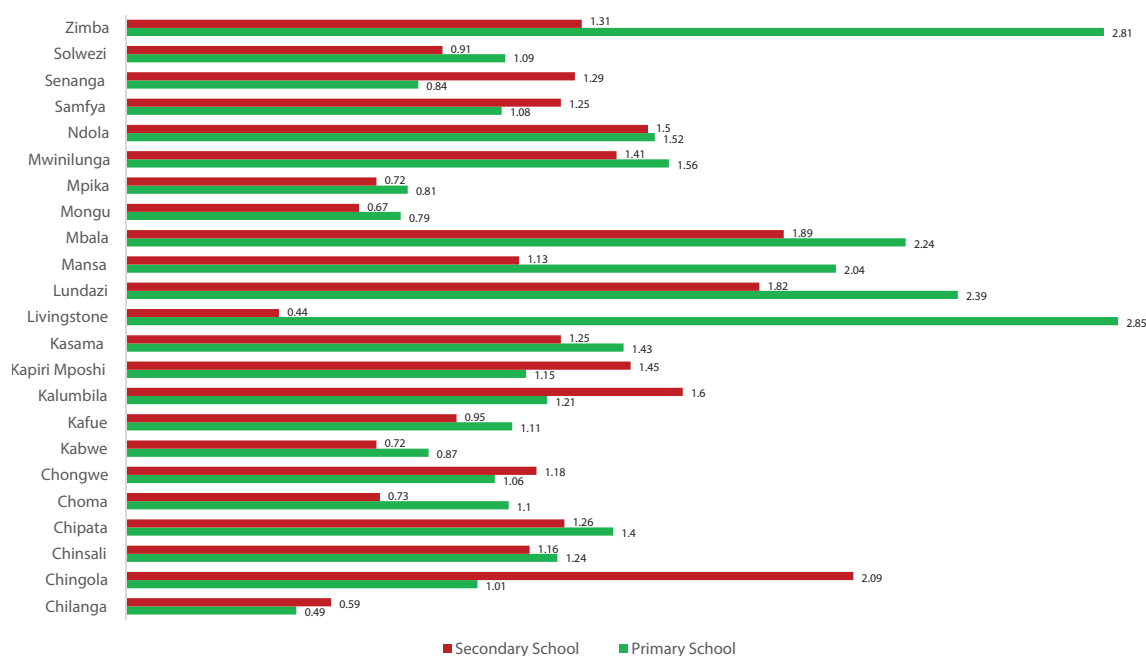
4.2 Education Services

Education is a fundamental human right and an essential prerequisite to all forms of human development. The quality and effectiveness of education depend on various indicators, including the characteristics of schools, teachers, and classrooms. The projections indicate that the population of primary and secondary school-going age will increase over the next ten (10) years (ZamStats, 2020). This increase will present challenges as it is not commensurate with the current number of classrooms and teachers, resulting in high teacher-pupil and high classroom-pupil ratios.

Teacher Capacity Index

Figure 4 shows the primary and secondary school teacher capacity indices in the 23 districts. Further, it highlights the deficits and surpluses recorded in the districts at both primary and secondary levels. Chilanga District had the lowest primary school teacher capacity index of 0.49 while Livingstone had the highest index of 2.85. Further, at the secondary level, Livingstone had the lowest secondary school teacher capacity index of 0.44 while Chingola had the highest index of 2.09. The results indicate that despite Livingstone District having had the highest deficit of primary school teachers, it also had a surplus of secondary school teachers. Chilanga had a surplus at both primary and secondary levels. Mongu and Mpika were within their comfortable range with indices below 1 at both primary and secondary levels.

Figure 4: Teacher Capacity Index



a) Chingola District

Chingola District recorded a primary school teacher capacity index of 1.01 and a secondary school teacher capacity index of 2.09 which were above 1 as reflected in table 10. This implies a deficit of teachers in both primary and secondary schools required to cater to the district's school-going population.

Table 10: Teacher Capacity Index for Chilanga District

District	Variable	Year		
		2020	2026	2030
Chingola	Baseline Capacity Index			
	Primary school teacher	1.01		
	Secondary school teacher	2.09		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	2206	2548	2805
	Gap of primary school teachers	889	869	647
	Required secondary school teachers	1837	2122	2336
	Gap of secondary school teachers	1309	1444	1464
	Comfortable Scenario			
	0.8	0.8	0.8	0.8
	Required primary school teachers	1655	1911	2104
	Gap of primary school teachers	348	232	-54
	Required secondary school teachers	1378	1592	1752
	Gap of secondary school teachers	850	913	880
	Stress Scenario			
	1	1	1	1
	Required primary school teachers	1324	1529	1683
	Gap of primary school teachers	17	-150	-475
	Required secondary school teachers	1103	1273	1402
	Gap of secondary school teachers	575	595	530
Source: Ministry of Education				

During the period under review, Chingola District had 1,317 primary school teachers. Under the Comfortable Scenario, Chingola would require a total of 1,911 and 2,104 primary school teachers by 2026 and 2030 respectively. Further, under the Stress Scenario, the district would require a total of 1,529 and 1,683 primary school teachers by 2026 and 2030.

The district had 528 secondary school teachers, and this means that a total of 1,592 and 1,752 secondary school teachers would be required under Comfortable Scenario in 2026 and 2030 respectively. Under the Stress Scenario, a total of 1,273 and 1,402 secondary school teachers, would be required in the district in 2026 and 2030 respectively.

b) Livingstone District Assessment

Livingstone District recorded a primary school teacher index of 2.85 which was above 1, whereas the secondary teacher index was below 1 at 0.44 as reflected in table 11. This implies a deficit of primary school teachers and a surplus of secondary school teachers.

Table 11: Teacher Capacity Index for Livingstone District

District	Variable	Year		
		2020	2026	2030
Livingstone	Baseline Capacity Index			
	Primary school teacher	2.85		
	Secondary school teacher	0.44		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1355	1475	1640
	Gap of primary school teachers	1070	1108	1169
	Required secondary school teachers	1201	1307	1454
	Gap of secondary school teachers	-438	-799	-557
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1016	1106	1230
	Gap of primary school teachers	731	740	759
	Required secondary school teachers	901	981	1091
	Gap of secondary school teachers	-738	-1125	-920
	Stress Scenario	1	1	1
	Required primary school teachers	813	885	984
	Gap of primary school teachers	528	519	513
	Required secondary school teachers	721	785	873
	Gap of secondary school teachers	-918	-1321	-1138
Source: Ministry of Education				

During the period under review, Livingstone District had 285 primary school teachers. Under the Comfortable Scenario, Livingstone would require a total of 1,106 and 1,230 primary school teachers by 2026 and 2030, respectively. Further, under the Stress Scenario, the district would require a total of 885 and 984 primary school teachers by 2026 and 2030, respectively.

The district had 1,639 secondary school teachers, and this means that to maintain the status quo under the Surplus Scenario, no additional secondary school teachers would need to be employed or transferred from or into Livingstone up to the year 2030.

c) Mongu District

Mongu District recorded a primary school teacher capacity index of 0.79 and a secondary school teacher capacity index of 0.67 which were below 1 as reflected in table 12. This implies that the district was within the Ministry of Education's recommended standards for both primary and secondary school teachers.

Table 12: Teacher Capacity Index for Mongu District

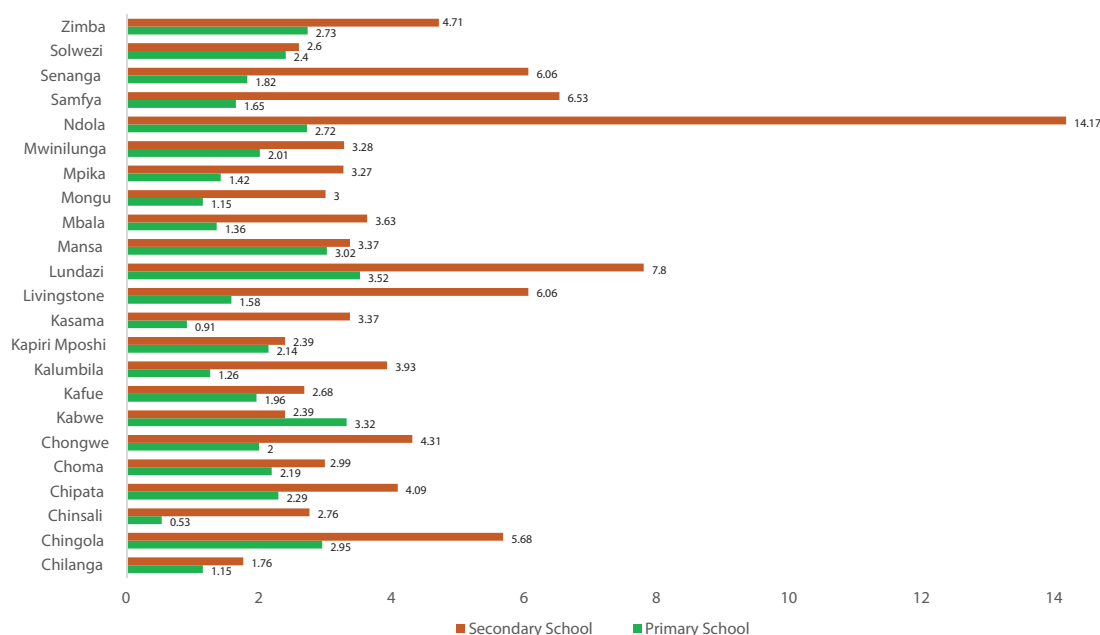
District	Variable	Year		
		2020	2026	2030
Mongu	Baseline Capacity Index			
	Primary school teacher	0.79		
	Secondary school teacher	0.67		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1184	1311	1412
	Gap of primary school teachers	283	311	12
	Required secondary school teachers	885	980	1055
	Gap of secondary school teachers	91	-170	-445
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	888	984	1059
	Gap of primary school teachers	-13	-16	-341
	Required secondary school teachers	664	735	791
	Gap of secondary school teachers	-130	-415	-709
	Stress Scenario	1	1	1
	Required primary school teachers	711	787	848
	Gap of primary school teachers	-190	-213	-552
	Required secondary school teachers	531	588	633
	Gap of secondary school teachers	-263	-562	-867
Source: Ministry of Education				

During the period under review, Mongu District had a total of 794 primary school teachers and 901 secondary school teachers. To ensure the district maintains its status under the Comfortable Scenario, a total of 984 and 1,059 primary school teachers would be required in 2026 and 2030, respectively. Further, a total of 735 and 791 secondary school teachers would be required by 2026 and 2030, respectively.

