



**Driving Digitalisation
of the Economy in
Zambia**
Leveraging policy
reforms



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1. Executive Summary

The digitalisation of the economy is a key driver of social and economic growth in Zambia. By taking advantage of the opportunities offered by digitalisation, the Government of Zambia can deliver on the development objectives that it has defined and achieve sustainable economic growth.

Adoption of digital technologies across both public and private sectors accelerates economic growth by promoting innovation and investment. It increases productivity across all sectors of the economy, improves access to global value chains (GVCs) and improves the efficiency and transparency of government and public services. Moreover, access to emerging technologies such as mobile money¹, artificial intelligence (AI) and cloud computing are desirable as drivers of digital and financial inclusion which in turn supports human development.

This study identifies opportunities and quantifies the economic value of adopting digital technologies across selected sectors of Zambia's economy. Accelerated development of the digital economy would benefit both the Government of Zambia and the country's citizens in multiple ways. Economic growth would raise incomes, create jobs and raise tax revenues. Digital technologies would also provide direct benefits through enhanced access to information, productivity-enhancing technologies and improved educational outcomes.

Mobile connectivity and mobile money both play a key role in digitalisation. Mobile broadband connectivity provides the foundation for the digitalisation process. Mobile money is also critically important, providing individuals and businesses an accessible and efficient route to financial inclusion.

¹ The term Mobile Financial Services is often used to refer to broad set of financial services provided over mobile networks, including mobile money. For simplicity and consistency, the term "mobile money" is used throughout this report to refer to mobile financial services.

The mobile telecoms sector in Zambia has made steady progress in recent years but there remain significant challenges. These challenges include expanding access and increasing adoption of digital services, particularly among low-income households and in rural areas. This will require further network rollout and upgrades, support to ensure that devices and services are affordable for everyone and boosting adoption through stimulating demand for digital services.

Policy plays a critical role in the future development of the digital economy in Zambia. The growth and development of the digital economy is strongly influenced by policy and regulatory decisions taken by the government. The study identifies how opportunities for economic growth and development can be unlocked through policy reforms. Overcoming the challenges facing the sector will require bold policy initiatives on the part of government to stimulate demand, reduce the cost of supply and promote investment in mobile telecoms networks and in mobile money services.






This report identifies a series of specific policy recommendations that, if implemented, would increase the number of internet users in Zambia by 2.1 million by 2028. This would reduce the internet usage gap by 9 percent points.

The priority policy reforms include:

- Reducing sector-specific taxes and fees on mobile telecoms services
- Reducing operating costs and improving the financial sustainability of the mobile business
- Modernizing the tariff regulation regime, to provide more certainty for operators
- Lifting restrictions on mobile money charges and removing the mobile money levy
- Stimulating additional demand for mobile telecoms services

If adopted, they will help Zambia to achieve its economic development objectives, including economic transformation across important sectors such as agriculture and manufacturing. The potential macroeconomic impacts are summarised below in Figure 1.

Figure 1: Sectoral impact of increased digitalisation of in Zambia following policy reforms (2028)

	 Agriculture	 Manufacturing	 Transport	 Trade	 Government
Digital Value Add (ZMW)	1,016,432,834	15,447,988,896	3,540,538,936	2,833,145,319	5,804,916,278
% of sector GDP	5.06%	5.95%	7.46%	2.42%	3.57%
% of Total GDP	0.14%	2.15%	0.49%	0.39%	0.81%
Employment	274,153	56,851	26,896	21,522	
Tax Revenue (ZMW)	229,602,013	3,489,546,212	799,772,340	639,979,196	

See separate methodological document that accompanies this report.²

More details on these policy reforms and the explanation behind them is provided in the rest of this report, particularly in Section 5. More details on the modelling methodology and assumptions are provided in the separate methodology report published to accompany this series of country digital economy studies.³

² GSMA, Driving digital transformation of African economies: Evidence and methodology document, May 2024

³ GSMA, Driving digital transformation of African economies: Evidence and methodology document, May 2024



2. Digital Economy Framework

A. Introduction

The African Union Agenda 2063 includes an aspiration to achieve an integrated, prosperous, and peaceful Africa, driven by its citizens and recognised as a global powerhouse. It recognises ICT as a key enabler of the broader goal of African countries being better connected and more integrated.⁴

Digitalisation has the potential to drive the economic transformation of Zambia in a way that supports its development objectives.

The digitalisation of the economy is a driver of both economic growth and socio-economic development. The mobile sector is the backbone of this digitalisation process, and a growing sector is an essential pre-requisite of a national digital transformation programme.⁵

The Government of Zambia recognises the importance of digital transformation in its development agenda. Enhancing the country's digital capacity is identified as one of the development outcomes in the 8th National Development Plan (8NDP).⁶ The 8NDP also highlights the role of digital in supporting development of other sectors such as trade, manufacturing and agriculture.

The government's strategy for ensuring that the ICT sector continues to grow and play its full role in contributing to the economic development of the country is articulated in the National Information & Communications Technology Policy 2023. The objectives of this policy include enhancing the availability and usage of ICT products and services, together with enhancing digital skills and the deployment of ICT in public service delivery.

This report focuses on the role of digitalisation in supporting the government to achieve the country's objectives, as laid out in the country's Vision 2030 and subsequent national

development strategy documents up to and including the 8NDP. The report identifies some key policy recommendations which, if adopted, would accelerate this process and support the government in major pillars of the national development strategy. These include improved coverage and quality of infrastructure and affordable access to digital services, better delivery of public services and enhanced job-creation.⁷

B. How does the digital economy drive development?

The process of digitalisation is continuing across every country in Africa. Digital services, mostly using mobile telecoms networks, are becoming more widely available, and their usage is continuing to grow. As they do so, they are becoming more integrated into other sectors of the economy.

The mobile telecoms industry, and the digital sector more broadly, make a significant contribution to the economy and to public services in Zambia. Widespread adoption of digital technologies across the public and private sectors enables better interactions between individuals and a more efficient use of resources, thereby raising productivity and supporting innovation. This directly benefits users of digital technologies. It also benefits the government through increased tax revenues, improved productivity in the public sector and enhanced delivery of public services.

Most of the economic impact of mobile technology is therefore realised outside of the mobile sector itself, through the positive impact that it has on productivity in sectors such as agriculture, manufacturing and retail; and in public services such as government administration, education and healthcare.

⁴ See, for example, African Union Commission, Agenda 2063 The Africa We Want, Aspiration 2, para 25

⁵ Throughout this study, the term digitalisation is used to denote the adoption of new technologies by consumers, businesses and governments across economic sectors. Digital transformation is the economic transformation resulting from such adoption. The digital economy encompasses the actors and exchanges taking place in the economy as a result of digitalisation.

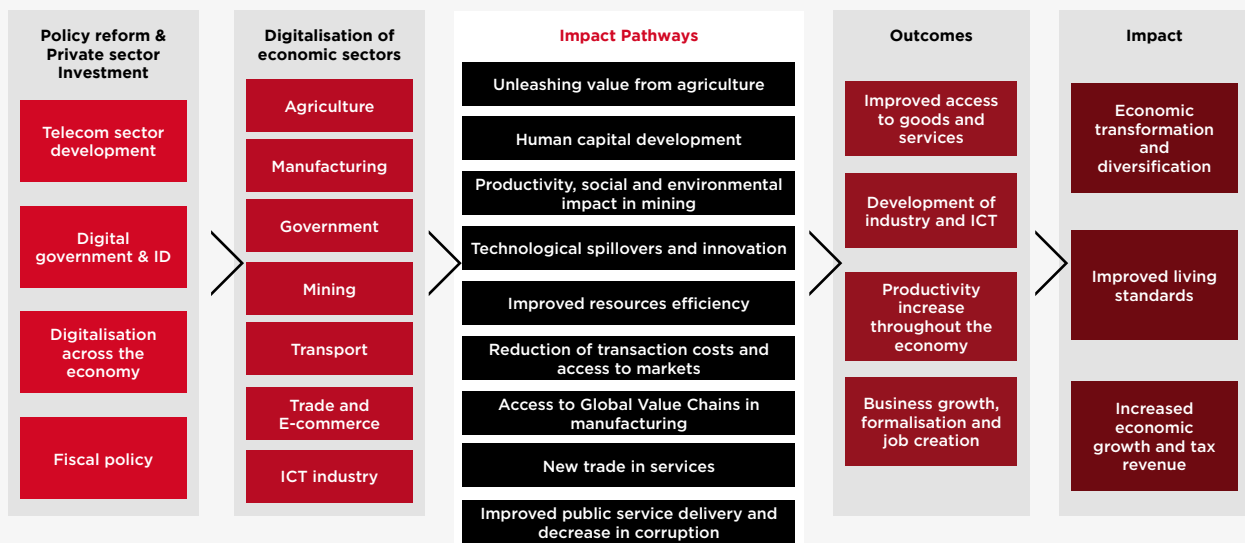
⁶ 8NDP, section 5.2 (i)

⁷ See, for example, Vision 2030 Annex 1: Sector Visions and Targets/Goals

In turn, the **adoption of digital technologies across economic sectors and public services can unlock important pathways for inclusive digital transformation**, for example through increasing value from agricultural resources, improving access to GVCs, enhancing education and healthcare provision, reducing transaction costs and improving efficiency, transparency and governance of government-to-business and government-to-citizen services. Access to emerging technologies such as AI, big data and cloud computing and to services such as mobile money drive increased digital and financial inclusion which, in turn, support human development.

As digitalisation works through each sector of the economy, the resulting effects include improvements in productivity, job creation and formalisation of the economy. These lead to increased standards of living, higher economic growth and greater availability of public resources.

Figure 2: Digital pathways to economic transformation



Source: Authors' synthesis based on literature, Government's strategy, discussion with stakeholders

C. The role of the mobile telecoms sector in the digital economy

The mobile telecoms sector provides the digital connectivity which forms the foundation of the digital transformation process. This is recognised by the Government of Zambia and reflected in the National Information and Communications Technology Policy 2023. Mobile network operators provide a technology platform for citizens to access information and communications services which enable many economic activities to be conducted digitally. This is particularly important in the delivery of public services. Digital technology helps to enhance transparency and reduce leakage in the system which results in a more efficient use of public resources. Mobile money services also play an increasingly important role in economic development through enhancing financial inclusion, reducing transaction costs and providing citizens and small businesses with access to a range of financial services.

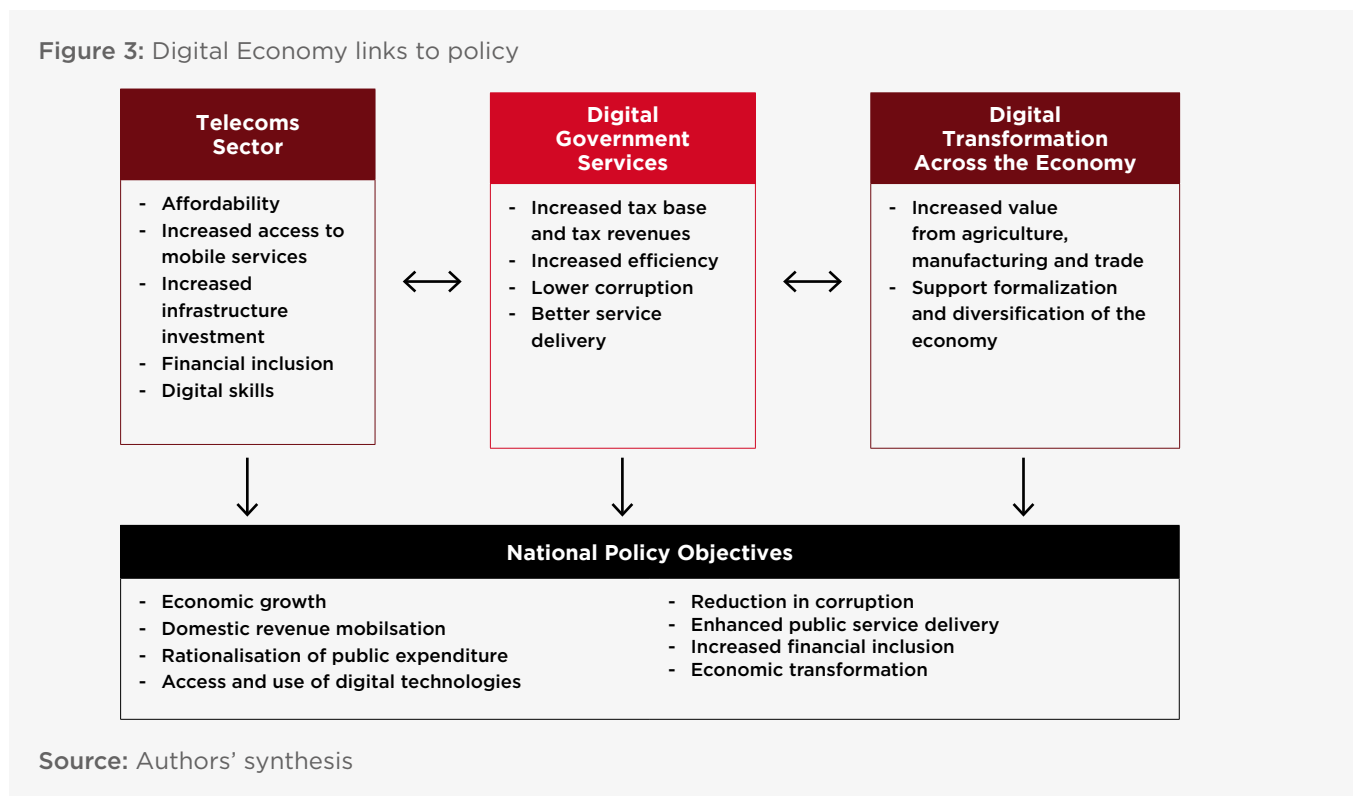
The mobile sector in Zambia continues to face several challenges such as financial sustainability, service affordability and the pace of digital adoption. These risk undermining future investment in mobile infrastructure and jeopardising the gains achieved in digital and financial inclusion. If these challenges are addressed, the mobile sector can support a greater economic impact through increased access, adoption and usage of digital technologies.

D. This study

This study examines the role of digital technologies in supporting the economic transformation of Zambia. The starting point is an analysis of how digital technologies can drive socio-economic development through enhanced productivity and job creation, as well as how they can be used to improve the way in which government functions.

It identifies opportunities and quantifies the economic value of adopting digital technologies across specific sectors of the economy. It explains how these can be unlocked through policy reforms, recognising the role that the mobile telecoms sector plays in supporting the process of digitalisation.

The potential quantitative impacts of digitalisation on each sector are based on these policy reform scenarios. Their impact on adoption and usage is modelled and these effects flow through to the other sectors of the economy. This is summarised in Figure 3 and more details are provided in Section 5 of the report.



The sections that follow consider how digitalisation affects outcomes in some of the major sectors of the economy. It is organised as follows:

- Section 3 provides an overview of the economy of Zambia and summarises its development strategy
- Section 4 focuses on the economic contribution of the ICT sector to the economy now and in the future
- Section 5 summarises the mobile market and describes the impact of addressing some key policy challenges
- Section 6 provides a summary of the policy recommendations

3. The Economy of Zambia



A. The economy of Zambia

Table 1: Zambia – key economic indicators

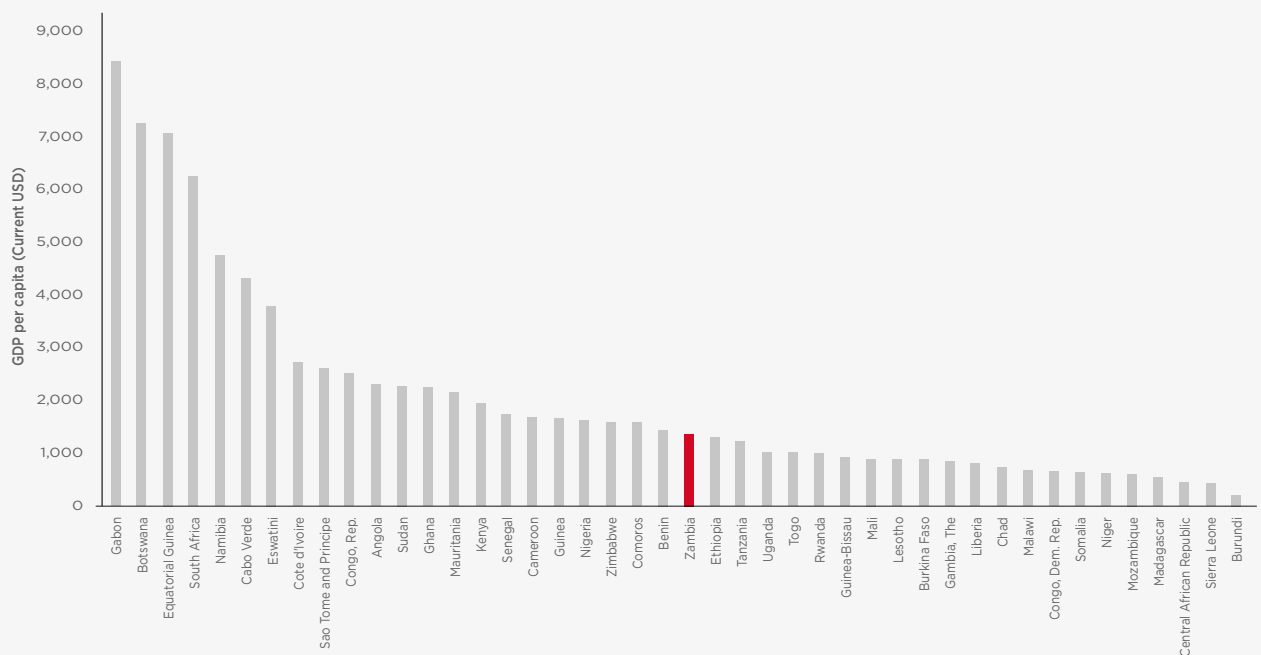
Gross Domestic Product (GDP, Kwacha billion)	569.2
Gross Domestic Product (GDP, US\$ billion)	28.2
GDP growth (annual %)	5.8
GNI per capita (Atlas method, current US\$)	1,320
Infant mortality rate (per 1,000)	39
School enrolment, primary (% gross)	94.8
Life expectancy (years)	61.8
Population, of which % rural pop	19.7 million (53%)
Net ODA received (% of GNI)	6.7

Data for most recent year available (2023 or 2022 in most cases)

Source: Zamstats, World Bank

Zambia is a large country in central southern Africa with a GDP per capita just below the average for Sub-Saharan Africa. Despite being one of the geographically bigger countries in the region, it has a relatively small population of around 20 million. This population is young but still largely rural with over half of Zambians living in rural areas.

