

https://dspace.org/

The role of Telcos in fostering Inclusive connectivity in South Africa

Taylor, Tsatsawani Jessica

2025
University of the Witwatersrand, Johannesburg
https://hdl.handle.net/10539/47924

Taylor, Tsatsawani Jessica . (2025). The role of Telcos in fostering Inclusive connectivity in South Africa [Master`s dissertation, University of the Witwatersrand, Johannesburg]. WIReDSpace. https://hdl.handle.net/10539/47924

Downloaded from a DSpace repository. https://dspace.org/

The role of Telcos in fostering Inclusive connectivity in South Africa

Tsatsawani Jessica Taylor

Supervisor: Dr Ayanda Magida

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business

Johannesburg, 2025

ABSTRACT

This study explores the role of telecommunications companies (telcos) in South Africa in fostering inclusive connectivity, and the effectiveness of regulatory frameworks and policies that drive inclusive connectivity in the telecommunication industry. While South African policies emphasise the significance of inclusive connectivity for socio-economic development, the digital divide remains a pressing issue.

Semi-structured interviews were conducted with nine purposively sampled industry professionals within the telecommunications sector. The interviews aimed to shed light on the ways in which those working in the sector perceive the role that telcos do, and should, play in fostering inclusive connectivity. Stakeholder Theory, together with the related Social Contract Theory and Technology Social Responsibility, were used as a theoretical framework for interpreting the responses of interviewees. A thematic analysis was used to analyse the data, identifying common or significant themes related to the role of telcos and of the regulatory frameworks that govern the sector.

The results reveal a strong consensus on the significant role telcos play in fostering inclusive connectivity in South Africa. However, industry professionals identify several barriers to telcos' contributions in this area. Some participants expressed that expanding services into rural and underserved regions is often not commercially viable due to high infrastructure costs and lower demand. Additionally, concerns were raised about the perceived lack of legitimacy of the Independent Communications Authority of South Africa (ICASA), stemming from the alleged misuse of the Universal Service Fund, which may be undermining its ability to effectively hold telcos accountable to their license obligations.

Despite these challenges, interviewees highlighted instances of positive practices, especially around digital skills programmes, and proposed innovative solutions for improvement. These insights led to several recommendations from

the study. For the government, key recommendations include stricter enforcement of license obligations, greater transparency around the Universal Service Fund, and better protection of infrastructure against theft and vandalism In addition, policies addressing spectrum allocation, business partnerships, and accountability in the management of the UFS must be prioritised. Telcos could also explore better collaboration and infrastructure sharing partnerships with each other and leverage new technologies to accelerate connectivity rollout in underserved areas. Innovative funding models, such as results-based financing, could also be considered as a way for government to incentivise greater market reach by telcos.

Suggestions for further research include comparative studies with other countries that are also pursuing inclusive connectivity, and impact evaluations of innovative solutions that are considered within the telecommunications sector.

This study contributes to the theoretical understanding of inclusive connectivity in South Africa by applying and extending Stakeholder Theory, Social Contract Theory and Technological Social Responsibility theoretical frameworks to the telecommunications context of South Africa. The research findings demonstrates that telcos view their role as extending beyond profit-making to ensuring societal benefits. The study further contributes to the body of qualitative research in inclusive connectivity in South Africa using a constructivist paradigm and semi-structured interviews.

KEYWORDS

Inclusive connectivity, telcos, digital divide, digital inclusion, telecommunications regulation, qualitative study

DECLARATION

I, Tsatsawani Jessica Taylor, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: Tsatsawani Jessica Taylor Signature: TJ Taylor

Signed at Lynnwood, Pretoria

On the 29 day of April 2025

ACKNOWLEDGEMENTS

Firstly, I am grateful for the opportunity to further my studies and expand my knowledge in Digital Business. This course has been an incredible journey, and I would recommend it to my friends and colleagues. Above all, I give glory to God for His strength and provision throughout the past two years.

To my supervisor, Dr Ayanda Magida – thank you for your invaluable guidance and kindness throughout this research journey. Research can be challenging, with days filled with doubt, but you made the journey easier for me.

To my husband, Stephen Taylor – thank you for being a great spouse. You have been the rock of our home, from cooking dinners and helping with laundry to staying up late with me, listening to my ideas and thoughts. Your unwavering support means the world to me, and I appreciate how you serve our home and desire the best for me.

TABLE OF CONTENTS

ABSTRACT ..... **ii**
KEYWORDS ..... **iv**
DECLARATION ..... **v**
ACKNOWLEDGEMENTS ..... **vi**
TABLE OF CONTENTS ..... **vii**
LIST OF TABLES ..... **ix**
LIST OF FIGURES ..... **x**
LIST OF ACRONYMS ..... **xi**
CHAPTER 1. INTRODUCTION **12**
1.1 Statement of purpose 12
1.2 Background of the study 12
1.3 Research problem 15
1.4 Research objectives 16
1.5 Rationale 16
1.6 Delimitations of the study 17
1.7 Definition of terms 17
1.8 Assumptions 18
1.9 Report outline 19
CHAPTER 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK 20
2.1 Introduction 20
2.2 Background discussion 20
2.2.1 Inclusive connectivity in South Africa 21
2.2.2 The barriers to inclusive connectivity 25
2.2.3 The role of telcos in fostering inclusive connectivity 27
2.2.4 The effectiveness of regulatory frameworks and polices 28
2.3 Analytical framework 31
2.3.1 Theoretical framework: Stakeholder Theory 31
2.3.2 Theoretical framework: Social Contract Theory 32
2.3.3 Theoretical framework: Technological Social Responsibility 33
2.4 Conclusion 34
CHAPTER 3. RESEARCH METHODOLOGY **35**
3.1 Research paradigm 35
3.2 Research approach 36
3.3 Research design 36
3.4 Data collection methods 36
3.5 Population and sample 37
3.5.1 Population 37
3.5.2 Sample and sampling method 37
3.6 The research instrument 38
3.7 Procedure for data collection 39
3.8 Data analysis strategies and interpretation 39

3.9 Quality Assurance 40
3.9.1 Transferability 40
3.9.2 Credibility 41
3.9.3 Dependability 41
3.10 Ethical considerations 41
CHAPTER 4. PRESENTATION OF FINDINGS 43
4.1 Demographic profile of participants 43
4.2 Theme development 44
4.3 Findings 45
4.3.1 Role of telcos 46
4.3.2 Stakeholder role 48
4.3.3 Government and Regulation 49
4.3.4 Barriers or challenges 51
4.3.5 Improvement strategies 56
4.4 Conclusion of findings 60
CHAPTER 5. DISCUSSION OF FINDINGS 62
5.1 Discussion of findings in relation to research objective 1 62
5.1.1 Role of telcos 62
5.1.2 Stakeholder role 63
5.2 Discussion of findings in relation to research objective 2 65
5.2.1 Government and regulation 65
5.3 Discussion of findings in relation to research objective 3 66
5.3.1 Barriers or challenges 66
5.4 Discussion of findings in relation to research objective 4 69
5.4.1 Improvement strategies 69
5.5 Conclusion of findings 72
CHAPTER 6. CONCLUSION AND RECOMMENDATIONS 74
6.1 Conclusion of the study 74
6.2 Possible limitations and challenges of the study 75
6.3 Implications of the study 76
6.4 Recommendations 77
6.5 Suggestions for further research 78
REFERENCES 80
APPENDIX A: Interview guide 86

LIST OF TABLES

Table 4-1: Sample demographics.....44
Table 4-2: Research objectives and themes. 61

LIST OF FIGURES

Figure 2-1: Internet use by geographical type. 23
Figure 2-2: Internet use by decile of household income. 24
Figure 2-3: Rural population network coverage per province in 2023. 26
Figure 4-1: Word cloud of the sub-themes. 45

LIST OF ACRONYMS

AI	Artificial Intelligence
BEE	Black Economic Empowerment
DDF	Digital Development Fund
ICASA	Independent Communications Authority of South Africa
ICT	Information Communications Technology
GSM	Global System for Mobile Communication
NDP	National Development Plan
NIP	National Infrastructure Plan
OECD	Organisation for Economic Co-operation and Development
POPIA	Protection of Personal Information Act
RDP	Reconstruction and Development Programme
SITA	State Information Technology Agency
UAS	Universal Access and Service
USF	Universal Service Fund
USO	Universal Service Obligations

CHAPTER 1. INTRODUCTION

1.1 Statement of purpose

This qualitative study explores the role of telecommunications companies (telcos) in fostering inclusive connectivity, and the effectiveness of regulatory frameworks and policies that drive inclusive connectivity in the telecommunication industry. Furthermore, it aims to investigate what further actions and strategies telcos could undertake to enhance digital access and inclusivity within the South African context.

1.2 Background of the study

Various policies, including the Electronic Communications Act 36 of 2005 and the National Development Plan, have emphasised the importance of bridging the digital divide and promoting inclusive connectivity. Furthermore, inclusive connectivity and the telecommunications sector are marked as key drivers of socio-economic development in South Africa (Department of Telecommunications & Postal Services, 2016). In light of this, fostering inclusive connectivity is a priority for realising a flourishing society in which every citizen can participate fully.

Inclusive connectivity and the notion of closing the digital divide are closely related, as inclusive connectivity is achieved through efforts to bridge the digital divide. The digital divide refers to the difference between individuals who have access to, and proficiency in, the use of technology and those who lack such access and proficiency (Afzal et al., 2023; Basit et al., 2021). The Organisation for Economic Co-operation and Development (OECD) defines the digital divide as “the gap between individuals, households, businesses, and geographical areas at different socio-economic levels concerning their opportunities to access information and communication technologies (ICTs) and their use of the internet for a wide variety of activities.” (OECD quoted in Lee & Armstrong, 2023, p. 173).

In the context of South Africa, it is crucial to acknowledge the historical legacy of racial segregation and apartheid planning, which distinctly shapes the digital divide in the country (Hadzic, 2024). The apartheid era resulted in unequal development and resource allocation, including technological and communications infrastructure (Aruleba & Jere, 2022; Chitimira et al., 2021; Faloye & Ajayi, 2021; Seadira & Heuva, 2021). The transition to democracy necessitated telecommunications reform to include those previously excluded from telecommunications services and ensure digital inclusion for all, also known as universal access and service (UAS). This acknowledgement of a deeply racialised communications divide was further reflected in the objectives of the 1996 White Paper on telecommunications as part of the telecommunications reform (Lewis, 2013; Seadira & Heuva, 2021).

New interventions and policies were drafted to address the aftermath of the apartheid regime, including the Reconstruction and Development Programme (RDP). This telecommunications reform led to the adoption of UAS interventions, which included universal service obligations (USOs) (Lewis, 2013). These USOs were imposed on telecommunications companies as part of their license conditions and spectrum allocation, mandating them to provide services according to the agreement. USOs require licensees to provide ICT services to specific customer groups, such as extending network coverage to particular geographic areas or segments of the population. Moreover, the Universal Services Fund (USF) was introduced under the Telecommunications Act 103 of 1996 to help bridge the digital divide (Lewis, 2013).

In 2013, another policy was introduced; the SA Connect broadband policy was approved and introduced to extend broadband access in rural areas of the country, and the USF was renamed the Digital Development Fund (DDF), still with the mandate of fostering inclusive connectivity (Department of Telecommunications & Postal Services, 2016). Evidently, there has been progress to foster inclusive connectivity from a network expansion perspective, with the latest report by ICASA (2024) revealing improvements in network coverage in rural areas over the years. However, an analysis of Statistics South

Africa's 2022 General Household Survey[1] highlighted that portions of the population are still digitally excluded, lacking adequate digital access and usage. For instance, an analysis of internet usage by geographical type indicated that urban areas have the highest internet usage, with 81% of households in urban areas using the internet. This is mainly the outcome of better infrastructure, greater accessibility and higher technology adoption rates in urban areas. The two categories of rural areas – traditional land and farms – exhibit lower percentages of internet usage at 64% and 59% of households, respectively.

Another study by Afrobarometer (2024) also highlighted the digital divide between rural and urban areas in South Africa. An analysis of internet access revealed that 73.6% of people residing in urban areas have internet access, while only 58.9% of people who reside rurally have access to the internet. Similarly, rural areas exhibit lower internet usage than urban areas, with 30.7% of respondents residing in rural areas not using the internet, compared to only 16.2% in urban areas (Afrobarometer, 2024). The low percentage in rural areas from both studies is likely due to the lack of infrastructure, limited-service providers, a low technology adoption rate and digital skills. These disparities emphasise the need for improved connectivity and digital inclusion efforts in rural areas to bridge the digital divide and realise inclusive connectivity.

Other researchers have also highlighted the gender disparities in digital inclusion, stating that women especially in rural areas face greater levels of digital exclusion when compared to men (Shiferaw, 2024). While progress has been made in promoting inclusive connectivity, it is evident that digital inequality remains an issue in the post-1994 era of the country (Faloye & Ajayi, 2021). Some analysts, such as Jacks et al. (2024), argue that issues of digital accessibility, usage, and skills must be addressed through policies and collaborative efforts between governments, the private sector, and civil society. This includes telcos, and it

[1] These statistics were calculated by the researcher using the microdata from Statistics South Africa's 2022 General Household Survey. This is a nationally representative survey of South African households, and the data can be downloaded from the "DataFirst" repository hosted by the University of Cape Town.

raises questions about the effectiveness and monitoring of the USOs and whether telcos can do more to help foster inclusive connectivity.

1.3 Research problem

As discussed in the background above, it is evident that South Africa has a persistent digital divide. The National Development Plan, in line with Section 3 of the Electronic Communications Act 34 of 2005, envisages that improving access to digital technologies will be a key component to achieving inclusive economic growth. (Department of Telecommunications & Postal Services, 2016). Telcos have a crucial role, and the government aims to incentivise and guide their efforts to help bridge digital divides and achieve inclusive connectivity in South Africa, including using USOs.

However, it is only reasonable to expect telcos to extend services to underserved areas if it makes economic sense to them. The high costs of building network infrastructure in rural areas and lower demand from less affluent and sparsely populated areas makes it financially non-viable for telcos to extend services, and thus creates a barrier to digital inclusion. For example, according to Reddick et al. (2020), it costs 80% more to deploy network infrastructure in rural areas than in urban areas. These costs discourage investments by telcos when considering the cost of deployment and the associated low return on investment (Arakpogun et al., 2023; Aruleba & Jere, 2022; Reddick et al., 2020; Seadira & Heuva, 2021). This is noteworthy, especially considering the cost of backup power and ensuring a high availability rate of base stations during load-shedding. According to ICASA (2024), telcos spent R2.5 billion on batteries and R930 million on generators in 2023 to ensure uninterrupted services to their customers during load-shedding (ICASA, 2024).

While the current state of economic development and power supply issues may impose some constraints, it is conceivable that telcos might be able to do more to ensure inclusive connectivity – a possibility which this study aims to explore. Despite great strides in telecommunications infrastructure and policy development, a large proportion of the country remain digitally excluded (Seadira

& Heuva, 2021). Such exclusion limits their access to health care, education and economic opportunities, and the persistent digital gap highlights the need for more effective approaches, especially given that there is limited evidence of the effectiveness of USOs and the USF (Chitimira et al., 2021).

This research explored telcos' role in addressing digital exclusion and their efforts, challenges or barriers, and strategies in fostering inclusive connectivity. Furthermore, it explored ways to mitigate these barriers for more affordable and equitable access to connectivity for all.

1.4 Research objectives

The objectives of the study were:

1. To investigate the role of telcos in fostering inclusive connectivity in South Africa.
2. To explore the effectiveness of regulatory frameworks and policies to foster inclusive connectivity in the telecommunication industry.
3. To explore barriers faced by telcos in fostering inclusive connectivity.
4. To explore potential strategies and actions that telcos could undertake to enhance digital access and inclusivity in South Africa.