Classroom Capacity Index

Figure 5 shows the primary and secondary school classroom capacity indices in the 23 districts. Further, it highlights the deficits and surpluses recorded in the districts at both primary and secondary levels. Lundazi District had the highest primary school classroom capacity index of 3.52, while Chinsali District had the lowest index of 0.53. Further, at the secondary school level, all districts assessed had deficits in classrooms with Ndola recording the highest deficit with an index of 14.17.

Figure 5: Classroom Capacity Index



a) Chinsali District

Chinsali District recorded a primary school classroom capacity index of 0.53 and a secondary school classroom capacity index of 2.76 as reflected in table 13. This implies a surplus of primary school classrooms and a deficit of secondary school classrooms.

Table 13: Classroom Capacity index for Chinsali District

District	Variable	Year		
		2020	2026	2030
Chinsali	Baseline Capacity Index			
	Primary school classroom	0.53		
	Secondary school classroom	2.76		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1138	1698	1959
	Gap of primary school classrooms	-150	43	-168
	Required secondary school classrooms	719	1073	1238
	Gap of secondary school classrooms	563	873	980
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	853	1273	1469
	Gap of primary school classrooms	-435	-382	-658
	Required secondary school classrooms	539	805	928
	Gap of secondary school classrooms	383	604	671
	Stress Scenario	1	1	1
	Required primary school classrooms	683	1019	1175
	Gap of primary school classrooms	-605	-636	-951
	Required secondary school classrooms	432	644	743
	Gap of secondary school classrooms	276	444	485

During the period under review, Chinsali District had 1,288 primary school classrooms. This means that to maintain the status quo under the Surplus Scenario, the district would require a total of 1,698 and 1,959 classrooms by 2026 and 2030, respectively.

The district had 156 secondary school classrooms, and this means a total of 805 and 928 secondary school classrooms would be required under the Comfortable Scenario in 2026 and 2030, respectively. Under the Stress Scenario, a total of 644 and 743 secondary school classrooms would be required by 2026 and 2030, respectively.

b) Kasama District

Kasama District recorded a primary school classroom capacity index of 0.91 and a secondary school classroom capacity index of 3.73 as reflected in table 14. This implies the district was in the comfortable range for primary school classrooms and in deficit for secondary school classrooms.

Table 14: Classroom Capacity index for Kasama District

District	Variable	Year		
		2020	2026	2030
Kasama	Baseline Capacity Index			
	Primary school classroom	0.91		
	Secondary school classroom	3.37		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	2668	3224	3622
	Gap of primary school classrooms	917	1266	-336
	Required secondary school classrooms	1843	2227	2503
	Gap of secondary school classrooms	1515	1177	1053
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	2001	2418	2717
	Gap of primary school classrooms	250	460	-1241
	Required secondary school classrooms	1383	1671	1877
	Gap of secondary school classrooms	1055	621	427
	Stress Scenario	1	1	1
	Required primary school classrooms	1601	1934	2174
	Gap of primary school classrooms	-150	-24	-1784
	Required secondary school classrooms	1106	1337	1502
	Gap of secondary school classrooms	778	287	52
Source: Ministry of Education				

During the period under review, Kasama District had 1,751 primary school classrooms. Under the Comfortable Scenario of achieving an index of 0.8, Kasama would require a total of 2,418 and 2,717 primary school classrooms by 2026 and 2030 respectively.

The district had 328 secondary school classrooms, which means a total of 1,671 and 1,877 secondary school classrooms would be required under the Comfortable Scenario in 2026 and 2030, respectively. Under the Stress Scenario, a total of 1,337 and 1,502 secondary school classrooms would be required by 2026 and 2030, respectively.

Based on the assessment results highlighted above, table 15 shows the policy issues, implications, and possible interventions required to improve the country's education sector.

Table 15: Key Policy Issues in Education

Policy Issues	Implications	Strategic Interventions
High pupil-teacher ratio and high pupil-classroom ratio	i. Reduced teacher effectiveness and decreased pupil engagement ii. Overcrowding of classrooms iii. Poor learning outcomes for learners	i. Continuous recruitment of teachers and equitable distribution of the existing teaching workforce ii. Increased investment in education infrastructure with matching inputs to the new infrastructure to support effective and efficient service. iii. Promotion of Technology and Alternative Modes of Education Provision iv. Increased investments in locally produced teaching and learning materials and equipment.

4.3 Electricity Services

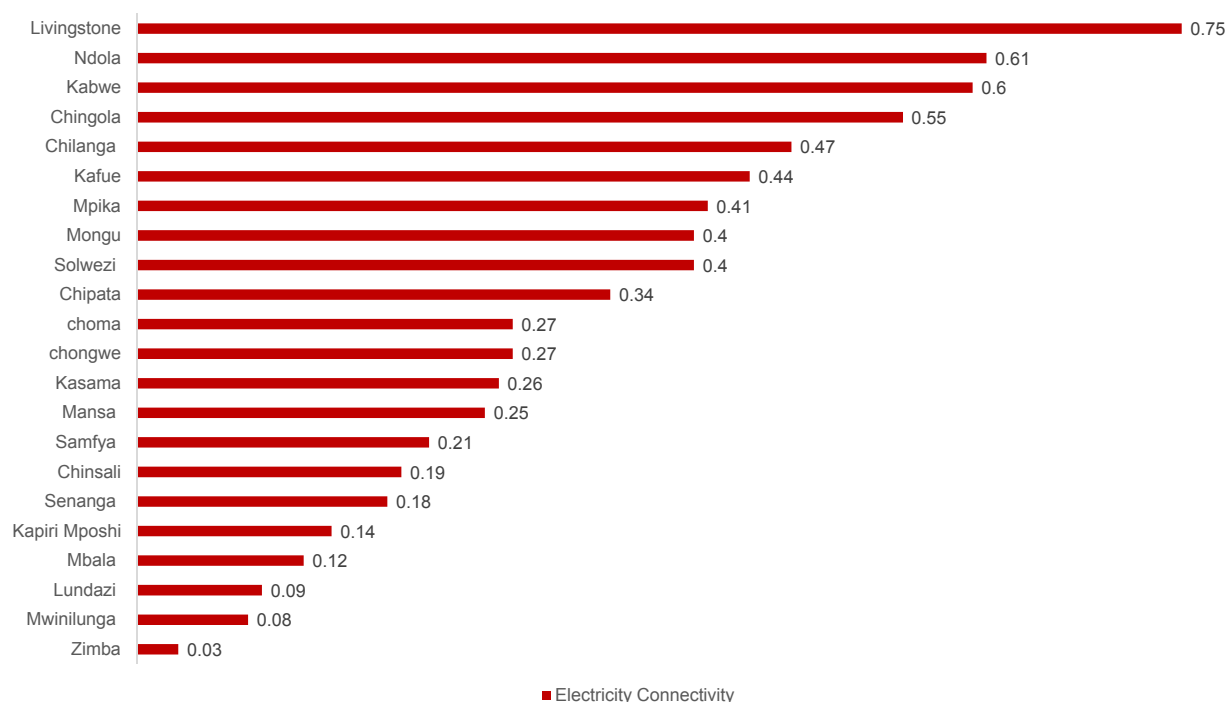
Electricity is a critical input in the socio-economic development of the country. Every productive sector in the economy relies on an adequate electricity supply. Zambia aspires to achieve the Vision of ensuring universal access to clean, reliable, and affordable energy at the lowest total economic, financial, social, and environmental cost consistent with national development goals by 2030.

The Cost of Service Study (COSS) projected that peak electricity demand will increase from 2,143 MW in 2020 to 10,000 MW in 2040. This demand would be largely driven by Government's desire to attain universal access to electricity, increased agricultural production, industrial development and the desire achieve copper production of 3 million tonnes by 2030. The Current generation is not sufficient and would require additional investment in generation and transmission to meet the projected demand over this period (EMRC, 2021).

Electricity Capacity Index

Figure 6 shows the level of electricity connectivity coverage in 22 districts. It highlights the districts from the highest connectivity coverage to the lowest. Livingstone District recorded the highest connectivity coverage of 75 percent while the lowest was in Zimba at 3 per cent.

Figure 6: Electricity Connectivity Coverage



a) Livingstone District

During the period under review, Livingstone District had an electricity connectivity coverage of 75 percent as reflected in table 16. This implies that 3 in every 4 people in Livingstone had a power connection.

An increase in connectivity coverage from 75 per cent to 90 per cent by 2030 in line with the REMP targets, would result in an increase of 45 per cent in household electricity consumption from 19,099,664 kWh to 27,836,341 kWh. While this does not immediately mean that demand would exceed distribution infrastructure capacity, it would be an important consideration of how total electricity demand (residential and other sectors) grows over time.

Table 16: Electricity Connectivity for Livingstone District

District	Variable	Year		
		2020	2026	2030
Livingstone	Electricity intensity per household	630.85		
	Electricity connectivity	0.75	0.83	0.9
	Household electricity consumption	19099664	23056756.81	27836340.86

Source: Zesco Limited

b) Zimba District

During the period under review, Zimba District had an electricity connectivity coverage of 3 percent as reflected in table 17. This implies that out of every 100 people in Zimba, 97 had no power connection.

An increase in connectivity coverage from 3 per cent to 51 per cent by 2030 in line with the REMP targets, would increase household electricity consumption from 173,779 kWh to 3,169,974 kWh. This scenario requires an acceleration of electricity infrastructure development to match the district's growing population.

Table 17: Electricity Connectivity for Zimba District				
District	Variable	Year		
		2020	2026	2030
Zimba	Electricity intensity per household	255.18		
	Electricity connectivity	0.03	0.47	0.51
	Household electricity consumption	173779	2630893	3169974.24
Source: Zesco Limited				

Based on the assessment results highlighted above, table 18 shows the policy issues, implications, and possible interventions required to improve electricity connectivity coverage for Zambian households.