Figure 4: GDP per capita, 2023



Source: World Bank

Zambia’s economic development since independence has seen cycles of growth followed by slow-downs. The country has suffered from a number of external economic shocks such as fluctuations in the global copper price and major adverse weather events such as droughts and floods. The economic performance of the country has also been affected by policy decisions which have resulted in slowdowns in investment, exports and economic growth. Together, the combination of adverse external events and an uncertain policy environment have affected long-term trends in growth and economic development.

Between 2001 and 2010 Zambia enjoyed a period of sustained economic growth in which real GDP grew at 7.7% per year. This growth was particularly notable when put in an international context of the global financial crisis which affected most countries around the world, including in sub-Saharan Africa. This period of growth saw the country reaching the completion point of the Heavily Indebted Poor Countries (HIPC) Initiative which released public funds for investment. It was also driven by a sustained increase in the value of mining output as a result of increased output volumes and higher global copper prices.⁸

Between 2011 and 2019, economic growth slowed to an annual rate of 4.1%. This was driven - in part - by a decline in copper prices which, by 2016, had fallen by 41.3% from their 2011 level. This period also saw continual decline in the value-added by the agricultural sector which suffered from more frequent floods, rising temperatures and droughts that affected both arable and livestock output. The decline in the value of output from the mining and agriculture sectors was offset, to some extent by other sectors and by public spending. This resulted in large public sector deficits which increased from 1.8% of GDP in 2011 to 9.4% in 2019. The growing levels of public debt increased government interest payments which limited public spending on other areas and resulted in drops in foreign investment inflows.⁹

The economic slow-down, combined with a continually growing population, adversely affected household incomes. GDP per capita grew at only 0.9 percent per year over this period. This slow-down was exacerbated by the COVID-19 pandemic and a government debt crisis which led to the country defaulting on its external debts in 2020. In recent years, the economy has stabilised and begun to grow again.

The largest sector of the economy is Services which contributed 57% of GDP. Industry contributed just over one-third of total GDP, manufacturing accounted for 8.1% while construction, utilities and industrial activities accounted for about 10.8%.

The economy is heavily affected by the performance of the mining sector, particularly copper mining. Mining and quarrying together contributed around 14% of the total GDP of the country.¹⁰ The sector is dominated by the copper mining industry which is estimated to have contributed 12.9% to total GDP in 2022 and accounted for 70% of export revenues. The role of mining in the country's overall economic performance is even more significant than these figures suggest as it is also subject to external shocks through the global copper price, as well as fluctuations in production and export volumes. The close relationship between the value of copper production and government revenue means that volatile global copper prices affect both the economy in general and the public finances. Economic diversification is therefore a high priority in the country's national development strategy. Successfully reducing the country's exposure to external shocks arising from fluctuations in the global copper price will support sustained long-term economic growth and development in the country.

Agriculture is also a critical sector for the economy and for the country's future development.

This is not because agriculture has a particularly large share of total GDP. This has declined steadily in recent years from 15.5%¹¹ in 2001 to 9.3% in 2012 and then further to 2.8% in 2023.¹² Rather, the importance of the agricultural sector in the country's overall development arises because of the large number of people employed in it, the amount of public resources dedicated to supporting it, its vulnerability to shocks and the direct impact that agricultural output has on poverty levels.

8 World Bank, Zambia Country Economic Memorandum, June 2024, page 4

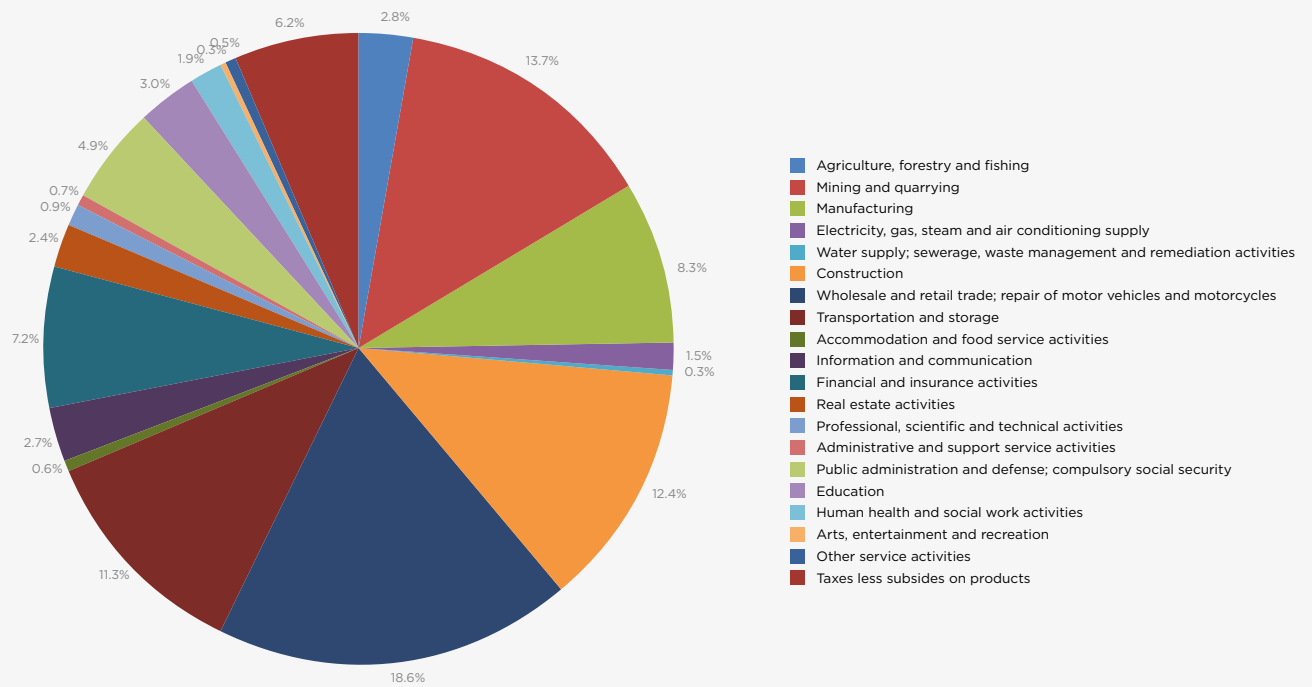
9 World Bank, Zambia Country Economic Memorandum, June 2024, page 4

10 Source: Zamstats. Note that the AfDB estimates a higher figure of 20.9%. AfDB, COMBINED COUNTRY STRATEGY PAPER 2017-2021 UPDATE AND EXTENSION TO DECEMBER 2022 AND 2021 COUNTRY PORTFOLIO PERFORMANCE REVIEW, December 2021

11 World Bank, Zambia Economic Memorandum page 38

12 Zamstats, The Monthly, Vol 252, March 2024

Figure 5: Composition of GDP by sector in Zambia, 2023



Source: Zamstats¹³

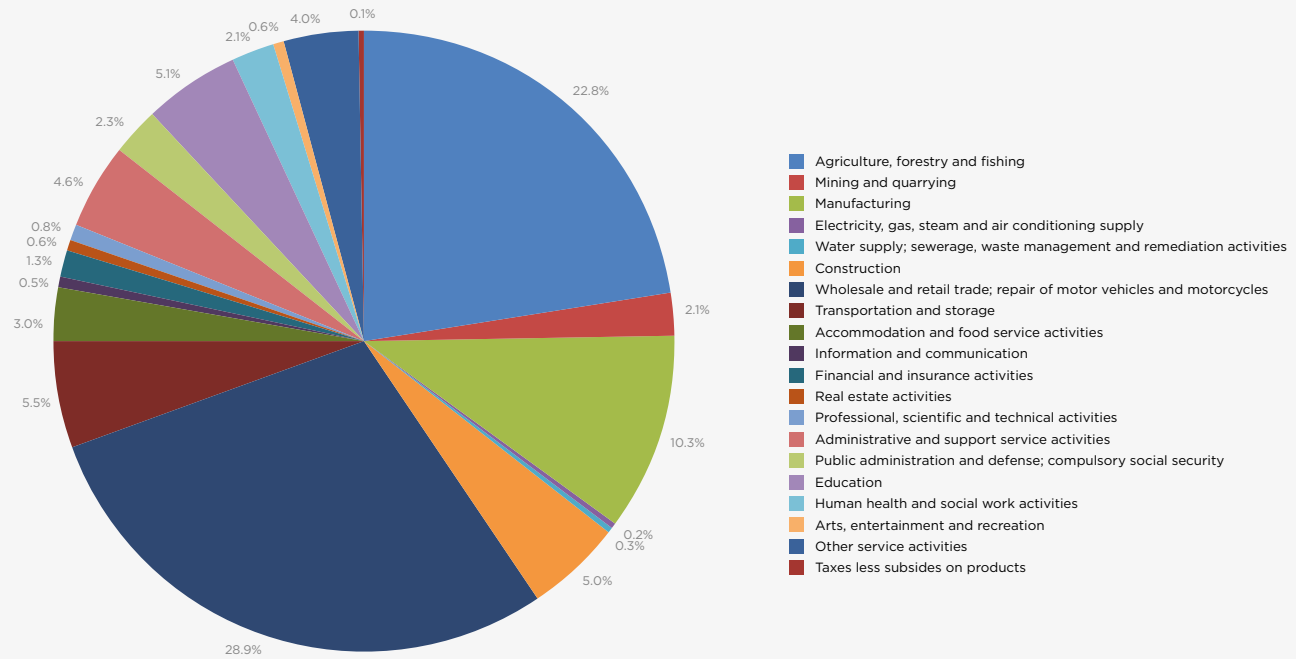
Employment in Zambia follows a very different sectoral pattern to that of value-added. Agriculture is one of the largest source of employment in the country, accounting for 23%¹⁴ of all jobs, despite accounting for only 3% of GDP^{15,16}. Mining and quarrying, by contrast, accounts for 14% of total GDP but only 2% of jobs (Figure 6). This illustrates the unbalanced nature of the economy in Zambia. Investment intensive industries such as mining have high labour productivity. They are therefore important to the macroeconomy but employ relatively few people. Agriculture and other informal forms of economic activity tend to have low rates of labour productivity but employ large numbers of people. Macroeconomic strategy needs to balance these two factors – the need to grow national output and tax revenues, while ensuring that sectors that employ the majority of the Zambian workforce are also supported.

13 Zamstats, The Monthly, Vol 252, March 2024

14 Zamstats, The Monthly, Vol 252, March 2024

15 Note that World Bank estimates that 58.7% of jobs are in agriculture, while the Department of Agriculture also estimates that 60% of the total labour force is “directly involved in the agricultural sector”. Source 1: World Bank Country Economic Memorandum, Figure 52. Source 2: Department of Agriculture National Mechanisation Plan, pp. 19-20.

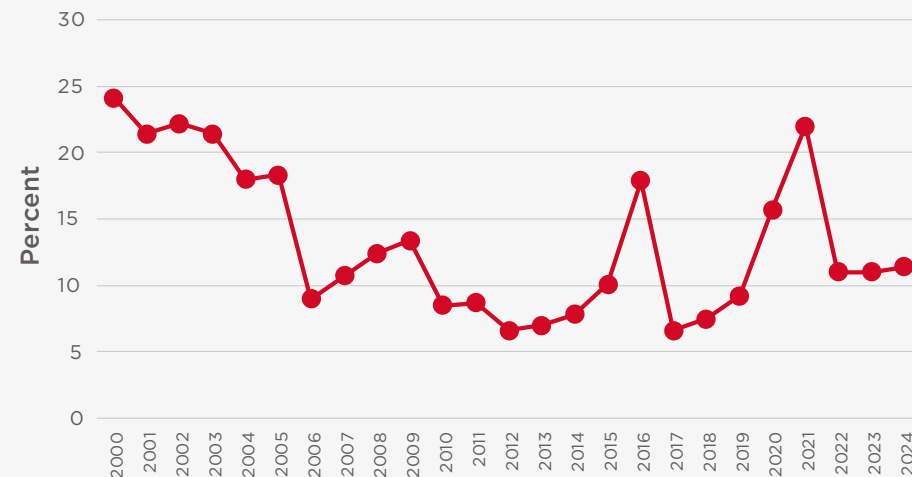
Figure 6: % of employed population by sector, 2022



Source: Zamstats¹⁷

Following a period of slow economic growth, compounded by the COVID-19 pandemic, the economy has experienced steady growth in real GDP in recent years. GDP growth was 5.2% in 2022 and 5.8% in 2023.¹⁸ It is projected to grow at 4.5% in 2024 and 2025¹⁹, as a result of continued improvement in the mining, services and manufacturing sectors, although this may be adversely affected by the ongoing drought. Inflation has fluctuated over time, driven by external shocks and fiscal imbalances. Since 2000, the average rate of CPI inflation was 13.2%. It has trended downwards over the period but with significant short-term fluctuations. Most recently, spikes in inflation have been driven by fiscal imbalances (2015-2016) and external shocks such as the COVID-19 pandemic (2021-2022) (Figure 7).

Figure 7: Inflation rate, average consumer prices (Annual percent change)



Source: IMF

17 Zamstats, 2022 Labour Force Survey Report, June 2023

18 African Development Bank

19 African Development Bank, Zambia Economic Outlook

Recently inflation has risen again, partly due to the effects of the floods and the subsequent drought. Inflation has risen in the last year, from 10.3% in July 2023 to 15.4% in July 2024.²⁰ It is hoped that ongoing reforms will reduce the fiscal deficit and improve the country's debt sustainability thereby putting downward pressure on inflation.

The country has been suffering from extensive adverse weather events, including both floods and drought, which impact the economy in several different ways. Most of the agriculture in Zambia is rain-fed and undertaken by smallholder farmers which are vulnerable to adverse weather. When rains fail, agricultural output falls which hits GDP. It also increases demand for government subsidies to smallholder farmers and income support payments.

Adverse weather events can also have a further negative effect on the economy through the impact on electricity generation. Zambia has a total installed electricity generation capacity of 2,800 MW. This is heavily dependent on hydropower which accounts for 83 percent of installed capacity with only 3% from solar. 43% of Zambians are connected to the national power grid so power cuts arising from lack of generation capacity affect many households. However, the major economic impact of power shortages is on the mining industry which consumes 51% of the total generated electricity.²¹ The heavy reliance on hydropower means that the recent drought has resulted in a shortfall of 1,300 MW of generation capacity.²² This has a direct impact on the economy, with major consumers of electricity such as the mining industry being directly affected. The mobile networks are also dependent on electricity from the national grid. Power outages drive up costs as MNOs are forced to rely more on diesel generators and reduce the quality and reliability of the networks.

Economic growth in recent decades has largely benefited the urban population, particularly those working in the formal sector. For example, between 2006 and 2010 when economic growth was at its peak, household expenditure in rural areas grew by less than 1 percent. The economic growth that happened in subsequent years benefitted rural populations even less, with real household expenditure for many households declining.²³ As a result, poverty and inequality have increased for many Zambians over the past 20 years, despite periods of relatively high rates of growth of the national economy.²⁴ The impact of this rural-urban divide on poverty is exacerbated by population growth in rural areas. Between 1996 and 2022, the number of rural poor in the country increased by around 4.8 million.²⁵

This situation highlights two structural challenges facing the country – 1. the need for economic diversification to raise productivity and economic output, and 2. the need to protect against adverse external shocks – particularly those related to climate change – which impose a range of different costs on the country.

²⁰ Zamstats. Year-on-Year Inflation for July 2024 at 15.4 Percent – Zambia Statistics Agency (Zamstats.gov.zm)

²¹ International Trade Administration

²² ZESCO

²³ World Bank, Zambia Country Economic Memorandum, 2024., page 22

²⁴ World Bank, Zambia Poverty Assessment: Stagnant Poverty and Inequality in a Natural Resource-Based Economy, December 2012

²⁵ World Bank, Zambia Country Economic Memorandum, 2024., page 37

B. Zambia's economic strategy

The Government's economic strategy is articulated in the 8NDP which runs from 2022 to 2026 and is anchored in the country's Vision 2030.²⁶ This identifies some of the key economic and development challenges that the country faces and defines a medium-term strategy for addressing them. In addition to macroeconomic stability and management, it identifies some major reforms that will support long-term sustainable growth.

Reform of the Farmer Input Support Programme (FISP) is one policy priority that has implications for both macroeconomic stability and medium-term economic development. The FISP has been a significant drain on the public expenditure and has had mixed results in terms of agricultural productivity and poverty alleviation. Improving the performance of this programme is therefore a priority from a short-term macroeconomic perspective as well as in terms of long-term economic development. This is discussed in more detail in Section 4.B below.

The 8NDP identifies some key strategic shifts that are required to enable the country to achieve the Vision 2030 goals. The 8NDP highlights the importance of industrialisation through improving the value-added in agriculture, mining, manufacturing and tourism. These sectors have strong linkages within the rest of the economy and therefore growth in these sectors has both direct and indirect benefits. The 8NDP also focuses on micro, small and medium enterprises (MSMEs) across all sectors as they have high income, value-added and job creation potential.

The 8NDP also highlights the importance of making progress on human and environmental development as a complement to economic development plans. It identifies the importance of health, education and wellbeing for Zambians if they are to be able to participate in the economic transition. Environmental sustainability is highlighted as a development objective in itself, but it is also a complement to the country's economic strategy.²⁷

The 8NDP pinpoints some of the key challenges facing the country. These include low levels of diversification and industrialisation, low private sector competitiveness, inadequate infrastructure such as transport, energy, agriculture and ICT, especially in rural areas and limited access to finance.²⁸

The government has implemented policies to help address some of these challenges. Systems that provide direct financial and technical support to farmers is one way in which the government has attempted to address rural poverty. Similarly, investment into infrastructure and social services is a way of mitigating regional income disparities. Underpinning all of these policies is the need for digital connectivity which improves the reach and efficiency of public service delivery. It also helps to stimulate economic activity in areas that otherwise suffer from distance from the large centres of economic activity.

