THE EFFECT OF THE ICT POLICY AND LEGISLATIVE REGIME ON THE NAMIBIAN TELECOMMUNICATIONS SECTOR 2009 – 2024

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DECLARATION

I declare that this report is my own unaided work. It is submitted in fulfilment of the requirements of the Master of Arts in the field of ICT Policy and Regulation at the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

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DEDICATION

I dedicate this research report to my grandmother, Engela Louw who has inspired my career and motivated me to become the best version of myself.

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AI	Artificial Intelligence
CRAN	Communications Regulatory Authority of Namibia
ECNS	Electronic Communications Network Service
ECS	Electronic Communications Service
ICT	Information and Communication Technology
ICT4D	Information Communications Technology for Development
IMT	International Mobile Telecommunications
IOT	Internet of Things
ITU	International Telecommunication Union
LAN	Local Area Network
LTE	Long Term Evolution
MICT	Ministry of Information and Communication Technology
MTC	Mobile Telecommunications Limited
MVNO	Mobile Virtual Network Operator
NCC	Namibian Communications Commission
NDP	National Development Plan
NPTH	Namibian Postal and Telecommunications Holdings
OPGW	Optical Ground Wire
OTT	Over-the-Top
PBX	Private Branch Exchange
SADC	Southern African Development Community
SAT-3	South Atlantic Telecommunications-3
VSAT	Very Small Aperture Terminals
WACS	West African Cable System

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Chapter 1: Setting the scene – An overview of the ICT Governance Framework and the regulatory dilemma for Namibia

1.1 Introduction

Namibia has a system of policies, laws, and regulations aimed at regulating the ICT space within the country. These instruments prescribe how the industry should be regulated by the Namibian ICT regulator, Communications Regulatory Authority of Namibia (CRAN), and date back to 2009. The ICT policies and laws have not been significantly reformed since then, despite the new age in advanced technologies, ICT services, and innovative approaches to ICT regulation – except for the amendment to the Communications legislation, in 2020, to improve the provisions dealing with the collection of regulatory levies by the regulator. The global digital environment has evolved significantly over the last decade with new technological trends and best practices demanding regulatory reform. National policy and legislation are important for the development of any sector because they lay down the goals and objectives for the development of the sector and how they should be achieved. Namibia's ICT policies set out the country's goals and aspirations in terms of the direction in which the digital sector should be navigated to become a digital economy in the ensuing years. This is achieved through the implementation of relevant legislation and strategies in the interest of the industry, the consumers, the public, the economy, and social-economic development. However, at the same time, ICT legislation and strategies should be crafted and implemented in such a way that is sufficiently flexible to the ever-changing needs and demands of the sector.

The Namibian ICT governance framework adopted a command-and-control style of regulation compared to a more future-oriented approach to regulation which requires constant change and reform as the ICT industry evolves. The legislative framework appears to be outdated and imposes rigid and mandatory rules and requirements for compliance and considerable fines and penalties are imposed for non-compliance.

It is also important to determine how flexible the current Namibian ICT legislative landscape is to technological innovation. Such a stagnant and rigid regulatory regime may cause the industry to lag compared to other SADC countries and stifle digital development and regulation.

The different areas and facets of telecommunications sector are vast and therefore, this research will focus on three specific areas of the sector namely market development and competition, universal access and services and spectrum management.

1.2 Research problem statement: Crystallizing the gap in knowledge

The research problem is premised on the observation that the telecommunications sector, in Namibia, has been firmly governed by the current national ICT policy and legislative framework since 2009 with a "command-and-control" approach to regulation. It is observed that the policy and legal frameworks remained constant since 2009 as far as the regulation of the telecommunications market, competition, universal access and services and spectrum management are concerned - despite considerable changes in telecommunications technologies and digital transformation. To date, there is no evidence of research conducted in Namibia to determine the effect that the current framework has had on the development of the telecommunications sector since 2009. Therefore, the research problem is the lack of knowledge on the effect that the current ICT policy and the legislative regime has on the development of the telecommunications sector in Namibia. This knowledge gap will be explored through the following dimensions as was determined by the conceptual/theoretical framework: the current state of development of the Namibian telecommunications sector; the benefits and shortcomings of the current ICT policy and legislative framework and regulatory approach; and the level of responsiveness of the telecommunications policy and legislation to technological innovation and sector evolution based on the three research focus areas identified in paragraph 1.1 of the research report.

1.3 Research purpose statement

The purpose of this research is to determine, through an assessment, the effect that the ICT policy and legislation has on the Namibian telecommunications sector in the context of transitioning into a digital economy. The research will also explore the current state of development of the telecommunications sector; the benefits and shortcomings of the Namibian ICT Policy and legislative framework and regulatory approach; and the level of responsiveness of the telecommunications policy and legislation to technological innovation and sector evolution – to make this determination. Industry views and opinions were also solicited in this regard. The purpose of the study is also to identify the shortcomings and challenges in ICT legislation and regulation that hinder the development of the Namibian telecommunications sector as a basis to implement law and policy reform strategies. It will also examine the shortcomings of the policy making and regulatory processes within the system and assess how such shortcomings and impediments affect telecommunications sector development in Namibia.

1.4 Research questions

Pursuant to the above research problem and purpose, the study will seek to address the following main research question and sub-research questions:

1.4.1 Main question

How does the ICT policy and legislative regime affect the Namibian telecommunications sector from 2009 to 2024?

1.4.2 Research sub-questions

(a) How has the telecommunications sector evolved in light of the national ICT policy vision and goals, and global trends?
(b) What are the benefits and shortcomings of the current ICT policy and legislative framework and regulatory approach?
(c) How responsive are the current policy and legislation to technological innovation and sector evolution?

1.4.3 Significance of the research

The research is significant insofar as it will add value to the pool of knowledge on the effect of existing ICT regulatory regimes on the development of the telecommunications sector, with special focus on Namibia. The research will identify the shortcomings and challenges concerning legislation and regulation of the telecommunications sector and will therefore aid the Namibian Government and regulator to implement strategies and policies for reform and improve the regulation of the sector to the benefit of the industry, consumers and in the interest of socio-economic development.

1.5 The road paved for policy and legislation for the regulation of the ICT sector (2009–2024)

1.5.1 The road paved for the ICT sector

The Government of Namibia promulgated the Namibian Communication Commission Act 1992, two years after independence, on the 03rd of April 1992. The legislation established the then Namibian Communication Commission, also known as the “NCC” under the then Minister of Information and Broadcasting. The NCC Act prescribes the mandate of the Commission to, amongst others, regulate the broadcasting sector within Namibia, issue broadcasting licenses, control broadcasting activities and services, and manage the radio frequencies for broadcasting. The Namibian Government promulgated separate legislation, to make provision for the regulation of the telecommunications and postal sectors. On the 15th of August 1992, the Posts and Telecommunications Act 1992 was enacted. The legislation prescribes the powers, duties, and functions of Namibia Post Limited and Telecom Namibia Limited; and provides for incidental matters related thereto. Telecom Namibia Limited is the dominant public / national telecommunications operator providing both mobile and fixed telecommunications services in Namibia and Namibia Post Limited is the public postal service operator.

The Namibian Government launched its Vision 2030 policy framework for long-term national development in 2004 which sets out the policy frameworks for long-term national development goals and strategies for the country. The Vision 2030 ICT goals for the country include:

- To have a comprehensive national ICT policy fully implemented by 2030;
- Have access to broadband internet for use by all Namibians; affordable internet costs and broadband speed enhanced to a high-quality level;
- Installation of wireless networks rolled-out across Namibia; achievement of significant local manufacturing of digital equipment; and
- Availability of incentives and subsidies for computer hardware acquisition; and advanced infrastructure for digital services.

Furthermore, the target for the development of the ICT sector is to provide economic benefit to all citizens with the deployment of the following strategies:

- To develop, and implement a national ICT policy and monitor implementation;
- Digital training for learners in pre-primary education, and funding for students in applied sciences;
- Investments in electrical/electronic engineering, and education in the computer science field;
- Online internet based-training facilities;
- Free access to the internet for the public;
- The support and rollout of internet access hubs in rural areas; and
- Installation of wireless LAN applications in identified centres in Namibia.

The most important objective of the Vision 2030 policy is to transform Namibia into a knowledge-based economy by 2030. Consequently, the ICT sector was to become the most important sector, economically by 2030. Melber (2017) believes that the goals and objectives in this policy are based on illusions instead of proper assessments and planning. Also, there was a lack of political will to implement a policy that would give the goals and objectives more priority than the self-enrichment of a minority in control over the state and economy. Melber (2017) also stated that the Vision 2030 policy is too ideal and not focused on the socio-economic realities of Namibia.

1.5.2 The inception of the legislative regime for the ICT sector in Namibia

In 2009, the Government published the national policies on ICTs under the Ministry of Information and Communication Technology. These policies made provision for the establishment of a national independent regulator tasked to regulate the ICT sector of the country and also gave effect to the country's Vision 2030. One of the ICT policies is the

National Telecommunications Policy that prescribed national goals for the telecommunications sector in respect of market structure, competition, consumer protection, regulatory framework, ownership and shareholding, licensing regime, interconnection, facility sharing, numbering, universal access, and services, bandwidth, and spectrum management.

On the 28th of October 2009, the Communications Act 2009 was promulgated and established the Communications Regulatory Authority of Namibia, also known as CRAN, and was inaugurated on the 18th of May 2011. The legislation provides for, amongst other things, the regulation of the telecommunications sector and telecommunications networks, broadcasting, postal services, and the use and allocation of radio spectrum. The regulator is mandated to regulate the ICT sector, promulgate regulations in respect thereof and report to the relevant Minister and ensure compliance with the communications legislation. The Communications Act repealed the Namibian Communications Commission Act and consequently, the NCC was abolished as a government entity.

The latest legislation passed in 2009 consolidated the regulation of all sectors of ICT as opposed to the repealed laws that had separate legislation for telecommunications and Postal services and a separate law for broadcasting. The national regulator enacted several regulations mandated by the Communications Act, to implement the objectives and provisions of the legislation and policies. The national policies and communications law were not amended or reformed ever since.