Table 18: Key Policy Issues in Electricity

Policy Issues	Implications	Strategic Interventions
Low electricity connectivity coverage	i. Increased deforestation and forest degradation due to heavy dependency on wood fuel.	i. Increased investment in electricity generation, transmission, and distribution infrastructure.
	ii. Low productivity for small and medium enterprises due to low accessibility to electricity.	ii. Scale up the Rural Electrification Programme through use of the comprehensive electrification pathways (extension of the grid and construction of mini-grids, depending on the distance of the communities from the grid).
	iii. Increased health risks as individuals may not have access to modern medical equipment and facilities, or may be forced to use unsafe sources of light and heating.	iii. Unlocking the Smart Subsidy mechanism by the Rural Electrification Authority to support worthy private companies in rolling out mini-grids in rural and peri-urban areas to cushion their investment costs and lead to tariff reduction for the poor rural communities.
	iv. Poor education performance due to inadequate study time, limited access to ICT equipment, and lack of electricity-dependent modern teaching and learning equipment	iv. Promotion of workable and innovative business-models in rolling out electricity infrastructure such as Public-Private Partnership model, Community-Private model, Anchor-Business-Customer model etc.
	v. Limited access to information as, individuals may not be able to access information and communication technologies, such as the internet, limiting their opportunities for learning and professional development.	v. Enhancing the investment environment for the private sector especially for mini-grids through development of light-handed regulations that will ensure support and protection of mini-grid investments.
	vi. Poor quality of life as individuals may not have access to basic amenities such as lighting, refrigeration, or air conditioning.	vi. Implementation of a sustainable connection Fee Subsidy Programme for low-income and female-headed households in rural and peri-urban areas.

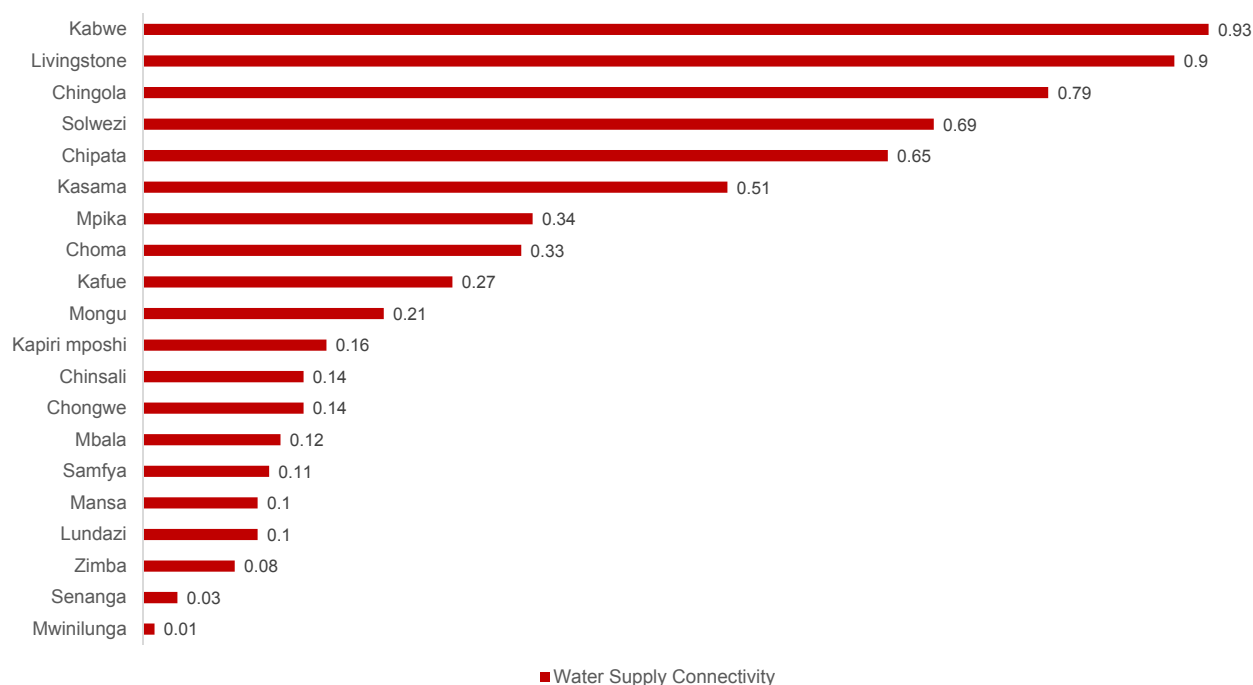
4.4 Water Supply

Zambia aspires to increase access to clean and safe water supply to 100 percent by all as envisioned in Vision 2030. As a result, progress has been made in implementing water supply interventions for both urban and rural areas. Much of the progress in the implementation of water supply interventions is being recorded in urban areas. Rural areas have continued to record low access to water supply due to various social, economic, and institutional challenges that have continued to hamper service provision, among other issues. With the country's population projected to increase in the next ten years, access to water supply is likely to be negatively affected if no strategic investments in water supply infrastructure are pursued.

Water Supply Capacity Index

Figure 7 shows the level of water supply connectivity coverage in the 20 districts. It highlights the districts from the highest connectivity coverage to the lowest. Kabwe District recorded the highest water supply connectivity coverage of 93 percent, while the lowest connectivity coverage of 1 percent was recorded in Mwinilunga.

Figure 7: Water Supply Connectivity Coverage



a) Kabwe District

During the period under review, Kabwe District had a water supply connectivity coverage of 93 percent. This implies that 9 in every 10 people in Kabwe had piped water. Further, on average, annual water per capita consumption was 2.18 m³ as reflected in table 19.

Increasing piped water connectivity coverage from 93 to 100 per cent by 2030 in line with Vision 2030 increases water consumption by 49 per cent in residential and social categories from 521,566 m³ to 777,397 m³. This implies there would be a need to ensure water supply infrastructure is expanded and rehabilitated to ensure the projected increase in demand as a result of the growing population is met.

Table 19: Water Connectivity of Kabwe District

District	Variable	Year		
		2020	2026	2030
Kabwe	Water intensity per capita	2.18		
	Water supply connectivity	0.93	0.96	1
	Total consumption for residential and social categories	521566.46	672491.89	777396.81

Source: Lukanga Water Supply and Sanitation Company

b) Mwinilunga District

During the period under review, Mwinilunga District had a water supply connectivity coverage of 1 percent. This implies that only 1 in every 100 people in Mwinilunga had piped water. Further, on average, annual water per capita consumption was 167.2 m³ as reflected in table 20.

Increasing connectivity to piped water from 1 per cent to 77 per cent in 2030 in line with vision 2030 results in an increase from 28,5684 m³ to 16,562,564 m³ in water consumption in the Residential and Social categories. This implies there would be a need for more investments in water supply infrastructure for the district to meet the demands of the growing population as well as increase the number of connections to piped water.

Table 20: Water Connectivity of Mwinilunga District

District	Variable	Year		
		2020	2026	2030
Mwinilunga	Water intensity per capita	167.21		
	Water supply connectivity	0.01	0.65	0.77
	Total consumption for residential and social categories	285684	17276390.84	16562563.76
Source: North Western Water Supply and Sanitation Company				

Based on the assessment results highlighted, table 21 shows the policy issues, implications, and possible interventions required to improve water supply connectivity.

Table 21: Key Policy Issues in Water Supply

Policy Issues	Implications	Strategic Interventions
Low water supply connectivity coverage	i. Insufficient water supply for social and economic uses ii. Increased risk and exposure to water-borne diseases.	i. Promotion of public-private partnerships in the construction and rehabilitation of water resources and supply infrastructure. ii. Development of alternative sources of clean and safe water, iii. Improving water management practices, including the reduction of water losses and improving water distribution systems

5 RECOMMENDATIONS AND CONCLUSION

5.1 Recommendations

- i. Promote the establishment of basic social and economic Infrastructure in rural and peri urban areas to make them attractive and reduce the rural-urban drift.
- ii. Promote the use of technology in the provision of agriculture extension, education and health services.
- iii. Strengthen partnerships with non-government organizations (NGOs), private companies, in the provision agriculture extension, water supply, electricity, health and education services.
- iv. Continuous recruitment of agriculture extension officers, essential health workers and teachers as well as ensuring equitable distribution of the workers.

5.2 Conclusion

The CCA has provided evidence for formulating, implementing, and monitoring the policies as well as sub-national plans. Further, it has also illustrated the vulnerability of the populations to development and humanitarian challenges, including the effects of climate change. Finally, it has also demonstrated how the needs of the current and future populations can be met given the available services being provided. Data has shown that with the rapid population growth rates in the assessed districts, most of the districts are in deficit in terms of service provision and resources.

This, therefore, requires that population variables, including population size, growth rates, and densities, age, and sex structure, and spatial distribution, among others, are adequately considered and integrated into all development processes. This is in line with the 2019 National Population Policy and the Planning and Budgeting Act No. I of 2020 which provides for the integration of population dynamics in all planning processes to ensure programs and projects benefit the majority of the population.

APPENDICES

Appendix I: Nurse and Doctor Capacity

District	Variable	Year		
		2020	2026	2030
Chilanga	Baseline Capacity Index			
	Doctor	15.73		
	Nurse	2.97		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	525	675	767
	Gap of Nurses	419	569	661
	Required Doctors	53	68	77
	Gap of Doctors	51	66	75
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	394	506	575
	Gap of Nurses	288	400	469
	Required Doctors	40	51	58
	Gap of Doctors	38	49	56
	Stress Scenario	1	1	1
	Required Nurses	315	405	460
	Gap of Nurses	209	299	354
	Required Doctors	32	41	46
	Gap of Doctors	30	39	44
Chingola	Baseline Capacity Index			
	Doctor	1.78		
	Nurse	1.71		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	980	1132	1246
	Gap of Nurses	636	1022	1046
	Required Doctors	98	114	125
	Gap of Doctors	65	94	95
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	735	849	935
	Gap of Nurses	391	739	735
	Required Doctors	74	85	94
	Gap of Doctors	41	65	64
	Stress Scenario	1	1	1
	Required Nurses	588	679	748
	Gap of Nurses	244	569	548
	Required Doctors	59	68	75

	Gap of Doctors	26	48	45
District	Variable	Year		
		2020	2026	2030
Chinsali	Baseline Capacity Index			
	Doctor	0.91		
	Nurse	1.55		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	439	655	756
	Gap of Nurses	269	515	556
	Required Doctors	44	66	76
	Gap of Doctors	15	51	51
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	329	491	567
	Gap of Nurses	159	351	367
	Required Doctors	33	50	57
	Gap of Doctors	4	35	32
	Stress Scenario	1	1	1
	Required Nurses	264	393	454
	Gap of Nurses	94	253	254
	Required Doctors	27	40	46
	Gap of Doctors	-2	25	21
Chipata	Baseline Capacity Index			
	Doctor	0.93		
	Nurse	1.56		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	996	1109	1225
	Gap of Nurses	614	727	843
	Required Doctors	100	111	123
	Gap of Doctors	36	47	59
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	747	832	919
	Gap of Nurses	365	450	537
	Required Doctors	75	84	92
	Gap of Doctors	11	20	28
	Stress Scenario	1	1	1
	Required Nurses	598	666	735
	Gap of Nurses	216	284	353
	Required Doctors	60	67	74
	Gap of Doctors	-4	3	10