²⁶ Republic of Zambia, Vision 2030 "A prosperous Middle-income Nation by 2030", December 2006

²⁷ 8NDP, Section 4.2

²⁸ 8NDP, Section 5.1





4. The overall economic impact of the mobile sector

A. Current contribution of the mobile sector to the economy of Zambia

The ICT sector is an important component of the Zambian economy. The total GDP of the country was ZMW 494 billion in 2022 and ZMW 569 billion in 2023.²⁹ GDP is the sum of all of the economic value-added by activity that takes place within the geographical borders of the country. Individual companies each make a contribution to that total GDP according to how much value-added they generate in a year.

The ICT sector is broader than just the MNOs. It would typically include any companies directly or indirectly involved in the production and supply of ICT-related products and services. This would include the mobile tower companies who build and manage sites on behalf of the MNOs. It would also include retailing of devices and other ICT-related goods. The ICT sector also usually includes other industry segments such as broadcasting, internet service providers and digital content creation. In Zambia, the MNOs have outsourced their towers to independent tower companies so these would be included in the value-added by the ICT sector. Also included are broadcasters and other providers of digital content. The MNOs and the tower companies are the largest segment of the sector and these other components are relatively small. Over the past 3 years, the Zambian Statistics Agency (Zamstats) has calculated the direct contribution to GDP by the ICT sector that has ranged between 2-3%.³⁰

The overall contribution that the sector makes to the country's national GDP is greater than the direct value-added by companies. The narrowest measure of the contribution of a company to the national economy is the direct value-added contribution that a company makes. This is the difference between the revenue that company generates in a year and the cost of direct inputs. However, the total contribution of the ICT sector to the economy is greater than indicated only by the direct contribution to GDP. For example, companies in the sector pay local suppliers who also contribute to the overall economy. Similarly, employees in ICT companies spend much of their incomes locally and this also contributes to the economy. This is the indirect economic impact of the sector. In the case of the ICT sector there is a further economic impact that arises from the use of productivity-enhancing digital technologies in other industries.

These indirect and productivity-enhancing impacts of the ICT sector are not reflected in the national accounts but can be estimated by applying multipliers derived from international research. Starting with the Zamstats estimate of the direct contribution to GDP, it is estimated that the overall economic impact of sector was equivalent to 13.1% and 10.5% of total GDP in 2022 and 2023 respectively. In 2023, approximately 2.9 percentage points of this total figure was from direct value-added while 0.8 percentage points was from indirect value-added. The productivity impact accounted for 6.9 percentage points.

B. The potential economic impact of further digitalisation in Zambia

This section estimates the macroeconomic impacts of increased digitalisation in Zambia for each key sector of the economy, based on academic and policy research and data on the economy of Zambia. These impacts reflect digital pathways to economic transformation and are mapped onto the Government's strategic objectives, as articulated in the 8NDP and the National ICT Policy 2023.³¹

More details on the methodology and evidence review are contained in the separate methodological document that accompanies this report.³²

²⁹ Zamstats, The Monthly, Vol 252, March 2024

³⁰ ZICTA, 2023 Annual Market Report for the Information and Communication Technologies Sector A Supply Side Assessment of Developments in the ICT Sector

³¹ The modelling results presented in this section are based on macroeconomic data from the World Bank.

³² The economic impact modelling presented in this report is based on international benchmarks and research from a wide range of countries. Where possible, analysis from relevant country comparators have been used. More details are provided in the accompanying methodology report.

Table 2: Mapping digitalisation to policy objectives and estimating the impact

Sector	Policy objectives	Outcomes of digitalisation	Impact relationship	Evidence rule
Agriculture	Agricultural development and agricultural productivity, access to markets, increase and diversify production	Precision agriculture, targeted information, better access to markets	Access to technology by farmers → productivity, profits	Access to technology and precision agriculture increase crop yields between 10.5% and 20%, and profits up to 23%
Manufacturing	Diversify and develop manufacturing, attract FDI, increase technology exports	Expand manufacturing capabilities, diversify production, increase FDI and exports	Adoption of new technologies by firms → productivity, GDP, exports	Application of industrial IoT and Industry 4.0 increases value add between 15-25%
Transport	Improve trade links, infrastructure for transport and logistics, strengthen competitiveness of ports	Reduce transaction and logistics costs, border delays and tax leaks. Increases productivity and integration into . Global Value Chains (GVCs)	Digital platforms and infrastructure → increase productivity, port capacity, GDP	Transport upgrades increase incomes by 10%. Digitising ports reduces logistics costs by 15-25%. Digital customs increases revenue by 54% in 5 years
Trade	Economic diversification, strengthen trade and exports	Improves trade flows, growth of E-commerce and exports of ICT ³³ services and digitally delivered services	Digital trade → increased integration in AfCFTA, E-commerce and service exports	Potential to increase E-commerce value to 15% GDP and ICT exports value to 7% GDP
MSMEs	Strengthening competitiveness and formalisation of MSMEs	Improves profits of MSMEs. Facilitates business registration, access to finance, formal contracts	Access to digital by MSMEs → increased incomes and formalisation	Technology adoption is associated with labour productivity of 2-4% for small firms
Government	Strengthen domestic revenue mobilisation, prevent corruption, improve services delivery	Increases tax revenue and provides saving in public expenditure through better targeting, transparency and reduction of corruption	Mobile money, P2G, G2P adoption → increase GDP, tax revenue, reduce leakage	Mobile money adoption increases tax revenue by 7-17%—12% on average. Digital ID for social protection decreases leakage by 41-47%

Note: For details and references see separate methodological document that accompanies this report³⁴

³³ ICT means Information Communications Technologies. A commonly used term over the last 2 decades. More recently, now being referred to as “digital”.

³⁴ GSMA, Driving digital transformation of African economies: Evidence and methodology document, May 2024



Impact of digitalisation on the agricultural sector in Zambia

Agriculture is a critical sector in Zambia. It only accounts for around 3% of GDP but it employs a significant proportion of the country's workforce and farm output has a direct impact on poverty and income levels, particularly in rural areas. Raising agricultural productivity would provide significant growth and development benefits for the country. As noted above, the performance of the agricultural sector also has implications for public expenditure through the programmes of farmer support such as FISP.

Agriculture in Zambia is dominated by smallholder farmers. There are 1.65 million farms in the country with an average cultivated land area of 5.6 Ha.³⁵ 90% of farmers are smallholders who cultivate less than 5 Ha and use hand tools.

In contrast, there are only around 1,500 large commercial farms (defined as farms with >20 Ha cultivated).^{36,37} These are mechanised and irrigated and have significantly higher yields per hectare. For instance, the Department of Agriculture states that commercial farms have an average maize yield of over 8MTs/Ha, whereas small and medium sized farms achieve maize yields of less than 2MTs/Ha.³⁸

This sector structure means that agricultural productivity is low and falling. Although large commercial farms have high productivity, their small number means that they have not offset the general decline in productivity in the rest of the sector. The total value-added by the sector has declined at an average annual rate of 1.1 percent between 2001 and 2019 and it has also declined as a share of total GDP. Agriculture now contributes a much smaller share of total GDP than many other countries in the region (Figure 8). In 2019, Zambia became a net importer of agricultural products after many years of being a net exporter.³⁹

³⁵ World Bank, Zambia Country Economic Memorandum, 2024., page 42

Note that the Department for Agriculture estimates that there are more than 3.8m small- and mid-scale farmers. Source: Department of Agriculture, National Mechanisation Plan, page 26-27

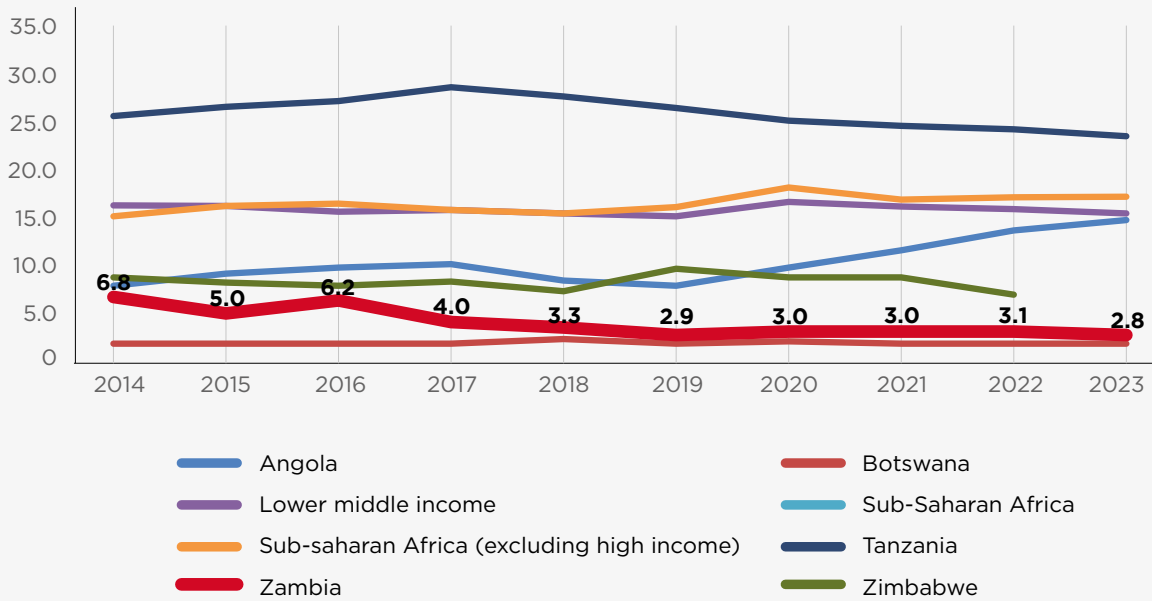
³⁶ Department of Agriculture National Mechanisation Plan, page 27

³⁷ World Bank, Zambia Economic Memorandum, page 44

³⁸ Department of Agriculture, National Mechanisation Plan, page 18

³⁹ World Bank, Zambia Country Economic Memorandum, 2024., page 40

Figure 8: Value added by Agriculture Forestry and Fishing as a % of total GDP



Source: World Bank

One of the reasons for low agricultural productivity is the predominance of rain-fed farms which account for a large majority of the total. Only 5.6% of total irrigable land in the country is irrigated.⁴⁰ In addition to limiting productivity, this dependence on rain for irrigation exposes farmers to climate-related events such as flooding and drought. As a result, national agricultural output is strongly correlated with overall rainfall which has been increasingly volatile in recent years.⁴¹ There were extreme droughts in 2015, 2018 and 2020/21. In early 2023 the country experienced the worst flooding in 50 years and this has been followed by a severe drought in 2024 which has affected both agriculture and energy production. This has a direct impact on household incomes and poverty with low-income rural households exposed to external shocks which they cannot protect themselves against.

The country’s overall strategy for improving agricultural output and supporting small-scale farmers has been to subsidise inputs such as a fertilizer and improved seeds. This has resulted in improved yields but they have been declining in recent years, partly as a result of environmental degradation. The approach to subsidising inputs has also imposed a very significant fiscal burden on the government. Since 2011, the government has spent between 4 and 10 percent of the national budget on agriculture and this expenditure has been overwhelmingly on the FISP and on the Food Reserve Agency (FRA). The dominance of these two programmes in the government’s agricultural expenditure has gone up in recent years rising from between 40-50% in the period 2011-2014 to 80-90% in 2021-2023.⁴²

The strategy for addressing the challenges of the agricultural sector involves several different components. It will require increasing productivity and resilience among smallholder farmers. This will require investing in infrastructure and services in the agriculture supply chains. It will require an expanded and more effective agricultural extension service that supports small-scale farmers to adopt new farming techniques, diversify their production and change the way that agricultural inputs are used.

40 World Bank, Zambia Economic Memorandum, page 41
 41 World Bank, Zambia Economic Memorandum, page 17
 42 World Bank, Zambia Economic Memorandum, page 23

Reform and improvement of the FISP is recognised as an important challenge that needs to be addressed. The programme needs to be more efficient and better targeted, reducing the overall cost to the government and improving its effectiveness. The government’s shift from direct input support towards an e-voucher system will have multiple benefits including more flexibility for farmers, stimulating private-sector participation in supply chains and reducing the cost of administration to both the government and to recipients.

The exposure of Zambia’s agricultural sector to the increasing risk of climate-related events also requires a new strategy towards the agricultural sector. It will involve greater investment in physical infrastructure such as flood control and irrigation. It will also require better information about soils, weather forecasting and emergencies.

One of the challenges facing the agricultural sector is greater participation of the private sector throughout the entire agricultural value chain. Markets that function more effectively at all levels from small-holder farmers through to large commercial farms, input suppliers and agricultural commodity traders. For these markets to work, greater availability of private finance is required at all levels, including microfinance for smallholder farmers. An important part of the strategy for mitigating agricultural market volatility is also to improve information and the provision of financial services to participants in value-chains.

Digital connectivity and services are all essential to successfully addressing these challenges. For example, the transition from direct input support to an e-voucher scheme requires affordable connectivity throughout rural areas. It also requires farmers to have basic digital skills and have access to mobile financial services. For many of these farmers issues such as the affordability of devices are critical and, by addressing these, the government – working together with the industry – can provide the foundation on which the country’s agricultural strategy is built. Similarly, programmes such as an enhanced agricultural extension service require digital skills and network coverage for extension workers. Approaches that involve microfinance and the use of other form of digital financial services to support farmers also require the digital foundations of coverage, affordable services, affordable devices and digital skills to be in place.

The policies described in this report would increase the level of digitalisation of agricultural value chains and the adoption of digital technologies by small scale farmers. This has the potential to add 1 bn Kwacha in value-added, equivalent to 0.14% of GDP, plus close to 300,000 jobs and 250 million Kwacha in tax revenue by 2028.

Table 3: Potential impacts of increased digitalisation of agriculture in Zambia in 2028

Digital agriculture value add (Kwacha)	1,016,432,834
% Sector GDP	5.06%
% of GDP	0.14%
Employment	278,477
Tax (Kwacha)	229,602,013

Constant 2023 Kwacha. See separate methodological document that accompanies this report



Impact of digitalisation on the mining sector in Zambia

Mining is a key sector for the economy of Zambia. As noted above, the mining sector is a major source of value-added to the overall economy. It also is a key driver of jobs, tax revenue and exports. Increasing the performance of the mining industry is therefore a central pillar of the government's overall economic development strategy.⁴³

Digital technologies can be used throughout the production process to improve the productivity and safety of mines. At one end of the production process, the application of advanced mapping and sensing technologies can improve the identification and evaluation of deposits. They are applied throughout the extraction process and also further downstream in areas such as transport logistics, safety and health. In addition to the physical processes of mineral extraction, digital technologies can also be applied to monitor environmental impacts within the mines and in surrounding areas.

There are many examples of practical applications of digital technologies in the mining industry that can have positive impacts on both business performance and human welfare. For example, networks of Internet of Things (IoT) devices can be used within mines to improve safety through monitoring air quality and tracking structural stability. Outside of the mines itself, such networks can be deployed to monitor environmental impacts such as water and air quality.⁴⁴ The advantage of digital technologies to mining operations has been seen globally and advancement in this area has begun to be built into explicit company goals. PwC's 2022 Global CEO survey reported that 49% of top executives at global mining and metals companies included automation and digitalization goals in their long-term strategy.⁴⁵

As part of its Digital Acceleration Index research, BCG found that mining companies that successfully digitalised experienced significant gains in productivity and safety, and reductions in cost. Metal production increased in the range of 3-5%, while asset lives increased by 8-10% and fuel costs reduced by 5-10%. Large improvements were seen in emissions, which reduced 15-30%, overhead cost, which reduced by c. 30%, and injuries, which reduced by 5-12%. Large improvements were also seen in procurement, contract costs, role filling and other areas.⁴⁶

⁴³ McKinsey & Co., How digital innovation can improve mining productivity, 2015

⁴⁴ Moshood Onifade, John Adetunji Adebisi, Amtenge Penda Shivute, Bekir Genc; Challenges and applications of digital technology in the mineral industry; Resources Policy Volume 85, Part B, August 2023

⁴⁵ PwC Canada, Digital Transformation in the Mining Industry

⁴⁶ BCG, Racing Toward a Digital Future in Metals and Mining

One major benefit from digitalization comes from the ability to automate tasks, including those dangerous for people. Autonomous machines can be used to explore dangerous areas and removes employees from dangerous working conditions,⁴⁷ as well as handle more mundane tasks such as transportation. Major mining operators have been implementing autonomous machines in various contexts. For instance, BHP has implemented autonomous trucks across its various operations, as well as beginning to use autonomous drilling. Rio Tinto has also been implementing autonomous haul trucks, as well as the world's first fully autonomous water trucks. Vale has begun using autonomous excavators and various other forms of autonomous equipment.⁴⁸

Another major use of **digitalisation is for predictive maintenance.** Mining equipment is expensive, and equipment downtime can be costly for operations. Predicting faults before they become severe can extend the life of assets as well as preventing costly equipment downtime. In one example of this, the international gold miner Barrick applies IoT linked sensors and equipment across its mines to monitor its equipment. It stated that "A single early fault detection for one piece of equipment alone saved the company US\$600,000."⁴⁹ Rio Tinto has also implemented similar systems in many of its mining operations.⁵⁰

In order for these technology applications to be effective in the Zambian context, several elements need to be in place. There needs to be the right digital communications infrastructure to support the applications. In the case of external IoT networks, logistics applications, tracking, security etc. there needs to be high quality network coverage over an extensive area around the mining facilities. Earlier generations of IoT devices can operate on 2G networks but more sophisticated applications require broadband connectivity provided by 4G. For more advanced analytics capabilities within mining facilities, high capacity networks and access to cloud computing infrastructure is required. This is heavily dependent on fibre-optic network infrastructure and cross-border access to cloud-service providers.

Impact of digitalisation on manufacturing in Zambia

Manufacturing has historically played a small but significant role in the economy of Zambia. **In recent years, it has increased in importance and is now a key part of the country's development strategy.** In particular, the capacity of the sector to create high value-added and high-paying jobs is central to the country's overall development plans, as articulated in 8NDP.

Between 2015 and 2019, manufacturing contributed around 8% of Zambia's GDP. This was adversely affected by the COVID-19 pandemic but it has since recovered. The sector's further growth is constrained by a high cost of doing business in Zambia together with competition from larger economies in the sub-Saharan Africa region.