The following regulations, amongst others, have been developed for the regulation and development of the telecommunications sector:

- The Telecommunications Service Licence Categories regulations;
- The Regulations to ensure fair competition in the telecommunications sector;
- The Regulations prescribing the provision of universal service by Telecommunications Service Licensees;
- The Regulations Prescribing Procedures Regarding Application for, and Amendment, Renewal, Transfer and Cancellation of Spectrum Licences; and
- The Regulations regarding licence conditions for telecommunications service licences

1.6 An overview of the national policy goals and aspirations for the development of the telecommunications sector and a digital economy in Namibia

The Telecommunications Policy, 2009

The Namibian Government developed a Telecommunications policy in 2009 which is still applicable today. The policy prescribes national goals for the telecommunications sector in respect of market structure, competition, consumer protection, regulatory framework,

ownership and shareholding, licensing regime, interconnection, facility sharing, numbering, universal access, and services, bandwidth, and spectrum management.

The intention is to facilitate the growth of ICT in Namibia with the development of this policy. The policy is also aligned to international and regional declarations and protocols of which Namibia is a signatory and member state (MICT, 2009a).

The Overarching Information and Communication Technology Policy, 2009

The Overarching Information and Communication Technology was developed in 2009 and is also still effective since then. The purpose of the overarching policy is to set out the overarching policy goals, objectives, and aspirations for the industry in the context of the convergence of telecommunications, broadcasting, information technology, and postal sectors for the Republic of Namibia. The policy focuses on content creation and connectivity and access to communication and recognises ICTs role in socio-economic development and poverty eradication (MICT, 2009b).

The General policy Guidelines on Universal Access and Service in Communications, 2013

In 2013, the Namibian government released the General policy guidelines on universal access and service in communications as published in the Namibian Government Gazette of 08 April 2013. The purpose of the policy was to set out guidelines in respect of universal access and service to ensure the availability of the following to the Namibian people: digital technology infrastructure, digital services, and content, fixed and mobile voice telephony, radio and television transmission services, broadband and data.

The National Broadband Policy (2018-2022)

The National Broadband Policy was developed in 2018 and is premised on the intention to achieve universal access and service in respect of a variety of different information and communications technologies. The objective of the policy is to bridge the digital divide in Namibia by ensuring all Namibians are provided with broadband connection at competitive pricing and in terms of industry ideals. The policy addresses issues such as access, affordability, quality, and usage. It aims to transform Namibia into a digital economy (MICT, 2018).

The 5th National Development Plan (NDP5)

Namibia released its 5th National Development Plan (NDP5) in May 2017. The purpose of the plan is to set out a roadmap for achieving rapid industrialization. The plan also supports the implementation of the Vision 2030 policy. According to the NDP5, a knowledge-based economy requires the universal availability, affordability, and accessibility of communications and digital infrastructure services ranging from landline and mobile phone services, radio, and television transmission services and high-speed internet and broadband services. It also requires the widespread adoption of available digital services. The purpose and goal of NDP5 are to give Namibians access to information, affordable communications, and technology infrastructure and services by 2022 (NDP5, 2017). The

key initiatives are as follows: 90% broadband infrastructure coverage; 100% of schools covered by broadband infrastructure, 90% radio FM population coverage, and 92.8% digital terrestrial television coverage.

1.6.1 Policy goals for market development and competition

The government has documented the following policy goals and objectives for the development of the telecommunications sector and market development:

- *Goal: The Government intends to dilute its shareholding in the commercial ICT orientated public enterprises (privatization) (MICT, 2009b) and Competition is further encouraged by diluting Government shareholding in telecommunications public Enterprises (MICT, 2009a).*
- *Goal: The Government will lower barriers to the ICT market, to allow new entrant operators to compete with the existing providers of ICT products and services (MICT, 2009b)*
- *Goal: The ICT market in Namibia and regulatory structures should be enhanced, and completely liberalised (open, competitive markets and private sector participation) subject to a controlled process by 2014 (MICT, 2009b).*
- *Goal: The Government will create an equitable, fair, just, and competitive sector based on the principles of the free market and open unconstrained access to products and services (MICT, 2009a).*
- *Goal: The Namibian Government encourages foreign participation in the telecommunications sector (MICT, 2009a).*
- *Goal: The Government is committed to move towards a service and technology neutral licensing approach (MICT, 2009a).*

1.6.2 Policy goals for universal access and service

The government has documented the following policy goals and objectives for the universal access and service:

- Goal: To achieve a 98% level of universal access in respect of telephony, and broadband services within a period of 20 years or less (Republic of Namibia, 2013).
- Goal: To achieve a 95% level of universal service in respect of telephony, and broadband services within a period of 10 years or less (Republic of Namibia, 2013).
- Goal: 100% of the Namibian schools should have 10 Mbps broadband speed and 80% schools at 100 Mbps broadband speed by 2020 (MICT, 2018).
- Goal: 90% of the Namibian population should be covered by broadband infrastructure by 2022 (NNPC, 2017).
- Goal: 100% Broadband Infrastructure coverage for schools by 2022 to allow for e-learning (MICT, 2018).
- Goal: 95% of the population to be covered by broadband services by 2023 (MICT, 2018).

1.6.3 Policy goals for spectrum management

The government has documented the following policy goals and objectives for the spectrum management:

- The regulator shall be responsible for the management of all spectrum in Namibia and administer the radio frequency spectrum (MICT, 2009a).
- Radio frequency spectrum should be assigned in accordance with the high-level principles of diversity, competition and open markets, transparency, consistency, and proportionality in decision making and regulation (MICT, 2009b).
- Radio frequency spectrum must all be regulated in ways that allow for the evolution of that ecosystem (Republic of Namibia, 2013).
- The Regulator must give attention to the future processes required for continuous ICT sector reform, including spectrum allocation and assignment (Republic of Namibia, 2013).
- The Regulator must establish a regulatory framework that will, amongst other things: support a flexible spectrum policy to ensure availability and affordability of spectrum in support of universal access and service (Republic of Namibia, 2013).

Reflections

The ICT policy and legislative framework and policy goals and aspirations discussed in section 1.6 above is relevant for purposes of analysing and assessing whether these policy goals and objectives have been achieved to date. This assessment would be in response to the current state of development of the Namibian telecommunications sector and the level of responsiveness to technological innovation and sector evolution.

1.7 Chapter summary

This chapter gives a brief overview of the Namibian ICT policy and regulatory governance framework and the research gap that will be explored and assessed through the research dimensions as determined by the literature review and conceptual framework in Chapter 2.

The Namibian telecommunications sector is primarily regulated by telecommunications national policies, (including policies such as the Vision 2030, the Telecommunications Policy, the Universal Services and Access Policy and the 5th National Development Plan) and the Communications Act, promulgated in 2009, and number of regulations, mandated by the Act, to implement the objectives and provisions of the legislation and policies. This constitutes the regulatory governance regime for the regulation of the sector in Namibia.

The established policy and legislative regime have remained constant and stagnant since 2009. The question would therefore be whether this framework, as it stands, ensures, and encourages the development of the telecommunications sector based on the policy goals and objectives, and the legislative mandate and in light of technological innovation and the

ever-changing needs and demands of the sector. It is thus important to determine how flexible the current Namibian ICT legislative landscape is to technological innovation.

1.8 Structure of the research report

Chapter 1 provided an overview of the Namibian ICT governance framework and the regulatory regime relevant to this research for the period 2009 to 2024.

Chapter 2 will provide a literature review on the role of policy and legislation in sector development and the different approaches to future-oriented regulation for a digital economy as a comparison to the approaches adopted and implemented by the Namibian telecommunications sector. The literature review will also focus on the three research focus areas namely market development and competition, universal access and services and spectrum management. The Chapter will also set out the conceptual/theoretical framework that informs the research based on the research gap identified.

Chapter 3 will set out the methodological approach and research design used to conduct a constructivism-based study for the purposes of this research.

Chapter 4 will present the current state of development of the Namibian telecommunications sector based on documentary data collected. It will also present the data collected from the interview participants based on the research dimensions of the conceptual/theoretical framework. The data will be presented based on analytical concepts which relate to the conceptual/theoretical framework design illustrated in Chapter 2.

Chapter 5 will provide an in-depth analysis of the data presented in Chapter 4. It will also bring into context the literature review as discussed in Chapter 2. The analysis of the data in Chapter 5 will be presented in relation to the research questions that relate to the conceptual/theoretical framework. Chapter 5 will therefore assess how the current policy and legislative framework affects or influences the development of the telecommunications sector.

Chapter 6 will conclude the research report, summarise the key findings of the research and provide recommendations for more innovative and effective telecommunications sector development.

Chapter 2: Literature review on telecommunications policies and legislative frameworks and the different approaches to future-oriented regulation for a digital economy

2.1 Introduction

This research studies the effect of ICT policy and legislation on telecommunications sector development in Namibia. Chapter 2 will therefore consider literature of renowned writers and industry experts on the role of national policy and legislation in telecommunications sector development. It will also provide a literature review on telecommunications sectors and development, in general, based on the three research focus areas, and best practice initiatives and regulatory models – in as far as the achievement of a more effective standard of digital regulation towards a digital economy and socio-economic development is concerned.

For an ICT sector that is ever changing and ever evolving, it is imperative that countries adopt a digital regulatory framework that is flexible and adaptive to technological innovation and industry evolution. National policies and legislative frameworks should be future orientated to consistently relate to and accommodate new digital realities and challenges and emerging technologies in the ICT environment.

2.2 The role of national ICT policies and legislation

National and public policies are formulated by government to reflect the overall vision and goals for the development and evolution of a particular sector or the country as a whole. Legislation, on the other hand, gives effect to national policy and enables its implementation by providing the statutory and regulatory foundation for public entities, regulators, and regulated entities.

According to Phamodi et al (n.d), national policies are typically aspirational, and have, in general, no legal binding effect. Policies should preferably be aligned and correspond with the legislation and regulations that gives effect to it. It is important that national policies, and its supporting legislation, should be mutually supportive and should be developed and executed in a reasonable and coherent manner. Regulations are developed to give effect to the relevant legislation in terms of implementation and execution and they define the rules and procedures that should be followed by regulator and the industry role players in their interactions with one another. They also prescribe the technical conditions under which action may be taken by the regulator, and the factors that have to be considered by the regulator in decision making (Phamodi et al., n.d.).

In the context of this research, ICT policy and legislation play a critical role in the development of the telecommunications sector since it lays the foundation and sets the tone for digital regulation in the country. Heeks, Gao & Ospina (2010) advise that developing countries should formulate policies that address the main ICT development

challenges in the country and the ICT4D value chain. ICT policy should not only put in place the rudiments necessary for digital “readiness” that can make ICTs available but should also ensure that there are policies in place which support the utilization of ICTs, and that technology should have a development impact. Coherent ICT policies should also ensure that there is policy integration between all components of the ICT4D value chain which includes ICT readiness, availability of digital services and technologies, use of ICT, and impact of ICT on the development of the country.