District	Variable	Year		
		2020	2026	2030
Choma	Baseline Capacity Index			
	Doctor	1.14		
	Nurse	1.19		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	875	952	818
	Gap of Nurses	433	214	-166
	Required Doctors	88	96	82
	Gap of Doctors	42	31	2
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	656	714	613
	Gap of Nurses	214	-24	-371
	Required Doctors	66	72	62
	Gap of Doctors	20	7	-18
	Stress Scenario	1	1	1
	Required Nurses	525	571	491
	Gap of Nurses	83	-167	-493
	Required Doctors	53	58	50
	Gap of Doctors	7	-7	-30
Chongwe	Baseline Capacity Index			
	Doctor	8.3		
	Nurse	2.13		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	693	890	1012
	Gap of Nurses	498	620	712
	Required Doctors	70	89	102
	Gap of Doctors	65	73	102
	Comfortable Scenario	0.8	0.8	82
	Required Nurses	520	668	759
	Gap of Nurses	325	398	459
	Required Doctors	52	67	76
	Gap of Doctors	47	51	56
	Stress Scenario	1	1	1
	Required Nurses	416	534	607
	Gap of Nurses	221	264	307
	Required Doctors	42	54	61
	Gap of Doctors	37	38	41

District	Variable	Year		
		2020	2026	2030
Kabwe	Baseline Capacity Index			
	Doctor	0.62		
	Nurse	0.78		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	857	1071	1189
	Gap of Nurses	199	215	233
	Required Doctors	86	108	119
	Gap of Doctors	3	17	18
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	643	804	892
	Gap of Nurses	-15	-52	-64
	Required Doctors	65	81	90
	Gap of Doctors	-18	-10	-11
	Stress Scenario	1	1	1
	Required Nurses	514	643	713
	Gap of Nurses	-144	-213	-243
	Required Doctors	52	65	72
	Gap of Doctors	-31	-26	-29
	Baseline Capacity Index			
Kafue	Doctor	1.31		
	Nurse	1.38		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	590	759	862
	Gap of Nurses	33	197	179
	Required Doctors	59	76	87
	Gap of Doctors	32	-5	-34
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	443	569	647
	Gap of Nurses	186	7	-36
	Required Doctors	45	57	65
	Gap of Doctors	18	-24	-56
	Stress Scenario	1	1	1
	Required Nurses	354	455	517
	Gap of Nurses	97	-107	-166
	Required Doctors	36	46	52
	Gap of Doctors	9	-35	-69

District	Variable	Year		
		2020	2026	2030
Kalumbila	Baseline Capacity Index			
	Doctor	4.48		
	Nurse	1.57		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	374	435	482
	Gap of Nurses	231	80	94
	Required Doctors	38	44	49
	Gap of Doctors	33	29	24
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	281	326	361
	Gap of Nurses	138	-29	-27
	Required Doctors	29	33	37
	Gap of Doctors	24	18	12
	Stress Scenario	1	1	1
	Required Nurses	225	261	289
	Gap of Nurses	82	-94	-99
	Required Doctors	23	27	29
	Gap of Doctors	18	12	4
Kapiri Mposhi	Baseline Capacity Index			
	Doctor	6.79		
	Nurse	2.84		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	1019	1231	1366
	Gap of Nurses	804	1031	1116
	Required Doctors	102	124	137
	Gap of Doctors	93	108	117
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	764	923	1024
	Gap of Nurses	549	723	774
	Required Doctors	77	93	103
	Gap of Doctors	68	77	83
	Stress Scenario	1	1	1
	Required Nurses	612	739	820
	Gap of Nurses	397	539	570
	Required Doctors	62	74	82
	Gap of Doctors	53	58	62

District	Variable	Year		
		2020	2026	2030
Kasama	Baseline Capacity Index			
	Doctor	1.29		
	Nurse	2.41		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	1051	1270	1427
	Gap of Nurses	789	470	427
	Required Doctors	106	127	143
	Gap of Doctors	57	57	18
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	788	952	1070
	Gap of Nurses	526	152	70
	Required Doctors	79	96	107
	Gap of Doctors	30	26	-18
	Stress Scenario	1	1	1
	Required Nurses	631	762	856
	Gap of Nurses	369	-38	-144
	Required Doctors	64	77	86
	Gap of Doctors	15	7	-39
Livingstone	Baseline Capacity Index			
	Doctor	0.5		
	Nurse	0.87		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	676	735	818
	Gap of Nurses	208	185	168
	Required Doctors	68	74	82
	Gap of Doctors	-13	-36	-68
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	507	552	613
	Gap of Nurses	39	2	-37
	Required Doctors	51	56	62
	Gap of Doctors	-30	-54	-88
	Stress Scenario		1	1
	Required Nurses	406	441	491
	Gap of Nurses	-62	-109	-159
	Required Doctors	41	45	50
	Gap of Doctors	-40	-65	-100

District	Variable	Year		
		2020	2026	2030
Lundazi	Baseline Capacity Index			
	Doctor	8.56		
	Nurse	5.42		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	714	616	680
	Gap of Nurses	635	616	680
	Required Doctors	72	62	68
	Gap of Doctors	67	62	68
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	535	462	510
	Gap of Nurses	456	462	510
	Required Doctors	54	47	51
	Gap of Doctors	49	47	51
	Stress Scenario	1	1	1
	Required Nurses	428	370	408
	Gap of Nurses	349	370	408
	Required Doctors	43	37	41
	Gap of Doctors	38	37	41
Mansa	Baseline Capacity Index			
	Doctor	0.72		
	Nurse	1.11		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	881	1016	1119
	Gap of Nurses	404	599	554
	Required Doctors	89	102	112
	Gap of Doctors	16	-13	-17
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	661	762	840
	Gap of Nurses	184	345	275
	Required Doctors	67	77	84
	Gap of Doctors	-6	-38	-45
	Stress Scenario	1	1	1
	Required Nurses	529	610	672
	Gap of Nurses	52	193	107
	Required Doctors	53	61	68
	Gap of Doctors	-20	-54	-61

District	Variable	Year		
		2020	2026	2030
Mbala	Baseline Capacity Index			
	Doctor	5.34		
	Nurse	1.94		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	534	607	682
	Gap of Nurses	369	399	372
	Required Doctors	54	61	69
	Gap of Doctors	48	40	27
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	401	455	511
	Gap of Nurses	236	247	201
	Required Doctors	41	46	52
	Gap of Doctors	35	25	10
	Stress Scenario	1	1	1
	Required Nurses	321	364	409
	Gap of Nurses	156	156	99
	Required Doctors	33	37	41
	Gap of Doctors	27	16	-1
Mongu	Baseline Capacity Index			
	Doctor	0.58		
	Nurse	0.69		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	514	569	613
	Gap of Nurses	67	282	316
	Required Doctors	52	57	62
	Gap of Doctors	-1	4	6
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	385	427	460
	Gap of Nurses	-62	140	163
	Required Doctors	39	43	46
	Gap of Doctors	-14	-10	-10
	Stress Scenario	1	1	1
	Required Nurses	308	341	368
	Gap of Nurses	-139	54	71
	Required Doctors	31	35	37
	Gap of Doctors	-22	-18	-19

District	Variable	Year		
		2020	2026	2030
Mpika	Baseline Capacity Index			
	Doctor	2.12		
	Nurse	0.97		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	389	608	702
	Gap of Nurses	149	463	521
	Required Doctors	39	61	71
	Gap of Doctors	28	44	42
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	292	456	526
	Gap of Nurses	52	311	345
	Required Doctors	30	46	53
	Gap of Doctors	19	29	24
	Stress Scenario	1	1	1
	Required Nurses	233	365	421
	Gap of Nurses	-7	220	240
	Required Doctors	24	37	43
	Gap of Doctors	13	20	14
Mwinilunga	Baseline Capacity Index			
	Doctor	6.83		
	Nurse	3.33		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	456	530	429
	Gap of Nurses	374	352	231
	Required Doctors	46	53	43
	Gap of Doctors	42	35	7
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	342	398	322
	Gap of Nurses	260	220	124
	Required Doctors	35	40	33
	Gap of Doctors	31	22	-3
	Stress Scenario	1	1	1
	Required Nurses	274	318	258
	Gap of Nurses	192	140	60
	Required Doctors	28	32	26
	Gap of Doctors	24	14	-10

District	Variable	Year		
		2020	2026	2030
Ndola	Baseline Capacity Index			
	Doctor	0.35		
	Nurse	0.84		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	2041	2357	2595
	Gap of Nurses	577	893	1131
	Required Doctors	205	236	260
	Gap of Doctors	-147	-166	-92
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	1531	1768	1946
	Gap of Nurses	67	304	482
	Required Doctors	154	177	195
	Gap of Doctors	-198	-175	-157
	Stress Scenario	1	1	1
	Required Nurses	1225	1415	1557
	Gap of Nurses	-239	-49	93
	Required Doctors	123	142	156
	Gap of Doctors	-229	-210	-196
Samfya	Baseline Capacity Index			
	Doctor	7.87		
	Nurse	1.86		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	394	454	500
	Gap of Nurses	267	234	200
	Required Doctors	40	46	50
	Gap of Doctors	37	19	18
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	296	341	375
	Gap of Nurses	169	121	75
	Required Doctors	30	35	38
	Gap of Doctors	27	8	6
	Stress Scenario	1	1	1
	Required Nurses	237	273	300
	Gap of Nurses	110	53	0
	Required Doctors	24	28	30
	Gap of Doctors	21	1	-2

District	Variable	Year		
		2020	2026	2030
Senanga	Baseline Capacity Index			
	Doctor	5.65		
	Nurse	2.26		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	283	313	337
	Gap of Nurses	208	114	133
	Required Doctors	29	32	34
	Gap of Doctors	26	8	-4
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	212	235	253
	Gap of Nurses	137	36	26
	Required Doctors	22	24	-12
	Gap of Doctors	19	0	
	Stress Scenario	1	1	1
	Required Nurses	170	188	203
	Gap of Nurses	95	-11	-1
	Required Doctors	17	19	21
	Gap of Doctors	14	-5	-17
Solwezi	Baseline Capacity Index			
	Doctor	0.53		
	Nurse	1.05		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	579	674	746
	Gap of Nurses	249	626	684
	Required Doctors	58	68	75
	Gap of Doctors	-7	-38	-31
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	435	505	560
	Gap of Nurses	105	457	498
	Required Doctors	44	51	56
	Gap of Doctors	-21	-55	-50
	Stress Scenario	1	1	1
	Required Nurses	348	404	448
	Gap of Nurses	18	356	386
	Required Doctors	35	41	45
	Gap of Doctors	-30	-65	-61