47 Moshood Onifade, John Adetunji Adebisi, Amtenge Penda Shivute, Bekir Genc, Challenges and applications of digital technology in the mineral industry, Resources Policy

48 Tawanda Zvarivadza, Moshood Onifade, Oluwatobi Dayo-Olupona, Khadija Omar Said, Joseph Muchiri Githiria, Bekir Genc & Turgay Celik (07 May 2024): On the impact of Industrial Internet of Things (IIoT) - mining sector perspectives, International Journal of Mining, Reclamation and Environment. page 20-21

49 Aveva, Barrick Gold: Turning data into gold

50 Tawanda Zvarivadza, Moshood Onifade, Oluwatobi Dayo-Olupona, Khadija Omar Said, Joseph Muchiri Githiria, Bekir Genc & Turgay Celik (07 May 2024): On the impact of Industrial Internet of Things (IIoT) - mining sector perspectives, International Journal of Mining, Reclamation and Environment. page 20

The Government’s strategy for promoting growth and development of the manufacturing sector includes support to hard infrastructure such as Multi-facility Economic Zones (MFEZs) across the country and targeting support to specific businesses. The role of ICT in supporting the development of manufacturing in Zambia has not yet been fully articulated. However, there are wide range of technologies that can be adopted by small and large-scale manufacturing businesses to support their growth. Research indicates that businesses that do adopt technology in their production and management processes tend to have higher levels of productivity and profitability.⁵¹

Further, as a land-locked country, access to regional trade opportunities is particularly important for Zambian manufacturers who are focused on exports within the sub-region and beyond. ICT is important in building on those trade linkages. These internal uses of ICT for businesses’ own purposes are further complemented by the Government’s e-government initiatives such as business registration, tax and trade-facilitation. By improving the quality, speed and reliability of these services, the government supports the growth and export of manufactured goods.

The policies described in this report would increase the level of digitalisation of the manufacturing sector and could potentially add over 3.5 billion Kwacha in value add to the economy per year by 2028, equivalent to 0.49% of GDP. Moreover, these policies could results in 25 thousand more people employed in manufacturing and 803 million Kwacha additional tax revenue to fund public services.

Table 4: Potential impacts of increased digitalisation of manufacturing in Zambia in 2028

Digitalisation of manufacturing value add (Kwacha)	3,555,122,770
% Sector GDP	5.95%
% of GDP	0.49%
Employment	24,558
Tax (Kwacha)	803,066,683

Constant 2023 Kwacha. See separate methodological document that accompanies this report.

Impact of digitalisation on the transport sector in Zambia

Zambia’s economic development will depend on the production and export of bulky goods such as mining and agricultural products for many years to come. For example, the Copperbelt region in Zambia and neighbouring DRC produced around 3.3 million tonnes of copper in 2021/2022. Further growth in extraction rates are planned in both countries which will increase the load on the regional transport networks. Access to other markets both directly and indirectly via ports in neighbouring countries is therefore a critical component of the Zambia’s development strategy.

Zambia’s geographical location provides both challenges and opportunities. It does not have direct access to ports but it borders eight different countries plus Burundi via Lake Tanganyika. This central location at the heart of southern Africa creates multiple opportunities for trade, based on the six regional transport corridors which pass through the country.

Improved transport is also a key element of the country’s ability to withstand external shocks such as adverse weather events. An efficient transport network improves the functioning of regional markets for imports and exports. This allows the private sector to respond to price signals arising from such shocks and increased supply of key goods such as food and agricultural inputs.

⁵¹ See, for example, World Bank Group, Digital Africa: Technological Transformation for Jobs, 2023

The performance of the transport network also has economic implications that go beyond just the import and export of commodities. Sectors of the economy that are potential future sources of growth and diversification are also dependent on effective transport networks. Tourism, for example, has been identified in the 8NDP as a key area of growth for the Zambian economy. Successfully growing the tourism industry will require improvements in transport and logistics as a way of reducing the cost of tourism and therefore widening its appeal.

The physical condition of the infrastructure in major transport corridors is one factor that determines the contribution of the transport sector to Zambia’s economic development. **However, a second critical issue is inefficiencies at border crossings.** Slow and cumbersome procedures combined with poor physical facilities has been a problem for many years, slowing down the passage of trucks across borders and thereby increasing the cost of trade.

The Government has invested in border processes and infrastructure, including a single window and a one stop border post (OSBP). However, digitalisation of border processes is still underway and a system connecting all relevant government border agencies does not yet exist. Many processes are therefore still manual and there is limited coordination between government agencies. The result is that there are still significant delays in trucks crossing over borders. For example, it is reported that trucks can wait as long as 4 days at the border crossing on the Dar es Salaam Corridor between Tanzania and Zambia at Nakonde. This is also experienced in the Kasumbalesa route for copper belt trade. This is a significant impediment to Zambia’s trade since about 20 percent of all of Zambia’s customs consignments are processed at this crossing point.⁵²

Digitalisation and automation are key to improving the performance of Zambia’s border crossings. These would be relatively low cost to implement, could be done rapidly and would complement the investments in physical transport infrastructure that the government is undertaking. They would build on the work already done by the government through its SMART Zambia programme (discussed in more detail below). The potential gains from such initiatives are large. In West Africa, for example, it was estimated that investments in both physical transport infrastructure and border crossing processes would result in increased real wages by up to 20%.⁵³

The policies described in this report would increase the level of digitalisation of the transport sector infrastructure, potentially adding 3.5 billion Kwacha to the economy and 27 thousand jobs per year by 2028. This would involve a combination of improved connectivity and greater adoption of digital services by participants in the transport sector.⁵⁴

Table 5: Potential impacts of increased digitalisation of transport in Zambia in 2028

Digitalisation of transport value add (Kwacha)	3,540,538,936
% Sector GDP	7.46%
% of GDP	0.49%
Employment	26,896
Tax (Kwacha)	799,772,340

Constant 2023 Kwacha, see separate methodological document that accompanies this report

52 World Bank, Project Appraisal Document for Transport Corridors for Economic Resilience Project, January 29 2024

53 World Bank, Policy Research Working Paper 9855, Corridors without Borders in West Africa, Mathilde Lebrand, 2021.

54 For more detail on estimation methodology, see GSMA, Driving digital transformation of African economies: Evidence and methodology document, May 2024

Impact of digitalisation on trade in digitally-enabled services in Zambia

Trade in services is a key area of economic growth for all developing countries, driven in part by the growth of digitally delivered services. Globally, trade in services accounts for 50% of the total value-added by trade and many such service exports are delivered digitally. Global trade in digitally delivered services grew by an average rate of 8.1 percent per year between 2005 and 2022 – faster than trade in goods and other (non-digitally delivered) services. By 2022, digitally delivered services represented 54% of total global services exports.⁵⁵

Zambia's trade has historically been dominated by commodities such as mining and agricultural outputs. This will continue to be the case for some years to come. However, the 8NDP highlights the role of services in general as a source of productivity growth and job creation. Tourism is one example of such an area of potential growth. Tourism is labour intensive and high productivity compared with many of the alternative employment opportunities available to Zambians. The country currently has an underdeveloped tourism sector and it therefore provides a major opportunity for growth in the short to medium term.

Adoption of new technologies is an important enabler of growth in trade in both goods and services. Promoting the growth of export industries requires a mix of policies that complement a country's natural comparative advantages. These include the development of skills and training, investing in trade infrastructure and logistics services, improved governance and better regulation. ICT is becoming increasingly integral to all of these efforts. Exporting even basic commodities requires connectivity through the production and supply chain. As exports become more complex and of higher value, more advanced ICT services are required to facilitate the production and export process. By improving the quality and availability of ICT services, developing countries such as Zambia can support growth in the value of their exports.⁵⁶

Through growth in digital payment services, E-commerce and the reduction of barriers to cross-border digital trade, Zambia will also be able to **take advantage of opportunities in digital trade arising from the African Continental Free Trade Area (AfCFTA)**. This will further support diversification of the economy and deepening of economic cooperation in the region.

There are a range of different policies that can be implemented to support growth in digitally-enabled trade. These include development of ICT infrastructure, support to innovation and business start-ups and skills development. On the regulatory side, issues such as business registration, competition policy, intellectual property protection and data protection all have an impact on the development of digital trade. Regulation of cross border data flows will need to be carefully considered and localisation requirements set to the minimum necessary to achieve essential policy objectives in ways that minimise restrictions to trade. The overall economic impact of this could be significant. It is estimated that improving mobile broadband connectivity could reduce average trade costs by 10% in low-income economies. This effect is doubled with an enabling regulatory environment for digitally delivered services.⁵⁷

The policies described in this report would increase the digitalisation of trade in Zambia, potentially adding 2.8 billion Kwacha to the economy and 22 thousand additional jobs per year by 2028. Moreover, this would generate 640 million Kwacha in additional tax revenues.

⁵⁵ World Bank, World Trade Organisation, Trade in Services for Development, 2023

⁵⁶ World Bank, World Development Report 2020, Figure O.4

⁵⁷ WTO, IMF, Digital Trade for Development, 2023

Table 6: Potential impacts of digitalisation of trade in Zambia in 2028

Digitalisation of trade value add (Kwacha)	2,833,145,319
% Sector GDP	2.42%
% of GDP	0.39%
Employment	21,522
Tax (Kwacha)	639,979,196

Constant 2023 Kwacha. See separate methodological document that accompanies this report.

Formalisation of businesses and raising business productivity

Encouraging the growth of digital businesses - particularly MSMEs - and supporting the formalisation of businesses are identified as important objectives in the 8NDP. Digital entrepreneurship provides new, high-productivity job opportunities for Zambia’s large youth population.

Access to ICTs and digital services are essential for making this vision a reality. This access has been associated with benefits for SMEs ranging from better access to information and markets, to increased productivity and job creation. For formal firms, higher technology adoption is associated with labour productivity of up to 2%, reaching 4% for informal firms.⁵⁸

Formalisation of businesses is an important first step on the path to them becoming taxpayers. Formalisation of a business does not, in itself, result in it becoming a taxpayer. Indeed, many informal firms already pay some types of tax. However, the process of formalisation can be thought of as a necessary (although not sufficient) step in the process of expanding the size of a country’s tax base. Once a company or individual is officially registered, it is easier for tax authorities to bring them into the tax net and enforce tax compliance. A World Bank study in Benin, for example, showed that 55% of informal firms paid some tax with the average amount of tax paid equal to 9% of annual profits. 84% of formal firms, on the other hand, paid some taxes and paid, on average, 17% of profits.⁵⁹

There are significant barriers to companies switching from informal to formal status. Multiple steps are usually required to register a business with significant fees payable to government. Once registered, a company is then more likely to be subject to other types of regulatory or licensing rules which raise the costs of doing business.⁶⁰

Increasing the rate of formalisation involves a broad and sustained effort by government to create positive and negative financial incentives. Ideally, it should be as simple and as cheap as possible for companies to register as formal businesses so that the barriers to registering are reduced. This needs to be complemented by more efforts at compliance in which companies are penalised for not complying with rules.

Digitalisation has an important role to play in the process of registration with the authorities. The time and financial cost of registering a business can be significantly reduced if the processes are digitalised. It also reduces leakage and corruption that is often involved. Similarly with tax compliance, requirements to register and file taxes electronically can reduce costs and improve the quality of service.

There are many examples from around the world of developing countries using digital technology to enhance formalization of businesses and grow tax revenues. In Ghana, the e-Transform project resulted in significant improvements in the services provided to businesses. The length of time that it takes to register a business, for example, fell from 4 days to 2 as a result of the automation of the processes.⁶¹ The government also established the Ghana.gov.gh website which is a single

58 Cirera, Comin, and Cruz 2022. Also: Bhattacharya, 2019 and Mothobi, Gillwald, and Aguera, 2020
 59 World Bank, Policy Research Working Paper 7900, Can Enhancing the Benefits of Formalization Induce Informal Firms to Become Formal? Experimental Evidence from Benin
 60 ILO, New technologies and the transition to formality: The trend towards e-formality, 2018
 61 World Bank. Restructuring Paper On A Proposed Project Restructuring Of E-Transform Ghana, 2023

portal that provides access to a wide range of government services, including business registration and collection of fees owed to government. It is an integrated service that handles payments and transfers, post-payment workflows and provides customer notification and feedback. Take-up on the platform has been significant with the number of transactions increasing from 1.61 million in 2020 to 10.03 million in 2022. The value of payments made through the platform also increased from GHC 5 billion to GHC 63 billion over the same period.⁶²

Zambia remains some way off achieving the productivity benefits that can arise when firms increase their adoption of digital technologies. The Government has made efforts in recent years to improve the level of digital skills through including teaching of computer literacy in schools. This has had some positive results with increasing levels of digital skills across the country. However, much remains to be done in this area. ZICTA’s 2022 survey found that only 11.5% of Zambians aged over 10 years old know how to use a computer, while 27.3% know how to use a smartphone.⁶³

Figure 9(a): Firms using technology licensed from foreign companies (Percent of latest Enterprise Survey respondents)

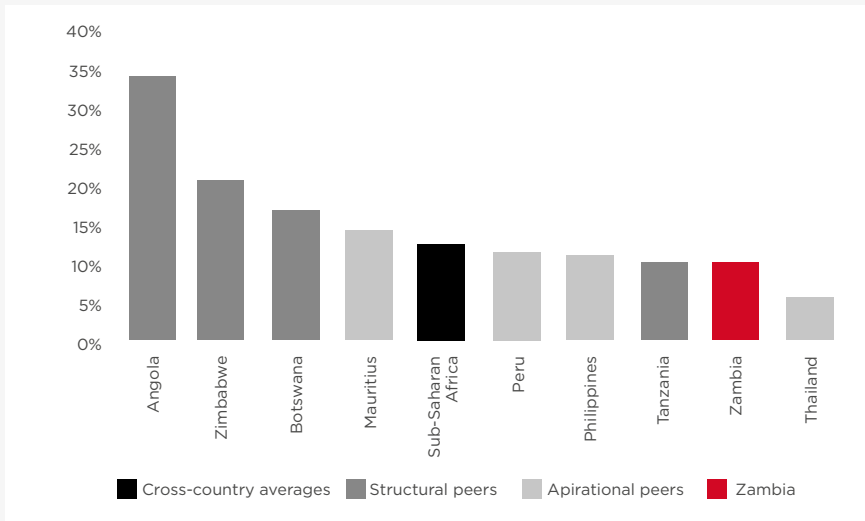
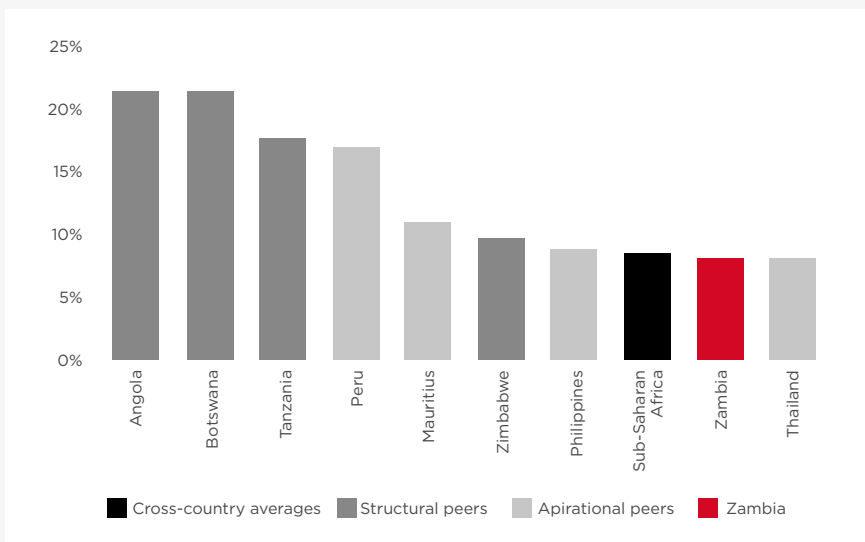


Figure 9(b): Firms with internationally recognised quality certification (Percent of latest Enterprise Survey respondents)



Source: World Bank⁶⁴

62 GSMA, Inclusive E-Government Services in Ghana: Enhancing Women’s Access and Usage, July 2023

63 ZICTA, 2022 National Survey on Access and Usage of Information and Communication Technologies by Households and Individuals, 2023

64 World Bank, Zambia Economic Memorandum, 2024

There are many ways in which the government could increase the levels of adoption of productivity-enhancing digital technologies. On the supply-side, these include improving the availability and affordability of digital connectivity. To complement this, efforts are required to enhance the demand for digital services. Education and digital skills training, strengthening of the regulatory frameworks around data protection, cybersecurity and customer protection all help foster demand for digital services. Supporting digital entrepreneurship is also important. Fostering local digital talent and enterprises creates demand for digital services through those businesses themselves but also strengthens the locally-based digital ecosystem which further stimulates demand.

Reforms to the business regulatory frameworks could particularly support the development of the digital ecosystem. This includes strengthening the digital business registration process, adopting a risk-based approach to business regulation and licensing, setting up regulatory sandboxes so that small businesses can get started with the minimal regulatory burden. Further reductions in the cost of interacting with the state will also encourage businesses to transition from informal to formal status and thereby engage in the process of raising output and productivity.

The government has made a number of important steps in reducing the cost of doing business and increasing the incentives for firms to formalise (described in more detail below). Mobile telecoms operators are important players in this process. They provide the basic communications infrastructure through which these channels operate. They also increasingly provide the financial payments platforms through which interactions with governments are mediated. Further investment in digital infrastructure and services is therefore needed to support efforts to transform the economy of Zambia more broadly. Increased uptake of telecom services and mobile internet have been shown to have a strong positive impact on the level of formalisation in an economy.⁶⁵

Impact of digital government in Zambia

The EGD 2022 ranks Zambia at 131 of 192 UN Member States. This places the country in the High EGD Group, amongst the highest ranked in Africa, and there has been notable improvement in its ranking from 148 position and the Middle EDGI Group in 2020.⁶⁶

This improvement reflects the commitment by the Government to digitalisation and digital government as outlined in the 8NDP: “The integration of digital technologies ... will be key to enhancing efficiency and productivity for economic transformation ... as a result, internet penetration is targeted to increase to 80 percent by 2026 from 52.9 percent in 2020”.⁶⁷

Table 7 summarises some of the key digital development outcomes contained in 8NDP.