The International Telecommunication Union (ITU, 2010) recommends that countries’ ICT policies map the directions for digital development. ICT policies assist countries in achieving their ICT vision in relation to setting out the goals, objectives, and strategies. Policies for the digital economy should also outline the activities, responsibilities, and measurements for evaluation. Moreover, countries also need ICT policies to enable them to address technological convergence and the ever-changing roles of ICT in the economy and society because ICT plays a critical role in the social-economic development of a country.

Policies and legislation should be dynamic and flexible (Roux, 2002) and should consistently relate to current and future issues and challenges in society and should continuously be modified to adapt to the impact of environmental variables and influencing factors. This also requires an inclusive approach whereby industry players and other relevant stakeholders are involved and consulted in the formulation of ICT policy, laws, and regulations. This approach to policy and legislative formulation will encourage sector development as an enabler for a digital economy.

Phamodi et al (n.d.) advises that ICT policy and legislation should be relevant and should cater for the needs and demands of a country considering user demands, availability of infrastructure and regulatory imperatives. Moreover, ICT legislation should not be customised to specific technologies that may eventually become outdated as technology evolves and therefore such legislation should be developed in a way that will ensure it remains relevant and “fit-for-purpose” for a long period of time.

Nicol (2003) argues that digital policy needs to address the expansion of communications infrastructure through telecommunications reform to stimulate growth in the private sector and create employment opportunities. Social goals must also be incorporated by building human capabilities and creating conditions for the development of important applications and content.

ICT sector legislation should provide a brief and well-articulated statement of rights and obligations pertaining to the various market players in the ICT sector including the consumers and the small-medium enterprises (SMEs). It should also fully enable the implementation of ICT sector policy and objectives and should reflect the essential widely accepted sector standards such as the competitive provision of digital and communications services, transparent licensing procedures, and non-discriminatory network access (European Bank for Reconstruction and Development, 2022). ICT legislation should also

set out the mandate and functions of the regulator of the ICT sector and prescribe the regulations that may and or should be promulgated by the regulator.

As mentioned before, it is imperative that policies and legislation should be coherent and aligned *inter se* and should allow for the changing realities of the sector. Regulatory entities must develop regulations that lead to the implementation of policy and legislative objectives in the interest of the development of the ICT sector and the country as a whole.

Reflections

Policy and legislation play an integral role in the effective regulation of any sector. Digital regulation requires policy, legislation and regulations that are flexible, forward looking and cater for the needs and demands of a country considering user demands, availability of infrastructure and regulatory imperatives. It is therefore important to assess how effective the Namibian ICT policy and legislation is for the telecommunications sector and its development for purposes of this research. Policy and legislation pave the way for the development of a sector thus, the research will also consider how beneficial the telecommunication policy and legislative framework is in its current form and whether there are any shortcomings in the framework that holds back the development of the sector.

Rigid and inflexible policies, legislation and regulations would not yield any success for the development of the telecommunications sector. Such laws and regulations refer to stringent rules that govern a particular sector and leave limited room for interpretation and discretion. Such laws often require regular audits and reporting to demonstrate how sector players comply and adhere to the legal and regulatory framework. A rigid and inflexible framework results in a sector that is “command and control” driven and regulated. “Command” relates to the imposition of strict legal standards and requirements that must be adhered to by regulated entities whilst “control” refers to the enforcement of these standards through inspections, monitoring and penalties imposed by the regulator for non-compliance.

2.3 Command-and-control regulation versus other more effective forms of regulation

The Command-and-control approach to regulation refers to the direct regulation of a particular industry or sector by legislation that authoritatively prescribes what is permitted and what is unlawful and prohibited (McManus, 2009). "Command" is the dictation of rules and standards by the government that must be complied with by the particular sector it relates to, and the “control” refers to the sanctions and or penalties that may be imposed by either the government or regulatory body in the event of non-compliance.

Command-and-control style regulation has been subject to extensive criticism and scrutiny. In relation to ICT sector regulation, this approach may stifle innovation and competition within the ICT market because of the inflexible and immutable rules and laws

enforced by this regulatory approach (Baldwin, Cave, & Lodge, 2011). This style of regulation may also result in disengagement between the regulator and the regulated entities within the sector which may lead to the interests of the public and users of ICTs being either neglected or ignored (Baldwin, Cave, & Lodge, 2011). According to Gunningham & Sinclair (2002), this approach to regulation devotes resources but generates little revenue, and therefore it is an inefficient system.

Command-and-control regulation can result in overregulation by the regulator and restricts ICT markets and industry players from growing and developing with the opportunities of digital innovation. This may hinder competition in the market. This style of regulation portrays the regulator as an enforcement agency policing the activities of the regulated entities to ensure compliance with rigid laws and regulations. It can also become bureaucratic. Regulators should be seen as bodies that oversee the function of a particular industry and implement regulations that are effective and relevant to situations within which the regulatory framework applies (Maddocks, 2018). Furthermore, regulators' main function is to regulate the industry in a manner that will achieve the national goals and objectives for that particular industry or country. Regulating to ensure compliance with laws and regulation is necessary, however, it should be to achieve the vision and goals and in the interest of socio-economic development.

O'Sullivan & Flannery (2012) contend that command-and-control regulation also has its strengths such as decreased costs in information and collection, increased accountability, and legitimacy, improved access to decisions for public enquiry, reduced opportunities for regulatory capture in response to political action, and the increased likelihood that regulations will survive judicial scrutiny.

Pritchett (2016) refers to two effective alternative approaches to regulation. These alternatives include performance-based regulation and management-based regulation. Performance-based regulation entails the setting of ultimate production standards that a sector should meet as opposed to rigid legislation and rules that must be complied with. This approach also allows regulated entities more flexibility to determine the most efficient way to meet the standards. Moreover, it promotes innovation and decrease costs by supporting the regulated entity to determine the best way to achieve societal and national policy goals (Pritchett, 2016). Pritchett also refers to self-regulation – an approach that promotes innovation by enabling regulated entities to develop and adopt their own standards and practices. However, self-regulation, is not very effective when it is applied as the only method of regulation to a particular sector because it can lead to abuse of market power. Self-regulation may be applied in conjunction with another form of regulation depending on the needs, demands, and environment of the particular sector and how beneficial it would be for the consumers.

The International Telecommunications Union (ITU), on best practices in policy and regulatory frameworks, advises that an inclusive, collaborative, and harmonized regulatory approach across all sectors is the desired destination for digital regulation. Collaborative sector regulation asserts new emphasis on consumer protection and benefits, and it

ensures the beneficial use of government, regulators, and industry players' resources to ensure consumer protection and benefits through flexible consultation, collaboration, and conciliation (ITU 2022).

Digital regulation should be more flexible as opposed to stringent and rigid. The mandate and role of digital regulators would have to be changed and enhanced to fully accommodate the new digital realities and emerging technologies in the ICT environment (ITU & World Bank, 2020). Regulators should determine the most suitable regulatory approaches, in collaboration with the government, based on the attributes and critical factors relating to digital ecosystems and should regard regulation as a component for moulding the future of digital systems as an adaptive, interpretative activity as opposed to a rule-driven activity based on past experience and historical tendencies (Abrahams, 2017). Abrahams also advises that SADC regulators will have to adopt greater research capacity than is available at the moment, as well as forward-looking initiatives, to adapt to the complex digital ecosystem.

Therefore, the world is inevitably moving away from the traditional command-and-control regulatory frameworks and style of regulation towards a more future-oriented approach to regulation that enables technological and digital innovation, emerging technologies, and digital evolution.

2.4 Telecommunications sector: market development and competition, universal access and services and spectrum management

As mentioned before, this research has three research focus areas namely market development and competition, universal access and services and spectrum management. The literature review of this section will therefore focus on telecommunications sector development in relation to market development and competition, universal access and service and spectrum management.

2.4.1 Market expansion and competition

There are many aspects that play a role in the development of telecommunications markets and competition. These aspects include, but not limited to, effective licensing frameworks, internet connectivity, technological innovation and deployment, infrastructure development and sharing and investment.

Licensing plays an important role in telecommunications market development in forming the competitive landscape in the sector, influencing market dynamics, creating investment opportunities, ensuring technological advancements, and consumer outcomes in the telecommunications sector. Having an effective licensing framework ensures the promotion of competition in the telecommunications market while safeguarding the interest of the public. Licensing directly impacts market entry of new operators by determining the conditions under which new operators can participate and operate in telecommunications

markets. According to Buehler et al. (2022), transparent and predictable licensing processes encourage investment and promote market entry by new entrants, motivating competition among operators in the sector. On the contrary, rigid or complex licensing requirements and processes may result in barriers to market entry, limiting competition and innovation. Picot et al. (2010) argues that competition in the market depends on whether licensing promotes fair market access, prevents monopolistic practices, and encourages efficient use of resources such as spectrum.

Licensing also plays a role in the promotion of innovation and improving consumer protection and wellbeing in telecommunications markets. According to ITU (2022), licensing policies, laws and regulations that encourage spectrum sharing, promote infrastructure investment, and facilitate technological neutrality enable operators to deliver new services and improve service quality. To this end, consumer benefits include expanded coverage of services, enhanced broadband connectivity options, and competitive pricing resulting from market-driven innovation. Ofcom (2021) alludes that one of the main challenges for regulators in the award of appropriate licenses are spectrum scarcity, regulatory complexity, and the pace of technological changes and evolution. The harmonisation of spectrum management objectives with industry and consumer demands for flexibility and investment certainty also remains a challenge for regulators (Ofcom, 2021).

Other aspects that play a role in market development and competition are innovation, technological advancement and deployment and infrastructure development and sharing and investment opportunities which are all interrelated and dependent factors for sector development.