1.5 Rationale

It has been established that a significant digital divide exists in South Africa, exacerbating socio-economic inequalities and enabling more privileged groups to enjoy the benefits of digital connectivity and its outcomes (Chitimira et al., 2021; Seadira & Heuva, 2021). As Afzal et al. (2023) mentioned, despite technological advancements and adoption in developing countries, a segment of the population remains excluded due to insufficient access and skills, resulting in the "digital outcome divide”. This raises important questions about reducing the digital divide and ensuring inclusive connectivity. One potential solution involves examining the

role of telcos in driving inclusive connectivity, particularly given the limited evidence of their contributions to these efforts based on the licence obligations in South Africa.

This research aimed to evaluate what telcos are currently doing and identify what could be done better or differently to promote inclusive connectivity. It explored the role of telcos in fostering digital inclusion in South Africa, with the goal of providing insights to inform more effective strategies and regulations.

1.6 Delimitations of the study

I. This study focuses on the telecommunication industry in South Africa. Furthermore, within the industry, the study focuses on only the major mobile network operators (i.e. Vodacom, MTN, Telkom and Cell C) and ICASA as the regulator.

II. This study focuses on the first level (i.e. Access) and second level of the digital divide (i.e. Use and skills) and the role of Telcos in closing the digital gap at both levels. The third level of digital divide (impact of digital access and skills on lives of individuals) was excluded from the study.

III. The study explores initiatives and business models initiated by Telcos, such as infrastructure investments and digital literacy programmes.

1.7 Definition of terms

Inclusive connectivity: Focuses on closing the digital divide. It is ensuring that access to technology is not only equitable but also affordable for everyone, regardless of gender, age, race, or religion (Aruleba & Jere, 2022).

Digital access: Refers to physical access to digital technology and digital devices and internet connectivity (Sharp, 2022; Van Dijk, 2017).

Digital divide: Refers to the difference between individuals who have access to and proficiency in the use of technology and those who lack such access and proficiency (Afzal et al., 2023).

Telcos: A term that refers to telecommunications companies.

1.8 Assumptions

It was assumed that:

1. Participants will answer honestly and share all information that is helpful to the study.
2. If there is any confidential information that the participants cannot share, they will notify the researcher.
3. It will be possible to establish a sufficiently shared understanding of inclusive connectivity between the researcher and respondents so that all participants understand the questions provided in the interview.
4. Participants (in telecommunications companies) will share their subjective understandings of inclusive connectivity and responses, which do not necessarily reflect reality from the perspective of those who have access to digital technologies or not.
5. The sample size and sampling design will not allow generalisation to a larger population, but valid experiences and insights may still emerge, leading to testable hypotheses in further research.
6. Various economic factors and features of the regulatory environment will influence Telcos' ability and willingness to invest in activities that foster inclusive connectivity.

1.9 Report outline

The introduction provides background and rationale for the research. Chapter Two provides a review of relevant literature and presents theoretical frameworks useful for analysing the role of telcos in closing the digital divide and achieving inclusive connectivity.

Chapter Three describes the research methodology for the study. It explicitly acknowledges the research paradigm and assumptions. It also describes the data collection strategy and interview approach and discusses the ethical considerations and protocols.

Chapter Four presents the research findings organised by the research objectives. The chapter includes excerpts from participant interviews to support the themes identified.

Chapter Five discusses the research findings and interprets them in light of the existing literature and theoretical frameworks.

Chapter Six summarises the main conclusions of the study and offers recommendations aimed at strengthening the role of telcos in extending inclusive connectivity.

CHAPTER 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This chapter reviews literature on the role of telcos in fostering inclusive connectivity in South Africa. Literature is also reviewed on the effectiveness of regulatory frameworks, such as the USOs mandated by ICASA and the USF for telecommunications infrastructure investment in underserved areas. Furthermore, the chapter discusses Stakeholder Theory, Social Contract Theory and Technological Social Responsibility as three related analytical frameworks useful for interpreting the role of telcos in supporting inclusive connectivity as perceived by individuals working within the telecommunications sector.

2.2 Background discussion

Inclusive connectivity focuses on closing the digital divide, ensuring no one is excluded from participating fully in society. It includes improved access to employment opportunities, education, health services, and civic engagements. The digital divide can be defined as the difference between individuals who have access to, and proficiency in, the use of technology and those who lack such access and proficiency (Afzal et al., 2023; Basit et al., 2021; Lythreatis et al., 2022). The divide highlights broader socio-economic disparities and the unequal distribution of resources and opportunities in the digital age (Basit et al., 2021; Lee & Armstrong, 2023; Seadira & Heuva, 2021).

Various authors have categorised the digital divide into different levels, but commonly recognised are three primary levels: access, usage and skills, and outcomes. The first level of access is about physical access to technology. The second level, usage and skills, pertains to being able to use technology and having the skills to use it effectively. Lastly, the third level of the digital divide, outcomes, is about the benefits or returns of effectively accessing and using technology (Lee & Armstrong, 2023; Lythreatis et al., 2022).

Consequently, these levels are interdependent and build upon one another. The first step to bridging the digital divide is providing physical access to the internet and technology, including the network infrastructure facilitating digital participation. However, providing access is not enough; people also need to use the technology (i.e. adoption of technology) and have the skills to use it effectively. Lastly, having access, using technology, and possessing the skills needed to use it effectively leads to what is referred to as 'offline benefits,' such as better economic participation, increased employment opportunities, improved educational outcomes and greater access to healthcare services (Afzal et al., 2023; Aruleba & Jere, 2022; Lee & Armstrong, 2023).

The United Nations, and in particular Sustainable Development Goal 9, highlights the extension of internet access and technology use through the telecommunications and technology sectors as an important driver of social and economic development (Aruleba & Jere, 2022). For example, by providing telecommunications infrastructure, financial inclusion can be realised through the adoption of financial technology (FinTech). FinTech has significantly enabled a large portion of the previously unbanked African population to participate in the economy in previously impossible ways, where traditional banks had deemed that market segment unprofitable (Nchake & Shuaibu, 2022; Yermack, 2018).

The clear benefits of inclusive connectivity for addressing a range of socio-economic issues has motivated various policies aimed at extending inclusive connectivity (Oloyede et al., 2023). Jacks et al. (2024) argue that addressing the issues of digital accessibility, usage and skills requires enabling policies and collaborative efforts between governments, the private sector, and civil society.

The next section will review the literature on inclusive connectivity in South Africa, specifically evaluating the country's progress in closing the digital divide.

2.2.1 Inclusive connectivity in South Africa

Various authors illustrate how much work is still needed to achieve inclusive connectivity in South Africa, describing challenges such as digital illiteracy, poor regulation, and inadequate network infrastructure (Chitimira et al., 2021). To

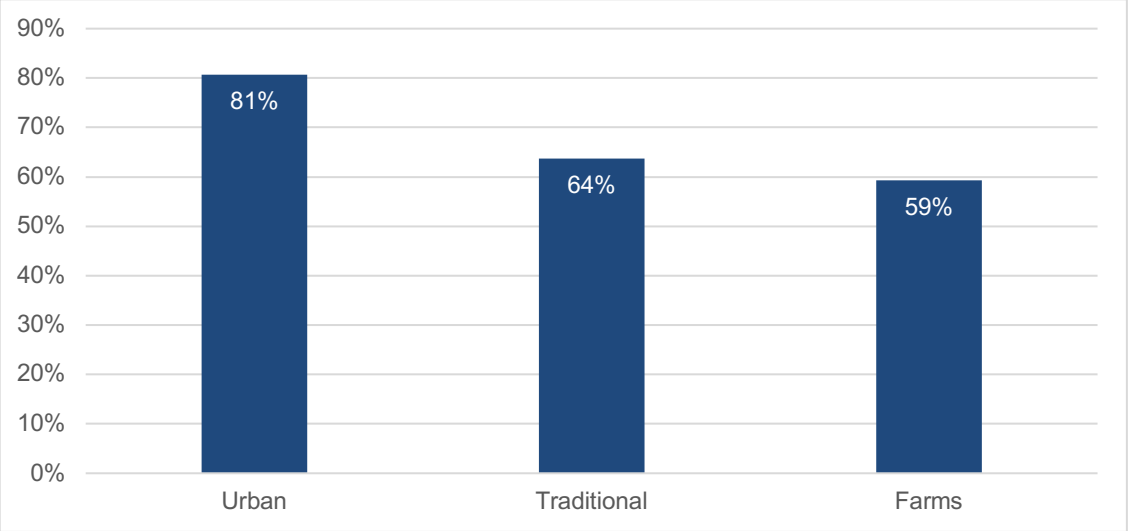
complement the insights from the literature, data from Statistics South Africa's 2022 General Household Survey was analysed[2], to explore patterns of digital access and usage.

The first analysis measured the percentage of households using the internet in South Africa by province. The lowest internet use was observed in Limpopo province, where only 62% of households reported using the internet, while the Western Cape led with 85% of internet use.

Figure 2-1 shows the distribution of internet use by geographical area type. Statistics South Africa divides area types into urban, traditional, and farm areas. Traditional and farm areas could be considered rural. Urban areas have the highest internet usage, with 81% of households. This is probably the outcome of better infrastructure, greater accessibility and higher technology adoption rates in urban areas. Households in traditional areas follow with 64% internet usage. The lowest internet usage is observed in farm areas, with only 59% of households using the internet. According to Seadira and Heuva (2021), this is due to a lack of infrastructure, limited-service providers, low technology adoption rate and lack of digital skills.

[2] These statistics were calculated by the researcher using the microdata from Statistics South Africa's 2022 General Household Survey.

Figure 2-1: Internet use by geographical type.



Source: Researcher's calculations using the General Household Survey 2022.

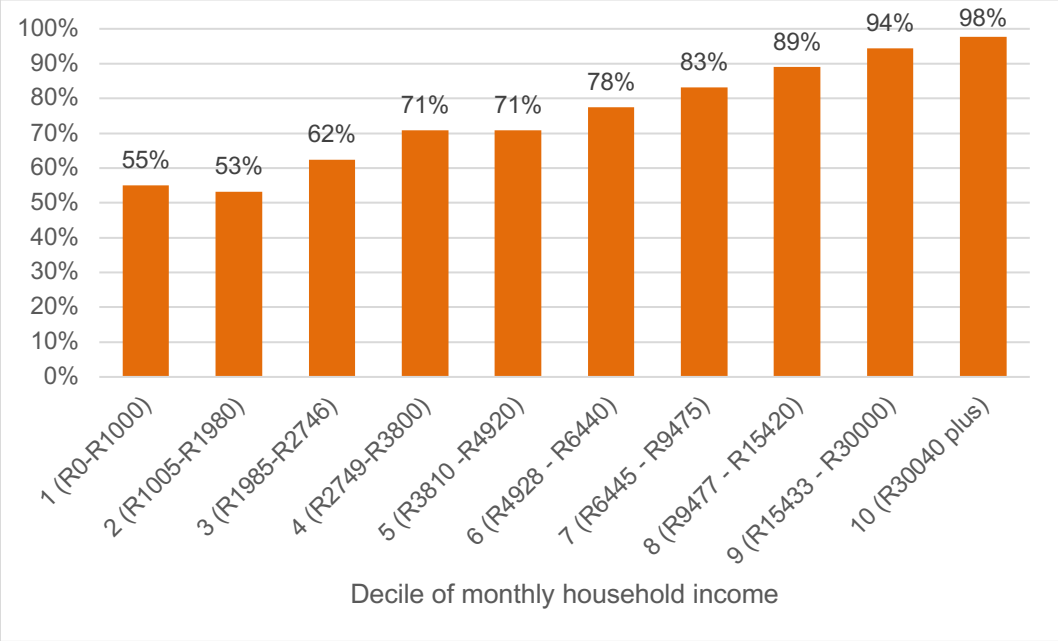
The analysis of internet use by geographical type is further supported by examining data at the municipal level[3]. The City of Cape Town Municipality has the highest internet use, with 88% of households. Other metros follow closely, including eThekwini at 86%, Ekurhuleni at 85%, City of Johannesburg (Gauteng) at 82%, and Nelson Mandela Bay at 80% (Stats SA, 2022). Overall, there is a clear trend of higher internet usage in metropolitan areas compared to non-metropolitan areas, with most non-metro areas exhibiting low internet usage. ICASA's *State of the ICT Sector Report of South Africa* 2024 also highlighted a lower population coverage with regards to 3G, LTE and 5G in rural areas when compared with urban areas (ICASA, 2024). The disparity highlights an urban-rural divide in internet usage (and access) within South Africa.

A further analysis of the data based on income brackets, categorised by income deciles[4], indicated a clear positive correlation between household income and internet usage. To produce the analysis shown in Figure 2-2, all households were divided into deciles of monthly income. These are ten equally sized groups of households arranged in order of household income, such that the first decile is

[3] Researcher's own analysis based on the Statistics South Africa 2022 General Household Survey.
[4] Researcher's own analysis based on the Statistics South Africa 2022 General Household Survey.

the 10% of households with the lowest income and the 10th decile is the richest 10% of households. The lowest income groups show the least internet usage, with 55% of households in the first decile (which earned less than R1 000 a month) using the internet. The highest decile (R30 040 plus) has the greatest rate of use, with 98% of households using the internet. As household income increases, the percentage of internet usage also increases, highlighting the impact of economic resources on access to digital connectivity and thus emphasising the digital divide between different income groups in South Africa. This finding is also supported by a study by Mulyaningsih et al. (2021), who also describe the impact of resources on digital access.

Figure 2-2: Internet use by decile of household income.



Source: Researcher's own calculations using the General Household Survey 2022.

It is evident that there are barriers to achieving inclusive connectivity. Another study by *Statista* indicated that internet usage has increased significantly from the year 2009 to 2021, from 5.3 million people to 38.13 million, however there is more work to be done in achieving inclusive connectivity, including empowering especially the underserved areas through digital skills programmes (Aruleba & Jere, 2022). Removing barriers to connectivity is crucial for bridging the digital divide. For a developing country like South Africa, the starting point is enhancing

or investing in telecommunications infrastructure in rural areas, as well as driving digital literacy programmes (Chitimira et al., 2021). Such actions will foster inclusive connectivity and enable economic participation and sustainable development (Oloyede et al., 2023).

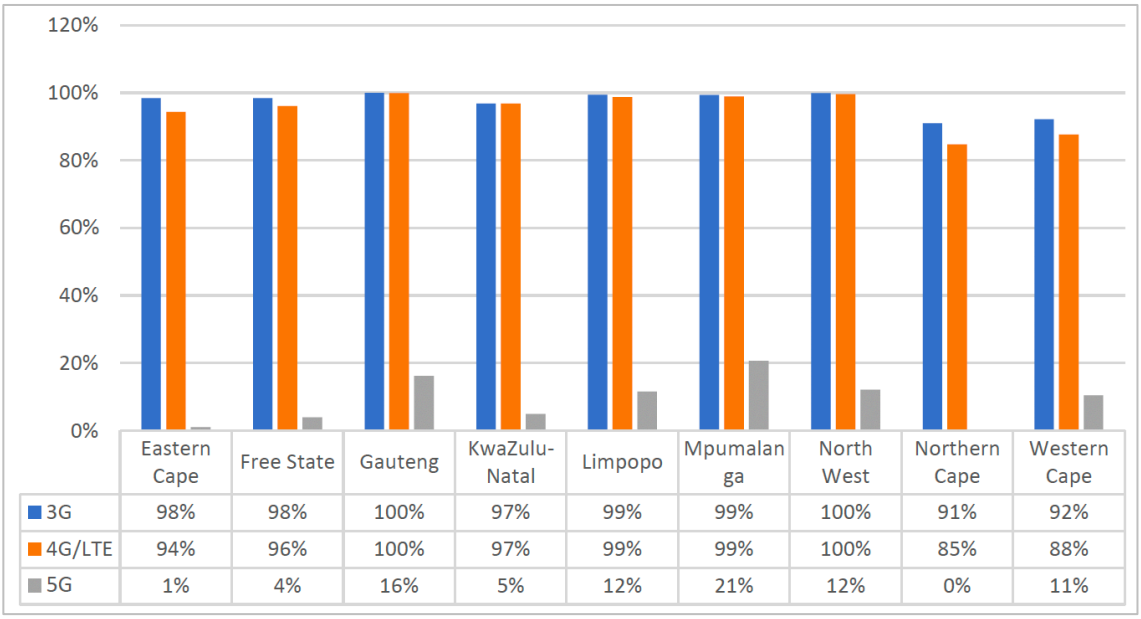
2.2.2 The barriers to inclusive connectivity

The *National Integrated ICT Policy White Paper* of 2016 points out that the difficulty in implementing universal access programmes in rural South Africa stems from the lack of a clear vision and plan for ensuring equitable service provision in rural and urban areas (Seadira & Heuva, 2021). Below are provided the supply-side and demand-side barriers to inclusive connectivity.