Table 7: Digital development outcomes in 8NDP

8NDP Strategic Development Area	Digital Development Outcomes
Human and social development	Enhance science, technology and innovation, including: <ul style="list-style-type: none"> - ICT promotion for education - Infrastructure - Digital skills development
Environmental Sustainability	Enhance disaster risk reduction and response
Good governance environment	Strengthen national data and information Systems Strengthen public service performance management systems, including electronic government

Source: Author summary, extracted from 8NDP

65 ILO, New technologies and the transition to formality: The trend towards e-formality, 2018, Table A.1

66 United Nations Department of Economic and Social Affairs E-Government Survey 2022 and 2020.

67 8NDP, p. 14

The National ICT Policy 2023 issued by the Ministry of Technology and Science is aligned with 8NDP and builds on the previous National ICT Policy 2006. It articulates a vision of an “integrated ICT ecosystem for Zambia’s digital economy” and includes the objective of promoting the development and utilization of e-services in the public sector with the following measures:

- Promote the use of e-services
- Facilitate the integration and harmonisation of systems and the establishment of data sharing framework
- Facilitate e-commerce
- Promote the development of a digital identity systems
- Enhance Consumer protection.⁶⁸

In 2021, the Electronic Government Act became law and the Government established the Electronic Government Division - the SMART Zambia Institute - to coordinate the digital government and public services programme. SMART Zambia has since published the 2023-2026 National Electronic Government Plan and the 2023 Digital Transformation Change Management Strategy for Public Services, providing objectives and targets to accelerate digital government services. Table 8 and Table 9 below summarise some of the key digital objectives and strategies from these documents.

Table 8: Summary of objectives from National Electronic Government Plan 2023

National Electronic Government Plan 2023 – 2026 objectives	
1)	To improve digital infrastructure development, administration, and management in the public sector.
2)	To improve provision and utilisation of e-Government Services.
3)	To build capacities of citizens in digital skills.
4)	To strengthen public service digital information security.
5)	To promote digital innovation and entrepreneurship in the public sector.
6)	To standardise public sector digital platforms and services.
7)	To improve the policy and legislative framework governing ICTs in the public sector.

Table 9: Summary of 2023 Digital Transformation Change Management Strategy

2023 Digital Transformation Change Management Strategy for Public Services objectives and strategies	
1)	To increase the adoption, provision, and availability of digital government services in public bodies and the general citizenry <ul style="list-style-type: none"> • Promote the development and implementation of Electronic Government Change Management initiatives in public bodies. • Strengthen awareness and sensitisation of digital government services to the public bodies and general citizenry. • Promote the migration of public service process and services from manual to digital processes • Enhance capacities of public bodies for digital transformation. • Stimulate demand towards the consumption of digital government services.
2)	To increase access and utilization of digital Government services by the general public <ul style="list-style-type: none"> • Enhance Digital literacy skills. Facilitate the creation of multiple digital platforms for increased access to electronic government services.
3)	To strengthen the leadership, coordination and monitoring and evaluation of the digital transformation program

The establishment of SMART Zambia has coincided with significant changes to the way that the government manages its digital services. The government has set up a single integrated infrastructure for hosting and delivering e-government services, known as the Government Service Bus (GSB).

⁶⁸ National ICT Policy 2023 <https://www.mots.gov.zm/wp-content/uploads/2023/10/National-ICT-Policy-2023.pdf>

This approach began with efforts to improve revenue collection through digitalisation of services but has since also integrated other ministries such as the Ministry of Lands and Natural Resources which currently has around 20 services on the GSB. The Ministry of Mines and Mineral Development has also recently been integrated into the system. There is now a single portal for access to government services – Zamportal which is integrated with ZamSign e-signature services, the government data exchange platform, ZamConnect, and ZamPay a payment gateway integrated with bank and mobile operator payment service providers. As of this year, 300 out of an estimated 1,500 services (including birth certification, passports and visas, taxation, social welfare payments, land registration, government procurement) provided by the government are available on ZamPortal. Further expansion of the services on the portal are planned.⁶⁹ These initiatives are resulting in government efficiency and revenue collection as evidenced by over ZMW 1.5 billion non-tax revenue collected by December 2022.⁷⁰

The Government has identified some initiatives that will expand access to digital services. The digitalisation of government is currently mainly focused on the national and provincial levels. The next step will be to roll it out to district level and bring lower levels of government within the government digital architecture. This will include the rollout of last mile connectivity through the Government Wide Area Network (GWAN) which, by December 2022, had connected a total of 263 of the targeted 15,600 national sites.⁷¹ The government is also now present in 109 post offices which are able to serve as walk-in services and offer access to government services.⁷² The government is also aware of the need to improve digital literacy and support training and is working with partners such as the Post Office and the MNOs to provide frontline training and support.

The Government is committed to further digitalisation of government services. Some initiatives have moved faster than others. The Zambia Revenue Authority (ZRA) has been one of the leading agencies in the digitalisation of government services. The shift to digital payments of individual and company taxes has been successfully implemented and virtually all payments of individual and company income tax are made electronically. For example, the governments of Zambia, Zimbabwe and Malawi implemented a Customs-to-Customs Electronic Data Exchange system in 2023. This facilitates sharing of customer data with revenue authorities in neighbouring countries and so reduces the cost of compliance with government clearance processes. A system for issuing electronic customs bonds was also introduced in 2023 to support compliance and reduce forgery of documents.⁷³

Despite these successful initiatives, progress has been limited in some instances and this is causing a drag on economic growth in areas that are critical for the national development strategy.

Although progress has been made on digitalisation of border crossing processes, the implementation is not complete and the lack of a fully integrated network connecting different border crossing points means that cross-border traders are still required to use manual, paper-based processes. This slows down the overall border crossing process, creating a drag on trade. Until the clearance processes are fully digitalised, this situation is likely to continue and the country will not fully benefit from the investment in automation that it has already made. A separate but important issue arises from the difficulties with network access in rural areas near border crossing points. Even if government border crossing facilities have reliable connectivity, traders also need reliable network coverage if they are to be able to successfully interact with the digitalised border management processes.

The reform of the FISP is an example of an ambitious initiative to digitalise a government programme that could have major benefits if successfully implemented. This is a high priority for the government because of the cost of the programme and challenges with leakage, inefficiency and beneficiary targeting. The importance of this has been highlighted by both government and

69 World Bank, Digital Zambia Acceleration Project Information Document, July 2024

70 Republic of Zambia, National E- Government Plan 2023, page 15

71 Republic of Zambia, National E- Government Plan 2023, page 13

72 Interview with SMART Zambia

73 ZRA, Annual Report 2023, page 38

development partners. The Government did start a shift to an e-voucher scheme in 2015 but this was stopped partly due to difficulties with network coverage and affordable access to devices by farmers. The Government has renewed its commitment to moving to an e-voucher system but the success of this programme is highly dependent on farmers having access to digital services and connectivity.

In addition to coverage and affordable access, there are some key initiatives that are also required if the government is to make progress on digitalisation. These include:

- Establishing a Digital ID so that users can be reliably authenticated and are able to access services;⁷⁴
- Ensuring that data protection and cybersecurity frameworks continually evolve to reflect the needs of individuals and businesses;
- Ensuring that the legal and regulatory framework for electronic signatures creates an enabling environment for both government transactions and e-commerce; and
- Implementing a broad campaign of digital skills and awareness, particularly in low-income and in rural areas.

Evidence indicates that successful implementation of digitalisation of government services will have significant economic benefits. Countries with advanced digital government services are seeing benefits, notably when integrated with digital payments. This has been documented by research and analysis of the effects of digital transformation in the public sector. For example, studies have found that digitalizing government payments could save roughly 0.8-1.1% of GDP.⁷⁵ Similarly, it has been shown that countries that have adopted digital payment-to-government (P2G) services experience a 1.2-1.3 percentage point boost in direct tax revenue as a share of GDP.⁷⁶

It is estimated that the increased adoption of digital government services that would arise if the policies described in this report were implemented has the potential to add 5.8 billion Kwacha in tax revenues, equivalent to almost 4% of total revenues by 2028.

Table 10: Potential impacts of increased adoption of digital government on tax revenue in Zambia in 2028

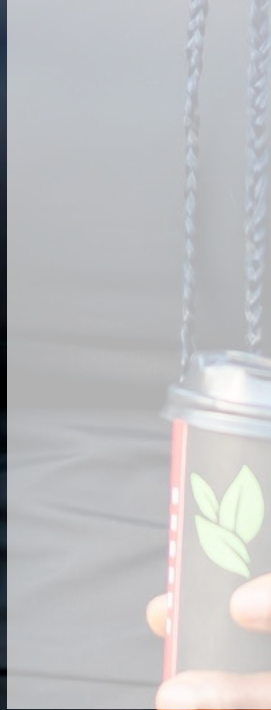
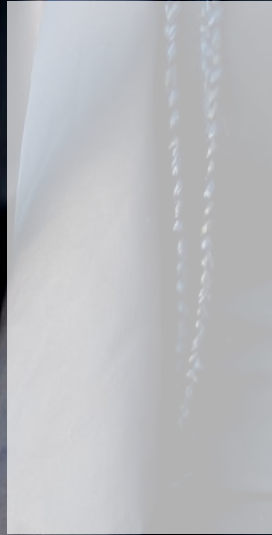
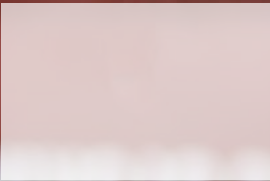
Digital government revenue increase (Kwacha)	5,804,916,278
% tax revenues	3.57%
% of GDP	0.81%

Constant 2023 ZMW. See separate methodological document that accompanies this report.

74 It is noted that the Government and the World Bank are contemplating this as part of a new digital acceleration plan, The World Bank Digital Zambia Acceleration Project Information Document, July 2024

75 Susan Lund, Olivia White, and Jason Lamb, The Value of Digitalizing Government Payments in Developing Economies, in Digital Revolutions in Public Finance, IMF 2017.

76 UNU-WIDER Working Paper 2022/18 Does the adoption of peer-to-government mobile payments improve tax revenue mobilization in developing countries? Abdoul-Akim Wandaogo, 1 Fayçal Sawadogo, 2 and Jesse Lastunen; 3 February 2022



5. The Digital Communications Sector in Zambia

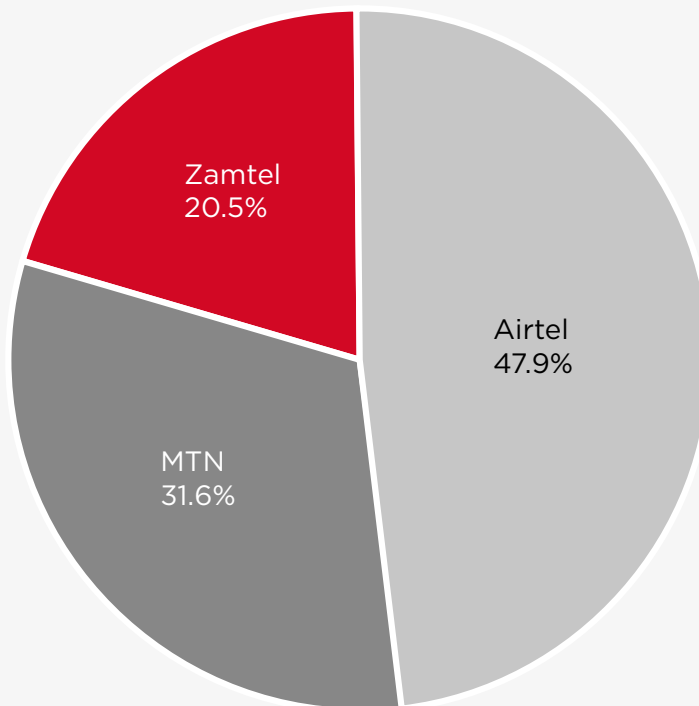


A. Sector Overview

Market structure

Zambia has issued four mobile network operating licenses. Airtel Zambia is the largest operator with MTN Zambia the second largest followed by Zamtel. The fourth licensee, ZedMobile, has just launched its services.

Figure 9: Mobile subscriber market shares, Q2 2024



Source: ZICTA

The mobile sector combines both local and international ownership. MTN Zambia is a subsidiary of the South African MTN Group, Airtel Zambia is majority owned by the Indian conglomerate Bharti Airtel and Zamtel is wholly owned by the Government of Zambia.

Mobile penetration

ZICTA reports the total number of mobile connections as 21.1 million in Q4 2023 and a penetration rate of 108%.⁷⁷ This would imply an adult penetration rate of 175%.⁷⁸ Its 2022 National Survey on Access and Usage of ICT indicated that 63.3% of the population over 10 years old had used a mobile phone in the prior 3 months, up from 51% in 2015. This national average figure hides large differences in mobile phone use between urban and rural areas. In 2022, 55.3% of the population over 10 years old had used a mobile phone in the prior 3 months compared with 76.1% in urban areas.

Adoption of mobile internet has increased significantly in recent years. In the last decade, the number of mobile internet subscriptions has more than tripled, from less than 4 million in 2014 to 12.5 million at the of 2023. This represents a mobile internet subscriber penetration rate of 64%,⁷⁹ or an adult penetration rate of 104%. This is based on the number of active SIM cards which are being used for mobile internet and therefore includes situations in which an individual has more than one SIM card.

⁷⁷ ZICTA

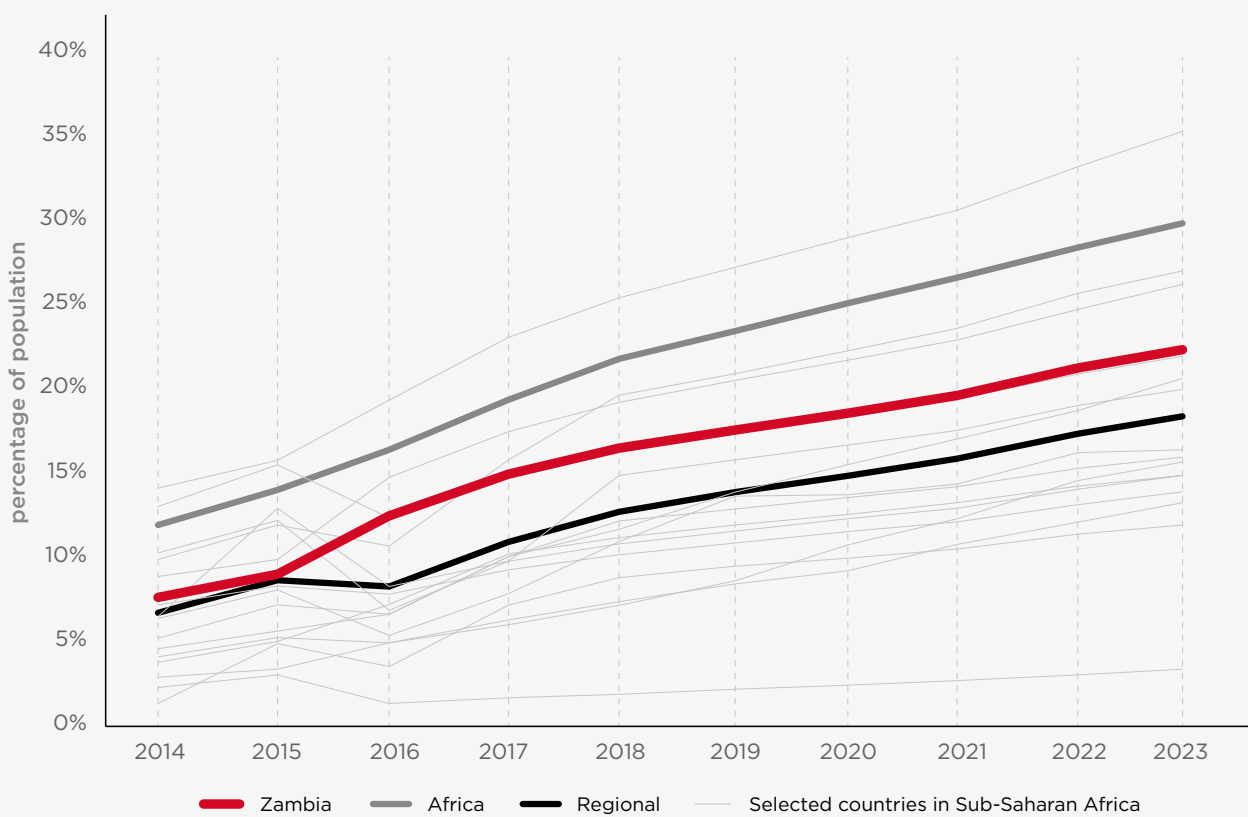
⁷⁸ Using GSMA estimates of the adult population (i.e. those who are 15 or older) of 12 million.

⁷⁹ ZICTA

GSMA undertakes analysis of the number of unique mobile internet subscribers across the region.