In evolving markets, telecommunications growth has been driven by expanding mobile penetration and internet connectivity, supported by regulatory reforms aimed at attracting investment and promoting market entry (Sridhar & Sridhar, 2021). Although there are still challenges related to infrastructure development, deployment, and infrastructure sharing, these developments have contributed to socio-economic development and enhanced digital inclusion. According to Whitacre et al (2015), infrastructure development is important for telecommunications market expansion and competition. The expansion of broadband infrastructure, specifically in rural and remote areas is critical and policy makers and industry stakeholders empathizes the need for investments in high-speed internet infrastructure (Whitacre, et al. 2015). Moreover, 5G technology is accelerating and the deployment of 5G networks and infrastructure represents a significant advancement in telecommunications technology. This improves connectivity and supports emerging technologies such as the Internet of Things (IoT), artificial intelligence and smart cities (Matinmikko-Blue, 2020). These technological advancements are transforming the telecommunications environment. The deployment of 5G networks ensures enhanced data speeds, lower latency, and support for Internet of Things, which are expected to drive new revenue streams and service innovations especially for the operators (ITU, 2021). Furthermore, developments in artificial intelligence (AI) and machine learning are transforming network management, customer service operations, and cybersecurity within

the telecommunications sector. AI-driven analytics enable operators to optimize network performance, predict customer behavior, and personalize service offerings, thereby improving operational efficiency and enhancing customer satisfaction (Ghazanfar & Hafeez, 2023). The rise of Over-the-Top (OTT) services has further intensified competition by offering alternative communication and entertainment options directly to consumers, challenging traditional revenue models of telecommunications companies (Rosston et al., 2020). This has prompted operators to explore partnerships with OTT providers or develop their own content offerings to remain competitive in the evolving digital ecosystem.

2.4.2 Universal access and service

Universal access and service in telecommunications sector refer to policies, regulation and initiatives aimed at ensuring that ICT services are made available and affordable to all segments of society, regardless of geographical location or economic status. Governments and regulators across the world implement policies and regulations that impose universal service obligations on telecommunications operators. Such services usually include provisions for basic telephony services and broadband internet access in undeserved or underserved areas (ITU, 2023). Technological advancements and innovation have contributed to the expansion of access to telecommunication services. The deployment of wireless networks, including 4G and upcoming 5G technologies, has allowed cost-effective solutions for rolling out connectivity to rural and remote areas (Qiang et al., 2021). Additionally, satellite technologies and innovative approaches such as TV white spaces (unused television frequencies) are being explored to bridge digital gaps in underserved regions (Gurstein, 2019).

Several initiatives, best practices and trends have emerged globally to encourage universal access and service as well as digital inclusion. Some legal frameworks make provision for the establishment of a universal service fund. The purpose of the fund is to collect contributions from telecommunications operators to finance universal service projects aimed at rolling out network coverage and infrastructure in underserved areas (Cecchini & Scott, 2022). These universal service funds support infrastructure deployment, subsidize service costs for low-income households, and promote digital literacy initiatives to empower communities.

There are also a number of challenges and impediments that hinder the achievement of universal access and service in the telecommunications sector. These include geographic barriers, particularly in remote and sparsely populated areas, which poses challenges for the deployment of infrastructure and increase operational costs for service providers (UNESCO, 2021). Economic constraints and affordability issues also limit access to telecommunication services among poor communities, worsening the digital gap based on income and socio-economic status. Moreover, spectrum allocation, licensing requirements, and bureaucratic regulatory processes can also delay the rollout of network initiatives and restrict investment in underserved regions (ITU, 2022). Addressing these challenges requires collaboration from governments, regulators, and industry players to

streamline and improve regulatory processes, incentivize private sector investment, and prioritize universal access and service goals in national policies and laws.

2.4.3 Spectrum management

Spectrum management refers to the efficient and effective allocation and use of radio frequencies, which is a scarce finite resource, for the purpose of telecommunications service provision. Spectrum and the management thereof play a crucial role in telecommunications sector development. It also serves as an enabler for the provision of telecommunications services. Technological advancements have increased the demand for spectrum especially the deployment of 5G networks. 5G's promise of higher data speeds, lower latency, and support for massive IoT applications requires a mix of low, mid, and high-frequency bands to meet diverse use cases (ITU, 2021). As a result, regulators face challenges in reassigning spectrum while ensuring continuity for existing services and accommodating new entrants. To address spectrum scarcity and promote efficient use, regulators are exploring innovative ways such as spectrum sharing and dynamic spectrum access. Spectrum sharing allows multiple users to access the same frequency bands under defined conditions, maximizing spectrum utilization without geographical or temporal constraints (FCC, 2022). Dynamic spectrum access technologies enable real-time allocation and reassignment of frequencies based on demand, optimizing spectrum efficiency and supporting emerging applications like IoT and smart cities (Ofcom, 2020). As mentioned before, spectrum management plays a crucial role in enabling telecommunications services, supporting socio-economic development, and enhancing digital connectivity.

Reflections

The literature review presented above advises that market development, effective competition, universal access and services and effective spectrum management are all essential for the telecommunications sector and its development. For purposes of this research, it is therefore important to assess and determine the role that these components play in the Namibian telecommunications sector, at the moment, - in order to evaluate the extent to which the Namibian telecommunications sector has evolved as a whole, in light of policy aspirations and compared to global trends and best practices.

2.5 Future-oriented ICT sector regulation for development toward a digital economy

One of the main objectives of the Namibian Vision 2030 Policy is to transform Namibia into a knowledge-based economy by 2030. The mission is to ensure that every Namibian citizen and resident shall have affordable access to high-quality information and communication services.

A knowledge-based economy is an economic system whereby the manufacturing of goods and production of services are primarily based on knowledge-intensive initiatives that add

to the development of technical and scientific innovation (Powell & Snellman, 2004). Knowledge-intensive initiatives are driven by extensive industry research, industry expertise, knowledge, and skills in as far as the manufacturing of goods and production of services are concerned. It is an economy where members acquire, develop, apply, and share knowledge to enable economic and social development (Kefela & Ghirmai, 2020). The fast-paced globalization of economic activities is one of the main features of the emerging knowledge economy (Unger, 2019).

The United Nations Commission on Science & Technology for Development (UNCSTD) (1997) held that developing countries must intervene collectively and strategically to effectively incorporate ICTs and sustainable development to take part in the knowledge economy. Such intercession would be in the development of effective digital policies, to encourage the new regulatory framework, encourage the selected knowledge creation and use of digital services and ensure environmental sustainability and develop a universal partnership for development.

The ICT sector must be efficiently and effectively regulated in such a manner that regulation enables technological and digital innovation, emerging technologies, and ICT evolution to develop the sector and achieve a knowledge-based economy. Bauer (2012) states that formulating conditions that foster innovation has become a central matter for policymakers and regulators because digital innovation and development affect a country's economic growth directly and indirectly. Furthermore, sector regulation affects the pace with which digital innovation potential is brought to the market and the direction of innovative efforts. Regulation affects innovation in several ways including the risk of innovation projects in the ICT sector, the profitability of innovation and the scope of available innovation activities (Bauer, 2012). Hence, the effective regulation of a future-oriented ICT sector is imperative. According to Chen (2019), governments should put in place clear, coherent rules to facilitate digital economic activities to respond to the new market players and business models.

ITU and The World Bank (2020a) find that policymakers and governments should develop policy and legislation which may include deregulation, self-regulation, or co-regulatory approaches and methods. Such regulatory approaches would result in better innovation, easier deployment of new and emerging technologies, incentivize investment, and it will result in a more focused and collaborative approach to regulation. Therefore, policymakers and regulators should follow a more principles-based approach to regulation as opposed to a rules-based approach. Moreover, digital policies and regulations for the ICT sector should be developed optimally to fast-track digital transformation. ICT laws and regulations should achieve its goals and objectives in the most effective and efficient way, more specifically, ensure network elasticity and improving both the capacity and coverage of networks without imposing inconsistent, redundant, or overlapping challenges on the market and the sector (ITU, 2021).

Abrahams (2017), postulates that in the next decade, as the SADC region moves to an internet-based regime, it will experience more complex economic, social, and institutional

arrangements that would expect regulators to get ahead with disruptive change and to develop regulations for a "digital complexity ecosystem". The digital economy is a complex adaptive ecosystem and would oblige SADC regulators to respond thereto in a correspondingly complex, adaptive manner. Abrahams (2017) also argues that in order to ensure effective regulation - regulators should improve the institutional environment towards intensive knowledge formation given the adaptive complexity in digital ecosystems such as digital markets, internet-based services markets, and digital platforms emerging from the convergence of digital and internet-based services.

ITU (2020) calls for collaborative regulation, among all sectors, to achieve sustainable development goals. It's a regulatory approach that facilitates digital markets universally on the way to digital transformation and a knowledge-based economy. Collaborative regulation will promote wider socio-economic development for most people around the world. It is also driven by leadership, evidence, and incentive rather than by command-and-control systems. Collaborative regulation will also align rules and ensure the consistent execution of policy and regulatory systems that have evolved independently in many sectors over the years (ITU, 2020).

According to the ITU and The World Bank (2020b), collaborative regulation supplements formal processes to place more emphasis on sector and multisector government agencies for competition, consumer protection, and data protection among other sectors. Such an approach would effectively promote the development of digitalisation. Collaborative regulation will provide for more flexible regulatory governance frameworks that will eliminate and avoid burdensome regulation that could hold back innovation.

Collaborative regulation reflects the interaction of digital infrastructure, services and content across different industries and national borders. It also enables coordination of regulatory rules and processes and ensures consistent execution of policy and regulatory frameworks that have developed independently in many sectors over the years. Collaborative regulation is people-centred regulation and should focus on sustainability and long-term benefits. The ITU emphasises that a silo approach to the regulation of the ICT sector is not viable in the digital world (ITU, 2021).

To regulate the telecommunications markets effectively, the following best-practice components should be incorporated into the ICT national legislation: a clear licensing framework that is predictable and consistently applied; the right of new entrants to rollout their infrastructure and the right to establish international gateways; the right to interconnect with and obtain access to networks; wholesale services pricing regulation based on up to date costs models; retail price regulation framework that leaves room for competition; excellent regulatory toolbox to fight anticompetitive behaviour; fair and transparent universal service funding system; updated spectrum allocation plan that is implemented in consultation with telecommunications market players; provision for an independent, non-political and professional regulator and accessible and speedy appeal processes (ITU, 2016).

For ICTs to deliver on its promise of economic and social development, countries must adopt enabling regulatory environments that support e-development i.e., the use of ICTs to bring about social and economic development in the country. Enabling environment refers to policy, law, regulations, markets, and social considerations that interrelate both at domestic and international levels to produce fertile conditions for digital development (Guermazi & Satola, 2005). Strand (2016) points out that some of the regulatory challenges that impact telecom operators and regulators are the following: ICT technology and service convergence; spectrum policies that are outdated and not harmonized with other neighbouring countries and best practice; lack of skills and tools to access and interpret industry data; and politicians that do not have an understanding of the industry and that undermine the regulators' independence.