On the supply side, rural areas are typically not regarded as high-revenue regions, with sparsely populated areas and hence less incentive for investment. Mobile network operators hesitate to deploy networks due to a perceived lack of commercial viability (Aruleba & Jere, 2022; Seadira & Heuva, 2021). Research done by Schneir and Xiong (2016) in Reddick et al. (2020) indicates that it costs 80% more to deploy network infrastructure in rural areas than in urban areas. This explains why telcos are reluctant to invest in infrastructure in rural areas, considering the low return on investment. Seadira and Heuva (2021) also mention other barriers such as regulatory constraints, the difficulties faced by potential new market entrants who struggle to compete with incumbent operators, high costs associated with broadband devices, lack of relationship between telcos and traditional leaders, and delays in releasing spectrum by ICASA.

Still on the supply side, ICASA reported on rural population network coverage in its 2024 *State of the ICT Sector Report of South Africa* (Figure 2-3).

Figure 2-3: Rural population network coverage per province in 2023.



	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	North West	Northern Cape	Western Cape
3G	98%	98%	100%	97%	99%	99%	100%	91%	92%
4G/LTE	94%	96%	100%	97%	99%	99%	100%	85%	88%
5G	1%	4%	16%	5%	12%	21%	12%	0%	11%

Source: ICASA (2024).

The graph illustrates the percentage of rural network coverage in South Africa in 2023, showing the availability of 3G, 4G/LTE, and 5G across nine provinces. The data indicates that at least 90% of the rural population has network coverage in all provinces, which is a significant achievement. However, Hadzic (2024) argues that this approach to measuring connectivity is flawed as it does not align with other studies showing that a significant portion of the rural population remains unconnected. Reporting should provide a holistic view of digital inclusion, considering various factors beyond mere coverage. The current perspective creates the impression that the vast majority of the population is connected, while in reality, many remain excluded due to issues such as affordability and digital skills (Hadzic, 2024).

Regarding the demand side, barriers to inclusive connectivity include low technology adoption rates, a lack of digital skills, and affordability issues. (Arakpogun et al., 2023; Aruleba & Jere, 2022; Chitimira et al., 2021; Reddick et al., 2020). Similar barriers were also highlighted in the National Infrastructure Plan 2050, stating that while broadband is available across the country, most households do not experience meaningful digital connectivity. South Africa ranks

poorly globally with regard to the demand-side indices, including internet use, digital skills, and awareness (Department of Public Works and Infrastructure, 2022). Chitimira et al. (2021) attribute the low digital adoption rate in rural areas to language barriers, as most applications and instructions on digital technologies are in English. However, companies like Google mitigate this issue by providing translation features.

These findings are in line with the analysis of the Statistics South Africa household survey data already presented (Figure 2-2), which highlighted the relationship between household income and internet use, thus emphasising the digital divide between different income groups in South Africa. Hadzic (2024) also mentioned that policies have not effectively addressed issues related to demand-side barriers in South Africa, with the more privileged benefiting more from being digitally connected.

2.2.3 The role of telcos in fostering inclusive connectivity

This section explores the role of telcos in fostering inclusive connectivity in South Africa, looking at regulatory frameworks and USOs. The transition to democracy brought about new regulations and policies regarding telecommunications reform, including those previously excluded from telecommunications services and ensuring digital inclusion for all, also known as universal access and service (Seadira & Heuva, 2021).

Numerous policies highlight the pivotal role of the telecommunications industry in promoting participative and inclusive development nationwide. Key policies include the Telecommunications Act 103 of 1996, the Electronic Communications Act 36 of 2005, the *National Integrated ICT Policy White Paper* of 2016, the National Infrastructure Plan 2050, and the National Development Plan 2030 (Department of Telecommunications & Postal Services, 2016). In 2013, the SA Connect broadband policy was approved and introduced to extend broadband access in rural areas of the country. These policies clearly indicate that telcos are expected to play a crucial role in inclusive connectivity, and the government is committed to ensuring that telcos contribute to extending inclusive connectivity

across South Africa. This includes leveraging Universal Service Obligations (USOs) to ensure that underserved and rural areas gain access to essential telecommunications services (Seadira & Heuva, 2021).

USOs are imposed on telcos as part of their license conditions and spectrum allocation, mandating them to provide ICT services and extend their network coverage to particular geographic areas or segments of the population (Department of Telecommunications & Postal Services, 2016). Subsequently, the Universal Service Fund (USF) was established under the Telecommunications Act 103 of 1996 to bridge the digital divide in South Africa. Regulated by ICASA, this fund supports projects to extend network infrastructure in underserved areas that telcos might otherwise overlook due to perceived low profitability. Mobile operators contribute to the USF through a revenue-based levy, which is also used to subsidise the expansion of telecommunications infrastructure in these regions (Lewis, 2013). The scope of this fund was expanded to include not only infrastructure roll-out but also programmes dedicated to digital literacy and skills. Subsequently, the name was changed to the Digital Development Fund (DDF) (Department of Telecommunications & Postal Services, 2016).

2.2.4 The effectiveness of regulatory frameworks and polices

The previous section highlighted the telecommunications industry's significance and telcos' role in promoting inclusive connectivity in South Africa following the transition to democracy. Some scholars hold the view that regulatory policies have created opportunities for telcos to extend services to underserved areas and address the aftermath of apartheid planning (Lewis, 2013; Seadira & Heuva, 2021). In contrast, others believe that South Africa's regulatory frameworks, including the USOs, have been ineffective in driving telcos' desired behaviour and actions. According to Hadzic (2024), the issue of ineffective regulation stems from policies that provide a vision and emphasise the importance of digital inclusion without a clear plan on how digital inclusion will be realised. An example of such a policy is the National Infrastructure Plan 2050 (Hadzic, 2024).

The *National Integrated ICT Policy White Paper* of 2016 also highlights difficulty in implementing universal access programmes in rural South Africa due to a lack of a clear vision and plan to ensure equitable provision of services in rural and urban areas (Seadira & Heuva, 2021). Other issues such as governance and misalignment between different government departments have been highlighted as a barrier to implementing inclusive connectivity initiatives.

For example, the USF failed to meet its objectives primarily because its budget was not fully used and faced governance challenges (Arakpogun et al., 2023). In the 2019/20 financial year, only 10% of its objectives were achieved (Department of Public Works and Infrastructure, 2022). Arakpogun et al. (2023) go further than the report by the Department of Public Works, and argue that the underperformance of USF in South Africa is due to political interference and corruption. They also provided insights into the USF in Africa, arguing that they have not been as effective as they could be due to a lack of clarity and transparency regarding the allocation of funds. Furthermore, their effectiveness, including the incentivisation of telecommunications companies to build infrastructure in rural areas, depends on the country's institutional environment (Arakpogun et al., 2023).

These perceived problems raise questions about ICASA and its ability to regulate the industry and ensure that telcos fulfil their obligations. Arakpogun et al. (2023) proposes that a framework should clearly state the desired rural coverage when issuing or renewing GSM (Global System for Mobile) licences. This would improve accountability and monitoring, and avoid situations where telcos are given funds but fail to deliver as agreed.

The mechanisms for monitoring telcos' compliance with USOs and the associated penalties for non-compliance remain unclear (Arakpogun et al., 2023). Upon examination of the amendments made to these obligations over the years, it becomes apparent that the situation lacks urgency, with insufficient monitoring and no discernible consequences for non-compliance. The conclusion provided in the 2012 review of USOs report by ICASA suggested discarding unmet old obligations in favour of new ones (ICASA, 2012). This indicates a deficiency in

accountability and enforcement of licence obligations. Numerous authors have also stated that ICASA has not been effective in fostering digital inclusion due to delays in spectrum allocation, inadequate enforcement of obligations and insufficient customer protection (Chitimira et al., 2021; Hadzic, 2024). These deficiencies have resulted in high connectivity prices, which constitutes a barrier to inclusive connectivity in South Africa.

Moreover, one might question whether the ‘relaxed approach’ noted in the literature on the part of ICASA to enforcing these obligations stems from an awareness that they are not adequately funded. A report by the GSM Association (GSMA) stated that “many USFs in Africa are underperforming and have become ineffective in closing the connectivity gap” (GSMA, 2024, p. 5). In essence, without sufficient resources to deploy network infrastructure in underserved areas, particularly rural areas, ICASA may struggle to hold telcos accountable, especially considering the high cost of deploying network infrastructure in rural areas (Seadira & Heuva, 2021). The lack of enforcement is conceivable given the issues of institutional instability at ICASA (Hadzic (2024) and the misalignment of mandates due to the constant changes in leadership in the institution. Other authors like Chitimira et al. (2021) state that ICASA has failed in delivering its mandate as set out in the ICASA Act 13 of 2000, resulting in continuing digital exclusion in South Africa.

Lastly, there is a gap in the literature regarding the extent of telcos' contributions to fostering inclusive connectivity in South Africa. Despite the challenges they face, it remains unclear whether they are doing enough to bridge the digital divide, particularly given evidence in the literature of insufficient monitoring of USOs. This raises the question of whether telcos could, in fact, do more to promote inclusive connectivity if stronger regulatory oversight and enforcement were in place. These perceptions of ICASA’s role and the potential for telcos to contribute further are explored through the interviews conducted in this study.

2.3 Analytical framework

2.3.1 Theoretical framework: Stakeholder Theory

Stakeholder Theory can be traced back to the work of the Stanford Research Institute in the 1960s, which emphasised that organisations should consider the interests of all stakeholders in their decision-making processes, not just shareholders. Stakeholders include anyone affected by or contributing to the organisation's actions, such as employees, customers, suppliers, communities, governments, and investors. The theory emphasises that the welfare of all these groups should be considered crucial for an organisation’s long-term success. The theory argues that by addressing the needs and concerns of various stakeholders, organisations can achieve better outcomes, more ethical practices, greater social responsibility, and improved business performance (Dagada & Lee, 2022; Iqbal & Piwowar-Sulej, 2024; Lee & Armstrong, 2023; Mahajan et al., 2023).

Donaldson and Preston (1995) identified three different ways to apply Stakeholder Theory. Firstly, the descriptive approach uses Stakeholder Theory as a lens through which to understand organisations as entities comprised of a range of stakeholders who influence or are affected by the organisation. Secondly, the instrumental approach suggests that stakeholder management is useful for improving organisational performance. Thirdly, the normative approach places stakeholders as the “ends” or beneficiaries of the organisation’s activities rather than merely as the “means” to achieve better organisational performance. It is argued by Phillips et al. (2003) that Stakeholder Theory is not primarily a normative approach setting forth a theory of business ethics but rather a framework for understanding and responding to the interests of different stakeholders (Mahajan et al., 2023). For this research project, Stakeholder Theory will be most useful as a framework to enrich our knowledge of telcos' role in fostering inclusive connectivity in South Africa. This includes looking at stakeholders such as ICASA, government, telcos (i.e. MTN, Vodacom, Telkom, Cell C, etc.), citizens, employees and customers.

Using Stakeholder Theory as a theoretical framework is useful for identifying research questions. Mahajan et al. (2023) propose a number of research questions that future studies using Stakeholder Theory could explore. Some of the more relevant ones, which can guide the current study, adapted for the current context of telcos and the digital divide, include the following: Who are the relevant stakeholders and how can their collective resources be brought together to foster more inclusive connectivity in South Africa? What are the expectations of different stakeholders for the role that telcos should play in fostering inclusive connectivity? These sorts of questions arising from an application of Stakeholder Theory informed the design of specific questions that were put to those interviewed for the qualitative research undertaken in this study.

2.3.2 Theoretical framework: Social Contract Theory

As an extension of Stakeholder Theory, another crucial framework is Social Contract Theory. Social Contract Theory posits that there is an implicit 'contract' between the government and citizens, wherein citizens surrender certain rights or autonomy in exchange for governance that ensures societal flourishing and collective benefits. In the context of businesses, the theory suggests that firms implicitly recognise a mutually beneficial relationship between themselves and the rest of society. In being granted the space to operate and utilise resources within society, they would, therefore, ensure that their existence contributes positively to societal well-being. Specifically, the benefits they provide should outweigh the costs (Dagada & Lee, 2022).

When applied to telcos, Social Contract Theory implies that telcos, having been granted licenses to operate within society, must ensure that their activities benefit the public, particularly regarding inclusive connectivity. The benefits of their operations should surpass any associated costs, and their activities should not leave any group within society worse off than before. This is emphasised under the justice obligations of firms according to Social Contract Theory, stating that firms should “avoid any practice that systematically worsens the situation of any given group in society” (Dagada & Lee, 2022, p. 42).

In the context of South Africa, the shift to democracy required telecommunications reform to include the historically marginalised groups who had been excluded from telecommunications services in the apartheid era. The aftermath of apartheid planning and policies continues to affect South Africa, with many individuals still being excluded from fully participating in society. Such exclusion includes access to employment opportunities, education and healthcare. The role of telcos goes beyond providing connectivity. They are pivotal in addressing the deep-seated inequalities in the country and bringing about transformation (Lewis, 2013; Seadira & Heuva, 2021). In light of the social contract, telcos are obligated to operate in a way that promotes societal well-being by closing the digital divide and fostering inclusive connectivity.

The theoretical framework of Social Contract Theory provides a lens in assessing the telcos' understanding of their role in advancing inclusive connectivity and evaluating their efforts in fostering inclusive connectivity.

2.3.3 Theoretical framework: Technological Social Responsibility

Technological Social Responsibility could be viewed as a specific extension of Social Contract Theory to the space of technological innovation, and the benefits that accrue to those who enjoy its commercial profits. There is some evidence in the literature that Technological Social Responsibility activities can influence organisational pride and commitment among employees (Iqbal & Piwowar-Sulej, 2024). This aspect is further explored in the South African telecommunications sector through this study's interviews.

Although Technological Social Responsibility is a broad concept based on stakeholder theory and includes employees, shareholders, customers, suppliers, the environment, and society (Iqbal & Piwowar-Sulej, 2024), its application to society is perhaps the most relevant to inclusive connectivity (or the digital divide). In terms of the social aspect of the theory, it involves organisations acting in the best interest of society as a whole and contributing positively to inclusive technology provision (Iqbal & Piwowar-Sulej, 2024).

The study explores whether senior leaders in telcos consider Technological Social Responsibility in their investment decisions. If leaders currently underappreciate the importance of Technological Social Responsibility for organisational pride and employee commitment, interventions highlighting this to business leaders could promote greater investment in Technological Social Responsibility activities.