The number of unique individuals using mobile internet is lower than the number of active SIM cards because some customers have multiple SIM cards. Estimating the number of unique mobile internet users is important for policy because it is a measure of how many people have access to digital services. However, it is difficult to estimate from MNO subscriber data alone. The GSMA uses a range of different techniques, including surveys and modelling, to estimate the number of unique mobile internet users using a consistent methodology that allows cross-country comparison. It estimates the number of people in Zambia who access the internet on their mobile devices on a regular basis as around 4.6 million in 2023 which is equal to 22% of the total population or 38% of the adult population.⁸⁰ This puts Zambia above the regional average in terms of unique mobile internet subscribers, when using a like-for-like comparison (Figure 10).⁸¹

Figure 10: Mobile Internet unique subscriber



Source: GSMA

⁸⁰ GSMA

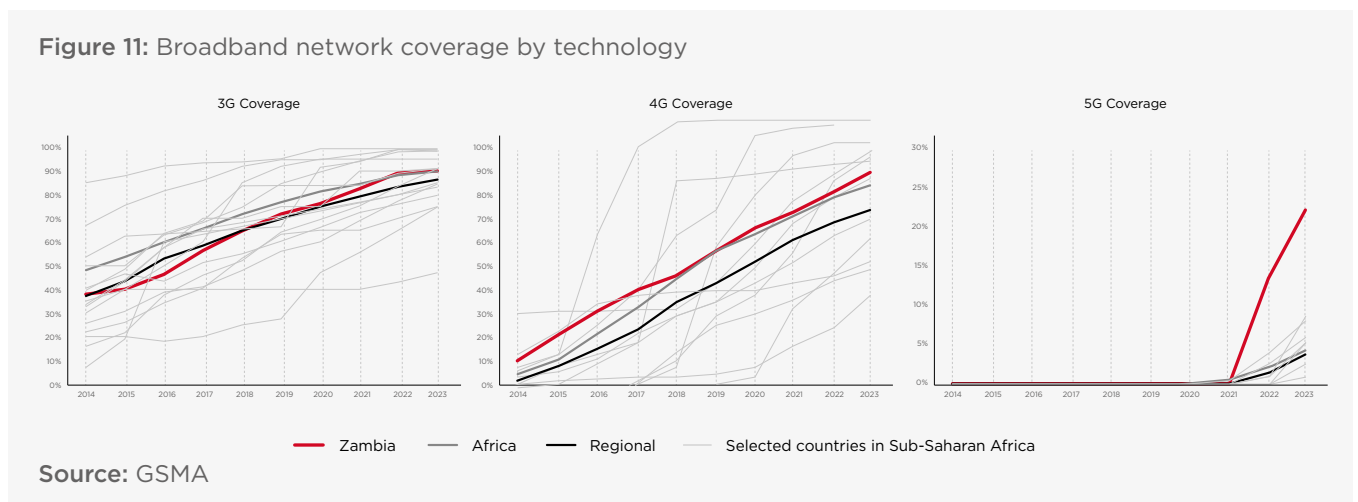
⁸¹ The number of unique mobile internet subscribers used in this section is based on GSMA estimates. Regional countries included in this analysis were Burundi, Djibouti, Eritrea, Ethiopia, Madagascar, Malawi, Kenya, Mozambique, Rwanda, Somalia, South Sudan, Tanzania, Uganda, the DRC and Zimbabwe. With the exception of the DRC, these make up the GSMA’s “Eastern Africa” region (small island nations such as Mauritius are excluded)

Smartphones are the most common means of accessing the internet in Zambia but rates of access are low, particularly in rural areas. Access to smartphones is a key determinant of whether people are able to use the internet. Rates of smartphone ownership in Zambia are low, particularly in rural areas. In 2022, 41% of people over the age of 10 nationwide owned a mobile phone. Of these people, only 17.7% owned smartphones. In rural areas, rates of smartphone access are much lower. Only around 7% of people over the age of 10 years old in rural areas owned a smartphone.⁸² Even in urban areas, where rates of ICT usage are higher, only 36% of the population over the age of 10 owned a smartphone. These low rates of smartphone ownership are a key constraint in internet uptake and digitisation as smartphones are one of the most important methods for accessing the internet in African countries.

Mobile coverage and the internet usage gap

Mobile broadband coverage is growing as a result of consistent levels of investment into network infrastructure by the MNOs. Mobile coverage can be measured either as a proportion of the population or as a proportion of the land area of the country.⁸³ Providing network coverage in unpopulated areas of the country provides no economic benefit so, in countries where there are significant areas with no or low levels of population, it is more relevant to measure population coverage than geographical coverage. This is reflected in many of the targets and objectives set at national and international level. The UN, for example, is focused on ensuring access to digital services by people and institutions, rather than geographical coverage.⁸⁴

Zambia is now one of the leading countries in Africa in terms of 4G and 5G coverage, with almost 80% 4G population coverage and 20% 5G population coverage (up from 0% in 2021) (Figure 11).⁸⁵

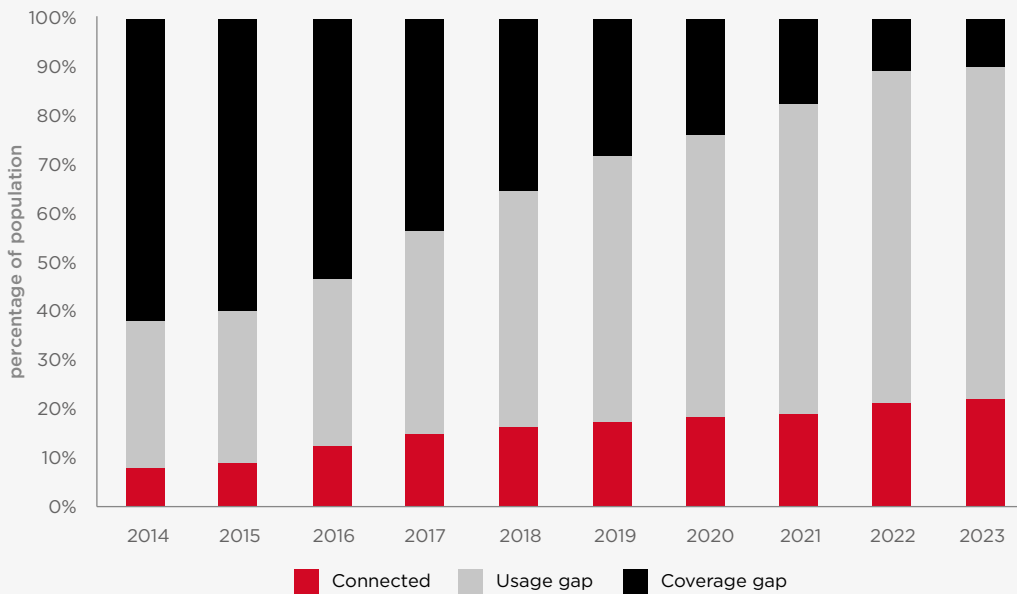


The usage gap is calculated by comparing the number of unique mobile broadband users with the size of the population covered by the mobile broadband networks. This is a measure of the number of individuals covered by mobile networks but who do not use it.

82 ZICTA, 2022 National Survey on Access and Usage of Information and Communications Technologies by Households and Individuals
 83 Zambia, in common with most other countries, has some areas of its country where the population density is low. Measures of population network coverage are therefore generally higher than measures of land area coverage.
 84 United Nations, Office of the Secretary-General’s Envoy on Technology. Achieving universal and meaningful digital connectivity in the decade of action Aspirational targets for 2030
 85 The number of unique mobile internet subscribers used in this section is based on GSMA estimates. Regional countries included in this analysis were Burundi, Djibouti, Eritrea, Ethiopia, Madagascar, Malawi, Kenya, Mozambique, Rwanda, Somalia, South Sudan, Tanzania, Uganda, the DRC and Zimbabwe. With the exception of the DRC, these make up the GSMA’s “Eastern Africa” region (small island nations such as Mauritius are excluded)

As noted above, 22% of the population in Zambia are unique mobile internet subscribers,⁸⁶ while 90% of the population is now covered by mobile broadband networks. This means that 68% of the population is covered by a mobile broadband-capable network but is not using the internet. This is known as the “usage gap” (Figure 12).⁸⁷

Figure 12: Evolution of mobile internet connectivity in Zambia



Source: GSMA and authors’ calculations. See separate methodological document that accompanies this report.

“Connected” refers to unique mobile internet users⁸⁸ as a % of population; “Usage gap” refers to populations that live within the footprint of a mobile broadband network but who are not using mobile internet; “Coverage gap” refers to populations that do not live within the footprint of a mobile broadband network (3G or above).

The rapid expansion of 3G and 4G network coverage in Zambia has resulted in a relatively large usage gap. This situation means that the policy focus needs to be on promoting adoption through improving affordability and stimulating demand. This is unlike the situation in some other African countries where there are lower rates of broadband network coverage. In DRC, for example, a smaller proportion of the population is covered by the mobile broadband networks and, as a result, it has a smaller usage gap. In countries like that, the policy focus is on expanding network coverage in a way that provides access to a greater proportion of the population.

86 Also referred to in this report as “mobile internet users” or “unique mobile internet users”. For the purpose of this report, these are defined as unique individuals using the mobile internet. The terms do not refer to the number of SIM cards or mobile internet accounts, which is usually greater than the number of individuals using the internet.

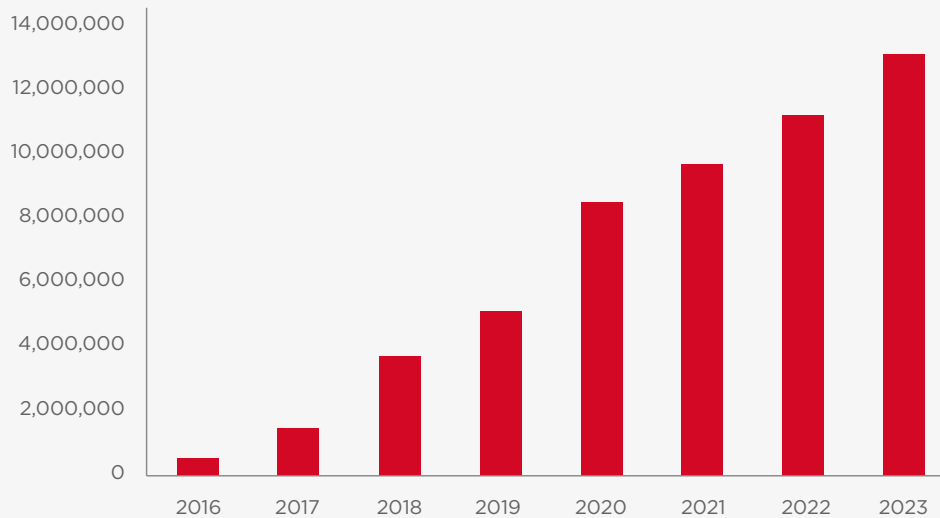
87 The precise size of the usage gap depends on the definition and measure of unique mobile internet subscribers and coverage. The 90% mobile broadband coverage is the GSMA’s estimate for 3G coverage in Zambia. ZICTA reports a lower total network coverage of 89% in 2023, which would imply a lower usage gap of 67% rather than 68%. In this report we use GSMA data for consistency.

88 In this report “mobile internet users” or “unique mobile internet users” refers to unique individuals using the mobile internet. It does not refer to the number of SIM cards or mobile internet accounts, which is usually greater than the number of individuals using the internet.

Mobile money

Zambia has seen sustained growth in mobile money usage in recent years, with active mobile money accounts increasing from around 500,000 in 2016 to almost 13 million at the end of 2023 (Figure 13). In this period, the value of transactions processed over mobile money platforms increased from ZMW2.8 billion to ZMW452.0 billion.⁸⁹

Figure 13: Mobile Money active users, 2016-2023



Source: Bank of Zambia⁹⁰

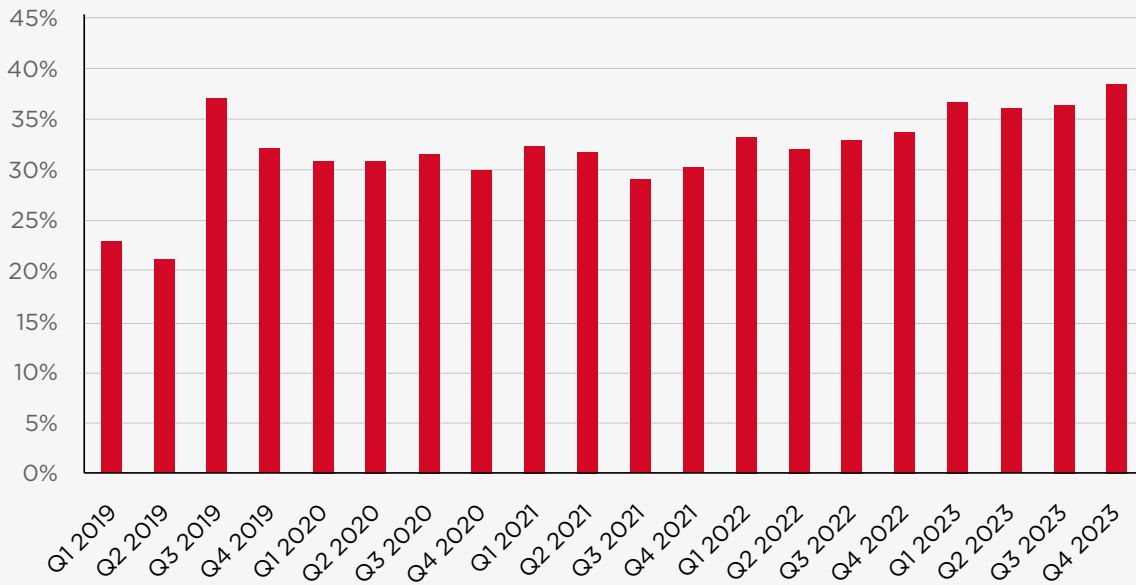
The COVID-19 pandemic boosted adoption of mobile money in Zambia. The pandemic had a significant impact on the use of mobile money in Zambia. Restrictions on physical interactions between people, and campaigns to promote the switch from cash to electronic transactions stimulated adoption and usage of mobile money. Once people had become accustomed to using mobile money as a means of transferring cash balances and undertaking transactions, the growth continued after the pandemic had subsided.

The launch of e-government services has also been a contributing factor in the growth of mobile money. Although e-government services make up a relatively small percent of the total value transacted over money (around 6% in 2023), they make up almost 40% of mobile money revenues and therefore have been a key driver of mobile money roll-out and investment (Figure 14).

89 Bank of Zambia, National Payment Systems Reports

90 Bank of Zambia, National Payment Systems Reports, 2016-2023

Figure 14: P2G/G2P Contribution to Mobile Money Revenue

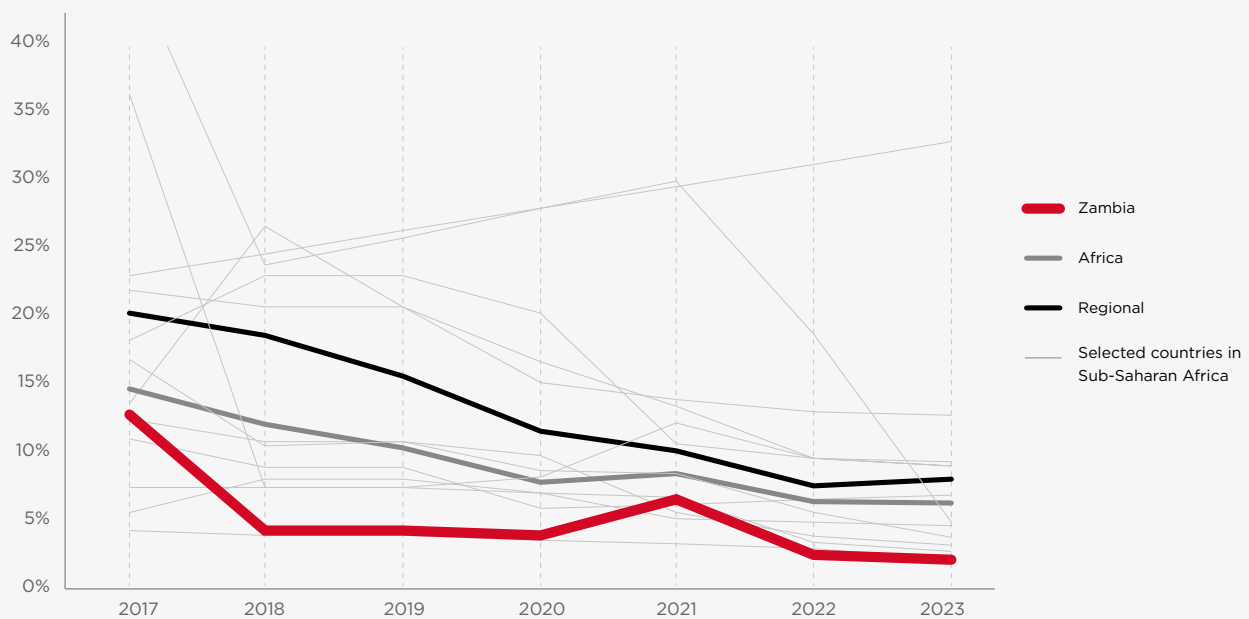


Source: MNO data

Mobile Prices

Competition between MNOs has driven down prices paid by consumers for mobile services. At 2% of GNI per capita, the cost of a basic basket of data in Zambia is well below both the regional⁹¹ and the African average (see Figure 15).⁹²

Figure 15: Basic Data Price



Source: ITU

91 The number of unique mobile internet subscribers used in this section is based on GSMA estimates. Regional countries included in this analysis were Burundi, Djibouti, Eritrea, Ethiopia, Madagascar, Malawi, Kenya, Mozambique, Rwanda, Somalia, South Sudan, Tanzania, Uganda, the DRC and Zimbabwe. With the exception of the DRC, these make up the GSMA's "Eastern Africa" region (small island nations such as Mauritius are excluded).

92 ITU

B. Policy challenges

The “Business as Usual” (BAU) scenario

The mobile telecoms sector in Zambia has made steady progress in recent years and this is likely to continue into the future. Coverage and availability of mobile telecoms services have increased progressively, and prices have generally fallen. Together, these trends have stimulated uptake and raised levels of adoption of mobile telecoms services. On the current trajectory, the sector will continue to grow but the regulatory and policy framework for the sector will stifle this growth which will be slower than it otherwise would be.⁹³

The BAU scenario will limit the government’s ability to achieve the objectives laid out in 8NDP.

Many of the ambitious reforms and initiatives included in the 8NDP involve digital approaches to improving the efficiency and effectiveness of government processes. Reform of the FISP, for example, will require enhanced use of digitalisation to reduce costs, enhance targeting and improve the economic impact. The experience of previous attempts to move towards an e-voucher system indicates that lack of digital adoption and affordable connectivity among farmers is a problem. Similarly, strengthening of the customs management system and improvement of border crossing processes require further digitalisation of government services. More broadly, the search for sources of economic development through diversification will involve growth of non-traditional sectors such as tourism. All of these efforts require better network coverage and greater levels of digital adoption, particularly in rural areas. Policies under the BAU scenario are putting the brakes on digital adoption and thereby constraining the government’s ability to meet its objectives.

Adjusting some of the policies relating to mobile will improve the financial sustainability of the industry and make digital adoption more affordable for Zambian citizens. Policy steps are needed to stimulate demand, reduce the cost of supply and promote a policy environment that supports investment in both mobile telecoms and mobile money. In order to promote growth in the mobile sector, several key policy challenges will need to be addressed. These focus on reducing the cost to customers of using mobile telecoms services and promoting investment into network expansion.