Benjamin and Speta (2015) agree that the fundamental problem of contemporary ICT law and regulation is the actual convergence of technology whereby different digital services, whether by voice, video, or data, can be delivered over multiple platforms using different technologies. Furthermore, digital regulation must consider significant changes and reforms across the different technological and commercial platforms given the context of digital convergence and information technologies. Another concern is market competition in the ICT sector. Anti-competitive behaviour and abuse of dominance in the market can adversely affect the development of the ICT market and sector. Therefore, emerging monopolistic behaviours require government and regulatory intervention. The rapid development of digital platform businesses also calls for an intervention of adaptive policies, laws, and regulations, especially competition laws and regulations that will address the notion of digital businesses to establish monopolies. Such laws and regulations will eliminate entry barriers to emerging digital businesses and ensure a level playing field between digital and traditional businesses in the market (Chen, 2019). According to Chen (2019), a competitive market that nurtures innovation and ensures an enabling environment to reap digital dividends should be one of the national goals for digital regulation. Governments and regulators should also conduct research and studies to determine and understand why new telecommunications business entrants fail in the market and develop strategies and regulations to address the challenges for new entrants.

According to Eggers et al. (2018), digital developments are currently causing a substantial shift in the regulatory environment resulting in a number of challenges for regulators who aims to uphold a balance between promoting innovation, protecting consumers, and dealing with the unintended consequences and impact of disruptions. Moreover, today's digital environment does not allow for regulations to be developed at a slow pace and purposely, and then remain unchanged for long periods. As new technologies and innovation evolve, governments and regulators are challenged with creating and reforming regulations, enforcing, and communicating them to the public and industry whilst working within the legislative framework and attempting to foster innovation. Eggers et al (2018) discuss five principles to guide future regulation namely regulations that are adaptive to change; regulatory sandboxes; outcome-based regulation; risk-weighted regulation; and collaborative regulation.

Martin and Finucan (2016) propose that national policymakers should be well informed about the different types of digital technologies for providing broadband, its costs, benefits, and technical competencies to understand the services that it would enable for citizens and how regulatory frameworks will enable, hinder, or jeopardise current access to evolving digital technologies or continued innovation. They furthermore advise that national policies and plans should aim for technological neutrality, to allow for the rollout and future evolution of various services and the development of innovative business models. As far as the development of effective regulatory approaches is concerned, Martin and Finucan (2016) also contend that improved synchronization of regulation across various sectors and authorities may assist in the facilitation of innovation and investment in the sector. Therefore, they recommend that government departments, ministries, and regulatory authorities should determine suitable ways to collaborate and coordinate on common cross-sector matters in order to support and encourage more effective policy and regulatory frameworks whilst taking into account the various stakeholders in the rollout and use of ICTs.

It is also important to equip and capacitate regulators with the necessary skills and digital tools to deal with future regulatory challenges and to executive its mandate more effectively and efficiently. This is also because digital transformation and restructuring functions and expectations demand enhancement in capabilities and continuous investment in data and digital skills to keep up. Digital tools, better data and improved digital skills could also enable a shift to outcome-focused regulations (OECD, 2020, p.4).

Regulators should use regulatory impact assessments (RIA) as a tool to determine whether to adopt or change laws and regulations based on facts and industry evidence. RIA provides the necessary information on costs and benefits to different industry stakeholders and analyses economic, environmental, and social impacts of potential solutions. RIA will also allow for collaborative consultations and engagement with the relevant stakeholders and industry players which is an integral part of the legislation and regulatory development process (OECD, 2020, p.4).

Reflections

The above literature review gave an overview of best practices, regulatory approaches, and global trends relating to future-oriented ICT sector regulation for development in today's digitally complex ecosystem. Based on the literature, an assessment should be made on how responsive Namibia's current telecommunications policies, laws and regulations are to technological advancement and innovation and sector evolution that caters for future-oriented telecommunications regulation.

2.6 Characteristics of a developed telecommunications sector

Infrastructure development is one of the fundamental characteristics of a developed telecommunications sector. A developed sector typically features widespread and high-quality network infrastructure, including extensive fiber-optic cables, advanced cell towers, and robust data centers. According to the International Telecommunication Union (ITU), a developed sector shows high levels of network coverage, speed, and reliability, which are important for both urban and rural areas (ITU, 2021). Another characteristic of a developed telecommunications sector is technological innovation. This includes the adoption and deployment of cutting-edge technologies such as 5G, Internet of Things, and next-generation broadband services. The Global System for Mobile Communications (GSMA) emphasizes that a developed telecommunications sector integrates these technologies to enhance connectivity and enable new applications in the sector (GSMA, 2023).

A supportive regulatory environment is also crucial for a developed telecommunications sector. The Organisation for Economic Co-operation and Development (OECD) highlights that effective regulation ensures fair competition, protects consumer interests, and promotes investment. Fundamental regulatory aspects include spectrum management, data protection laws, and policies that facilitate market entry and innovation (OECD, 2022). Market penetration and adoption rates also plays an essential role for a well developed sector. A developed telecommunications sector shows high levels of mobile and internet penetration, with wide access to services across different demographics. According to the World Bank, developed sectors achieve high adoption rates for both fixed and mobile broadband, reflecting widespread consumer access and usage (World Bank, 2023).

According to INSEAD & World Intellectual Property Organisation (2023), innovation drives the growth and competitiveness of a developed telecommunications sector. The Global Innovation Index (GII) indicates that advanced sectors invest significantly in research and development (R&D), fostering a culture of continuous improvement and technological advancement. Countries with high GII rankings often exhibit robust innovation ecosystems in telecommunications (INSEAD & WIPO, 2023).

Finally, cybersecurity and resilience are critical for the stability and trustworthiness of a telecommunications sector. The European Union Agency for Cybersecurity (ENISA) emphasizes the importance of robust cybersecurity measures to protect networks from threats and security breaches and ensure service continuity. A developed sector prioritizes cybersecurity and implements comprehensive strategies to safeguard its infrastructure (ENISA, 2023).

Therefore, a developed telecommunications sector is characterized by advanced infrastructure, technological innovation, supportive regulation, high market penetration, substantial investment, and strong customer satisfaction. The integration of these aspects creates a robust and dynamic telecommunications ecosystem capable of supporting economic and social development. It is thus imperative that national goals, objectives and

targets are set for the achievement of these characteristics towards a developed and innovative telecommunications sector.

2.7 Reflection on the overall literature review presented

It is clear from the ICT experts and the digital regulation scholarly literature that ICT national policies and laws should be developed in such a way that it adapts to the emerging realities of the ICT sector. This means that policies, laws, and regulations should be flexible and dynamic, as opposed to enforcing a command-and-control style of regulation and allow industry players and operators to be innovative in achieving the ICT and sustainable development goals for the country.

This chapter highlights the following best practice policy, legislative and regulatory principles, and approaches for digital regulation, amongst others:

- ICT policy and legislation should address the key ICT development challenges of a country;
- ICT Policy should address technological convergence and the ever-changing roles of ICT in the economy and society;
- Digital regulation requires an inclusive, collaborative, and harmonized regulatory approach across all sectors;
- Effective digital regulation may include deregulation, self-regulation, or co-regulatory approaches and methods;
- Policies and regulations for the ICT sector should be developed optimally to fast-track digital transformation;
- Institutional environment should be enhanced towards intensive knowledge formation given the adaptive complexity in digital ecosystems such as digital markets, internet-based services markets, and digital platforms emerging from the convergence of digital and internet-based services;
- Digital regulators are required to conduct research and studies to determine and understand why new telecommunications business entrants fail in the market and develop strategies and regulations;
- Digital regulations should be adaptive to change; regulatory sandboxes; outcome-based regulation; risk-weighted regulation; and collaborative regulation; and
- ICT policies and regulations should aim for technological neutrality, to allow for the rollout and future evolution of various services and the development of innovative business mode.

It is important that regulators involve the ICT stakeholders, operators, consumers, end-users, the communities with no digital access and other sector players in the developing of digital regulation to ensure an inclusive approach. The government and regulators should also adopt a more frugal approach to digital regulation that addresses the current challenges in the digital sector such as market dominance, anti-competitive behaviour, and technological convergence. Digital regulation should be future-oriented and should

encourage a platform for new players to enter the market and ensure a level playing field and digital inclusion.

2.8 Conceptual / Theoretical framework

The literature review presented herein informed the researcher of the crucial role that polices, laws and regulation play in telecommunications sector development. It also showed the researcher that certain benefits in policy and legislative frameworks can boost telecommunications sector development whilst at the same time impediments can also hinder the development of a sector. The literature also reflected on the role that the three research areas, namely market development and competition, universal access and services and spectrum management play in telecommunications sector development and gave the researcher an overview of the best practices, trends and approaches to future-oriented ICT sector regulation for development toward a digital economy. Therefore, based on the literature review, the research problem of this study will be explored through the lenses of the following three dimensions in relation to the research focus areas:

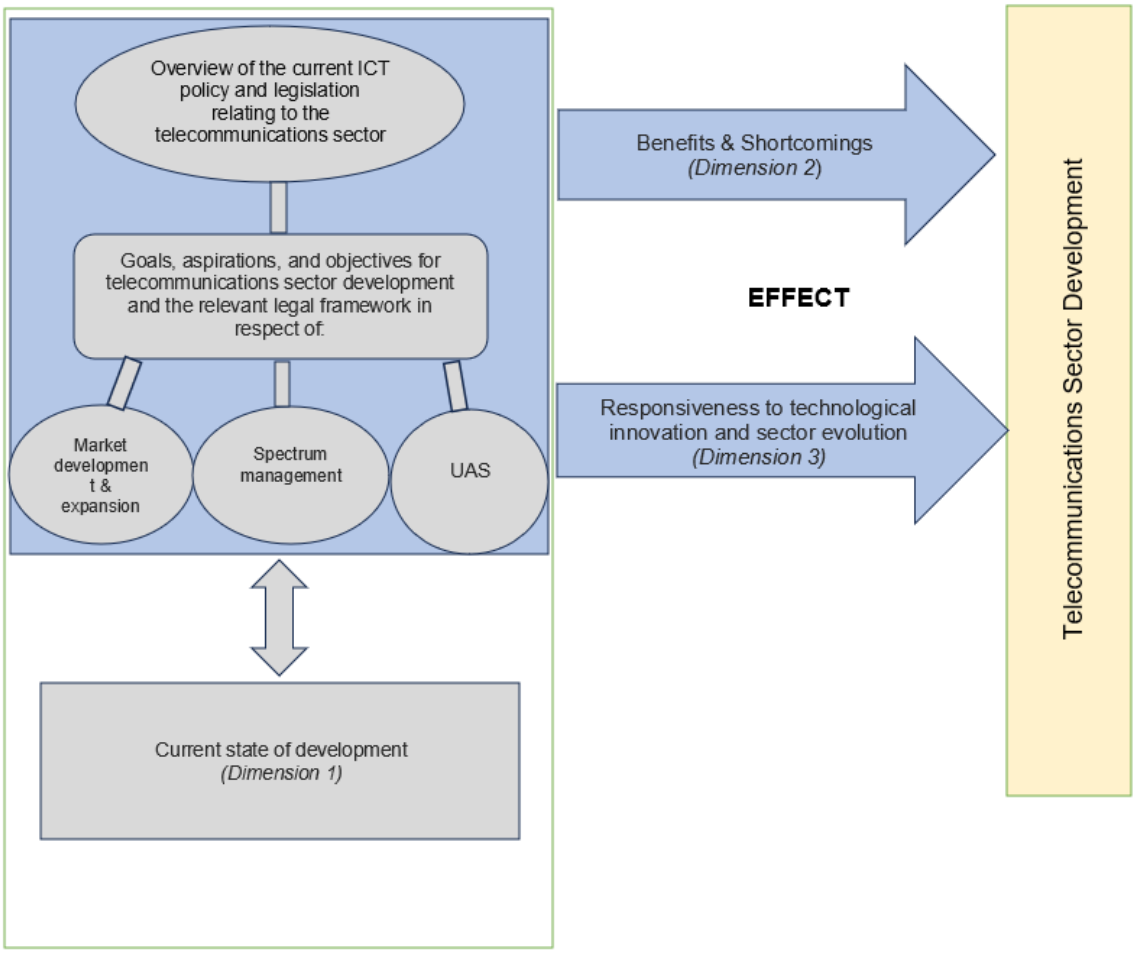
- The current state of development of the telecommunications sector;
- The benefits and shortcomings of the current Namibian ICT policy and legislative framework and regulatory approach; and
- The level of responsiveness of the telecommunications policy and legislation to technological innovation and sector evolution.

As such, the conceptual / theoretical framework demonstrated in figure 1 below, illustrates the relationship between the independent, dependent, and mediating variables in as far as the effect of the ICT policy and legislative regime on the Namibian telecommunications sector, is concerned, with specific focus on its development based on the identified research dimensions.

It also shows that the goals, aspirations, and objectives of the Namibian government affect the development of the telecommunications sector specifically in respect of market development and competition, spectrum regulation, and universal access and services. It further illustrates that the compatibility between ICT Policy and legislation or lack thereof, will influence how the telecommunications sector develops towards the goals and aspirations of the Vision 2030 policy, ICT policies, NDP5, and the Namibian Communications legislation.

The various intermediary factors and facets that influence the development of the ICT sector will therefore be explored through this research by means of an assessment based on the research dimensions.

Figure 1: Conceptual/Theoretical Framework based on the effect of the current ICT Policy and legislative regime on the development of the telecommunications sector in Namibia



Source: Davies, 2024

Chapter 3: A constructivism-based study to fill the knowledge gap for Namibia

3.1 Introduction

Chapter 1 crystalised the knowledge gap (upon which this research is based) on the effect that the ICT policy and the legislative regime has on the Namibian telecommunications sector. Chapter 2 outlined the conceptual/theoretical framework that illustrates the relationship between the independent, dependent, and mediating variables in as far as the effect of the ICT policy and legislative regime on the Namibian telecommunications sector is concerned with special emphasis on its development. It also highlighted the various intermediary factors and facets that influence the development of the sector.

The knowledge gap will therefore be explored through the research dimensions identified in the conceptual/theoretical framework – based on a constructivism research methodological approach.

3.2 Constructivist research methodology and research methods

3.2.1 Methodological approach

The researcher used the constructivist research methodology approach for the purposes of this research. Constructivism, as a research methodology, believes that knowledge is socially constructed and co-constructed based on multiple perspectives and multiple realities of society, individuals, and groups of people in respect of a particular subject matter (Kriukow, 2020). The purpose of constructivism is to understand people's experiences and it is informed by hermeneutics and phenomenology (Chilisa & Kawulich, 2012).

According to Honebein (1996), the philosophical paradigm of constructivism is an approach that claims that people experience things and build their own understanding and knowledge of the world by reflecting those experiences. Constructivism is associated with the qualitative research approach because the paradigm seeks to understand a phenomenon under research from the experiences or viewpoints of the different research participants using different data collection methods (Adom, Yeboah & Ankrah, 2016). Moreover, according to the constructivism paradigm, reality is subjective, as opposed to objective, because it is derived from the perspectives of the individual participants of the research and is thus diverse. This research approach is one of the best philosophical approaches that assist in the understanding of complexities and multiplicity of phenomena (Adom, Yeboah & Ankrah, 2016).

There are two major constructivist research methods namely one that focuses on the individual personal constructions and the other on meanings and opinions that are shared which reflects social constructions (Williamson, 2006). The constructivist research approach is based on observations by the research participants. Participant observation is

one of the most flexible methods for doing research. It combines interviews, questionnaires, observations, focus groups, and many other methods depending on the limitations and what is required of the research itself, such as time, finances, and available resources (Bow, 2002). Constructivism seeks to determine opinions, subjective meanings, views and perspectives within social contexts and is reliant on the beliefs and opinions of the participants being researched to guide the researcher to identify and determine patterns and themes in the "…complexity of views rather than narrow meanings in a few categories or ideas" (Creswell, 2014). The ontology of this research approach is that the situations researched or studied have multiple realities based on the school of thought that reality is socially constructed. The epistemology of the research is that the researcher interacts with the research participants and interprets and co-creates their own meaning of the data. i.e., the researcher and participants collaborate to create knowledge (Denzin & Lincoln, 2013).

3.2.2 Data collection and ethical clearance

3.2.2.1 Population and sampling

According to Patton (1990), the logic and power of purposeful sampling lie in selecting "information-rich" cases, for the research, from which one can substantially learn about issues that are critical to the purpose of the particular research. Therefore, the researcher administered purposeful sampling and selected participants who represent the critical characteristics that are of interest to the research.

The researcher interviewed nine telecommunications service licensees in the market consisting of the mobile and internet service providers; network facilities providers; and private network operators. The researcher also interviewed three experts employed at the Namibian ICT regulator and one employee from the Ministry of Information and Communication Technology for a policy perceptive to the research subject matter.

The above population and sampling were selected to ensure views and opinions from industry participants on the research subject matter and guarantee the perceptions of a wide variety of different types of licensees and players in the market. Carmichael & Cunningham (2017) advise that qualitative samples should be sizeable enough to discover data that are meaningful however, the samples should not be too large that much data becomes superfluous.

3.2.2.2 Interviews and ethical clearance

As mentioned, the researcher administered nine interviews based on the constructivism research paradigm. The interviewees were selected within the Namibian telecommunications sector based on their expertise and experience in Namibian ICT policy and regulatory environment.

Each interviewee was provided with a Research Participant Information Sheet setting out the subject matter and the purpose of the research. It also advised the interviewee that his/her participation is voluntary and when participating, his/her participation will remain

anonymous. The interviewees were also advised that they may terminate their participation at any time, and they also do not have to answer questions if they are not comfortable to do so. Furthermore, all the interviewees were informed that the researcher is employed by the sector regulator, and he is not conducting the research for the regulator but for academic purposes only. A sample Research Participant Information Sheet is attached as ***Appendix "A"*** to this report. All the interview participants were also required to complete and sign a research participation consent form prior to the interview. A sample Consent Form is attached as ***Appendix "B"*** to this report. Moreover, the researcher also obtained written permission from the regulator to interview employees of the regulator for purposes of the research. The written permission from the regulator is attached as ***Appendix "C"*** to this report.

The interviews were semi-structured, and the researcher asked the participants open-ended questions and encouraged the interviewees to explain their unique perspectives on the subject matter. The semi-structured interviews of the participants were directed and steered to ensure that the required data in terms of the research is collected (Williamson, 2006). This method also allowed the interviewer, in this instance the researcher, to clarify vague and unclear responses by participants by using probes or requesting further information on incomplete answers as opposed to structured interviews (Welman & Kruger, 1999).

The researcher explained the research intent and purpose to all the interview participants and obtained written permission and consent from the interviewees/participants to conduct and record the interviews. According to Manning (1997), the constructivism approach to research has legal and ethical implications, particularly when viewed in the context of a subjective researcher-respondent relationship. Therefore, consent from the interviewee or respondent, for that matter, is critical. The interviewees were also allowed to express their intention about the distribution restrictions of the information or views provided, the authorship, and the use of his or her words and experience. The interviewees were also advised that the researcher will not divulge or disclose any confidential information shared by the interviewee during the interview with any third party.

All the interviews were audio recorded, based on the consent given by the participants, and the duration of each interview was approximately between 45 to 60 minutes. The researcher opted for the audio recording method since taking notes during interviews is usually distracting. The interviews were conducted at private locations in Namibia's capital city, Windhoek, in order to ensure the interviewees anonymity.

The following interviewees were selected, and interviewed as follows:

1. Regulatory Body
   RB-1 – 24 July 2023
   RB-2 – 20 July 2023
   RB-3 – 25 July 2023

2. Regulated Entities
   RE-1 – 17 July 2023
   RE-2 – 17 July 2023
   RE-3 – 17 July 2023
   RE-4 – 25 July 2023
   RE-5 – 04 March 2024

3. Relevant Ministry
   RM-1 – 13 April 2024

The Human Research Ethics Committee (Non-Medical) issued the ethics clearance certificate on 22 November 2022 (***Appendix "F***").

3.2.2.3 Interview guide

The researcher made use of an interview guide which was distributed to the interviewees prior to the interviews. The guide contained a list of topics, aspects, and open-ended questions relevant to the research being conducted. This allowed the interviewer to adapt and formulate the interview questions to fit the background and expertise of the interviewee (Welman & Kruger,1999). Two different interview guides were used. One customised for the interviews with the regulator and ministry and one for the interviews with the industry operators. The interview questions were structured, as outlined below, based on the research dimensions derived from the conceptual framework in Chapter 2:

- Evolution of the telecommunications sector in light of ICT policy vision and goals and global trends.
- Benefits and shortcomings of the current ICT Policy and legislative framework and regulatory approach.
- Responsiveness of the current policy and legislative landscape to technological innovation and sector evolution.