District	Variable	Year		
		2020	2026	2030
Zimba	Baseline Capacity Index			
	Doctor	4.06		
	Nurse	2.11		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required Nurses	339	368	410
	Gap of Nurses	243	28	-18
	Required Doctors	34	37	41
	Gap of Doctors	29	-1	-20
	Comfortable Scenario	0.8	0.8	0.8
	Required Nurses	254	276	307
	Gap of Nurses	158	-64	-121
	Required Doctors	26	28	31
	Gap of Doctors	21	-10	-30
	Stress Scenario	1	1	1
	Required Nurses	203	221	246
	Gap of Nurses	107	-119	-182
	Required Doctors	21	23	25
	Gap of Doctors	16	-15	-36

Appendix 2: Teacher Capacity

District	Variable	Year		
		2020	2026	2030
Chilanga	Baseline Capacity Index			
	Primary school teacher	0.49		
	Secondary school teacher	0.59		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1213	1560	1773
	Gap of primary school teachers	-275	-300	-552
	Required secondary school teachers	889	1143	1299
	Gap of secondary school teachers	-17	11	-117
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	910	1170	1330
	Gap of primary school teachers	-578	-690	-995
	Required secondary school teachers	667	857	974
	Gap of secondary school teachers	-239	-275	-441
	Stress Scenario	1	1	1
	Required primary school teachers	728	936	1064
	Gap of primary school teachers	-760	-924	-1261
	Required secondary school teachers	534	686	779
	Gap of secondary school teachers	-372	-446	-636
Chingola	Baseline Capacity Index			
	Primary school teacher	1.01		
	Secondary school teacher	2.09		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	2206	2548	2805
	Gap of primary school teachers	889	869	647
	Required secondary school teachers	1837	2122	2336
	Gap of secondary school teachers	1309	1444	1464
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1655	1911	2104
	Gap of primary school teachers	348	232	-54
	Required secondary school teachers	1378	1592	1752
	Gap of secondary school teachers	850	913	880
	Stress Scenario	1	1	1
	Required primary school teachers	1324	1529	1683
	Gap of primary school teachers	17	-150	-475
	Required secondary school teachers	1103	1273	1402
	Gap of secondary school teachers	575	595	530

District	Variable	Year		
		2020	2026	2030
Chinsali	Baseline Capacity Index			
	Primary school teacher	1.24		
	Secondary school teacher	1.16		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1138	1698	1959
	Gap of primary school teachers	587	990	1049
	Required secondary school teachers	719	1073	1238
	Gap of secondary school teachers	348	596	625
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	853	1273	1469
	Gap of primary school teachers	302	565	559
	Required secondary school teachers	539	805	928
	Gap of secondary school teachers	168	328	316
	Stress Scenario	1	1	1
	Required primary school teachers	683	1019	1175
	Gap of primary school teachers	132	311	266
	Required secondary school teachers	432	644	743
	Gap of secondary school teachers	61	167	130
Chipata	Baseline Capacity Index			
	Primary school teacher	1.4		
	Secondary school teacher	1.29		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	2395	2669	2948
	Gap of primary school teachers	1366	1347	1248
	Required secondary school teachers	1774	1977	2184
	Gap of secondary school teachers	930	893	790
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1796	2002	2211
	Gap of primary school teachers	767	680	512
	Required secondary school teachers	1331	1483	1638
	Gap of secondary school teachers	487	399	244
	Stress Scenario	1	1	1
	Required primary school teachers	1437	1602	1769
	Gap of primary school teachers	408	279	70
	Required secondary school teachers	1065	1187	1910
	Gap of secondary school teachers	221	102	-83

District	Variable	Year		
		2020	2026	2030
Choma	Baseline Capacity Index			
	Primary school teacher	1.1		
	Secondary school teacher	0.73		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	2173	1475	1640
	Gap of primary school teachers	986	-903	-1810
	Required secondary school teachers	1573	1307	1454
	Gap of secondary school teachers	276	-70	-170
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1630	1106	1230
	Gap of primary school teachers	443	-1272	-2220
	Required secondary school teachers	1180	981	1091
	Gap of secondary school teachers	-117	-396	-533
	Stress Scenario	1	1	1
	Required primary school teachers	1304	885	-984
	Gap of primary school teachers	117	-1493	-2466
	Required secondary school teachers	944	785	873
	Gap of secondary school teachers	-353	-592	-751
Chongwe	Baseline Capacity Index			
	Primary school teacher	1.06		
	Secondary school teacher	1.18		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1663	2139	2430
	Gap of primary school teachers	720	960	957
	Required secondary school teachers	1222	1570	1784
	Gap of secondary school teachers	601	794	684
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1248	1604	1823
	Gap of primary school teachers	305	425	349
	Required secondary school teachers	916	1178	1338
	Gap of secondary school teachers	295	402	238
	Stress Scenario	1	1	1
	Required primary school teachers	998	1283	1458
	Gap of primary school teachers	55	105	-15
	Required secondary school teachers	733	942	1071
	Gap of secondary school teachers	112	166	-29

District	Variable	Year		
		2020	2026	2030
Kabwe	Baseline Capacity Index			
	Primary school teacher	0.87		
	Secondary school teacher	0.72		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	2014	2433	2700
	Gap of primary school teachers	632	657	-78
	Required secondary school teachers	1796	2170	2408
	Gap of secondary school teachers	301	301	4
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1510	1825	2025
	Gap of primary school teachers	128	49	-753
	Required secondary school teachers	1347	1628	1806
	Gap of secondary school teachers	-148	-241	-598
	Stress Scenario	1	1	1
	Required primary school teachers	1208	1460	1620
	Gap of primary school teachers	-174	-316	-1158
	Required secondary school teachers	1078	1302	1445
	Gap of secondary school teachers	-417	-567	-959
Kafue	Baseline Capacity Index			
	Primary school teacher	1.11		
	Secondary school teacher	0.95		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1402	1802	2048
	Gap of primary school teachers	647	859	869
	Required secondary school teachers	1112	1430	1625
	Gap of secondary school teachers	411	554	530
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1051	1352	1536
	Gap of primary school teachers	296	409	357
	Required secondary school teachers	834	1073	1219
	Gap of secondary school teachers	133	197	124
	Stress Scenario	1	1	1
	Required primary school teachers	841	1081	1229
	Gap of primary school teachers	86	138	50
	Required secondary school teachers	668	858	975
	Gap of secondary school teachers	-33	-18	-120

District	Variable	Year		
		2020	2026	2030
Kalumbila	Baseline Capacity Index			
	Primary school teacher	1.21		
	Secondary school teacher	1.6		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	964	1122	1243
	Gap of primary school teachers	487	402	223
	Required secondary school teachers	629	732	811
	Gap of secondary school teachers	393	346	225
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	723	841	932
	Gap of primary school teachers	246	121	-88
	Required secondary school teachers	472	549	608
	Gap of secondary school teachers	236	163	22
	Stress Scenario	1	1	1
	Required primary school teachers	579	673	746
	Gap of primary school teachers	102	-47	-274
	Required secondary school teachers	378	439	487
	Gap of secondary school teachers	142	53	-99
Kapiri Mposhi	Baseline Capacity Index			
	Primary school teacher	1.15		
	Secondary school teacher	1.45		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	2566	3099	3439
	Gap of primary school teachers	1231	1384	1235
	Required secondary school teachers	1796	2169	2407
	Gap of secondary school teachers	1054	1216	1182
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1925	2325	2580
	Gap of primary school teachers	590	609	375
	Required secondary school teachers	1347	1627	1805
	Gap of secondary school teachers	605	673	580
	Stress Scenario	1	1	1
	Required primary school teachers	1540	1860	2064
	Gap of primary school teachers	205	144	-141
	Required secondary school teachers	1078	1302	1444
	Gap of secondary school teachers	336	348	219

District	Variable	Year		
		2020	2026	2030
Kasama	Baseline Capacity Index			
	Primary school teacher	1.43		
	Secondary school teacher	1.25		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	2668	3224	3622
	Gap of primary school teachers	1552	538	-264
	Required secondary school teachers	1843	2227	2503
	Gap of secondary school teachers	958	717	863
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	2001	2418	2717
	Gap of primary school teachers	885	-268	-1169
	Required secondary school teachers	1383	1671	1877
	Gap of secondary school teachers	498	161	237
	Stress Scenario	1	1	1
	Required primary school teachers	1601	1934	2174
	Gap of primary school teachers	485	-752	-1712
	Required secondary school teachers	1106	1337	1502
	Gap of secondary school teachers	221	-173	-138
Livingstone	Baseline Capacity Index			
	Primary school teacher	2.85		
	Secondary school teacher	0.44		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1355	1475	1640
	Gap of primary school teachers	1070	1108	1169
	Required secondary school teachers	1201	1307	1454
	Gap of secondary school teachers	-438	-799	-557
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1016	1106	1230
	Gap of primary school teachers	731	740	759
	Required secondary school teachers	901	981	1091
	Gap of secondary school teachers	-738	-1125	-920
	Stress Scenario	1	1	1
	Required primary school teachers	813	885	984
	Gap of primary school teachers	528	519	513
	Required secondary school teachers	721	785	873
	Gap of secondary school teachers	-918	-1321	-1138

District	Variable	Year		
		2020	2026	2030
Lundazi	Baseline Capacity Index			
	Primary school teacher	2.39		
	Secondary school teacher	1.82		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1780	1536	1696
	Gap of primary school teachers	1334	963	960
	Required secondary school teachers	1158	999	1103
	Gap of secondary school teachers	776	508	473
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1335	1152	1272
	Gap of primary school teachers	889	579	536
	Required secondary school teachers	868	749	828
	Gap of secondary school teachers	486	259	197
	Stress Scenario	1	1	1
	Required primary school teachers	1068	922	1018
	Gap of primary school teachers	622	349	282
	Required secondary school teachers	695	600	662
	Gap of secondary school teachers	313	109	31
Mansa	Baseline Capacity Index			
	Primary school teacher	2.04		
	Secondary school teacher	1.13		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	2207	2545	2803
	Gap of primary school teachers	1557	1111	705
	Required secondary school teachers	1528	1762	1941
	Gap of secondary school teachers	718	658	477
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1656	1909	2102
	Gap of primary school teachers	1006	475	4
	Required secondary school teachers	1146	1322	1456
	Gap of secondary school teachers	336	218	-8
	Stress Scenario	1	1	1
	Required primary school teachers	1325	1527	1682
	Gap of primary school teachers	675	93	-416
	Required secondary school teachers	917	1058	1165
	Gap of secondary school teachers	107	-46	-299