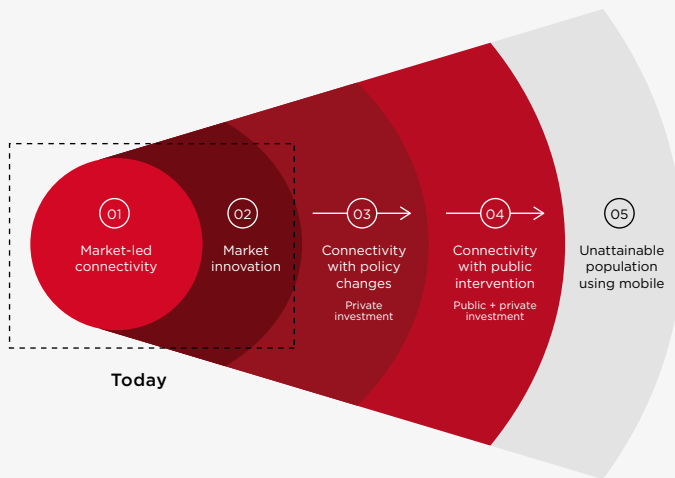
MNOs will continue to invest in new network infrastructure to provide services to customers.

In future years, this will deliver some degree of additional coverage which will extend further as technology innovation reduces costs and extends the reach of networks. A pro-investment policy environment would enhance the financial sustainability of the MNOs and would allow them to push network coverage out further still. To extend networks beyond this point, some level of public support will be required for sites to be financially sustainable. Once this expansion of network coverage is complete, there may remain a small segment of the population – those living in remote rural areas – for whom it is not financially viable to reach using mobile networks. Alternative technologies would be more suitable for providing connectivity in these areas. This framework is illustrated in Figure 16.

⁹³ The number of unique mobile internet subscribers used in this section is based on the GSMA measurement and forecast of this number.

The impact of selected policy decisions on mobile adoption is summarised in the sections below.

Figure 16: Illustration of mobile connectivity analysis



- 1) **Market-led connectivity:** The level of coverage and adoption expected in prevailing market conditions with no policy reform or innovation
- 2) **Market innovation:** The additional coverage and adoption expected due to the deployment of recent technology innovations
- 3) **Connectivity with policy changes:** The additional coverage and adoption that could be achieved by implementing enabling policy reforms
- 4) **Connectivity with public intervention:** The additional coverage and adoption that could be achieved with additional investment*
- 5) **Population unattainable using mobile:** Population unlikely to obtain mobile coverage, as the costs are too high; other technologies needed

*infrastructure and demand subsidies

Source: World Bank, GSMA

Policy scenario 1: Reducing sector-specific taxes on mobile telecoms services

Excessive taxation of the sector raises costs to consumers irrespective of how the taxes are structured.

Although some taxes are levied on mobile operators, most of the costs are ultimately passed on to customers in the form of higher prices. Previous studies have found that 90% of changes to the value of consumer taxes (e.g. sales and usage taxes) tend to be passed through to consumers, while 85% of changes to the value of operator taxes (e.g. revenue and profit taxes, spectrum and license fees) tend to be passed through to consumers.⁹⁴ Studies also show a relationship between data and handset prices on the one hand and the rate of uptake of mobile broadband on the other - higher prices lead to lower rates of broadband uptake.⁹⁵

The 2022 National Survey on Access and Usage found that the majority of households that did not have access to the internet at home attributed this to the high cost of equipment and services.

41.3% identified the cost of equipment and 25.2% identified the “cost of internet” generally as the barrier to access.⁹⁶

Mobile operators and customers face a wide range of taxes in Zambia. Under the current tax structure, operators pay corporate income tax at a rate of 35%. This is higher than the standard 30% corporate income tax applied to other industries.⁹⁷ It is worth noting that even this higher rate is a reduction compared to the previous system, which was 30% for income up to ZMW250,000 and then 40% after that.

94 World Bank, “Using Geospatial Analysis to Overhaul Connectivity Policies”, 2022, Table A.2

95 See separate methodological document for details on the elasticities used.

96 ZICTA 2022 National Survey on Access and Usage, section 4.1.6.5.

97 PWC, Zambia - Corporate - Taxes on corporate income

Mobile customers also face an array of taxes on the services they use. These include:⁹⁸

- VAT of 16%
- A telecoms-specific airtime excise duty of 17.5%
- An international call surcharge of ZMW0.09 per minute
- A new (2024) mobile money levy of ZMW0.08-ZMW1.8 per P2P transaction⁹⁹

Reducing the overall level of taxation on mobile services would feed through into lower prices and higher levels of digital adoption. Competition forces MNOs to pass the majority of any reduction in tax rates onto customers in the form of lower prices. Many people in Zambia – particularly those from low-income households and in rural areas – struggle to afford services. In addition to favourable tax treatment of devices, further measures could include a public-private device affordability programme including handset financing. Lowering prices for devices and services – even by a relatively small amount - will result in a faster rate of digital adoption.

Two changes to the tax regime facing mobile operators and users have been modelled. The economic modelling for this report has analysed the impact of two changes to the current tax rates in Zambia:

- Removing the airtime excise duty of 17.5%
- Reducing corporate income tax to the standard levels (i.e. 30%)

The impact of these two changes would be significant. Taken together, they could result in 325,000 additional unique mobile internet users in 2028. Table 11 below shows outputs from modelling of the impact of a mobile tax reduction on mobile internet uptake.¹⁰⁰

Table 11: Mobile internet uptake with sector-specific tax reduction

Mobile internet users (m)	2023	2024	2025	2026	2027	2028
BAU	4.61	5.02	5.46	5.94	6.46	7.03
Tax reduction	4.61	5.07	5.57	6.12	6.71	7.35
Y-on-Y difference to BAU	0%	1%	2%	3%	4%	5%
Increase in growth vs BAU	0%	+1%	+2%	+4%	+5%	+7%

Policy scenario 2: Sustaining the case for investment in the telecom sector

Financial sustainability is essential if mobile businesses are to be able to continue expanding coverage. Mobile operators need to be financially sustainable if they are to invest into expanding network coverage and providing services in currently underserved areas. This means that they need to be able to cover the cost of building and operating new sites from the revenues that they generate from customers.

ARPU in Zambia are low by regional standards. Revenues generated by the MNOs in Zambia are very low as a result of competition between MNOs pushing down prices and customers’ financial constraints (Figure 17). ARPUs are even lower in rural areas where households have less disposable income than in urban areas.

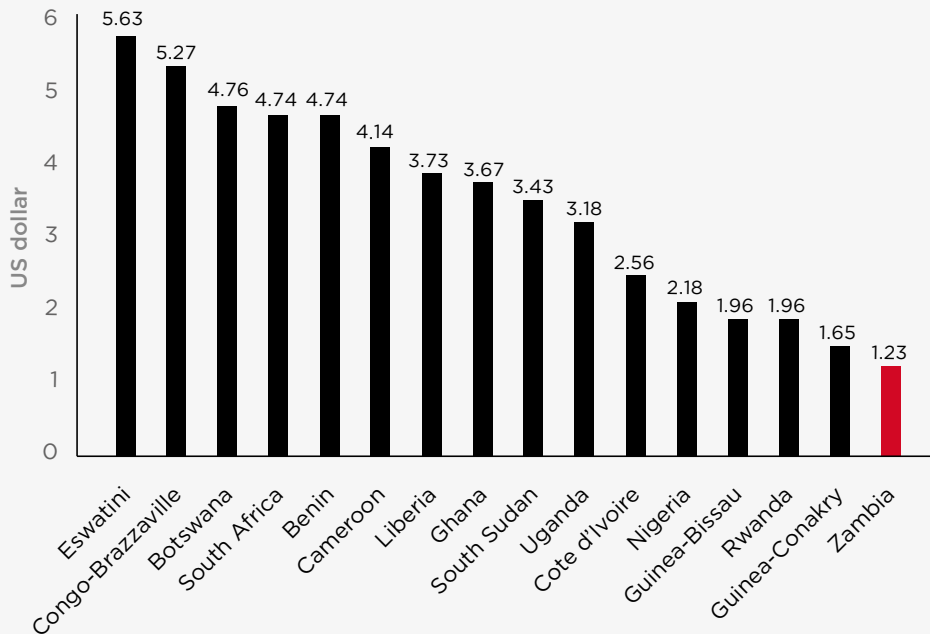
⁹⁸ GSMA, Reforming mobile sector taxation in Zambia: Promoting economic and social development through a more efficient tax system, 2018

⁹⁹ ICTD, Unpacking Zambia’s proposed mobile money levy: Lessons and considerations, November 2023. Resilient, Mobile money: a tax policy that is spreading, January 2024

¹⁰⁰ See separate methodological document for modelling assumptions.



Figure 17: MTN ARPU, Q1 2024



Source: MTN¹⁰¹

Low mobile prices and low ARPUs in Zambia help promote affordability. However, they also put significant financial strain on operators who need to operate their networks profitably and continue investing in infrastructure. If costs are too high they can result in an unsustainable market for investment.

Costs are a critical factor in the overall financial sustainability of the mobile operators. The capex involved in investing in new sites is one of the challenges that operators face. In rural areas, this may involve additional costs because infrastructure is required to cater for power and backhaul etc. In Zambia, the cost of operating these sites also has a major impact on financial viability. The drought has resulted in repeated power shortages and extended periods without grid electricity. This has resulted in network outages and increased operating costs as MNOs have had to rely more on diesel generators to power sites. This increase in operating costs, combined with the lost revenue when networks are down, has further threatened the financial sustainability of the business.

Policy measures and fiscal incentives to enhance the financial sustainability of MNOs would benefit customers. Support to the MNOs to manage the inflated operating costs would release funds to invest in network capacity and expansion. It would increase the operators' ability and willingness to invest in rural areas as lower operating costs would make new sites more financially sustainable. In addition, it would allow them to invest in upgrading existing sites to support new mobile broadband technologies and thereby expand broadband coverage, reduce costs and increase the quality of services.

Enhancing the sustainability of investment could result in 874,000 additional unique mobile internet users in 2028. The table below shows outputs from modelling of the impact of sustainable investment on mobile internet uptake.¹⁰²

¹⁰¹ MTN, Quarterly update for the period ended 31 March 2024

¹⁰² See separate methodological document for modelling assumptions.

Table 12: Mobile internet uptake with sustainable investment

Mobile internet users (m)	2023	2024	2025	2026	2027	2028
BAU	4.61	5.02	5.46	5.94	6.46	7.03
Sustainable investment	4.61	5.04	5.52	6.06	6.81	7.90
Y-on-Y difference to BAU	0%	0%	1%	2%	5%	12%
Increase in growth vs BAU	0%	+0%	+1%	+3%	+7%	+19%

Policy scenario 3: Modernizing the tariff regulation regime, to provide more certainty for operators

Mobile retail tariffs are required to be approved by the regulatory authority. When MNOs want to introduce new tariffs or retail packages, they require approval by the regulatory authority. The regulatory framework requires that tariffs reflect costs and are not discriminatory.¹⁰³ The non-discrimination requirements can result in operators being prevented from introducing retail offers targeted at specific groups (e.g. students, farmers etc.).

Regulators usually focus on regulating wholesale tariffs. In countries where there is a competitive mobile retail market, it is common practice for regulators to focus on setting rates for wholesale tariffs (e.g. call termination) and allow operators to set their own retail rates, subject to competition with other operators. In some cases, there are rules around customer protection, transparency and fairness. However, there are frequently no regulatory controls on tariffs or any retail tariff approval process.

Revisiting rules around non-discrimination in retail tariffs would benefit customers. Zambia has a highly competitive market and low prices, which result in low ARPUs (Figure 17). Competition is effective at constraining prices and offering customers good value for money. One feature of effective retail competition is operators’ efforts to win market share by targeting specific groups through offers and promotions. Such efforts have the effect of reducing prices overall and driving operators to be more innovative and efficient. A prohibition on such offers can have the opposite effect. By requiring all retail tariffs to be available to everyone, it can dampen competition and suppress operators’ attempts to win new customers. The overall impact can be to raise average prices rather than lower them. Relaxing some of the current rules around non-discrimination in retail tariffs would be likely to further strengthen competition which would ultimately benefit consumers in the form of lower prices and greater rates of adoption.

Policy scenario 4: Lifting restrictions on mobile money charges and removing the mobile money levy

The government has recently introduced a levy on mobile money transactions, prohibited some types of charges and capped fees for mobile financial services.¹⁰⁴ The levy is a tax on all transactions with a rate that varies according to the size of the transaction (as discussed in the tax section above).¹⁰⁵ The Government recently prohibited mobile money providers from charging customers for a range of different services such as, opening an electronic wallet, PIN resets, closure and re-activating wallets, surcharges for merchant payments, balance enquiries etc. In the same decision, the government also capped fees for certain types of transactions. For example, the fee for cash-out transactions between ZMW 5,001 and ZMW 10,000 (and above) is capped at ZMW60, the collection fee for Micro, Small and Medium Enterprises is capped at 1.0% etc.

103 ICT Act of 2009, Section 47 (2)

104 Republic of Zambia, Government Gazette No. 7625, 2 August 2024

105 ICTD, Unpacking Zambia’s proposed mobile money levy: Lessons and considerations, November 2023

These are new changes to the controls on the mobile financial services market in Zambia. These changes have only recently been introduced, so the impact has not yet been seen in the market. However, evidence from other countries that have implemented similar controls shows that they can have a negative impact on the mobile financial services market and on digital adoption more broadly.

Studies have consistently shown a negative effect of mobile money levies on both uptake and usage. In Tanzania, the introduction of a levy on mobile money withdrawals and P2P transactions resulted in a large decline in both the value and number of these transactions. Even after three reductions in the size of the levy, P2P transaction numbers remained 30% below their pre-levy trend, with an even larger reduction in withdrawals.¹⁰⁶ (Figure 18 & 19).

Figure 18: Total number of transactions, by transaction type

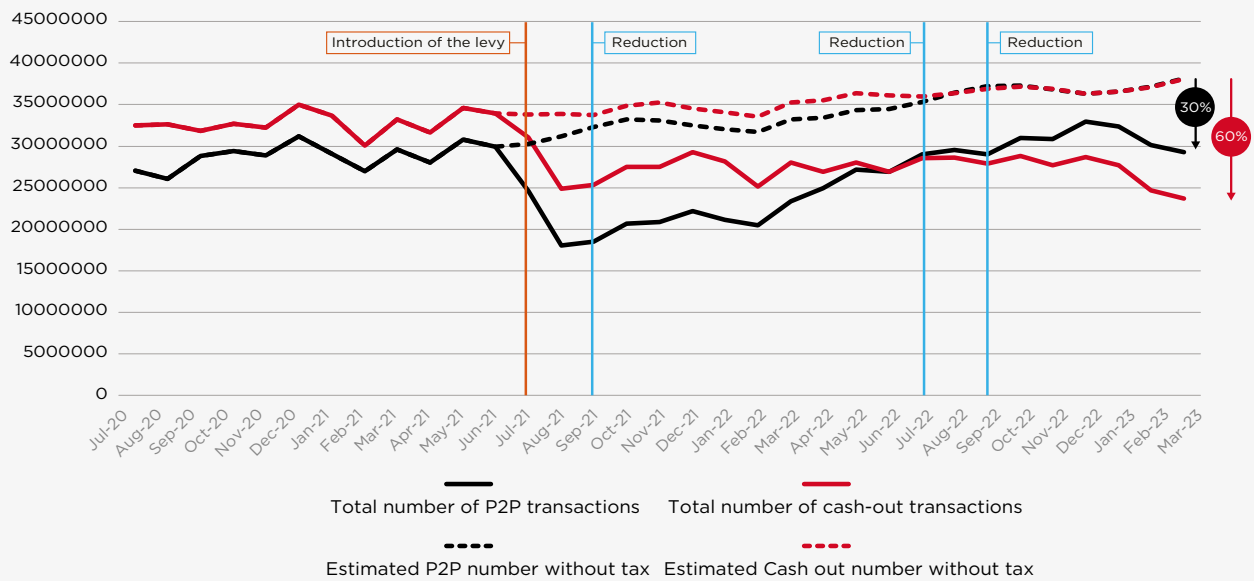
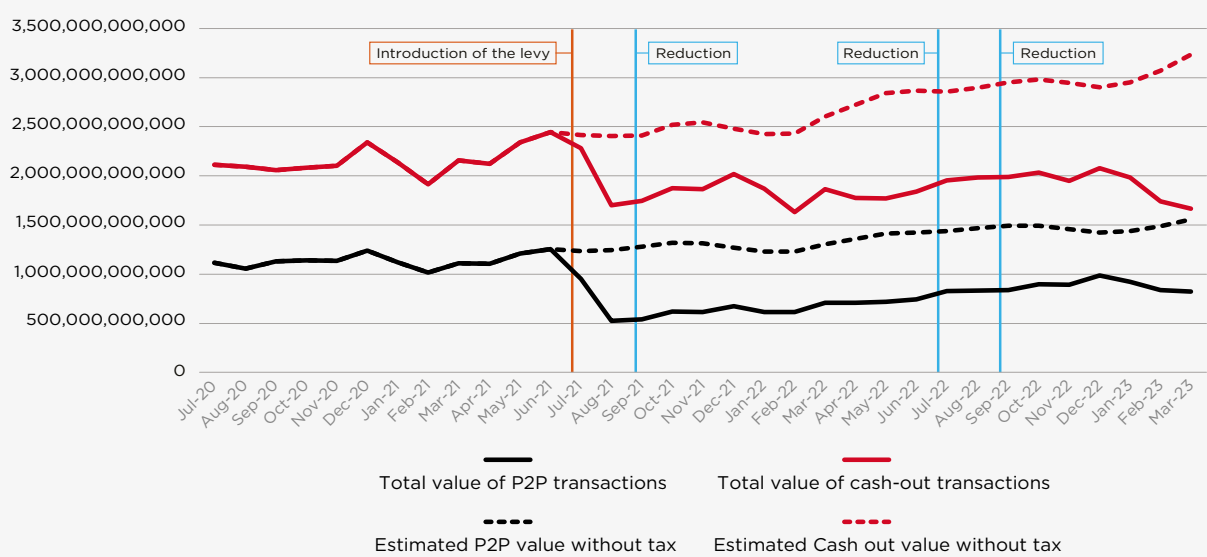


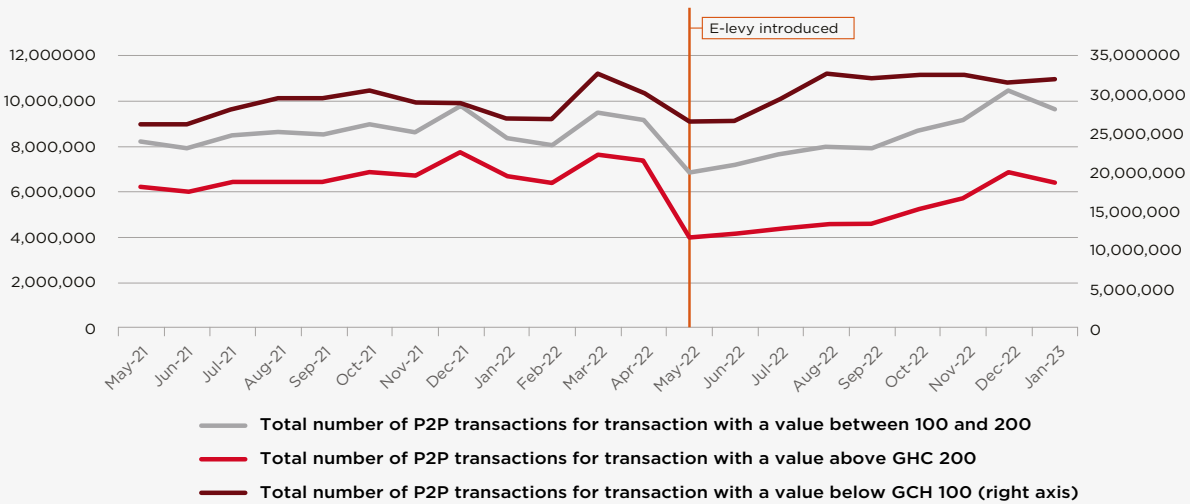
Figure 19: Total value of transactions (TZS), by transaction type



Source: GSMA

In Ghana, the introduction of a levy on mobile money transaction values resulted in a 5% reduction in the number of active subscribers compared to the pre-levy trend.¹⁰⁷ Transaction numbers overall decreased following the introduction of the levy in May 2022. The total number of P2P transactions fell by 25% on average immediately after the implementation of the levy in May, from a peak of almost 50 million transactions in 3.1 Implementation of the E-levy March.¹⁰⁸ (Figure 20).