The interview guides are attached as ***Appendix "D"*** and "***E***" to this report.

3.2.2.4 Documentary sources

Interpretative research requires that interviews are supplemented by other methods of data collection, such as documentary reviews (Walsham, 2006, p.323) therefore, document reviews, literature, and visual data analysis were also carefully assessed and analyzed by the researcher to substantiate the construction of the data and knowledge of the research. The researcher reviewed and assessed the following documents, information, and data in support of determining the effect of the digital regulatory regime on the telecommunications sector:

Relevant ICT policies, legislation and regulations

- The Communications Act, No. 8 of 2009. Government Gazette No. 4378, Government Notice No. 226.

- The Telecommunications policy for the Republic of Namibia 2009.
- The General policy guidelines on universal access and service in communications: Communications Act, 2009.
- The Overarching information communications technology policy for the Republic of Namibia 2009.
- The national Broadband policy.
- The Namibian Vision 2030 policy
- The 5th National Development Plan (NDP5).
- The Regulations setting out broadcasting and telecommunications service licence categories. Government Gazette No. 4714, Government Notice No. 124.
- The Regulations regarding licence conditions for telecommunications service licences. Government Gazette No. 5037, Government Notice No. 308.
- Regulations to ensure fair competition in the telecommunications sector: Communications Act, 2009. Government Gazette No.6593, Government Notice No. 179.
- The Regulations prescribing procedures regarding application for, amendment, renewal, transfer, and cancellation of spectrum licences: Communications Act, 2009. Government Gazette No. 6888, Government Notice No. 104.
- Notice in terms of the regulations prescribing procedures regarding application for, and amendment, renewal, transfer and cancellation of spectrum licences: Communications Act, 2009. Government Gazette No. 8235, Government Notice No. 656.

Relevant industry documents and reports

- Telecom Namibia (2020) Annual Report 2019/2020.
- Nampower (2021) Annual Report 2021.
- Paratus (2022) Annual Report 2022.
- MTC (2022) Annual Report 2022.
- CRAN (2023) Integrated Annual Report.
- CRAN (2023) ICT Sector – Regulatory Environmental Assessment ICT-REA
- CRAN (2021) Telecommunications sector market report of October 2021.
- CRAN (2022) Universal access and service report of 2022.

The above-mentioned documentary sources contain comprehensive, detailed and accurate information relevant to the research problem.

3.2.3 Data analysis

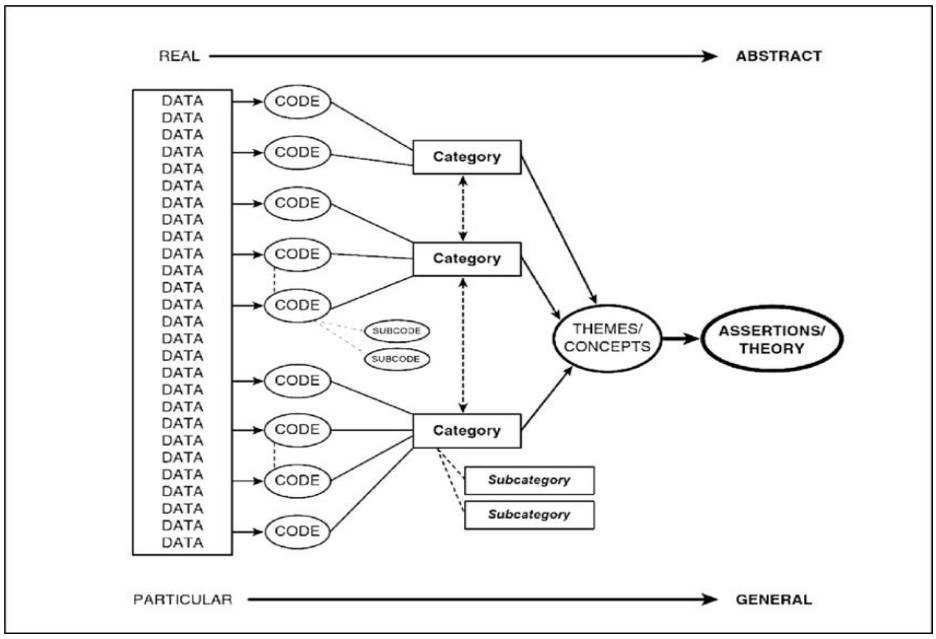
Carmichael and Cunningham (2017) suggest that the collection of data and the analysis thereof in constructivist research, should happen at the same time and iteratively, and that constant comparison of the previously collected data with the new data should take place throughout the research. This implies that the researcher collects data from a small,

selected sample. The data from these initial interviews are iteratively compared and coded before more data are collected or gathered from further interviews and or questionnaires. the emerging theoretical ideas from the previous analysis then guide the next interviews and the process of data collection and analysis is repeated.

Saldana (2009) suggests that qualitative data analysis process must adhere to a systematic flow of procedure where coded data must be grouped into different categories of similar characteristics. The categorised data must then be interpreted to discover its meaning which in principle is the development of different themes or concepts.

The streamlined code-to-theory model was therefore applied in analysing the data for this research – whereby related codes were organised into high level groups of categories. The code to theory model is illustrated Figure 2 below.

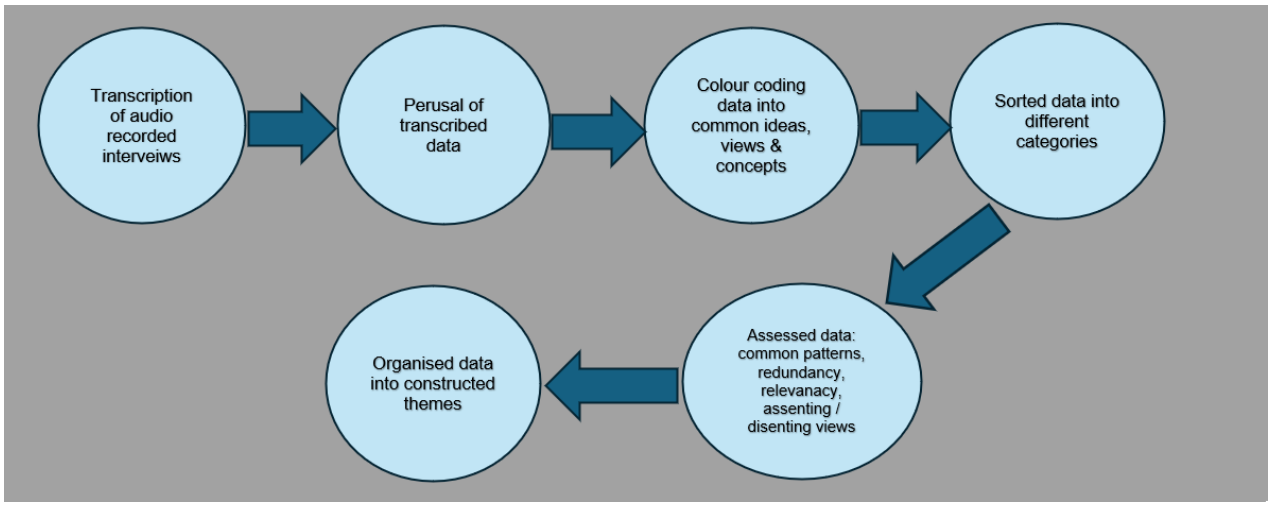
***Figure 2:** Streamlined codes-to-theory model for qualitative enquiry.*



Source: Saldana, 2016, p.14

The following process was followed to analyse and code the interview data aligned with conceptional/theoretical framework and research dimensions:

***Figure 3:** Data coding process*



Source: Davies, 2024

Step 1: All audio-recorded interviews were transcribed, verbatim, by the researcher and were reviewed and edited for accuracy. The interviews were transcribed in accordance with the outline of the respective interview guides and the dimensions of the research - to maintain consistency and structure. Transcripts assist researchers to systematically organise and manage data collected for purposes of research. Transcription makes it easier for the researcher to identify specific themes or concepts, patterns, concepts, and keywords in the data which will the speed up the analysis process (Atlas.ti, 2023).

Step 2: The researcher conducted an initial perusal of the transcribed interview data to obtain a general overview of the views, perceptions, and opinions of the interview participants. This provided the researcher with a full overview of the researched phenomenon (Eliot & Timulak, 2005, p.153).

Step 3: The researcher then perused the interview data in more detail, comparing the one with the other, to identify common concepts, ideas, constructs, perspectives, or opinions, that arise from the data collected.

Step 4: The researcher used a colour coding system to sort and categorise the data that have common ideas, interdependencies, concepts, views and opinions based on the conceptual/theoretical framework of this research and under the respective research dimensions namely: the current state of development of the telecommunications sector; the benefits and shortcomings of the current Namibian ICT policy and legislative framework and regulatory approach; the level of responsiveness of the telecommunications policy and legislation to technological innovation and sector evolution.

This provided the researcher with an overall organising structure for the data into categories that provide the conceptual framework for the data. This is referred to in the grounded theory as axial coding (Elliot & Timulak, 2005, p.154).

Step 5: The researcher then assessed the coded data under the different categories and identified patterns in terms of assenting and dissenting views from the interview participants. During this process, the researcher also disregarded redundant data and information and excluded irrelevant data that is not needed for purposes of the research (Eliot & Timulak, 2005, p.153).

The categorisation of the data, according to Elliot & Timulak (2005, p.154), develops from the meaning in the meanings unit, and the development of categories is an interpretive process, whereby the researcher is attempting to respect the data and use category labels close to the original language of the research participants. The creation of categories usually ends with a classification that describes and interprets the whole phenomenon as it was contained in the gathered data. These categories are important to communicate the essence of the phenomenon (Elliot & Timulak, 2005, p.155).

The results and findings of the research have been summarised and abstracted creating categories and from which themes or concepts were constructed. The coded data was organised and categorised into different analytical concepts aligned with the conceptual/theoretical framework. The following broader analytical concepts were constructed based on the future perspective of the research – future-oriented and collaborative regulation of the telecommunications sector:

- Policy, regulatory and technological advancement; and
- Regulatory processes.

The following more specific analytical concepts were constructed based on the research focus areas:

- Market development and competition;
- Universal access and service; and
- Spectrum management.