District	Variable	Year		
		2020	2026	2030
Mbala	Baseline Capacity Index			
	Primary school teacher	2.24		
	Secondary school teacher	1.89		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1374	1561	1754
	Gap of primary school teachers	1006	311	-466
	Required secondary school teachers	921	1046	1175
	Gap of secondary school teachers	629	92	-125
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1030	1171	1315
	Gap of primary school teachers	662	-79	-882
	Required secondary school teachers	691	785	882
	Gap of secondary school teachers	399	-169	-590
	Stress Scenario	1	1	1
	Required primary school teachers	824	937	1052
	Gap of primary school teachers	456	-313	-1148
	Required secondary school teachers	553	628	705
	Gap of secondary school teachers	261	-326	-595
Mongu	Baseline Capacity Index			
	Primary school teacher	0.79		
	Secondary school teacher	0.67		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1184	1311	1412
	Gap of primary school teachers	283	311	12
	Required secondary school teachers	885	980	1055
	Gap of secondary school teachers	91	-170	-445
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	888	984	1059
	Gap of primary school teachers	-13	-16	-341
	Required secondary school teachers	664	735	791
	Gap of secondary school teachers	-130	-415	-709
	Stress Scenario	1	1	1
	Required primary school teachers	711	787	848
	Gap of primary school teachers	-190	-213	-552
	Required secondary school teachers	531	588	633
	Gap of secondary school teachers	-263	-562	-867

District	Variable	Year		
		2020	2026	2030
Mpika	Baseline Capacity Index			
	Primary school teacher	0.81		
	Secondary school teacher	0.72		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	984	1541	1777
	Gap of primary school teachers	258	608	579
	Required secondary school teachers	730	1143	1318
	Gap of secondary school teachers	124	364	318
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	738	1156	1333
	Gap of primary school teachers	12	223	134
	Required secondary school teachers	548	857	989
	Gap of secondary school teachers	-58	79	-12
	Stress Scenario	1	1	1
	Required primary school teachers	591	925	1067
	Gap of primary school teachers	-135	-8	-132
	Required secondary school teachers	438	686	791
	Gap of secondary school teachers	-168	-93	-209
Mwinilunga	Baseline Capacity Index			
	Primary school teacher	1.56		
	Secondary school teacher	1.41		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1185	1379	1116
	Gap of primary school teachers	728	439	86
	Required secondary school teachers	799	930	752
	Gap of secondary school teachers	460	323	-201
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	889	1034	837
	Gap of primary school teachers	432	94	-193
	Required secondary school teachers	600	697	564
	Gap of secondary school teachers	261	90	-389
	Stress Scenario	1	1	1
	Required primary school teachers	711	827	670
	Gap of primary school teachers	254	-113	-360
	Required secondary school teachers	480	558	452
	Gap of secondary school teachers	141	-49	-501

District	Variable	Year		
		2020	2026	2030
Ndola	Baseline Capacity Index			
	Primary school teacher	1.52		
	Secondary school teacher	1.5		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	4586	5297	5831
	Gap of primary school teachers	2774	2969	2839
	Required secondary school teachers	3896	4500	4954
	Gap of secondary school teachers	2338	2498	2381
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	3440	3973	4374
	Gap of primary school teachers	1628	1645	1382
	Required secondary school teachers	2922	3375	3716
	Gap of secondary school teachers	1364	1373	1143
	Stress Scenario	1	1	1
	Required primary school teachers	2752	3179	3499
	Gap of primary school teachers	940	850	507
	Required secondary school teachers	2338	2700	2973
	Gap of secondary school teachers	780	698	400
Samfya	Baseline Capacity Index			
	Primary school teacher	1.08		
	Secondary school teacher	1.25		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1004	1158	1275
	Gap of primary school teachers	449	445	359
	Required secondary school teachers	643	741	816
	Gap of secondary school teachers	334	344	306
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	753	869	956
	Gap of primary school teachers	198	155	40
	Required secondary school teachers	482	556	612
	Gap of secondary school teachers	173	159	102
	Stress Scenario	1	1	1
	Required primary school teachers	603	695	765
	Gap of primary school teachers	48	-18	-151
	Required secondary school teachers	386	445	490
	Gap of secondary school teachers	77	48	-20

District	Variable	Year		
		2020	2026	2030
Senanga	Baseline Capacity Index			
	Primary school teacher	0.84		
	Secondary school teacher	1.29		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	681	754	812
	Gap of primary school teachers	195	-135	-460
	Required secondary school teachers	465	515	555
	Gap of secondary school teachers	248	98	-97
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	511	566	609
	Gap of primary school teachers	25	-323	-663
	Required secondary school teachers	349	387	416
	Gap of secondary school teachers	132	-30	-236
	Stress Scenario	1	1	1
	Required primary school teachers	409	453	487
	Gap of primary school teachers	-77	-436	-785
	Required secondary school teachers	279	309	333
	Gap of secondary school teachers	62	-108	-319
Solwezi	Baseline Capacity Index			
	Primary school teacher	1.09		
	Secondary school teacher	0.91		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	1361	1583	1754
	Gap of primary school teachers	611	333	104
	Required secondary school teachers	1009	1174	1300
	Gap of secondary school teachers	344	309	235
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	1021	1187	1316
	Gap of primary school teachers	271	-63	-334
	Required secondary school teachers	757	880	975
	Gap of secondary school teachers	92	15	-90
	Stress Scenario	1	1	1
	Required primary school teachers	817	950	1053
	Gap of primary school teachers	67	-300	-597
	Required secondary school teachers	606	704	780
	Gap of secondary school teachers	-59	-161	-285

District	Variable	Year		
		2020	2026	2030
Zimba	Baseline Capacity Index			
	Primary school teacher	2.81		
	Secondary school teacher	1.31		
	Targeted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	870	947	1053
	Gap of primary school teachers	684	697	789
	Required secondary school teachers	581	899	1000
	Gap of secondary school teachers	316	543	523
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	653	710	790
	Gap of primary school teachers	467	460	526
	Required secondary school teachers	436	674	750
	Gap of secondary school teachers	171	318	273
	Stress Scenario	1	1	1
	Required primary school teachers	522	568	632
	Gap of primary school teachers	336	318	368
	Required secondary school teachers	349	540	600
	Gap of secondary school teachers	84	184	123

Appendix 3: Classroom Capacity

District	Variable	Year		
		2020	2026	2030
Chilanga	Baseline Capacity Index			
	Primary school classroom	1.15		
	Secondary school classroom	1.76		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1213	1560	1773
	Gap of primary school classrooms	578	896	448
	Required secondary school classrooms	889	1143	1299
	Gap of secondary school classrooms	586	765	826
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	910	1170	1330
	Gap of primary school classrooms	275	506	5
	Required secondary school classrooms	667	857	974
	Gap of secondary school classrooms	364	479	501
	Stress Scenario	1	1	1
	Required primary school classrooms	728	936	1064
	Gap of primary school classrooms	93	272	-261
	Required secondary school classrooms	534	686	779
	Gap of secondary school classrooms	231	308	306
Chingola	Baseline Capacity Index			
	Primary school classroom	2.95		
	Secondary school classroom	5.68		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	2206	2548	2805
	Gap of primary school classrooms	1758	1972	2065
	Required secondary school classrooms	1837	2122	2336
	Gap of secondary school classrooms	1643	1873	2016
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	1655	1911	2104
	Gap of primary school classrooms	1207	1336	1364
	Required secondary school classrooms	1378	1592	1752
	Gap of secondary school classrooms	1184	1342	1432
	Stress Scenario	1	1	1
	Required primary school classrooms	1324	1529	1683
	Gap of primary school classrooms	876	953	943
	Required secondary school classrooms	1103	1273	1402
	Gap of secondary school classrooms	909	1024	1081

District	Variable	Year		
		2020	2026	2030
Chinsali	Baseline Capacity Index			
	Primary school classroom	0.53		
	Secondary school classroom	2.76		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1138	1698	1959
	Gap of primary school classrooms	-150	43	-168
	Required secondary school classrooms	719	1073	1238
	Gap of secondary school classrooms	563	873	980
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	853	1273	1469
	Gap of primary school classrooms	-435	-382	-658
	Required secondary school classrooms	539	805	928
	Gap of secondary school classrooms	383	604	671
	Stress Scenario	1	1	1
	Required primary school classrooms	683	1019	1175
	Gap of primary school classrooms	-605	-636	-951
	Required secondary school classrooms	432	644	743
	Gap of secondary school classrooms	276	444	485
Chipata	Baseline Capacity Index			
	Primary school classroom	2.29		
	Secondary school classroom	4.09		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	2395	2669	2948
	Gap of primary school classrooms	1768	1863	1912
	Required secondary school classrooms	1774	1977	2184
	Gap of secondary school classrooms	1514	1643	1754
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	1796	2002	2211
	Gap of primary school classrooms	1169	1196	1175
	Required secondary school classrooms	1331	1483	1638
	Gap of secondary school classrooms	1071	1149	1209
	Stress Scenario	1	1	1
	Required primary school classrooms	1437	1602	1769
	Gap of primary school classrooms	810	796	733
	Required secondary school classrooms	1065	1187	1310
	Gap of secondary school classrooms	805	853	881