Figure 20: Evolution of transaction number of P2P transactions, by value



Source: GSMA

Similarly, in Benin, although the government barred mobile operators from passing through its new mobile money levy to consumers, the introduction of the levy resulted in a significant reduction in investment in mobile money agent networks compared to the pre-levy trend. As a result, active user growth also decreased, with mobile money subscribers forecast to be almost 10% lower in 2028 than they would have been without the levy.¹⁰⁹

Mobile money users are keenly aware of the fees that they pay. They also usually have multiple mobile money accounts with several different providers. This is therefore a highly competitive market in which customers are able to switch easily between providers, often on a transaction-by-transaction basis. Mobile money providers are subject to competitive pressure which is what controls their prices. Unwarranted regulatory intervention in these markets is more likely to stifle innovation and investment into the market which will ultimately be to the detriment of customers.

Policy scenario 5: Stimulating additional demand for mobile telecoms services

There are multiple policies that the government could adopt that would have the effect of stimulating demand for mobile internet and mobile money. Even when affordable mobile internet is physically available to citizens, there remain significant barriers to adoption for many people.

Improving the affordability of broadband devices. Broadband enabled devices are more expensive than voice-only devices and the cost of purchasing them can be a barrier to adoption, particularly in low-income households. Tax – discussed in more detail above – is one of the factors that affects the cost and affordability of device purchase and ownership.

107 GSMA, Driving digital transformation of the economy in Ghana, forthcoming.
 108 GSMA, The E-levy in Ghana: Economic Impact Assessment, 2023.
 109 GSMA, Driving digital transformation of the economy in Benin, forthcoming.

Some countries, such as Kenya, have taken steps to reduce costs by encouraging local assembly of broadband devices although the success of this policy will depend on a range of factors, including the capacity of local manufacturers to compete with global players.¹¹⁰ Other measures to improve affordability focus on the provision of financing for the supply and purchase of devices. Consumer credit has been a key facilitator of the adoption of broadband devices in high-income countries. The very high rates of pre-paid subscribers in most African countries have made this mechanism difficult to establish. However, private-sector companies and other types of organisation are looking at business models that could provide consumer credit to support the purchase of broadband devices in low-income markets.¹¹¹ These efforts could be enhanced by supportive government policies such as regulatory sandboxes, credit guarantees and other forms of support to financial service providers.

Promoting e-government services can also be a driver of increased demand for broadband.

Zambia has already established a programme that has this effect. Migrating the FISP to an e-voucher-based scheme in which farmers use mobile devices as a means of accessing support, provides an incentive for farmers to get devices and adopt them. This programme is still underway in Zambia and the full impact of the transition has not yet been seen. However, it is clear that, as the system becomes embedded and adoption increases, farmers will be more likely to get devices and become users of digital services. A similar mechanism is taking place with the income support grants and the digitalisation of customs processes at border crossing points. The impact of these initiatives on digital adoption could be significant. The FISP is currently benefitting 1 million small farmers. These are all in rural areas and are predominantly low-income households. Levels of digital adoption among this group of the population would typically be lower than average for the country. By providing a direct financial incentive for such farmers to use mobile devices, the scheme is likely to boost adoption in a material way.

There are a wide range of further initiatives that governments can take to promote the productive use of mobile internet. Training and education for digital knowledge and skills is an essential component of the policy framework. This should be targeted at all levels within the education system, adapted to local contexts and combined with awareness campaigns that promote the safe and productive use of the internet.

Stimulating demand could result in 892,000 additional unique mobile internet users in 2028. The table below shows outputs from modelling of the impact of demand stimulation on mobile internet uptake.¹¹²

Table 13: Mobile internet uptake with demand stimulation

Mobile internet users (m)	2023	2024	2025	2026	2027	2028
BAU	4.61	5.02	5.46	5.94	6.46	7.03
Demand stimulation	4.61	5.14	5.74	6.39	7.12	7.92
Y-on-Y difference to BAU	0%	3%	5%	8%	10%	13%
Increase in growth vs BAU	0%	+3%	+6%	+10%	+14%	+19%

110 Safaricom, Kenya Sets Up First Smartphone Assembling Plant in East Africa, 30 October 2023

111 See <https://watuafrika.com/watu-simu/> for an example.

112 See separate methodological document for modelling assumptions.

C. Modelling future developments in the telecoms sector

The digital communications market has been extensively studied by academics and policy makers.

Much of this research has been in relation to markets in Africa. This has been applied in a model of the telecoms market in Zambia that combines up-to-date information on the current market with this body of evidence.

The base case forecast of the market projects market developments, assuming that the policy environment remains as it is today. It is based on historical trends and sector analysis which are used to extrapolate market outcomes to 2028. This base case focuses on mobile subscriptions, mobile broadband adoption, and mobile money usage.

The impact of changes in regulation and policy towards the sector are modelled by analysing how these changes would affect the operators in general and, in particular, how they would affect adoption and usage of mobile broadband and mobile money (Table 14).

Table 14: Modelled policy and regulatory reform scenarios

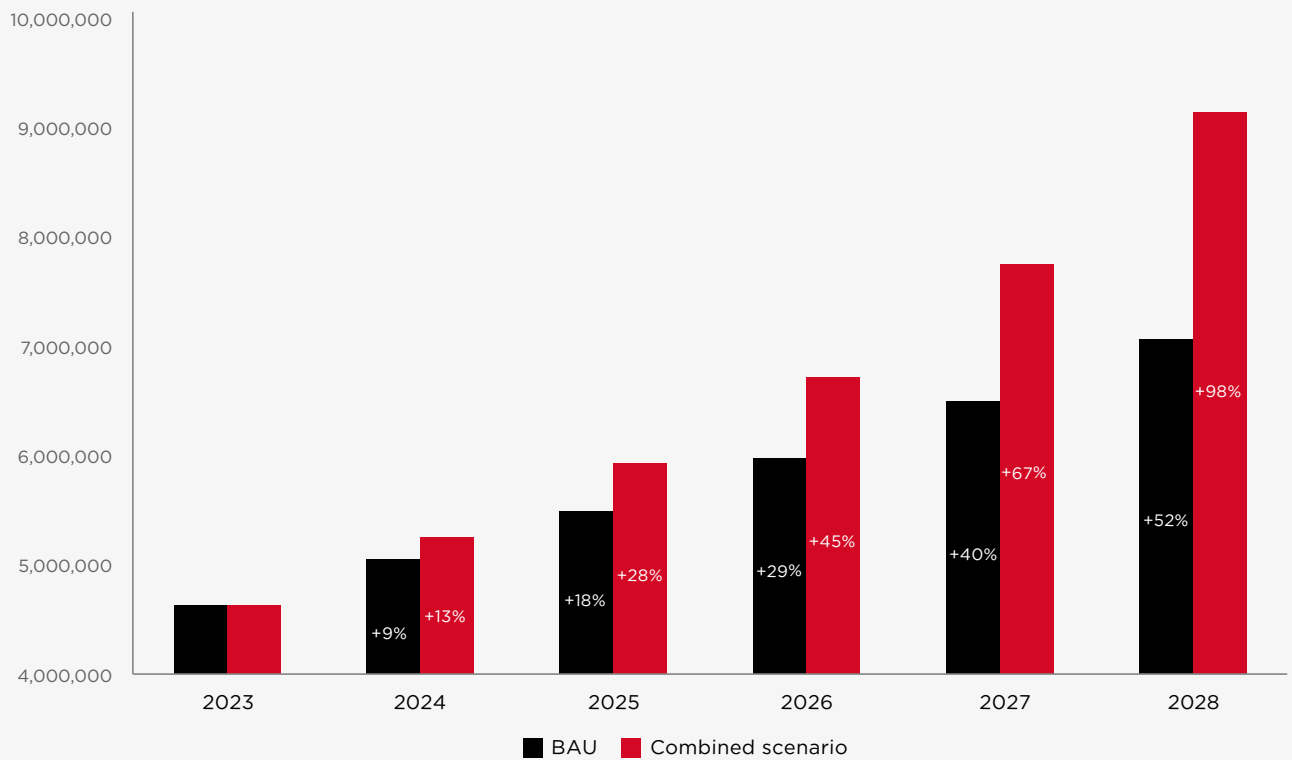
Policy/regulatory change	Expected Impact	2028 increase in users vs BAU
1. Removing the airtime excise duty of 17.5%; and reducing corporate income tax to the standard levels (i.e. 30%)	Reducing the sector-specific taxes would reduce the costs to both MNOs and customers. This would result in increased digital adoption.	5% or 325,000 additional unique mobile internet subscribers.
2. Increasing the reliability of power supply to MNOs by treating them as critical national infrastructure	Support to the MNOs in managing their operating costs by increasing reliability of grid power would free-up investment in new sites and upgrading existing sites. This would reduce costs and promote digital adoption.	12% or 874,000 additional unique mobile internet subscribers.
3. Modernizing tariff regulation regime in market, to provide more certainty for operators	Modernising the framework for regulating mobile retail tariffs through, for example, easing restrictions on MNOs from offering specific groups targeted offers would promote competition and result in better value for money to customers.	Not quantified
4. Lifting restrictions on mobile money charges and removing the mobile money levy	Lifting the recently imposed restrictions on some types of charges for mobile money services, together with removing the new mobile money levy would promote competition in MFS and increase access.	Not quantified
5. Stimulating additional demand for mobile telecoms services	By successfully implementing the rollout of e-government services, including transitioning the FISP to an e-voucher scheme, the government will increase demand for digital services. Training and development of digital skills will further increase demand.	13% of 892,000 additional unique mobile internet subscribers.

Taken together, these policy initiatives would have a significant impact on digital adoption in Zambia. The policies outlined in this report would be mutually reinforcing. They would reduce costs to customers, increase access and promote digital adoption. They would increase the number of people using the internet by one-third compared with the BAU scenario. This increase in the number of internet users would have a major impact on the usage gap in Zambia. By 2028, the usage gap would be 58% instead of 67% in the basecase. The combined effect of the policies is therefore to reduce the usage gap by 9 percentage points (Table 15, Figure 20).

Table 15: Mobile internet uptake with combined policy initiatives

Mobile internet users (m)	2023	2024	2025	2026	2027	2028
BAU	4.61	5.02	5.46	5.94	6.46	7.03
Combined scenario	4.61	5.22	5.91	6.69	7.71	9.12
Y-on-Y difference to BAU	0%	4%	8%	13%	19%	30%
Increase in growth vs BAU	0%	+4%	+10%	+16%	+27%	+45%

Figure 20: Impact of combined policy scenario on the number of mobile internet users



Importantly, this would also benefit government and the country more broadly. Greater digital adoption will promote uptake of digital government services. This will reduce costs, increase access and reduce leakage within the public financial management system. Greater

levels of digital adoption will also increase productivity and expand the out of Zambian businesses. These policies applied to the ICT sector would therefore have a positive impact on the government’s broader development objectives.



6. Policy Recommendations

6. Policy Recommendations

Zambia stands to gain significant benefits from digital transformation. The government will be able successfully implement its plans for digitalisation, thereby increasing the efficiency and effectiveness of public services. The private sector will also benefit in a wide range of ways from lower costs, improved access to customers, innovation etc. Digitalisation is particularly important in the context of the country’s strategy to diversify its economy, reduce the volatility of economic growth and mitigate the impact of external forces such as climate change.

To reap these benefits, digitalisation will require bold actions to support demand, reduce the cost of supply and promote a policy environment that supports investment towards the collective goals of digital transformation and universal connectivity.

Mobile networks are the backbone of digitalisation of the economy and the mobile sector is best positioned to partner with the government in creating the foundations on which its digital strategy is built. The mobile operators provide the digital infrastructure on which the digital economy is based. It also provides a decentralised platform through which government and companies can gain access to a very large section of the population, even in rural and remote areas.

This report identifies supply-side policy recommendations for action to unlock the catalysing role of the mobile sector:

Supply-side policy Recommendations		
Policy recommendation	Expected Impact	Stakeholders involved
Removing the airtime excise duty of 17.5%; and reducing corporate income tax to the standard levels (i.e. 30%)	Reducing the sector-specific taxes would reduce the costs to both MNOs and customers. This would result in increased digital adoption.	Ministry of Finance, Ministry of Technology and Science
Increasing the reliability of power supply to MNOs by treating them as critical national infrastructure	Support to the MNOs in managing their operating costs, particularly in the cost of energy.	Ministry of Finance
	This could be done through designation of ICT infrastructure as critical and therefore protected from load-shedding. Increasing reliability of grid power would free MNOs to invest in new sites and upgrade existing sites. This would reduce costs and promote digital adoption.	Ministry of Energy Ministry of Technology and Science
Modernizing the tariff regulation regime, to provide more certainty for operators	Modernizing the framework for regulating mobile retail tariffs through, for example, easing restrictions on MNOs from offering specific groups targeted offers would promote competition and result in better value for money to customers.	Ministry of Technology and Science ZICTA
Lifting restrictions on mobile money charges and removing the mobile money levy	Lifting the recently imposed restrictions on some types of charges for mobile money services, together with removing the new mobile money levy would promote competition in MFS and increase access.	Ministry of Finance Bank of Zambia

In addition, the following framework is used for demand-side and other policy recommendations to enhance digital transformation:

Demand-side policy recommendations

Policy recommendation	Expected Impact
<p>Accelerate implementation of e-government measures</p>	<p>The Government of Zambia has already implemented a number of e-government projects and this has supported digital adoption.</p> <p>Some policy initiatives that have been proposed are still pending full implementation. For example, the transition to an e-voucher scheme to update the FISP programme is planned but not yet fully implemented. A successful rollout of this and similar digital programmes will have a strong positive impact on digital adoption, particularly in rural areas and among low-income households.</p> <p>Other such initiatives, in which public services are provided through digital channels, will provide a further boost to digital adoption.</p> <p>It is important to note that, as levels of digital adoption increase, and people become more used to interacting with the government via digital channels, the easier and cheaper it is to implement new digital applications.</p> <p>The government is encouraged to accelerate the planning and implementation of such schemes. This will meet the twin goals of improving access and reducing costs of public service delivery.</p>
<p>Digital skills and literacy</p>	<p>Enhancing digital literacy and skills among the general population will support demand for digital adoption. This will include a wide range of initiatives from basic digital education through to advanced digital skills, programming etc.</p> <p>The Government of Zambia has made notable efforts in improving levels of digital skills and literacy through the general education system.</p> <p>The government is encouraged to further these efforts, working in partnership with the private sector to strengthen digital skills and literacy.</p>
<p>Promote adoption of digital technologies by businesses</p>	<p>By providing incentives to businesses to adopt digital technologies, the government can boost demand. This can include initiatives such as digital entrepreneurship schemes and direct support to MSMEs focused on the local development of digital technologies.</p> <p>Digitalisation of e-government services also has an impact on digital adoption among firms. This has already been seen through government initiatives to digitise processes such as business registration and tax-filing. The rapid adoption of digital channels by businesses is evidence of the demand-stimulating effect that such e-government initiatives can have.</p> <p>It is recommended that the government pushes this programme of e-government further. Existing digital processes need to be improved with better user interfaces, deeper back-office integration and an improved user experience. This will enhance trust in the system and promote digital adoption among users.</p>
<p>Increase confidence and trust in digital safety and security</p>	<p>By ensuring that the regulatory frameworks around data protection, cybersecurity, trust and consumer protection are up to date, the government will increase trust in the digital ecosystem. This will help overcome caution about transition from manual to digital processes and thereby promote digital adoption.</p> <p>Digital ID is a critical part of this trust system. Implementing an effective Digital ID in Zambia is a high priority as it will make other e-government initiatives more effective and easier to access. It will also boost private-sector digital businesses as they can take advantage of the security and authentication that a Digital ID provides.</p> <p>The Government of Zambia has taken some steps towards implementing a Digital ID. However, the programme is currently not progressing as quickly as it needs to.</p> <p>It is recommended that the Government redoubles its efforts to design and implement a Digital ID in Zambia.</p>

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