2.4 Conclusion

The literature review highlights the critical role that telcos play in fostering inclusive connectivity in South Africa. Key government policies position the telecommunications industry at the forefront of socio-economic development, emphasising the need to partner with telcos in bridging the digital divide. USOs mandated by ICASA further reinforce this role, requiring telcos to extend their services to underserved and rural areas.

However, the review also identified several challenges that hinder the effectiveness of these initiatives. Incorporating Stakeholder Theory, and its extensions, the review highlights the importance of considering the interests of various stakeholders, including employees, shareholders, customers, suppliers, the environment, and society. Overall, while the potential for telcos to drive inclusive connectivity is significant, there is a pressing need for improved governance, clearer frameworks, and better resource alignment to realise this potential fully. The issues raised in the literature and the possibilities following from the analytical frameworks served to inform the questions posed to those who work in the telecommunications sector, and thus to locate the specific contribution of this study.

CHAPTER 3. RESEARCH METHODOLOGY

This chapter outlines the research methodology employed in this study, detailing the research approach, design, and sampling methods. It also covers the data collection methods, the research instruments, ethical considerations, study limitations, and the validity and reliability of the methods.

3.1 Research paradigm

The research followed a constructivist approach based on the idea that reality is subjectively constructed by individuals through social processes and interactions (Chandra & Shang, 2017; Kamal & Lin, 2019). This paradigm facilitated an exploration of how telcos (and those working in telcos) build and interpret their role in fostering inclusive connectivity. A constructivist epistemology facilitated an exploration of how collective meanings and strategies around inclusive connectivity are formed within telcos. In particular, a constructivist approach was appropriate for analysing how different stakeholders construct meaning around the activities of their organisations, the barriers they face in contributing to inclusive connectivity, the impact of regulation, and other industry dynamics.

In view of this constructivist approach, it is recognised that the researcher was involved in the co-construction of the results and their interpretation. Although the intention of the researcher was not to force any values onto the discussions with those in telcos, it is acknowledged that the researcher was involved and that their values would have inevitably shaped the questions and interactions that followed. Having previously worked for a telco, and having been researching the topic of inclusive connectivity, it is acknowledged that the researcher holds a value position that telcos should play an active role in extending inclusive connectivity. Axiology refers to the ethics and values underpinning the research. Values influenced the research, both those of the researcher and the participants, and these values shaped the outcomes and interpretations (Kahlke, 2014; Kamal & Lin, 2019).

3.2 Research approach

The research is a qualitative study using semi-structured interviews (Maxwell, 2009; Tenny et al., 2023). A qualitative research approach was chosen because the nature of the research questions, and the theoretical frameworks, are inherently subjective, relating to how actors within telcos perceive their role in fostering inclusive connectivity. A quantitative approach would be overly reductive for the exploratory nature of the study. Rather, this study aimed to provide in-depth insights into the perspectives of various stakeholders, including ICASA and telcos, regarding the role of telcos in promoting inclusive connectivity in South Africa.

3.3 Research design

Within the broad category of qualitative research, the study design can further be described as a case study, owing to its focus on a clearly defined context, namely the telecommunications industry of South Africa, and because the study is empirical, providing real-world observations and experiences (Kahlke, 2014; Percy et al., 2015). Moreover, it is an exploratory case study, as an in-depth contextual analysis was done on the role of telcos in fostering inclusive connectivity in South Africa. As discussed by Wildemuth (2016), a case study is suitable for research questions that explore the "how" and "why" questions and are usually exploratory. Furthermore, this exploratory case study aims to draw out various perspectives from different actors within the defined case of the telecommunications sector.

3.4 Data collection methods

The study employed semi-structured interviews as the primary data collection method. Semi-structured interviews are ideal for exploratory research as they provide enough flexibility to investigate complex phenomena or themes that may not have been conceived of prior to the research design phase (Magaldi & Berler, 2020). Yet, they still provide enough structure to ensure that important topics are not excluded from any of the interviews. This was convenient for the current

research as it allowed certain key topics, such as barriers to fostering inclusive connectivity, to be addressed while also allowing specific emerging themes to be explored.

The interviews were held virtually using Microsoft Teams, allowing full transcription. In addition, triangulation of data was used to help corroborate information obtained from interviews for credibility and reliability of the research findings (Carter et al., 2014; Hopf, 2004). This entailed reviewing relevant policy documents, regulatory frameworks, and reports from ICASA and telcos.

3.5 Population and sample

3.5.1 Population

The study's population included all stakeholders involved in the telecommunications sector in South Africa, including the regulatory body (ICASA) and telcos. Although the wider population of stakeholders involved in the South African telecommunications sector includes other governmental and non-governmental organisations and individuals, including citizens and clients, only individuals within ICASA and major telcos were sampled for this research. In terms of telcos, the study focuses on only the four major mobile network operators (i.e., Vodacom, MTN, Telkom and Cell C). The focus on the four operators is mainly because of their dominant market presence and the important role they play in fulfilling USOs as mandated by ICASA. They are key players in inclusive connectivity through infrastructure investment, corporate social initiatives as well as government-led initiatives such as SA Connect. By focusing on the main telcos, the study can provide insights into the telecommunications industry within a manageable and clear scope.

3.5.2 Sample and sampling method

A purposive sampling method was used to select participants with extensive knowledge or direct involvement in the telecommunications sector and inclusive connectivity initiatives. The approach ensured that the sample included

individuals who could provide rich, relevant, and diverse perspectives on the research topic (Anney, 2014; Coyne, 1997; Suri, 2011). Ten (10) executives and senior managers from various telecommunications companies and five (5) senior managers from ICASA were selected.

The goal was to interview as many individuals as possible to gather valuable insights until reaching a point of saturation. Saturation is where the researcher is getting little to no value in interviewing more people regarding new information and insights (Suri, 2011). Guest et al. (2006) investigated the sample sizes needed to reach saturation and found that 12 interviews were generally enough but that even after only six interviews, broad themes had usually emerged. The sample size of ten executives and managers from telcos and five from ICASA, therefore, seems adequate to reach a degree of saturation, especially since this is a relatively homogenous group of interviewees compared to other case study contexts (Hennink et al., 2016). Furthermore, studies by Hennink et al. (2016) revealed that most qualitative studies reach thematic saturation after a small number of interviews, and therefore, a sample size of nine is sufficient.

Regarding telcos, the goal was to target individuals from various companies to ensure that perspectives and initiatives from multiple companies were represented.

3.6 The research instrument

For this study, a semi-structured interview guide served as the primary research instrument. Using Microsoft Teams to conduct interviews afforded both flexibility and accessibility to the study. The platform facilitated the recording and transcription of the interviews. The semi-structured format allowed the investigator to employ a predetermined set of questions whilst providing the opportunity to delve deeper into specific responses and seek elucidation when required. This approach thoroughly comprehended the participants' viewpoints and lived experiences. The interview guide is provided in Appendix A.

3.7 Procedure for data collection

The interviewees were purposively approached through LinkedIn, email, and personal referrals to ensure timely responses aligned with the Protection of Personal Information Act (POPIA) 4 of 2013. For example, at ICASA, industry contacts provided the researcher with relevant individuals and informed them about the research topic. The advanced notice facilitated smoother communication, and this referral approach helped identify potential candidates well-suited for research on inclusive connectivity. Interviews were then scheduled with the identified candidates after this initial interaction. Similarly, for individuals in the telecommunications industry, the researcher asked industry contacts to help identify and reach out to relevant individuals for the research.

Once the meetings had been scheduled, the interview guide was provided to the participants, giving them enough time to preview and consider the interview questions. In addition, the consent form was provided to ensure that participants fully understood the nature and purpose of the interview and gave their informed consent. This step was crucial for ethical compliance and ensured all participants willingly and knowingly participated in the research. The interviews were recorded to enable the researcher to refer to them and recall specific details. Additional documents or policies that might be helpful to the research were requested from the participants, which aided in the triangulation of the research findings.

3.8 Data analysis strategies and interpretation

The research employed Thematic Analysis to analyse the data, mainly because Thematic Analysis allows for flexibility in research analysis and helps to identify and analyse key themes that emerge from the data, which is useful in addressing the research questions and objectives (Braun & Clarke, 2006, 2012; Terry et al., 2017; Vaismoradi et al., 2016). Furthermore, it allows for a systemic approach to analysing qualitative data (Braun & Clarke, 2012).

The data collected from the semi-structured interviews were analysed using the six steps proposed by Braun and Clarke (2012) for Thematic Analysis. First, the

researcher began familiarising themselves with the data, reviewing the interview notes and the recordings. This step included transcribing the interviews and noting initial patterns. In the second step, meaningful data sections were systematically coded, focussing on themes relevant to the research questions, such as “spectrum allocation and affordability”. During the third step, these themes were grouped into broader potential themes, like “barriers/challenges”.

During the fourth step, themes were refined and reviewed to ensure they accurately reflected the interviews and aligned to the research questions. In this “recursive process”, overlapping themes were consolidated and sub-themes identified. In the fifth step, the final themes were identified and named, ensuring that they reflected the essence of their meaning and were clearly related to the research objectives. The final step entailed a detailed written analysis of how the data linked to the research questions and discourse on inclusive connectivity in South Africa, supported by direct quotations and drawing the main research conclusions (Braun & Clarke, 2012).

3.9 Quality Assurance

3.9.1 Transferability

Transferability pertains to the extent to which the research findings can be applied in other contexts (Anney, 2014). Qualitative research approaches, such as those employed in this study, are highly context-dependent, thus limiting the transferability of the findings. One strategy to enhance transferability is to provide comprehensive descriptions of the research process, context, and findings to enable readers to assess the applicability of the findings to other contexts (Anney, 2014). This study aimed to improve transferability by providing rich, detailed descriptions of the research process, context, and findings. Furthermore, through the utilisation of purposive sampling, the selected participants provided extensive, valuable and diverse perspectives on the research topic.

3.9.2 Credibility

Credibility pertains to the trustworthiness or accuracy of the research findings (Anney, 2014; Tracy, 2010). Triangulation of data was used in this study to help corroborate information obtained from interviews, enhancing the credibility and reliability of the research findings (Ghafouri & Ofoghi, 2016). It involved reviewing secondary data such as relevant policy documents, regulatory frameworks, and reports from ICASA and telcos.

3.9.3 Dependability

Dependability concerns how stable and consistent the data is over time (Ghafouri & Ofoghi, 2016). The study maintained thorough documentation of the research process, data collection, analysis, and findings to ensure the dependability of the research. The researcher also employed peer examination to enhance the credibility of the research findings. Peer examination helped to reveal if there are any personal biases by the researcher in the interpretation of the data and helped with reflexive analysis (Anney, 2014; Ghafouri & Ofoghi, 2016).

3.10 Ethical considerations

I. Ethical clearance was obtained from the University of the Witwatersrand.
II. The researcher obtained informed consent from participants, ensuring they understood the purpose of the study, their rights as participants, and how their data would be used.
III. The study respected all participants' privacy, confidentiality, and autonomy. Participation in interviews was only done after securing informed consent. To the best of the researcher’s knowledge, there were no power imbalances between the researcher and the participants, although the researcher remained alert to the possibility. The study intended to understand participants’ perspectives without passing judgement.
IV. The researcher protected confidential and sensitive information through avoiding the use of direct quotations that might prompt any other individual

or organisation to take retaliatory actions. The confidentiality and anonymity of all participants were maintained by restricting access to raw data or transcripts that contain personal details bystoring the interview transcripts on a password protected hard drive that nobody else had access to. No names or identifying information such as job titles were reproduced in the final report.

V. Unless participants explicitly granted permission, any quotations did not disclose their names, other identifying information or information that could be used to infer the identity of any participants.

VI. The data will be securely disposed after five years following research completion as per the university's data retention policy.

CHAPTER 4. PRESENTATION OF FINDINGS

This chapter presents the research findings derived through Thematic Analysis of the data. The research findings are organised into themes and these identified themes are aligned to the study's research objectives. This approach ensures a clear connection between the findings and the research objectives.

The chapter includes excerpts from participant interviews to illustrate the identified themes and provide rich descriptions for deeper insight into the participants' perspectives (Venter & Daniels, 2020).

4.1 Demographic profile of participants

The study aimed to interview fifteen (15) individuals from various telecommunications companies, including the telecommunications regulatory body, ICASA. However, saturation was reached after completing nine interviews, and no additional value was found in conducting further interviews. It proved challenging to secure participants from the regulator, resulting in only one interviewee. This contribution was particularly valuable, as it provided feedback from a regulatory perspective and offered a different lens on the research topic. Of the nine participants, five (55%) were executives, while the remaining four held senior management positions within the telecommunications industry. The participants that were interviewed provided rich and in-depth data that adequately addressed the research objectives of the study. The participants also recommended other industry professionals who might be able to provide rich insights on the research topic. The interviews were subject to availability of participants with interviews being postponed numerous times, however perseverance paid off and the data collected was valuable and provided insights in light of our research objectives.

Please refer to Table 4-1 for the sample demographics. In terms of gender, males continue to dominate the executive and senior management levels within the telecommunications industry. Regarding work experience, most participants have over 20 years of experience in the field.

Table 4-1: Sample demographics.

Gender	n		Qualification	n
Male	7		Diploma	1
Female	2		Undergraduate	3
			Masters	5
Age	**n**		**Work experience**	**n**
Below 35	1		Less than 10 years	1
35-40	1		11-20 years	1
41-50	2		21-30	3
Above 51	5		31 and above	4

4.2 Theme development

A Thematic Analysis was employed to examine the data. The interviews were conducted via Microsoft Teams to facilitate recording and transcription. Afterwards, the interview notes and recordings were reviewed, and the transcripts were refined by correcting transcription errors. This process included identifying initial patterns and codes. Using Atlas.ti, the data was uploaded, and the transcripts were analysed based on the identified codes. Subsequently, the researcher identified themes and carried out a recursive process where the themes were reviewed. The final themes were identified and named at the end of this process.

The following themes emerged from the thematic analysis:

- Role of telcos
- Stakeholder role in…
- Government and regulation
- Barriers or challenges of…
- Improvement Strategies of... /on…

4.3 Findings

A word cloud of the sub-themes is presented as a starting point (Figure 4-1). The size of the words in the diagram is in proportion to the frequency with which they arose during the interviews. Analysing the word cloud, it is evident that *commercial viability*, *inclusivity*, *regulation, spectrum allocation*, and *infrastructure investment* are prominent. This section will unpack the findings by exploring the themes in detail, highlighting the most pronounced sub-themes within each, and discussing the participants' perspectives.

Figure 4-1: Word cloud of the sub-themes.



The first two themes shed light on Research Objective 1 (RO1). These themes are the role of Telcos and the role of stakeholders.

RO1: To investigate the role of Telcos in fostering inclusive connectivity.