District	Variable	Year		
		2020	2026	2030
Choma	Baseline Capacity Index	2020	2026	2030
	Primary school classroom	2.19		
	Secondary school classroom	2.99		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	2173	1475	1640
	Gap of primary school classrooms	1579	678	569
	Required secondary school classrooms	1573	1307	1454
	Gap of secondary school classrooms	1257	816	943
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	1630	1106	1230
	Gap of primary school classrooms	1036	309	159
	Required secondary school classrooms	1180	981	1091
	Gap of secondary school classrooms	864	490	580
	Stress Scenario	1	1	1
	Required primary school classrooms	1304	885	984
	Gap of primary school classrooms	710	88	-87
	Required secondary school classrooms	944	785	873
	Gap of secondary school classrooms	628	294	362
Chongwe	Baseline Capacity Index			
	Primary school classroom	2		
	Secondary school classroom	4.31		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1663	2139	2430
	Gap of primary school classrooms	1164	1515	1651
	Required secondary school classrooms	1222	1570	1784
	Gap of secondary school classrooms	1052	1358	1519
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	1248	1604	1823
	Gap of primary school classrooms	749	980	1043
	Required secondary school classrooms	916	1178	1338
	Gap of secondary school classrooms	746	965	1073
	Stress Scenario	1	1	1
	Required primary school classrooms	998	1283	1458
	Gap of primary school classrooms	499	660	679
	Required secondary school classrooms	733	942	1071
	Gap of secondary school classrooms	563	730	805

District	Variable	Year		
		2020	2026	2030
Kabwe	Baseline Capacity Index			
	Primary school classroom	3.32		
	Secondary school classroom	2.39		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	2014	2433	2700
	Gap of primary school classrooms	1650	1925	1903
	Required secondary school classrooms	1796	2170	2408
	Gap of secondary school classrooms	1346	1592	1666
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	1510	1825	2025
	Gap of primary school classrooms	1146	1317	1228
	Required secondary school classrooms	1347	1628	1806
	Gap of secondary school classrooms	897	1050	1064
	Stress Scenario	1	1	1
	Required primary school classrooms	1208	1460	1620
	Gap of primary school classrooms	844	952	823
	Required secondary school classrooms	1078	1302	1445
	Gap of secondary school classrooms	628	724	
Kafue	Baseline Capacity Index			
	Primary school classroom	1.96		
	Secondary school classroom	2.68		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1402	1802	2048
	Gap of primary school classrooms	973	1266	1378
	Required secondary school classrooms	1112	1430	1625
	Gap of secondary school classrooms	863	1119	1236
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	1051	1352	1536
	Gap of primary school classrooms	622	816	866
	Required secondary school classrooms	834	1073	1219
	Gap of secondary school classrooms	585	762	830
	Stress Scenario	1	1	1
	Required primary school classrooms	841	1081	1229
	Gap of primary school classrooms	412	545	559
	Required secondary school classrooms	668	858	975
	Gap of secondary school classrooms	419	547	586

District	Variable	Year		
		2020	2026	2030
Kalumbila	Baseline Capacity Index			
	Primary school classroom	1.26		
	Secondary school classroom	3.93		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	964	1122	1243
	Gap of primary school classrooms	506	489	400
	Required secondary school classrooms	629	732	811
	Gap of secondary school classrooms	533	633	613
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	723	841	932
	Gap of primary school classrooms	265	208	89
	Required secondary school classrooms	472	549	608
	Gap of secondary school classrooms	376	450	410
	Stress Scenario	1	1	1
	Required primary school classrooms	579	673	746
	Gap of primary school classrooms	121	40	-97
	Required secondary school classrooms	378	439	487
	Gap of secondary school classrooms	282	340	289
Kapiri Mposhi	Baseline Capacity Index			
	Primary school classroom	2.14		
	Secondary school classroom	2.39		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	2566	3099	3439
	Gap of primary school classrooms	1846	2174	2251
	Required secondary school classrooms	1796	2169	2407
	Gap of secondary school classrooms	1346	1591	1664
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	1925	2325	2580
	Gap of primary school classrooms	1205	1399	1391
	Required secondary school classrooms	1347	1627	1805
	Gap of secondary school classrooms	897	1049	1062
	Stress Scenario	1	1	1
	Required primary school classrooms	1540	1860	2064
	Gap of primary school classrooms	820	935	875
	Required secondary school classrooms	1078	1302	1444
	Gap of secondary school classrooms	628	723	701

District	Variable	Year		
		2020	2026	2030
Kasama	Baseline Capacity Index			
	Primary school classroom	0.91		
	Secondary school classroom	3.37		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	2668	3224	3622
	Gap of primary school classrooms	917	1266	-336
	Required secondary school classrooms	1843	2227	2503
	Gap of secondary school classrooms	1515	1177	1053
	Comfortable Scenario		0.8	0.8
	Required primary school classrooms	2001	2418	2717
	Gap of primary school classrooms	250	460	-1241
	Required secondary school classrooms	1383	1671	1877
	Gap of secondary school classrooms	1055	621	427
	Stress Scenario	1	1	1
	Required primary school classrooms	1601	1934	2174
	Gap of primary school classrooms	-150	-24	-1784
	Required secondary school classrooms	1106	1337	1502
	Gap of secondary school classrooms	778	287	52
Livingstone	Baseline Capacity Index			
	Primary school classroom	1.58		
	Secondary school classroom	6.06		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1355	1475	1640
	Gap of primary school classrooms	842	815	793
	Required secondary school classrooms	1201	1307	1454
	Gap of secondary school classrooms	1082	1155	1257
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	1016	1106	1230
	Gap of primary school classrooms	503	447	383
	Required secondary school classrooms	901	981	1091
	Gap of secondary school classrooms	782	828	894
	Stress Scenario	1	1	1
	Required primary school classrooms	813	885	984
	Gap of primary school classrooms	300	226	137
	Required secondary school classrooms	721	785	873
	Gap of secondary school classrooms	602	632	676

District	Variable	Year		
		2020	2026	2030
Lundazi	Baseline Capacity Index			
	Primary school classroom	3.52		
	Secondary school classroom	7.8		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1780	1536	1696
	Gap of primary school classrooms	1477	1147	1196
	Required secondary school classrooms	1158	999	1103
	Gap of secondary school classrooms	1069	885	956
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	1335	1152	1272
	Gap of primary school classrooms	1032	763	772
	Required secondary school classrooms	868	749	828
	Gap of secondary school classrooms	779	635	681
	Stress Scenario	1	1	1
	Required primary school classrooms	1068	922	1018
	Gap of primary school classrooms	765	533	518
	Required secondary school classrooms	695	600	662
	Gap of secondary school classrooms	606	485	515
Mansa	Baseline Capacity Index			
	Primary school classroom	3.02		
	Secondary school classroom	3.37		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	2207	2545	2803
	Gap of primary school classrooms	1769	1239	1105
	Required secondary school classrooms	1528	1762	1941
	Gap of secondary school classrooms	1256	856	727
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	1656	1909	2102
	Gap of primary school classrooms	1218	603	404
	Required secondary school classrooms	1146	1322	1456
	Gap of secondary school classrooms	874	416	242
	Stress Scenario	1	1	1
	Required primary school classrooms	1325	1527	1682
	Gap of primary school classrooms	887	221	-16
	Required secondary school classrooms	917	1058	1165
	Gap of secondary school classrooms	645	152	-49

District	Variable	Year		
		2020	2026	2030
Mbala	Baseline Capacity Index			
	Primary school classroom	1.36		
	Secondary school classroom	3.63		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1374	1561	-1754
	Gap of primary school classrooms	769	-44	-151
	Required secondary school classrooms	921	1046	1175
	Gap of secondary school classrooms	769	376	225
	<i>Comfortable Scenario</i>	<i>0.8</i>	<i>0.8</i>	<i>0.8</i>
	Required primary school classrooms	1030	1171	1315
	Gap of primary school classrooms	425	-434	-590
	Required secondary school classrooms	691	785	882
	Gap of secondary school classrooms	539	115	-68
	Stress Scenario	1	1	1
	Required primary school classrooms	824	937	1052
	Gap of primary school classrooms	219	-668	-853
	Required secondary school classrooms	553	628	705
	Gap of secondary school classrooms	401	-42	-245
Mongu	Baseline Capacity Index			
	Primary school classroom	1.15		
	Secondary school classroom	3		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1184	1311	1412
	Gap of primary school classrooms	568	520	395
	Required secondary school classrooms	885	980	1055
	Gap of secondary school classrooms	708	690	705
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	888	984	1059
	Gap of primary school classrooms	272	192	42
	Required secondary school classrooms	664	735	791
	Gap of secondary school classrooms	487	445	441
	Stress Scenario	1	1	1
	Required primary school classrooms	711	787	848
	Gap of primary school classrooms	95	-5	-170
	Required secondary school classrooms	531	588	633
	Gap of secondary school classrooms	354	298	283

District	Variable	Year		
		2020	2026	2030
Mpika	Baseline Capacity Index			
	Primary school classroom	1.42		
	Secondary school classroom	3.27		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	984	1541	1777
	Gap of primary school classrooms	569	1007	1092
	Required secondary school classrooms	730	1143	1318
	Gap of secondary school classrooms	596	971	1097
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	738	1156	1333
	Gap of primary school classrooms	323	622	648
	Required secondary school classrooms	548	857	989
	Gap of secondary school classrooms	414	685	768
	Stress Scenario	1	1	1
	Required primary school classrooms	591	925	1067
	Gap of primary school classrooms	176	391	381
	Required secondary school classrooms	438	686	791
	Gap of secondary school classrooms	304	514	791
Mwinilunga	Baseline Capacity Index	2020	2026	2030
	Primary school classroom	2.01		
	Secondary school classroom	3.28		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1185	1379	1116
	Gap of primary school classrooms	832	806	243
	Required secondary school classrooms	799	930	752
	Gap of secondary school classrooms	653	678	280
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	889	1034	837
	Gap of primary school classrooms	536	461	-36
	Required secondary school classrooms	600	697	564
	Gap of secondary school classrooms	454	445	92
	Stress Scenario	1	1	1
	Required primary school classrooms	711	827	670
	Gap of primary school classrooms	358	254	-203
	Required secondary school classrooms	480	558	452
	Gap of secondary school classrooms	334	306	-20

District	Variable	Year		
		2020	2026	2030
Ndola	Baseline Capacity Index			
	Primary school classroom	2.72		
	Secondary school classroom	14.17		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	4586	5297	5831
	Gap of primary school classrooms	3576	3999	4164
	Required secondary school classrooms	3896	4500	4954
	Gap of secondary school classrooms	3731	4288	4682
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	3440	3973	4374
	Gap of primary school classrooms	2430	2675	2706
	Required secondary school classrooms	2922	3375	3716
	Gap of secondary school classrooms	2757	3163	3443
	Stress Scenario	1	1	1
	Required primary school classrooms	2752	3179	3499
	Gap of primary school classrooms	1742	1881	1831
	Required secondary school classrooms	2338	2700	2973
	Gap of secondary school classrooms	2173	2488	2700
Samfya	Baseline Capacity Index			
	Primary school classroom	1.65		
	Secondary school classroom	6.53		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1004	1158	1275
	Gap of primary school classrooms	640	703	706
	Required secondary school classrooms	643	741	816
	Gap of secondary school classrooms	584	668	724
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	753	869	956
	Gap of primary school classrooms	389	414	388
	Required secondary school classrooms	482	556	612
	Gap of secondary school classrooms	423	482	520
	Stress Scenario	1	1	1
	Required primary school classrooms	603	695	765
	Gap of primary school classrooms	239	240	196
	Required secondary school classrooms	386	445	490
	Gap of secondary school classrooms	327	371	398