4.3.1 Role of telcos

This theme focuses on the participants' perceptions regarding the role of telecommunications companies in fostering inclusive connectivity. When asked, most of the participants suggested that telcos are instrumental in promoting inclusive connectivity in South Africa, but also felt that ICASA, as the regulator, bears the primary responsibility for inclusive connectivity, as evident in the extracts below:

> *"Ultimately, I'd say the government bears the responsibility, though telcos are key partners in delivering it. With connectivity increasingly seen as a human right, there's now a shared responsibility between the government and telcos. The government should create supportive policies, allowing telcos to reach underserved areas while maintaining business sustainability."* – Participant 9
>
> *"The responsibility begins with the regulator, ICASA."* – Participant 2
>
> *"It's multifaceted. Operators like Vodacom play a role through ICASA's licensing, but the government has a significant role through regulation."* – Participant 3
>
> *"It's a combination of stakeholders. The government plays a significant role as an enabler and regulator, especially through ICASA, which provides spectrum and oversees the telco industry in general. Telcos also bear responsibility – they decide where to invest in infrastructure and set prices for their products and services, which affects accessibility. Businesses, too, sometimes form strategic partnerships with telcos, so overall, it's a shared responsibility among the government, telcos, and other business stakeholders."* – Participant 7

The participants highlighted the importance of the regulator in helping telcos foster inclusive connectivity. One participant provided an interesting perspective. The participant previously worked in the public sector and was part of the team that drafted and initially introduced the SA Connect policy. The participant suggested that the heavy reliance on private sector telcos to foster inclusive

connectivity was a product of the failure of the government to fund projects and of political interference:

> *"SA Connect had four main pillars: creating a legislative framework, connecting public institutions like schools and clinics, implementing high-capacity technologies like fibre and satellite, and promoting innovation and small business development. The programme aimed to build an inclusive digital infrastructure with support from both the state and the private sector. However, in practice, political interests often influenced decisions, and funding models didn't always align with long-term goals. Eventually, private sector obligations were tied to spectrum licenses, transferring much of the responsibility for connectivity to telcos like Vodacom and MTN."* – Participant 8

Furthermore, the participant stated regarding SA Connect:

> *"Initially, the plan was for the state to manage the rollout through entities like Broadband Infraco and SITA* [State Information Technology Agency]*. But over time, obligations for connectivity were handed to telcos as part of our license agreements and spectrum conditions. So, while SA Connect is still operational in some form, it now relies heavily on private sector obligations to achieve its connectivity goals."* – Participant 8

Most participants also emphasised that telcos promote inclusive connectivity by adhering to license obligations and implementing various corporate social responsibility initiatives. Initiatives include educational programmes, digital skills training (i.e. "code like a girl"), bursary programmes, etc. Participants saw these efforts as instrumental in bridging the digital divide and ensuring access to communication services and digital literacy for underserved and marginalised communities. The following was said regarding this topic:

> *"ICASA's license conditions and corporate social responsibility drive it. MTN also understands that our customers are our communities, so there's value in investing in their connectivity needs. Through the MTN*

Foundation, we support schools in rural areas with digital tools and network access, which extends our service footprint" – Participant 2

"*Yes, many telcos have active corporate social responsibility programmes. For instance, MTN, Vodacom, and Telkom each have dedicated foundations or initiatives aimed at sustainable societies and social investments. They play a significant role in helping to bridge the digital divide by supporting connectivity and digital literacy in underserved communities.*" – Participant 1

4.3.2 Stakeholder role

The participants were probed with a question about the motivation behind telcos' investments in inclusive connectivity initiatives. The purpose of the question was twofold: first, to understand what drives telcos to engage in these efforts, and second, to determine whether elements of Stakeholder Theory (and its extension, namely, Social Contract Theory) underpin their motive.

Participants' responses align with Stakeholder Theory, which states that a company should not focus solely on its interests but also consider the interests of other stakeholders. One participant answered:

"Vodacom invests about 11 billion rand annually in South Africa alone, and that level of investment sustains the economy, employs small businesses, and empowers local communities. On the citizens' side, we need people to protect the infrastructure. Instead of destroying cell towers or stealing batteries, people should see connectivity as a valuable asset to their communities." – Participant 8

In the context of telecommunications, Social Contract Theory implies that telcos, having been granted licenses to operate within society, should ensure that their activities benefit the public, particularly regarding inclusive connectivity. The benefits of their operations should surpass any associated costs, and their activities should not leave any group within society worse off than before. Hasnas (1998) emphasised this under the justice obligations of firms according to Social

Contract Theory, stating that firms should “avoid any practice that systematically worsens the situation of any given group in society” (Hasnas, 1998).

Participants' responses revealed that the motivation behind telcos initiatives incorporates elements that are consistent with Social Contract Theory, as shown in the following two excerpts:

> *“There’s a commercial incentive, as connecting more people increases Vodacom’s customer base. But there’s also a corporate social responsibility. It’s about doing the right thing. Covid was a turning point for us; we realised our role in ensuring everyone is part of a digital society, which goes beyond just profit.”* – Participant 9

> *“Vodacom’s business is volume-driven, so expanding our customer base is important. Our growth depends on reaching more people. Besides the business imperative, Vodacom aims to connect people for a better future. This aligns with inclusive connectivity, ensuring we live up to our mission by increasing our footprint and providing accessible services to underserved communities.”* – Participant 8

Two participants included public reputation and defending the brand as motivation for telcos involvement in extending inclusive connectivity. For example, Participant 1 stated:

> *“Deploying infrastructure requires significant cost, but successful expansion can generate more revenue for telcos and enhance their public reputation. Consumers appreciate brands that contribute to societal improvement, so telcos have a reputational incentive to be seen as inclusive.”* – Participant 1

4.3.3 Government and Regulation

The analysis of this theme serves to address Research Objective 2 (RO2):

RO2: Explore the effectiveness of regulatory frameworks and policies to foster inclusive connectivity in the telecommunication industry.

This theme explores government interventions, such as those by ICASA, and the effectiveness of regulations and policies in helping telcos promote inclusive connectivity. Regarding government and regulation, participants highlighted spectrum access as crucial to enable telcos to move the needle in bridging the digital gap. It included the view that ICASA could do more from a regulatory point of view to have supportive policies in place and provide more affordable access to the spectrum as evident in the extracts below:

> *"Access to more spectrum is a priority. There should be public policy initiatives promoting advanced technologies that use spectrum more efficiently through sharing and access principles. ICASA also promotes collaboration in infrastructure deployment, encouraging telcos to work together on projects like fibre installations, which can reduce costs and improve coverage"* – Participant 1

> *"They could make spectrum more affordable. If spectrum costs were lower, telcos could invest more in infrastructure. Also, government action on issues like vandalism and theft could help, as these add costs to network maintenance."* – Participant 5

Participants also highlighted the lack of clarity of licence obligations and misalignment between different government policies, which creates confusion and fails to promote the appropriate actions:

> *"There's a mismatch. Different government departments and private sectors have initiatives for things like school connectivity, but it's not well-integrated. We need a more cohesive approach that fully uses connectivity's potential for schools, businesses, and other public services."* – Participant 7

Participant 9 expressed a similar concern, highlighting the lack of clarity in license obligations. For instance, an obligation to connect a certain number of public schools could be interpreted in various ways, such as to provide Wi-Fi connectivity in the library or merely to supply a modem. The vagueness leaves it

up to telcos to interpret and decide how to implement the obligations, ultimately influencing the outcomes. Participant 9 stated:

> *"It's not really well looked after. That's the fact of it. They are also not really well defined. For example, with a school, some telcos would just put a router in the principal's office and claim that they have connected the school."* – Participant 9

On a positive note, several participants stated that ICASA does a great job at measuring and monitoring network coverage:

> "*We report to ICASA regularly on network coverage and compliance. ICASA conducts drive tests to verify our coverage, ensuring we meet license conditions. We allocate part of our Capex to fulfil these obligations, focusing on deep rural coverage. So, yes, obligations are measurable, and both ICASA and Vodacom monitor progress."* – Participant 4

Participants' responses indicate that ICASA measures network coverage and the progress thereof. ICASA publishes an annual report titled, *State of the ICT Sector Report of South Africa*. The report monitors network coverage, as suggested in the excerpt above, but it does not include information on other license obligations related to digital literacy and connecting public institutions. In addition, the progress made in fulfilling them is not included.

4.3.4 Barriers or challenges

The next theme (i.e. Barriers/ challenges) addresses Research Objective 3 (RO3):

RO3: To explore barriers faced by Telco with regards to fostering inclusive connectivity.

Commercial viability was the greatest barrier identified by respondents in telcos' efforts to foster inclusive connectivity. Participants emphasised the high costs of deploying infrastructure, noting that underserved areas typically offer low returns

on investment. According to participants, investing in these areas often does not make financial sense when combined with high maintenance costs. Issues such as high cost of spectrum, as well as vandalism and theft were also mentioned. One participant argued that a lack of transparency around – and misuse of the USFs – leads to a missed opportunity to assist with the issue of commercial viability in rural spaces.

The barrier of commercial viability regarding the erection of telecommunications infrastructure was a recurring theme, highlighting the importance of connectivity infrastructure as the foundation for achieving inclusive connectivity (i.e., bridging the first level of the digital divide):

> *"For telcos, it's largely a commercial challenge; rural areas lack the population density needed to recoup infrastructure costs, which slows down investment quickly. The challenge is balancing doing the right thing with financial sustainability."* – Participant 9

> *"One major barrier is cost. Telcos are private companies with shareholders who expect returns on investments. Providing connectivity in rural areas, where there's low demand, is challenging. Also, spectrum costs are high. Telcos need more government support, possibly through affordable spectrum allocations, to keep service costs down."* – Participant 5

> *"From my experience, initial rollouts tend to focus on urban or affluent areas where there's an expectation of an immediate uptake in products and services. Over the years, however, we've seen a shift toward more popular township areas, because they present high revenue opportunities. In rural areas, there's been some focus recently, but telcos consider the affordability and return on investment, given the high costs involved in building network infrastructure. Affordability and expected returns on investment tend to drive decisions on where to focus initially. Especially considering the high cost of spectrum, telcos would want to target areas of high return of investment."* – Participant 7

The second most frequently mentioned barrier was vandalism and theft, with participants also citing unstable power as a related issue that can be included in this category:

> "*Meeting these obligations can be challenging due to external factors. We'd like to do more, but the energy crisis and vandalism hinder our efforts. Although we allocate budget for rural coverage, power outages and theft slow our progress. We communicate these challenges to ICASA if they impact our ability to meet targets, as these issues significantly affect both service and costs."* – Participant 4

> *"Some areas are plagued by vandalism, where batteries and equipment are stolen, and in some cases, business forums, or "construction mafias," extort money by threatening workers. This, along with load shedding, has led to a rise in theft and vandalism. We see the same sites hit multiple times, and it becomes hard to justify investing in these areas when we have to continuously replace equipment."* – Participant 8

> *"Power stability is a major barrier, especially in remote communities. Some sites rely on diesel because they can't access the grid, which is costly. Then there's theft and vandalism – solar panels, batteries, and other equipment often get stolen, causing us to reinvest repeatedly. Lastly, geographical challenges, like mountainous terrain, complicate network expansion."* – Participant 3

In conclusion, regarding commercial viability, the participants added that telcos are facing declining revenue due to reduced data prices, the growing use of WhatsApp calling, and market saturation. The result, according to this participant, is that telcos have fewer resources to invest in inclusive connectivity initiatives:

> *"ICASA has done well to make data more affordable for consumers, but that's led to reduced margins for telcos, limiting our ability to reinvest. There's tension between making data accessible and telcos being able to sustainably invest in underserved areas. The regulatory framework needs a balance that supports both."* – Participant 9

Affordability was also highlighted as a major barrier to inclusive connectivity. Participants mentioned how the continued use of 2G devices, which is beyond the control of telcos, is perpetuating high connectivity costs. ICASA still permits 2G devices, requiring network providers to maintain 2G frequencies on their networks. If 2G devices were banned or discontinued, telcos could repurpose that spectrum for 4G and more advanced technologies:

> *"ICASA could ban the import of 2G devices to encourage a shift toward data networks. Legacy networks are very costly to maintain and yield low returns."* – Participant 2

> *"There's intention to phase out 2G and 3G, but execution is slow. Retailers still sell 2G phones because they're cheaper. To fully transition, affordable 4G devices need to be widely available. When we can refocus all spectrum on 4G, it will improve network efficiency."* – Participant 5

The view is that retailers continue to sell 2G phones because they are affordable to the broader population. This means that to transition to 4G devices, telcos and governments might need to subsidise these devices so that more people can afford them, allowing 2G technology to be repurposed for 4G and higher technologies. Telcos would then be able to reduce costs and use spectrum more efficiently. The reduction in costs would translate into lower services or data costs for customers.

Another recurring theme was reducing the cost of spectrum in exchange for license obligations. Furthermore, participants stated that lowering the cost of spectrum would translate into reduced data costs for customers:

> *"We could consider trade-offs like reducing spectrum fees in exchange for universal service obligations to lower costs. ICASA could also facilitate easier access to public infrastructure, which would help telcos lower their deployment costs. This, in turn, can contribute to lower data costs for consumers."* – Participant 1

A more positive finding regarding affordability is that telcos were reported to have been successful in implementing 'pro-poor' pricing for rural areas and offering

packages tailored to specific regions. This approach aims to include more people in the digital world and enable them to fully participate in its benefits, such as accessing digital financial services, job opportunities, and more:

> "*In the Consumer Business Unit (CBU), for example, we have initiatives like "Just for Your Town." This program uses census data to identify low- to average-income towns and tailor specific offers to those areas, aimed at making connectivity more accessible. We also offer zero-rated data for government-approved educational and healthcare websites, enabling people to access critical services even if they lack financial resources."* – Participant 7

> *"We've got initiatives across the value chain. Infrastructure-wise, we've achieved around 99% 3G and 94% 4G coverage in South Africa. Now, we're exploring partnerships with satellite providers to cover hard-to-reach areas. We're also working on "pro-poor" pricing in rural areas to make data more affordable. However, affordable 4G devices remain challenging, as device costs are beyond our control."* – Participant 9

Overall, participants' responses suggest that achieving affordable services and devices will require a multifaceted approach that addresses regulatory, infrastructural, and market challenges. Participant 8 alluded to the mismanagement of the USF and the lack of transparency in its usage, noting that it is not being adequately used for inclusive connectivity initiatives:

> *"ICASA could facilitate more collaboration among telcos, particularly in rural areas where we don't need multiple networks. For example, it's more efficient to have one shared network in rural areas rather than each telco building its own. Another point is the Universal Service Fund, which all telcos contribute to. This fund was supposed to support connectivity in underserved areas, but there's little transparency on how the money is used, and it's not always directed towards digital connectivity as intended."* – Participant 8

These reports about the USF suggest that the fund could be better used to offset some of the costs that telcos incur in trying to meet their obligations and implement more initiatives that promote inclusive connectivity in South Africa.

4.3.5 Improvement strategies

This last theme sheds light on Research Objective 4 (RO4):

RO4: To explore potential strategies and actions that Telcos could undertake to enhance digital access and inclusivity in South Africa.

The theme is about exploring innovative improvement strategies that can be implemented to assist telcos in fostering inclusive connectivity. It aims to explore ways to address inefficiencies and gaps in current practices. Below are the improvement strategies suggested by the participants:

I. Regulation:

One of the most prominent themes around strategies for improvement was regulation. Participants highlighted regulation as the key component to driving inclusive connectivity through telcos. Highlighting the importance of regulation Participant 9 said:

> *"Ultimately, I'd say the government bears the responsibility, though telcos are key partners in delivering it. With connectivity increasingly seen as a human right, there's now a shared responsibility between government and telcos. The government should create supportive policies, allowing telcos to reach underserved areas while maintaining business sustainability."* – Participant 9

Participants felt that government should implement policies that ensure more access to spectrum at a lower cost and incentivise obligations for telcos. They also recommended that government mandate the repurposing of legacy technologies (i.e. 2G and 3G) to free up spectrum for 4G and 5G for enhanced network efficiency and coverage.