District	Variable	Year		
		2020	2026	2030
Senanga	Baseline Capacity Index			
	Primary school classroom	1.82		
	Secondary school classroom	6.06		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	681	754	812
	Gap of primary school classrooms	457	399	230
	Required secondary school classrooms	465	515	555
	Gap of secondary school classrooms	419	440	454
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	511	566	609
	Gap of primary school classrooms	287	211	27
	Required secondary school classrooms	349	387	416
	Gap of secondary school classrooms	303	312	315
	Stress Scenario	1	1	1
	Required primary school classrooms	409	453	487
	Gap of primary school classrooms	185	98	-95
	Required secondary school classrooms	279	309	333
	Gap of secondary school classrooms	233	234	232
Solwezi	Baseline Capacity Index			
	Primary school classroom	2.4		
	Secondary school classroom	2.6		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school classrooms	1361	1583	1754
	Gap of primary school classrooms	1021	1143	1214
	Required secondary school classrooms	1009	1174	1300
	Gap of secondary school classrooms	776	866	932
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school classrooms	1021	1187	1316
	Gap of primary school classrooms	681	747	776
	Required secondary school classrooms	757	880	975
	Gap of secondary school classrooms	524	572	607
	Stress Scenario	1	1	1
	Required primary school classrooms	817	950	1053
	Gap of primary school classrooms	477	510	513
	Required secondary school classrooms	606	704	780
	Gap of secondary school classrooms	373	396	412

District	Variable	Year		
		2020	2026	2030
Zimba	Baseline Capacity Index			
	Primary school teacher	2.81		
	Secondary school teacher	1.31		
	Targetted Capacity Index			
	Surplus Scenario	0.6	0.6	0.6
	Required primary school teachers	870	947	1053
	Gap of primary school teachers	684	697	789
	Required secondary school teachers	581	899	1000
	Gap of secondary school teachers	316	543	523
	Comfortable Scenario	0.8	0.8	0.8
	Required primary school teachers	653	710	790
	Gap of primary school teachers	467	460	526
	Required secondary school teachers	436	674	750
	Gap of secondary school teachers	171	318	273
	Stress Scenario	1	1	1
	Required primary school teachers	522	568	632
	Gap of primary school teachers	336	318	368
	Required secondary school teachers	349	540	600
	Gap of secondary school teachers	84	184	123

Appendix 4: Electricity Capacity

District	Variable	Year		
		2020	2026	2030
Livingstone	Electricity intensity per household	630.85		
	Electricity connectivity	0.75	0.83	0.9
	Household electricity consumption	19099664	23056756.81	27836340.86
Chingola	Electricity intensity per household	218.5		
	Electricity connectivity	0.55	0.83	0.9
	Household electricity consumption	7122840	12296597.02	14695647.54
Chinsali	Electricity intensity per household	252.87		
	Electricity connectivity	0.19	0.83	0.9
	Household electricity consumption	1231730	8231638.29	10310058.02
Chipata	Electricity intensity per household	206.26		
	Electricity connectivity	0.34	0.83	0.9
	Household electricity consumption	4214883	11377159.57	13641333.21
Choma	Electricity intensity per household	109.09		
	Electricity connectivity	0.27	0.83	0.9
	Household electricity consumption	1541753	5162861.23	4813548.57
Chongwe	Electricity intensity per household	131.36		
	Electricity connectivity	0.27	0.47	0.51
	Household electricity consumption	1491723	3275102.99	4032340.97
Chilanga	Electricity intensity per household	100.87		
	Electricity connectivity	0.47	0.47	0.51
	Household electricity consumption	1484022	1905337.08	2345864.59
Kabwe	Electricity intensity per household	218.99		
	Electricity connectivity	0.6	0.83	0.9
	Household electricity consumption	6779046	11663559.97	14052255.46
Kafue	Electricity intensity per household	210.66		
	Electricity connectivity	0.44	0.83	0.9
	Household electricity consumption	3266879	7945447.58	9801863.03
Kapiri Mposhi	Electricity intensity per household	138.47		
	Electricity connectivity	0.14	0.47	0.51
	Household electricity consumption	1205766	4772411.28	5738412.42
Kasama	Electricity intensity per household	293.29		
	Electricity connectivity	0.26	0.83	0.9
	Household electricity consumption	4860772	18514622.89	22587605.38
Lundazi	Electricity intensity per household	125.36		
	Electricity connectivity	0.09	0.47	0.51
	Household electricity consumption	469365	2162427.74	2587657.33
Mansa	Electricity intensity per household	212.78		
	Electricity connectivity	0.25	0.47	0.51
	Household electricity consumption	2773624	6057171.8	7227243.06
Mbala	Electricity intensity per household	300.31		
	Electricity connectivity	0.12	0.47	0.51
	Household electricity consumption	1193113	5101239.71	6211230.84

District	Variable	Year		
		2020	2026	2030
Mongu	Electricity intensity per household	244.11		
	Electricity connectivity	0.4	0.83	0.9
	Household electricity consumption	2978577	6900152.68	8068081.92
Mpika	Electricity intensity per household	163.75		
	Electricity connectivity	0.41	0.83	0.9
	Household electricity consumption	1545294	4951116.9	6201215.53
Mwinilunga	Electricity intensity per household	180.74		
	Electricity connectivity	0.08	0.47	0.51
	Household electricity consumption	392397	2683375.56	2352947.68
Ndola	Electricity intensity per household	371.71		
	Electricity connectivity	0.61	0.83	0.9
	Household electricity consumption	27815557	43575532.96	52077788.2
Samfya	Electricity intensity per household	154.7		
	Electricity connectivity	0.21	0.47	0.51
	Household electricity consumption	771973	1967164	2347170.01
Senanga	Electricity intensity per household	265.8		
	Electricity connectivity	0.18	0.47	0.51
	Household electricity consumption	791274	2330179.45	2719199.47
Solwezi	Electricity intensity per household	196.62		
	Electricity connectivity	0.4	0.83	0.9
	Household electricity consumption	5034965	11731332.51	1372274.97
Zimba	Electricity intensity per household	255.18		
	Electricity connectivity	0.03	0.47	0.51
	Household electricity consumption	173779	2630893	3169974.24

Appendix 5: Water Supply Capacity

District	Variable	Year		
		2020	2026	2030
Livingstone	Water intensity per capita	30.91		
	Water supply connectivity	0.9	0.96	1
	Total consumption for residential and social categories	5653292.6	6556086.22	7576428.91
Chongwe	Water intensity per capita	43.47		
	Water supply connectivity	0.14	0.65	0.77
	Total consumption for residential and social categories	1297614	7542246.62	10152587.66
Mwinilunga	Water intensity per capita	167.21		
	Water supply connectivity	0.01	0.65	0.77
	Total consumption for residential and social categories	285684	17276390.84	16562563.76
Chingola	Water intensity per capita	28.77		
	Water supply connectivity	0.79	0.96	1
	Total consumption for residential and social categories	6707390.41	9374344.35	10749431.02
Chipata	Water intensity per capita	8.47		
	Water supply connectivity	0.65	0.96	1
	Total consumption for residential and social categories	1647809.37	2705808.37	3112868.62
Choma	Water intensity per capita	17.96		
	Water supply connectivity	0.33	0.96	1
	Total consumption for residential and social categories	1571565.42	4921711.61	4402829.39
Kapiri Mposhi	Water intensity per capita	11.77		
	Water supply connectivity	0.16	0.65	0.77
	Total consumption for residential and social categories	564805.22	2822391.13	3710349.54
Lundazi	Water intensity per capita	13.51		
	Water supply connectivity	0.1	0.65	0.77
	Total consumption for residential and social categories	298859.59	1621720.56	2121704.6
Mansa	Water intensity per capita	13.9		
	Water supply connectivity	0.1	0.65	0.77
	Total consumption for residential and social categories	375492.92	2753267.33	3591657.23
Mbala	Water intensity per capita	23.43		
	Water supply connectivity	0.12	0.65	0.77
	Total consumption for residential and social categories	464986.89	2769511.4	3686793.62
Mongu	Water intensity per capita	19.21		
	Water supply connectivity	0.21	0.96	1
	Total consumption for residential and social categories	610976.02	3144594.41	3527906.16
Samfya	Water intensity per capita	8.06		
	Water supply connectivity	0.11	0.65	0.77
	Total consumption for residential and social categories	105807.11	713081.31	930222.35
Senanga	Water intensity per capita	66.79		
	Water supply connectivity	0.03	0.65	0.77
	Total consumption for residential and social categories	171977.69	4074765.83	5198739.86
Solwezi	Water intensity per capita	27.65		
	Water supply connectivity	0.69	0.96	1
	Total consumption for residential and social categories	3311857.92	5361362.45	6187740.59

District	Variable	Year		
		2020	2026	2030
Zimba	Water intensity per capita	13.76		
	Water supply connectivity	0.08	0.65	0.77
	Total consumption for residential and social categories	112680.7	987033.97	1300254.54
Chinsali	Water intensity per capita	7.39		
	Water supply connectivity	0.14	0.96	1
	Total consumption for residential and social categories	136655.17	1393571.28	1674730.03
Mpika	Water intensity per capita	4.87		
	Water supply connectivity	0.34	0.96	1
	Total consumption for residential and social categories	193989.8	853056.16	1025160.96
Kafue	Water intensity per capita	27.82		
	Water supply connectivity	0.27	0.96	1
	Total consumption for residential and social categories	1348917.38	6075518.87	7191416.22
Kabwe	Water intensity per capita	2.18		
	Water supply connectivity	0.93	0.96	1
	Total consumption for residential and social categories	521566.46	672491.89	777396.81
Kasama	Water intensity per capita	1.18		
	Water supply connectivity	0.51	0.96	1
	Total consumption for residential and social categories	610976.02	3144594.41	3527906.16

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