> *"Access to more spectrum is a priority. There should be public policy initiatives promoting advanced technologies that use spectrum more efficiently through sharing and access principles. ICASA also promotes collaboration in infrastructure deployment, encouraging telcos to work together on projects like fibre installations, which can reduce costs and improve coverage."* – Participant 1

Under regulation, two participants suggested the introduction of pro-poor policies that mandate affordable pricing models for underserved areas. This includes transparency of pricing and services. It would ensure that telcos are intentional and tailor pricing of services based on affordability for inclusive connectivity. Participants also called for policies that promote collaboration between government and telcos to subsidise the cost of 4G devices so that they are affordable to low-income populations:

> *"Yes. Co-investing in rural sites could be very effective. It would allow telcos to share infrastructure costs rather than going it alone. Another important policy area is phasing out 2G/3G networks, allowing us to focus on 4G and 5G, which would reduce costs and improve network quality. Having the government support device affordability would also make a big difference, as affordable 4G devices are important for wider connectivity."* – Participant 9

One participant provided an interesting perspective and stated that if telecommunications is seen as a crucial enabler for socio-economic development, local governments should incorporate it in spatial planning:

> "*Connectivity isn't traditionally considered from a planning perspective; it's typically left to private companies. Planners focus on roads, schools, and commercial areas but don't incorporate plans for cell towers or satellite infrastructure. Connectivity should be integrated into spatial frameworks, with goals for telecommunications coverage so both government and private sectors can plan accordingly.*" – Participant 6

Furthermore, this participant went on to say:

"There's a mismatch. Different government departments and private sectors have initiatives for things like school connectivity, but it's not well-integrated. We need a more cohesive approach that fully utilises connectivity's potential for schools, businesses, and other public services." – Participant 6

II. Infrastructure investment:

Participants suggested infrastructure sharing among telcos, partly through the intervention of ICASA. This approach would not only reduce the cost of building new telecommunications infrastructure but also improve network coverage in underserved areas:

"They could enable more service providers and promote infrastructure sharing to avoid duplicate towers. There's also potential for using satellite connectivity, which could bridge gaps in remote areas. Cell phone costs and data prices should be regulated to make them more affordable." – Participant 6

"ICASA could facilitate more collaboration among telcos, particularly in rural areas where we don't need multiple networks. For example, it's more efficient to have one shared network in rural areas rather than each telco building its own." – Participant 8

III. Spectrum allocation:

A third proposed solution is for ICASA to realise more spectrum, more speedily, and specifically to promote access to spectrum for smaller telcos:

"ICASA could release more spectrum to allow for better coverage and faster rollout of services like 5G. They need a roadmap to ensure spectrum is available when needed. They also need to level the playing field in spectrum auctions to prevent an imbalance between large and small telcos." – Participant 3

"The release of spectrum was a big step, though it took over 15 years. Moving forward, ICASA should develop a roadmap aligned with telecommunications advancements to prevent long delays in future spectrum allocations. Spectrum availability is essential for expanding capacity and reaching underserved areas, so a clear plan would help us prepare better." – Participant 4

IV. Business partnership:

Lastly, participants suggested collaboration between businesses to promote inclusive connectivity and described several successful examples. Participant 7 provided an example of a partnership that works well:

"In South Africa, the Vodacom-Rain partnership is a good example. Rain uses Vodacom's infrastructure to provide data services, while Vodacom uses Rain's spectrum. This benefits consumers by increasing competitive pricing. The partnership allows Rain to offer competitive prices, and Vodacom earns roaming revenue from Rain while helping Rain expand its market reach by using Vodacom's network infrastructure." – Participant 7

Another participant suggested:

"*Yes, there are initiatives like tower sharing, which reduces costs and increases coverage. Vodacom also has a partnership with Google, which uses high-altitude balloons for connectivity. There's also Starlink by Elon Musk, though it faces BEE* [Black Economic Empowerment] *requirements in South Africa that complicate things."* – Participant 2

4.4 Conclusion of findings

Across participants, there was consensus that telcos have an important role to play in fostering inclusive connectivity in South Africa. However, participants generally felt that telcos experienced several key barriers and limitations. Firstly, it was felt that the role of government and regulatory frameworks, as administered by ICASA, was of primary importance. Accordingly, many of the strategies for improvement suggested by participants involved better regulations and government initiatives to change the incentives facing telcos.

Several of the motivations cited by participants for telcos being involved in extending inclusive connectivity align with the principles of Stakeholder Theory and Social Contract Theory, with participants recognising the importance of inclusive connectivity initiatives and uplifting communities through digital inclusion.

Amongst the most important and commonly mentioned barriers facing telcos in relation to inclusive connectivity was commercial viability, which is linked to the costs of extending network coverage, usually linked to the costs of spectrum and the cost of running base stations and maintenance. Therefore, it was not surprising that many of the improvement strategies suggested involved government reducing costs and increasing access to spectrum, as well as making changes in the regulatory environment to support inclusive connectivity initiatives by telcos.

Table 4-2 is a summarised view of the identified themes and their link to the research objectives.

Table 4-2: Research objectives and themes.

Research objective	Themes	Sub-themes
1. To investigate the role of telcos in fostering inclusive connectivity in South Africa.	1. Role of telcos	Obligations or responsibility of telcos
		Social responsibility
		Universal Service Obligations
		Connectivity expansion
		Inclusive
		Digital divide
	2. Stakeholder role	Spectrum licence obligations
		Customer expectations
		Corporate social responsibility
		Stakeholder Theory
		Social Contract Theory
2. To explore the effectiveness of regulatory frameworks and policies to foster inclusive connectivity in the telecommunications industry.	3. Government and regulation	Fair auctions
		Spectrum allocation
		Spectrum cost
		Subsidy programme
		Effective regulation
		Coverage expansion
		Monitoring
3. To explore barriers faced by telcos with regards to fostering inclusive connectivity.	4. Barriers or challenges	Commercial viability
		Theft
		Vandalism
		Funding
		Spectrum allocation
		Network congestion
		Spectrum cost
		Technology adoption
		Construction mafia
		Unstable power
		Affordability
4. To explore potential strategies and actions that telcos could undertake to enhance digital access and inclusivity in South Africa.	5. Improvement strategies	Alternative power sources
		Colocation
		Business partnerships
		Community partnerships
		Educational programmes
		Digital skills programmes
		Innovative business models
		Regulations
		Infrastructure investment
		Spectrum allocation
		Spectrum cost

CHAPTER 5. DISCUSSION OF FINDINGS

This chapter provides the discussion of the findings, in relation to the research objectives set out in Chapter One of the report: (I) To investigate the role of telcos in fostering inclusive connectivity in South Africa; (II) To explore the effectiveness of regulatory frameworks and policies to foster inclusive connectivity in the telecommunications industry; (III) To explore barriers faced by telcos with regards to fostering inclusive connectivity; and (IV) To explore potential strategies and actions that telcos could undertake to enhance digital access and inclusivity in South Africa.

The chapter examines the key themes in light of existing literature and the theoretical frameworks provided in Chapter Two. The discussion is structured according to the research objectives and the associated themes.

5.1 Discussion of findings in relation to research objective 1

The first two themes relate to Research Objective 1 (RO1), namely, role *of Telcos* and *Stakeholder role.*

5.1.1 Role of telcos

The findings regarding the role of telcos indicated that participants see telcos as instrumental in fostering inclusive connectivity in South Africa. However, the primary responsibility lies with ICASA as the regulator. Telcos drive inclusive connectivity through license obligations and corporate social responsibility initiatives. This perception amongst those working in the sector is consistent with the role envisaged in various policies, including SA Connect (2013), the ICASA Act 13 of 2000 and the Electronic Communications Act 36 of 2005 (Chitimira et al., 2021). According to the Department of Telecommunications & Postal Services (2016), USOs are imposed on telcos as part of their license conditions and spectrum allocation, mandating them to provide ICT services and extend

their network coverage to particular geographic areas or segments of the population.

Telcos also contribute to the USF, which is regulated by ICASA and earmarked for network expansion projects in the underserved areas and programmes dedicated to digital literacy and skills (Lewis, 2013).

5.1.2 Stakeholder role

Participants' responses indicated that telcos' motivations for driving inclusive connectivity initiatives have elements proposed in the Stakeholder Theory, which states that a company should not focus solely on its interests but should also consider the interests of other stakeholders. Furthermore, the benefits of their operations should surpass any associated costs, and their activities should not leave any group within society worse off than before (Hasnas, 1998). There are also motivations consistent with Social Contract Theory in their responses.

It was stated that the heavy reliance on the private sector to close the digital gap was a product of the failure of the government to fund projects and of political interference. In addition, the funds from the USF, also known as the DDF, have been misused, with one participant claiming that part of the funds was used in 2020 by the government to purchase sanitisers and masks during the Covid outbreak and lockdown.

Social Contract Theory provides a compelling framework for interpreting the dynamics between telcos and the South African government in fostering inclusive connectivity. At its core, social contract theory posits that individuals or entities consent, implicitly or explicitly, to cooperate for mutual benefit under an agreed set of rules or obligations (Dagada & Lee, 2022). When applied to the context of public-private partnerships in telecommunications, the theory can help analyse how trust and perceived legitimacy influence corporate participation in bridging the digital divide and fostering inclusive connectivity.

There is a perception among some participants that the government has mismanaged funds intended to support inclusive connectivity initiatives.

Arakpogun et al. (2023) also argued that the underperformance of the USF in South Africa is due to political interference and corruption. He also provided insights into the USFs in Africa, arguing that they have not been as effective as they could be due to a lack of clarity and transparency regarding the allocation of funds. Furthermore, their effectiveness, including the incentivisation of telcos to build infrastructure in rural areas, depends on the institutional environment of the country (Arakpogun et al., 2023).

From the perspective of Social Contract Theory, government mismanagement of funds could be interpreted as a failure to uphold its end of the “contract”. If telcos perceive that public funds have been wasted or misallocated, this could erode their trust in government and, by extension, their willingness to cooperate in fostering inclusive connectivity. Especially given that telcos contribute to the USF, which is supposed to be used to subsidise the expansion of telecommunications infrastructure in underserved regions (Lewis (2013).

The breakdown of trust undermines the implicit social contract, which relies on mutual accountability and the assumption that all parties are working toward shared goals. Without this trust, telcos may question the legitimacy of their obligations, whether explicit (e.g., through regulatory requirements) or implicit (e.g., a moral or societal expectation to support inclusivity).

Hadzic (2024) also highlighted that there have been numerous court cases between ICASA and telcos regarding access to more spectrum for network expansion. The struggle for more spectrum due to political interference and the high price of spectrum could discourage telcos from investing in inclusive connectivity initiatives in areas that present low returns on investment, and the fund that is meant to subsidise or offset the costs is being misused.

These perceptions also impact the sense of fairness, which is a cornerstone of the social contract. For the social contract to function effectively, each party must believe that others are contributing equitably to the collective effort. When telcos perceive the government as failing to deliver on its commitments, whether through ineffective policies, corruption or inefficiency, they may feel less

motivated to invest resources into public-private initiatives, particularly if they doubt the overall efficacy or alignment of government-driven programmes.

Lastly, this could lead to a lack of accountability, where the government (i.e., ICASA) loses integrity and, as a result, fails to hold telcos accountable or effectively monitor license obligations because they, too, have failed. This may explain why these obligations are loosely enforced and why ICASA lacks strictness in its oversight.

5.2 Discussion of findings in relation to research objective 2

5.2.1 Government and regulation

In addressing Research Objective 2: To explore the effectiveness of regulatory frameworks and policies to foster inclusive connectivity in the telecommunications industry, which explores the theme of government and regulation, participants underscored the critical importance of expanding spectrum availability. Such expansion was deemed essential for telecommunications providers to make substantial progress in narrowing the digital divide. Participants expressed how long telcos had to wait for ICASA to release more spectrum. Hadzic (2024) argued that this indicates institutional instability of ICASA and the Ministry, with auctions being cancelled numerous times. The high turnover rate of ministers for the department also exacerbates the issues, resulting in the misalignment of mandates and legal battles between telcos and ICASA (Hadzic, 2024).

The allocation of spectrum remains an unclear mandate, with a noticeable mismatch between the size of firms and their spectrum allocations. For example, Telkom, which holds less than 10% of the market share, has been allocated 23% of the spectrum. In contrast, MTN and Vodacom, which together command over 75% of the market share, have only 27% of the spectrum allocated to them. Furthermore, it is surprising that close to 40% of the mobile spectrum has been

allocated to companies that do not provide mobile voice services (Howell & Potgieter, 2022).

Participants also highlighted the lack of clarity of licence obligations, as well as misalignment between different government policies, which creates confusion and fails to promote the appropriate actions. The *National Integrated ICT Policy White Paper* of 2016 points out that the difficulty in implementing universal access programmes in rural South Africa stems from the lack of a clear vision and plan on how to ensure equitable provision of services in rural and urban areas (Seadira & Heuva, 2021). Hadzic (2024) argues that South Africa has solid ICT policies, according to global indices, but that they are poorly implemented.

Therefore, the views expressed by participants in this study seem to confirm what certain literature has indicated, that the problems in the area of government and regulation are not caused by an absence of ICT policies, but rather by weak execution. This is among the factors contributing to the poor implementation of ICT projects in rural areas and that hinder the effective role of telcos in extending inclusive connectivity (Aruleba & Jere, 2022).

5.3 Discussion of findings in relation to research objective 3

The next theme (i.e. *Barriers/ challenges*) sheds light on Research objective 3 (RO3).

5.3.1 Barriers or challenges

The greatest barrier identified from the study in telcos' efforts to foster inclusive connectivity was *commercial viability*. The construction of a single telecommunications mast can cost around R2 million, excluding the expenses for building approvals and other required permits before construction can commence. As profit-driven companies, telcos will evaluate the return on investment and determine whether it is financially viable to erect a mast based on the projected coverage and revenue from the infrastructure.

Participants also emphasised the high costs of deploying infrastructure, stating that underserved areas typically offer low returns on investment because of the low population density and demand. It costs 80% more to deploy network infrastructure in rural areas than in urban areas. It is often not commercially viable for telcos to invest in rural areas when considering the cost of deployment and the associated low return on investment (Arakpogun et al., 2023; Aruleba & Jere, 2022; Reddick et al., 2020). In addition, the current regulation does not encourage innovative bottom-up solutions where the community can drive their connectivity initiatives (Hadzic, 2024).

The USF could mitigate the issue of commercial viability by subsidising the expansion of telecommunications infrastructure in underserved regions. (Lewis, 2013). Kayum et al. (2025) state that many countries provide subsidies to telcos to close the digital infrastructure gap. In India, for example, in March 2022, subsidies amounting to ₹680 699 million were allocated to telcos (Kayum et al., 2025). Another way to address the issue is by promoting infrastructure sharing, where multiple companies use a single telecommunications mast to provide their network services. This approach allows companies to share the costs of deploying infrastructure, ultimately leading to more affordable services for customers (Houngbonon et al., 2023).

The second most frequently mentioned barrier was vandalism and theft, with participants also highlighting unstable power as a related issue that can be included in this category. In 2023, telcos spent R2.5 billion on batteries and R930 million on generators to assist during load shedding to ensure uninterrupted services to their customers (ICASA, 2024). Prevalent vandalism and theft result in additional funds allocated to repairs, which could have been used to expand the network in other areas. To state this in economics terms, the opportunity cost of spending more money on repairs and remediation is that less funding is available for social initiatives aimed at achieving digital inclusion.

Efforts to achieve digital inclusion require collaboration between the private and public sectors to address the challenges faced by telcos (Jacks et al. (2024). These efforts include educating the public about the importance of connectivity

infrastructure and digital literacy. Additionally, raising public awareness about the role that telcos play could encourage communities to help protect these companies by remaining vigilant and reporting suspicious behaviour at base stations to the relevant security authorities.

Regarding affordability, telcos face challenges in achieving affordable services because of several issues. Firstly, the high cost of spectrum translates into high retail prices for customers (Chitimira et al., 2021; Hadzic, 2024). Furthermore, because of the high costs of spectrum, telcos are inclined to use the newly acquired spectrum in densely populated urban areas where they can achieve a higher return on investment (Hadzic, 2024). The issue is compounded by the scarcity of spectrum, as ICASA has been slow to release additional spectrum (Howell & Potgieter, 2022). This was most evident during the 2020 Covid lockdown, when telcos used the emergency spectrum that was issued to them to assist with coverage gaps to expand 5G technology in urban areas (Hadzic, 2024). The issue of spectrum is not only about quantity but also about pricing. Expanding network coverage and addressing the first level of the digital divide requires providing more spectrum to telcos and lowering their costs to encourage investments in underserved areas (Howell & Potgieter, 2022). By failing to take these steps, the government becomes an obstacle and fails to encourage the desired behaviour from telcos.

The second issue related to affordability is the use of 2G devices. Participants highlighted that ICASA still permits the use of 2G devices, requiring network providers to maintain 2G frequencies on their networks. If 2G devices were banned or discontinued, telcos could repurpose that spectrum for 4G and more advanced technologies. As Hadzic (2024) argued, efficient use of spectrum impacts retail prices. Efficiently using spectrum could translate into lower retail prices for customers. Another point made was the affordability of 4G devices. The reason why 2G devices are still popular is because they are affordable to the broader population. Therefore, the issue of discontinuing 2G needs to be resolved by making 4G devices affordable for the broader population. It might involve subsidising 4G devices so that more people can afford them, allowing 2G technology to be repurposed for 4G and higher technologies. Telcos would then

be able to reduce costs and use spectrum more efficiently. The reduction in costs would translate into lower service and data costs for customers. This could mitigate some of the demand-side challenges related to the cost of data (Chitimira et al., 2021; GSMA, 2024; Hadzic, 2024).

The repurposing of the 2G spectrum could also resolve supply-side challenges. On a positive side, telcos have done well in implementing 'pro-poor' pricing for rural areas and offering packages tailored to specific regions. This approach helps avoid situations where low-income households pay more for data, firstly due to the higher cost of prepaid data compared to contract plans, and secondly, because only affluent individuals can afford the discounted high-value contracts (Aruleba & Jere, 2022).

5.4 Discussion of findings in relation to research objective 4

This last theme sheds light on research objective 4 (RO4), which is to identify potential strategies for improvement on inclusive connectivity efforts.

5.4.1 Improvement strategies

The participants suggested the following strategies:

I. Regulation:

Regulation emerged as one of the most prominent themes in the discussions around improvement strategies. It was highlighted as being at the core of driving inclusive connectivity through telcos. It includes implementing policies that ensure more access to spectrum at a lower cost, thereby incentivising obligations for telcos, and mandating the repurposing of legacy technologies (i.e. 2G and 3G) to free up spectrum for 4G and 5G for enhanced network efficiency and coverage. The introduction of pro-poor policies that mandate affordable pricing models for underserved areas was also suggested. The importance of inclusive policies was

also emphasised by Aruleba and Jere (2022), who mentioned that these are important to realising inclusive connectivity. It may seem, however, that the biggest hurdle is not drafting more policies but ensuring that existing policies are implemented correctly to realise their objectives. According to Hadzic (2024), global ICT indices indicate that the country has made strides in formulating ICT policies compared to other African countries, however the policies are not being implemented effectively.

There are also lessons to be learnt from policies that have failed in the past, including SA Connect, to avoid more policies experiencing the same fate. The perspective of Hadzic (2024) is likely valid, highlighting how little of the *National Integrated ICT Policy White Paper* of 2016 has been implemented. This raises important questions: Are policies only as good as their implementation? What is the point of having a well-drafted policy if it is not implemented?

These perspectives in the literature were certainly borne out in the interviews conducted by this study. South Africa clearly needs to address issues of governance and accountability to ensure alignment of responsibilities between different government departments and secure funding for effective implementation of policies. Policies can only achieve their objectives if they are properly and effectively executed. It is crucial to develop more policies that promote inclusive connectivity, address the barriers outlined in the previous section, and ensure their proper implementation. This includes the implementation of the USF, which has not been effective in driving inclusive connectivity in South Africa (Arakpogun et al., 2023; GSMA, 2024). Achieving inclusive connectivity requires solid policies, strategic planning, good leadership and effective monitoring frameworks (Chitimira et al., 2021; Oloyede et al., 2023).

An interesting perspective shared by one of the participants highlighted a gap in municipal planning. Spatial Development Plans or township establishment plans do not include telecommunications infrastructure and as a result, network expansion is largely reactive rather than proactive. If telecommunications infrastructure is essential for socio-economic development, why is it not included in municipal planning? Planners focus on roads, schools, and commercial areas

but do not incorporate plans for cell towers, fibre and other telecommunications infrastructure. Better coordination between government and telcos could ensure that connectivity is treated as a core component of development planning, ultimately driving digital inclusion initiatives more effectively. Literature does not address this insight regarding the lack of coordination between national policies and municipal planning.

II. Infrastructure investment:

Infrastructure sharing among telcos was suggested as one of the solutions to promoting digital inclusion. Various authors in the literature have stressed how this approach would not only reduce the cost of building new telecommunications infrastructure but also improve network coverage in underserved areas (Houngbonon et al., 2023; Katz et al., 2024). Another initiative that can be explored is the promotion of bottom-up approaches, which are owned and managed by local communities and can also boost the local economy and create employment (Hadzic, 2024).

An example of a bottom-up initiative working well is the Zenzeleni project in the Eastern Cape. Zenzeleni is a community initiative where the community owns and manages its own solar-powered Wi-Fi networks. Zenzeleni addresses affordability issues by providing internet at reduced rates and making internet access more affordable to low-income households in rural areas. The initiative also includes digital literacy programmes and building computer centres in unserved areas, aiming to promote digital inclusion. More initiatives like this can be explored throughout South Africa to promote inclusive connectivity while economically empowering rural communities (Hadzic, 2024).

The findings also highlighted that local planning does not include network expansion and digital inclusion initiatives, which is a valid point considering the importance of digital inclusion and its outcomes. Spatial Development Plans aimed at realising smart cities should focus on closing the digital gap and guiding local municipalities on areas of focus and specific actions for inclusive connectivity (Hadzic, 2024).

III. Spectrum allocation:

The third proposed solution is for ICASA to release more spectrum. Each participant thoroughly stressed the need for additional spectrum. Additional spectrum will resolve some of the challenges regarding affordable services. Not only is it a matter of volume, but also of pricing. Telcos need additional spectrum at lower prices to encourage network expansion in underserved areas, and this will translate into lower retail prices for customers (Chitimira et al., 2021; Hadzic, 2024).

IV. Business partnership:

The last proposed solution is a collaboration between businesses to promote inclusive connectivity. Colocation and roaming agreements help expand network coverage and reach more customers (Howell & Potgieter, 2022). This was evident in the accounts of participants who described the MTN and Cell C roaming deal and the Vodacom and Rain partnership. Rain uses Vodacom's infrastructure to provide data services, while Vodacom uses Rain's spectrum to provide quality networks and expand 5G coverage. Customers benefit from this partnership in terms of more competitive pricing and affordable broadband packages, which addresses the issue of affordability as a barrier to inclusive connectivity. The partnership allows Rain to offer competitive prices, and Vodacom earns roaming revenue from Rain while helping Rain expand its market reach using Vodacom's network infrastructure. Ultimately, customers win in this partnership in terms of having access to network connectivity at affordable prices. More partnerships that help foster inclusive connectivity should be encouraged and explored to mitigate some of the challenges faced by telcos (Howell & Potgieter, 2022).

5.5 Conclusion of findings

This chapter highlighted important insights and bridged the gap between the research findings and existing literature, providing a foundation for conclusions and recommendations in the next chapter. The findings reveal that telcos do

indeed play a significant role in promoting inclusive connectivity and socio-economic development. Furthermore, inclusive connectivity initiatives will demonstrate greater effectiveness in bridging the digital divide and promoting inclusive connectivity when clear and transparent plans, good governance, and accountability and monitoring frameworks support them.

The literature does not address insights regarding the lack of coordination between national policies and municipal planning. The research findings revealed that Spatial Development Plans or township establishment plans do not include telecommunications infrastructure, and as a result, network expansion is largely reactive rather than proactive. This is a gap in the literature that needs further exploration to enhance digital inclusion.

The research findings align with the principles of Stakeholder Theory, Social Contract Theory and Technology Social Responsibility. There is a consensus that telcos play a critical role in fostering inclusive connectivity in South Africa. Furthermore, this reinforces their responsibility to serve various stakeholders, including underserved communities. The challenges identified include ICASA's failure to effectively regulate the sector and manage the USF, which reflects the social contract between telcos, the government, and the public, bringing to light the need for accountability and effective regulation.

Lastly, the recommendations informed by research findings reveal the importance of technology and social responsibility and that telcos should be invested in activities that enhance social well-being, in this case, digital inclusion. Ultimately, these insights stress that achieving inclusive connectivity requires a balance of interests between businesses, ICASA and greater society.

CHAPTER 6. CONCLUSION AND RECOMMENDATIONS

Chapter Six summarises the main findings of the study and reflects on the implications for telcos and policy in the pursuit of inclusive connectivity. It offers several recommendations to address the issues identified in the research. The chapter also discusses the implications of the study, its contributions to the field, and identifies areas for future research.

6.1 Conclusion of the study

Telcos undeniably play a crucial role in fostering inclusive connectivity in South Africa. They achieve this by fulfilling license obligations, expanding their networks, and implementing digital skills programmes as required by these obligations. Additionally, they have corporate social investment programmes tailored to address digital illiteracy in the less affluent areas and empower communities by providing digital technology such as computer centres in rural areas.

The findings revealed that telcos face several challenges in fostering inclusive connectivity, and these were consistently highlighted by study participants working in telcos. A lack of accountability and oversight from the regulator creates a gap in understanding how much they are doing and whether they are doing enough. ICASA's internal issues such as organisational instability stemming from frequent changes in leadership and ministerial appointments was also brought to the forefront. Evidently, these internal issues have led to delays in spectrum allocation, auction cancellations, and a general inability to provide the necessary resources for telcos to expand network infrastructure effectively.

This is not to absolve telcos of their responsibility to step up and do more. Rather, it emphasises the critical role ICASA plays as an essential component in fostering inclusive connectivity in South Africa. For example, spectrum prices and allocation impact on affordability of connectivity. The scarcity and high cost of spectrum have a direct impact on the prices customers pay. High spectrum costs are often transferred to consumers through elevated data prices, making

connectivity less affordable. Additionally, telcos may be limited in their ability to invest in digital skills initiatives or programmes due to lower profit margins caused by these high costs, especially considering the ongoing pressure for telcos to lower data prices without corresponding reductions in spectrum costs.

The research findings also highlight elements of Stakeholder Theory in the telcos' approach to inclusive connectivity. This demonstrates that telcos view their role as extending beyond profit-making to ensuring societal benefits. They are not merely pursuing profits, but they are actively considering the broader interests of society by fostering inclusive connectivity.

In conclusion, fostering inclusive connectivity requires a collaborative approach between telcos and the government. While telcos play a pivotal role in meeting their obligations and expanding access, the government must enact policies that address systemic challenges, provide protection against theft and vandalism, and ensure the effective use of resources like the USF. This partnership is essential to unlocking the full potential of connectivity in driving socio-economic development across South Africa.

6.2 Possible limitations and challenges of the study

The selected participants were assumed to be familiar with the topic and understand the questions being asked. Their familiarity with the topic impacted the depth and quality of their responses. Furthermore, qualitative interviews are essentially subjective, and participants provide responses based on their own perspectives and potential biases (Markula & Silk, 2011; Zavattaro, 2021).

It is also possible that participants provided responses in line with their organisation's stance rather than an objective perspective on the topic which may come across as defending the organisation, as opposed to objectively assessing the efforts by telcos being made towards inclusive connectivity. The study focused only on the perspective of telcos and ICASA and did not include customers and the underserved communities. Research on digital inclusion by Warschauer (2004) and van Dijk (2006) capture end users experience and it

would be beneficial for future research to include different stakeholders' perspectives to the topic of inclusive connectivity.

Given the qualitative and constructivist approach followed in this research, it was not possible to quantify the impact of telcos on inclusive connectivity or to measure this objectively.

6.3 Implications of the study

Although the need for more inclusive connectivity in South Africa is widely agreed on, and further that telcos are expected to play an important role in fostering inclusive connectivity, this study has enriched the understanding of what activities telcos are undertaking and what barriers they face. In particular, the qualitative and constructivist approach taken in this study serves to describe the ways employees in telcos understand the role that telcos do, and should, play in extending connectivity to underserved parts of the country. Similarly, it gives insight into the perceptions of actors in the telecommunications sector about the obstacles to the effectiveness of telcos efforts and about how they perceive the impact of ICASA. Understanding the perceptions of those working in the sector is useful as an indication of possible areas for recommendations to telcos, policy makers and communities.

The study has also shed light on the gaps in regulatory oversight and accountability with regards to the licence obligations, as well as the need to align government policies to effectively drive inclusive connectivity initiatives in South Africa. Lastly, it highlighted the need to explore more innovative financial models to resolve some of the issues related to commercial viability faced by telcos in promoting inclusive connectivity.

This study contributes to the theoretical understanding of inclusive connectivity in South Africa by applying and extending Stakeholder Theory, Social Contract Theory and Technological Social Responsibility theoretical frameworks to the telecommunications context of South Africa. The study further contributes to the

body of qualitative research in inclusive connectivity in South Africa using a constructivist paradigm and semi-structured interviews.

6.4 Recommendations

The starting point should be for ICASA to enact monitoring and accountability frameworks to assess how much telcos are contributing to driving inclusivity and whether they are making sufficient use of their resources. While the barriers and challenges they face may be valid, it remains unclear to what extent they have fulfilled their licensing obligations and whether their efforts are adequate.

Another key recommendation is introducing supportive regulation for the telecommunications industry. Given the telecommunications sector's significance in socio-economic development, it is imperative for the government to protect and support the industry. Policies that safeguard network infrastructure and financing are important in driving inclusive connectivity initiatives. In addition, policies addressing spectrum allocation, business partnerships, and accountability in the management of the UFS must be prioritised. There should be greater transparency and accountability regarding how the USF is used to ensure that funds earmarked for digital innovation are appropriately allocated. Subsidising telcos for expanding infrastructure in rural areas is particularly critical, as these regions often lack commercial viability due to high deployment costs. By strategically using the USF toward these underserved areas, telcos can foster inclusive connectivity and drive long-term socio-economic benefits in rural areas.

ICASA also needs to provide a clear plan regarding spectrum allocation and be held accountable. This includes reviewing the cost of spectrum and ensuring timely allocation of spectrum. It is also worth mentioning the need to address the issues of institutional instability in ICASA to ensure its effectiveness in regulating the telecommunications industry in South Africa. ICASA needs to work on stable leadership, clear organisational structure and improved transparency in decision-making to strengthen operational efficiency and build credibility. The organisation's internal issues have been a barrier to progress in achieving inclusive connectivity.

The issue of theft and vandalism was highlighted in the research findings, and perhaps educating society about the benefits of network infrastructure and internet connectivity might help with reducing theft and vandalism of base stations. Moreover, it will promote community engagement and encourage individuals to play an active role in safeguarding the network equipment in their area. This could also encourage bottom-up initiatives where communities get involved in providing their own connectivity infrastructure.

Lastly, there should be more collaboration between businesses to promote inclusive connectivity. This includes enacting innovative financing models, colocation and roaming agreements.

6.5 Suggestions for further research

Despite the findings arising from this study, there are many areas for further research that would be useful for understanding how to improve the work of telcos in fostering inclusive connectivity.

The perceived weakness in the policy and regulatory environment points to the potential value in research focused on policy evaluation in the telecommunication sector. The effectiveness of existing policies aimed at driving inclusive connectivity could be evaluated to identify gaps and determine ways to address them. This is crucial as misalignment and poor implementation of policies was highlighted in the research findings. Such evaluations could either have a national focus or could involve case studies of municipalities where these policies are implemented in particular areas.

This study did not focus on what other countries have done around inclusive connectivity. Therefore, future research could conduct comparative studies, which could provide valuable insights and best practices on how telcos in other countries drive successful initiatives aimed at promoting inclusive connectivity. Specially countries with similar socio-economic contexts to South Africa.

Research done in collaboration with government could explore and pilot innovative funding models for network expansion in underserved areas.

Government could run a pilot of an innovative financing model, such as results-based finance, where a telco could be paid in proportion to a measurable indicator of inclusive connectivity provided to a defined group of beneficiaries. This could incentivise telcos to expand connectivity and help address the issue of commercial viability of expanding infrastructure in rural regions in South Africa. Further research could include investigating how other countries are navigating the issue of commercial viability of infrastructure deployment in more rural areas.

While evaluations and pilots at the level of national policy could be important, future research could also investigate the feasibility of community-level initiatives. Bottom-up initiatives, such as Zenzeleni in the Eastern Cape, have shown some potential to positively impact on inclusive connectivity and socio-economic development in rural areas. Such initiatives could be more formally evaluated or researched through a case study approach.

Future research could include the perspectives of other stakeholders, such as end-users, underserved communities, digital literacy programme beneficiaries and customers, to provide a more comprehensive assessment of digital inclusion initiatives. This could include studying the impact of digital literacy programmes on economic development and technology adoption in South Africa.

Future research could look at quantifying the impact of telcos on inclusive connectivity and measuring it objectively.

Finally, future research could explore and evaluate how emerging technologies like satellite and artificial intelligence could be used to fast-track inclusive connectivity in rural areas in South Africa.

REFERENCES

Afrobarometer. (2024). *Summary of results: South Africa – Afrobarometer Round 9.* . https://www.afrobarometer.org/publication/south-africa-round-9-summary-of-results/

Afzal, A., Khan, S., Daud, S., Ahmad, Z., & Butt, A. (2023). Addressing the Digital Divide: Access and Use of Technology in Education. *Journal of Social Sciences Review*, *3*(2), 883-895. https://doi.org/https://doi.org/10.54183/jssr.v3i2.326

Anney, V. N. (2014). Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria.

Arakpogun, E. O., Whalley, J., Wanjiru, R., Elsahn, Z., & Kummitha, R. K. R. (2023). Bridging the digital divide in Africa via universal service funds: an institutional theory perspective. *Emerald Publishing Limited*, *36*(8), 126-154. https://doi.org/DOI 10.1108/ITP-01-2023-0042

Aruleba, K., & Jere, N. (2022). Exploring digital transforming challenges in rural areas of South Africa through a systematic review of empirical studies. *Scientific African*, *16*. https://doi.org/https://doi.org/10.1016/j.sciaf.2022.e01190

Basit, S. A., Ahmed, S., Latif, M. T., Khan, M. A., & Gulzar, A. M. (2021). Bibliometric Analysis of Digital Divide Using Web of Science. *Library Philosophy and Practice (e-journal)*(6256). **https://digitalcommons.unl.edu/libphilprac/6256**

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*, 77-101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2012). *Thematic analysis*. American Psychological Association.

Carter, N., Bryant-Lukosius, D., Dicenso, A., Blythe, J., & Neville, A. (2014). The Use of Triangulation in Qualitative Research. *Oncology Nursing Forum*, *41*, 545-547. https://doi.org/10.1188/14.ONF.545-547

Chandra, Y., & Shang, L. (2017). An RQDA-based Constructivist Methodology for Qualitative Research. *Qualitative Market Research: An International Journal*, *20*, 90-112. https://doi.org/10.1108/QMR-02-2016-0014

Chitimira, H., Magau, P., & Za. (2021). A Legal Analysis of the Use of Innovative Technology in the Promotion of Financial Inclusion for Low-Income Earners in South Africa. *Potchefstroom Electronic Law Journal/Potchefstroomse Elektroniese Regsblad*, *24*, 1-27. https://doi.org/10.17159/1727-3781/2021/v24i0a10740

Coyne, I. (1997). Sampling in Qualitative Research. Purposeful and Theoretical Sampling; Merging or Clear Boundaries? *Journal of advanced nursing*, *26*, 623-630. https://doi.org/10.1046/j.1365-2648.1997.t01-25-00999.x

Dagada, R., & Lee, G. (2022). *Research in Southern African Digital Business Volume I*.

Department of Public Works and Infrastructure. (2022). *National Infrastructure Plan 2050*.

Department of Telecommunications & Postal Services. (2016). *National Integrated ICT Policy White Paper*. Retrieved from https://www.gov.za/sites/default/files/gcis_document/201610/40325gon1212.pdf

Faloye, S. T., & Ajayi, N. (2021). Understanding the impact of the digital divide on South African students in higher educational institutions. *African Journal of Science, Technology, Innovation and Development*. https://doi.org/DOI: 10.1080/20421338.2021.1983118

Ghafouri, R., & Ofoghi, S. (2016). Trustworth and Rigor in Qualitative Research. *7*.

GSMA. (2024). *The Mobile Economy Sub-Saharan Africa 2024*. https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-economy/wp-content/uploads/2024/11/GSMA_ME_SSA_2024_Web.pdf

Guest, G., Bunce, A., & Johnson, L. (2006). How Many Interviews Are Enough? *Field Methods - FIELD METHOD*, *18*, 59-82. https://doi.org/10.1177/1525822X05279903

Hadzic, S. (2024). South Africa's Digital Transformation: Understanding the Limits of Traditional Policies and the Potential of Alternative Approaches. *Computer Law & Security Review*, *55*, 106011. https://doi.org/https://doi.org/10.1016/j.clsr.2024.106011

Hasnas, J. (1998). The Normative Theories of Business Ethics. *Business Ethics Quarterly*, *8*(1), 19-42.

Hennink, M., Kaiser, B., & Marconi, V. (2016). Code Saturation Versus Meaning Saturation: How Many Interviews Are Enough? *Qualitative Health Research*, *27*. https://doi.org/10.1177/1049732316665344

Hopf, C. (2004). Qualitative interviews: An overview. *A companion to qualitative research*, *203*(8), 100093.

Houngbonon, G. V., Ivaldi, M., Palikot, E., & Strusani, D. (2023). *The Impact of Shared Telecom Infrastructure on Digital Connectivity and Inclusion*. Toulouse School of Economics. https://books.google.co.za/books?id=mSv_zwEACAAJ

Howell, B. E., & Potgieter, P. H. (2022). Effective competition and ineffective mobile industry regulation in South Africa. *Telecommunications Policy*, *46*(7), 102317. https://doi.org/https://doi.org/10.1016/j.telpol.2022.102317

ICASA. (2012). *Findings on Review on Universal Service Access Obligations*. Retrieved from https://www.saflii.org/za/gaz/ZAGovGaz/2012/632.pdf

ICASA. (2024). *The State of the ICT Sector Report in South Africa*. https://www.icasa.org.za/legislation-and-regulations/state-of-ict-sector-report-2023-report?TSPD_101_R0=086f0ac93aab20006080fdfdb79bd1b60f1e872f43f0193bafc649e608ee1067c8536b355dff6c3f08b850784b143000270ba2270890460df2af42c57132fcd225e23b708a5401a786a2916f04b3ffe229484b42be401ecdeb8ba2f8b486cf1c

Iqbal, Q., & Piwowar-Sulej, K. (2024). Technological social responsibility: A stakeholder theory-based measurement scale. *Technological Forecasting and Social Change*, *205*, 123465. https://doi.org/https://doi.org/10.1016/j.techfore.2024.123465

Jacks, B. S., Ajala, O. A., Lottu, O. A., & Okafor, E. S. (2024). Theoretical frameworks for ICT for development: Impact assessment of telecommunication infrastructure projects in Africa and the U.S. *World Journal of Advanced Research and Reviews*, *21*(3), 394-400. https://doi.org/https://doi.org/10.30574/wjarr.2024.21.3.0721

Kahlke, R. (2014). Generic Qualitative Approaches: Pitfalls and Benefits of Methodological Mixology. *International Journal of Qualitative Methods*, *13*, 37. https://doi.org/10.1177/160940691401300119

Kamal, A., & Lin, S. S. (2019). Research Paradigm and the Philosophical Foundations of a Qualitative Study. *4*, 1386-1394. https://doi.org/10.20319/pijss.2019.43.13861394

Katz, R., Callorda, F., & Valencia, R. (2024). *African Telecommunications.* T. A. Services. https://s24.q4cdn.com/543663333/files/doc_downloads/2024/04/09/2024-africa-white-paper.pdf

Kayum, A., Abdin, M. S., Mishra, B., & Kayum, A. (2025). Bridging the digital divide: Analyzing subsidy allocation efficiency in telecom sector reforms. *Telecommunications Policy*, *49*(1), 102880. https://doi.org/https://doi.org/10.1016/j.telpol.2024.102880

Lee, G. J., & Armstrong, B. (2023). *Introduction to Digital Business and Technology* (2nd ed.). Silk Route Press.

Lewis, C. (2013). Universal access and service interventions in South Africa: Best practice, Poor Impact. *South African Journal of Information and Communication*. https://doi.org/https://doi.org/10.23962/10539/19279

Lythreatis, S., Singh, S. K., & El-Kassar, A.-N. (2022). The digital divide: A review and future research agenda. *Technological Forecasting and Social Change*, *175*, 121359. https://doi.org/https://doi.org/10.1016/j.techfore.2021.121359

Magaldi, D., & Berler, M. (2020). *Semi-structured Interviews*. Springer International Publishing. https://doi.org/10.1007/978-3-319-24612-3_857

Mahajan, R., Lim, W. M., Sareen, M., Kumar, S., & Panwar, R. (2023). Stakeholder theory. *Journal of Business Research*, *166*, 114104. https://doi.org/https://doi.org/10.1016/j.jbusres.2023.114104

Markula, P., & Silk, M. (2011). Practice and the Politics of Interpretation: Interviewing. In P. Markula & M. Silk (Eds.), *Qualitative Research for Physical Culture* (pp. 81-111). Palgrave Macmillan UK. https://doi.org/10.1057/9780230305632_4

Maxwell, J. (2009). The SAGE Handbook of Applied Social Research Methods. In (2 ed.). SAGE Publications, Inc. https://doi.org/10.4135/9781483348858

Mulyaningsih, T., Wahyunengseh, R., & Hastjarjo, S. (2021). Poverty and Digital Divide: A Study in Urban Poor Neighborhoods. *Jurnal Ilmu Sosial dan Ilmu Politik*, *24*, 189. https://doi.org/10.22146/jsp.52325

Nchake, M., & Shuaibu, M. (2022). Investment in ICT Infrastructure and Inclusive Growth in Africa. *Scientific African*, *17*, e01293. https://doi.org/10.1016/j.sciaf.2022.e01293

Oloyede, A. A., Faruk, N., Noma, N., Tebepah, E., & Nwaulune, A. K. (2023). Measuring the impact of the digital economy in developing countries: A systematic review and meta- analysis. *Heliyon*, *9*(7), e17654. https://doi.org/https://doi.org/10.1016/j.heliyon.2023.e17654

Percy, W. H., Kostere, K., & Kostere, S. (2015). Generic Qualitative Research in Psychology. *The Qualitative Report*, *20*, 76-85. https://doi.org/10.46743/2160-3715/2015.2097

Reddick, C. G., E, R., Harris, R. J., & Sharma, B. (2020). Determinants of broadband access and affordability: An analysis of a community survey on the digital divide. *Elsevier*, *106*, 1-12. https://doi.org/https://doi.org/10.1016/j.cities.2020.102904

Seadira, B. D., & Heuva, W., E. . (2021). Exclusion of South African Rural Communities from Digital Communication Podia: A Regulatory Conundrum, Communicatio. *South African Journal for Communication Theory and Research*, *47*(4), 72–98. https://doi.org/DOI: 10.1080/02500167.2022.2039736

Sharp, M. (2022). Revisiting digital inclusion: A survey of theory, measurement and recent research. *Digital Pathways at Oxford*, *1*.

Shiferaw, Y. A. (2024). A spatial analysis of the digital gender gap in South Africa: Are there any fundamental differences? *Technological Forecasting and Social Change*, *204*, 123443. https://doi.org/https://doi.org/10.1016/j.techfore.2024.123443

Suri, H. (2011). Purposeful Sampling in Qualitative Research Synthesis. *Qualitative Research Journal*, *11*, 63-75. https://doi.org/10.3316/QRJ1102063

Tenny, S., Brannan, J. M., & Brannan, G. D. (2023). *Qualitative Study*. StatPearls Publishing, Treasure Island (FL). http://europepmc.org/abstract/MED/29262162

http://europepmc.org/books/NBK470395

https://www.ncbi.nlm.nih.gov/books/NBK470395

Terry, G., Hayfield, N., Clarke, V., & Braun, V. (2017). Thematic analysis. *The SAGE handbook of qualitative research in psychology*, *2*(17-37), 25.

Tracy, S. (2010). Qualitative Quality: Eight "Big-Tent" Criteria for Excellent Qualitative Research. *Qualitative Inquiry*, *16*, 837-851. https://doi.org/10.1177/1077800410383121

Vaismoradi, M., Jones, J., Turunen, H., & Snelgrove, S. (2016). Theme development in qualitative content analysis and thematic analysis.

van Dijk, J. (2006). *The Network Society: Social Aspects of New Media*. SAGE. https://books.google.co.za/books?id=-kVomAEACAAJ

Van Dijk, J. A. G. M. (2017). Digital Divide: Impact of Access. In. https://doi.org/10.1002/9781118783764.wbieme0043

Venter, I., & Daniels, A. (2020). *TOWARDS BRIDGING THE DIGITAL DIVIDE: THE COMPLEXITIES OF THE SOUTH AFRICAN STORY*. https://doi.org/10.21125/inted.2020.0937

Warschauer, M. (2004). *Technology and social inclusion: Rethinking the digital divide*. MIT press.

Wildemuth, B. M. (2016). *Applications of Social Research Methods to Questions in Information and Library Science, 2nd Edition*. ABC-CLIO. https://books.google.co.za/books?id=uv98DQAAQBAJ

Yermack, D. (2018). *Fintech in sub-Saharan Africa: What has worked well, and what hasn't*. http://www.nber.org/papers/w25007

Zavattaro, S. M. (2021). Why is this so hard?: An autoethnography of qualitative interviewing. *Public Performance & Management Review*, *44*(5), 1052-1074.

APPENDIX A: Interview guide

1. Can you please introduce yourself and briefly overview your professional background?
2. How long have you been working in the telecommunications industry?
3. In your words, what role do telcos play in fostering inclusive connectivity in South Africa?
4. What are the main initiatives currently being undertaken by telcos in South Africa aimed at bridging the digital divide? How effective have they been? Can you share any success stories or case studies where these initiatives have significantly impacted?
5. What are the barriers to fostering inclusive connectivity for telcos, and how can public policies mitigate these barriers?
6. How is your organisation addressing these barriers?
7. What has worked elsewhere to ensure that telcos have effectively bridged digital divides?
8. Are there any legal, regulatory or other changes ICASA could consider to mitigate some of the challenges telcos face in terms of initiatives aimed at bridging the digital divide?
9. What are the expectations of different stakeholders for the role that telcos should play in fostering inclusive connectivity?
10. Who are the relevant stakeholders and how can their collective resources be brought together to foster more inclusive connectivity?
11. How does satisfying these expectations impact the organisation's performance?
12. How does your company measure the impact of its inclusive connectivity efforts?
13. Is there anything else you would like to add or discuss?
14. Do you have any questions for me regarding this research?