The coding process into analytical concepts also assisted the researcher in identifying and determining the different policy and legislative framework factors that influence the development of the telecommunications sector.

The researcher also reviewed documentary sources relevant to the research phenomenon such as national policies, industry regulations, market and sector reports, and annual reports considering the data collected from the interviews.

3.3 Limitations of the research

Most of the invited interview participants, especially from the industry operators/licensees were not forthcoming in participating in the interviews. The researcher believes that this might be because the researcher is employed with the regulator. Some of the interviewees were uncomfortable to elaborate on some of their views and opinions and some evaded interview questions altogether. This was a challenge for the researcher because the data

collected from these participants were incomplete and vague. Some of the interviewees expressed their personal views and options on some of the research questions which makes the data inaccurate and subjective.

3.4 Chapter summary

The researcher followed the constructivism research methodology to assess the effect of the ICT policy and legislative regime on the Namibian telecommunications sector through the views, opinions, realities, beliefs, and perspectives of the sector players and participants in the market.

As noted above, the researcher made use of a triangulation of data collection methods to encourage validation of the data collected from the interviews, questionnaires, literature, and document reviews (Williamson, 2006).

Chapter 4: Presentation of data on the effect of the ICT policy and legislative regime on the telecommunications sector 2009-2024

4.1 Introduction

Chapter 4 presents the data collected to assess the effect of the ICT policy and legislative regime on the telecommunications sector during 2009-2024. The researcher followed the conceptual/theoretical framework developed in Chapter 2 to present the qualitative data, on the subject matter. The data is presented based on the following analytical concepts aligned to the research dimensions as per the conceptual/ theoretical framework design:

- Policy, regulatory and technological advancement;
- Regulatory processes;
- Market development and competition;
- Universal service and access; and
- Spectrum management.

A brief summary of the recommendations made by interview participants for the development of the telecommunications sector is also presented to conclude the chapter.

4.2 An overview of the current state of development of the Namibian telecommunications sector

4.2.1 Telecommunications market

The current state of telecommunications sector development is based on the documentary data and evidence reviewed as part of this study – in relation to the three research focus areas.

The Namibian telecommunications industry has adopted a service- and technology-neutral unified licensing framework. Therefore, operators in the telecommunication market are free to offer telecommunications services based on digital innovation and cutting-edge technologies in accordance with the needs and demands of the industry and the consumers. A service-and technology neutral licensing regime encourages integrated network platforms, technological convergence, and promotes efficient competition and sector growth (MICT, 2009, p.13).

The telecommunications sector, as at March 2023, holds sixty-eight telecommunications service licensees inclusive of mobile operators, internet service providers, MVNO's and telecommunications infrastructure and network facilities licensees (CRAN, 2023a, p.13).

As per the definitions provided in the Regulations setting out broadcasting and telecommunications service licence categories (CRAN, 2011a, p.2), an electronic communications network service licence (ECNS) is issued to a person who makes available an electronic communications network for that person's own use or for a third

party through the provision of an electronic communications service or for resale – including internet service providers. 8% of the market is made up of this category of licensees. An electronic communications service (ECS) licence is issued for services provided to the public which consists wholly or mainly of the transmission of electronic communications across an electronic communications network with the exclusion of broadcasting services. Only one ECS licence has been awarded to date.

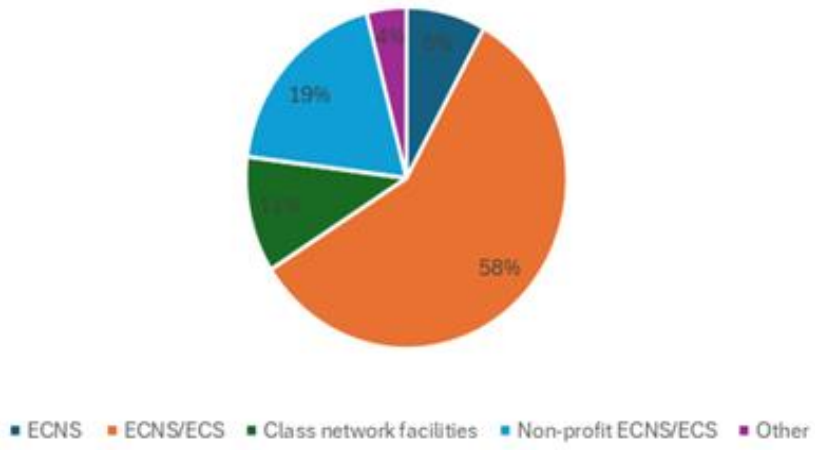
Much of the telecommunications market is made up of class comprehensive electronic communications network service (ECS & ECNS) licensees. This licence category is a combination of ECNS and ECS, and it allows operators to provide telecommunications services to their customers and to own and operate a network. 58 % of the market holds this category of licensees. Only one individual licence has been issued since 2011. This licence was awarded to the public telecommunications operators -Telecom Namibia Limited. A class network facilities license is issued to operators who intend to share its telecommunications and/or network infrastructure to other operators and licensees within Namibia. This licence also entitles the operator to construct, maintain and own one or more network elements, infrastructure and other facilities that facilitate telecommunications services. 11% of the telecommunications market is made up of this category of licensees.

19% of the market also consist of non-profit ECNS/ECS licenses. (The afore-mentioned statistics were obtained from the Namibian ICT Regulator's Integrated Annual Report as at 31 March 2023).

The telecommunications sector is made up of three major mobile telecoms operators. All three operators are holders of class comprehensive (ECS & ECNS) telecommunications service licence. These operators are Mobile Telecommunications Limited, Telecom Namibia Limited (TN Mobile) and Paratus Telecommunications Limited.

The figure below illustrates the telecommunications market structure per licence category:

Figure 4: Market structure per licence category



Source: Davies, 2024

The figure in essence illustrates that the majority of the Namibian telecommunications market, i.e. 58% is made up of class comprehensive (ECS & ECNS) telecommunications service licensees.

- ***Mobile Telecommunications (MTC)***

With roughly 2.52 million active customers, Mobile Telecommunications Limited (MTC) is Namibia's biggest mobile telecoms operator. MTC provides voice and data services to customer and businesses as well as secure cloud and private branch exchange (PBX) hosted solutions, roaming, and fiber to the home and office services and it has done so for 28 years (MTC, 2022). MTC is currently 60.1% owned by Namibia Post and Telecom Holdings (NPTH) who is owned by the Namibian government. This operator has been declared dominant in the market because of its mobile end-user access and it has extensive national network coverage in all the regions (CRAN, 2021). It has a national 3G population coverage of 88% and 85% 4G population coverage (CRAN, 2023b).

It has been found that MTC holds 90% mobile market share in Namibia's telecommunications market in respect of subscribers. MTC was the second operator in Africa to launch 4G in 2012 and followed up in 2013 with the launch of 4G LTE throughout Namibia. It has 337 agreements with roaming partner networks across 147 countries. MTC also provides 4G/LTE network coverage for schools (83%) and hospitals (87%) in Namibia. (MTC, 2022).

- ***Telecom Namibia Limited***

Telecom Namibia is the public telecommunications operator in Namibia and was established in 1992. This operator is also a subsidiary of Namibia Post and Telecom Holdings Limited (NPTH), together with MTC, who is 100% owned by the Namibian government. Since Telecom Namibia's commercialization in 1992, the company has grown into a multifaceted telecommunications service provider and invested billions of Namibian dollars in the construction of infrastructure throughout Namibia. The operator offers broadband, data and voice communications services and solutions to its customers across mobile, fixed wireless and mobile platforms. It has also invested in submarine cable systems such as SAT-3, Seacom and WACS, enhancing Namibia's connection reliability to the global submarine cable network and accessibility to destinations international voice, data, and Internet (Telecom Namibia, 2019-2020).

Telecom Namibia has a network rollout of 296 mobile base stations in Namibia, with numerous sites equipped with 3G and 4G technology for mobile broadband (Telecom Namibia, 2019-2020).

It owns 65% of the fiber routes in Namibia is all regions and has more than 50% share of the revenues and 65% of the national fiber network. Telecom also has extensive network coverage in all regions of Namibia with a 2G population coverage of 90% (CRAN, 2021). Telecom also achieved 70% population coverage for 3G and 54% population coverage for 4G (CRAN, 2023b).

The operator is also a declared dominant operator based on its national data transmission and wired and wireless end-user access. Telecom is the only dominant operator in the wired End-user access market (CRAN, 2021).

- ***Paratus Namibia Holdings Limited***

Paratus is a privately owned telecommunications operator that provides Voice, internet, satellite (VSAT), fiber, and cloud solutions services to its customers and businesses (Paratus, 2022). Paratus is not declared as a dominant operator despite its newly built fiber routes. It only operates 5.5% of Namibia's fiber routes in only four regions namely Erongo, Khomas, Otjozondjupa and Omaheka compared to Telecom Namibia with 65% and Nampower with 29.3%. Paratus currently has 88% coverage in respect of 3G, 85.3% in respect of 4G and 90.1% in respect of broadband (Paratus, 2022).

- ***Nampower***

Nampower is the national power utility operator providing the bulk electricity supply to Namibia. Nampower's key focus is availability, reliability, accessibility, and affordability of electricity. Nampower's core business is generation, transmission, and energy trading, however, Nampower has been issued with a network facilities licence and therefore offers fibre-optic broadband service under the name "The Grid Online" since 2019. The Grid Online is focused on telecommunications service providers and wholesale clients, providing Namibia with additional national telecommunications bandwidth.

The GridOnline provides controlled capacity services using its internal OPGW network, providing a national backbone to telecommunications operators. The services provided by the GridOnline are available in capacities of 1 Gbps, 10 Gbps and 100 Gbps or multiples thereof (Nampower, 2021).

4.2.2 The universal access and service and broadband situation in the telecommunications sector

Universal Access and Services (UAS) in the ICT space aims to increase access to digital and ICT technologies and services - for a specific community (in this context is Namibia) considering affordability, accessibility, and availability.

The Namibian Communications Act, 2009, requires the ICT regulator in Namibia to establish a universal service fund for the purposes of defraying the costs for the rollout of ICT and digital services to the unserved and underserved communities in Namibia (Republic of Namibia, 2009, p.41). This forms part of the country's socio-economic development goals and will enable all Namibians to reap the benefits of digital and ICT services. To date, the regulator was unable to establish the fund due to the relevant provisions of the law which was caught up in litigation (CRAN, 2022a).

The table below provides an overview of the population coverage in respect of 3G, 4G and broadband in Namibia as of 2023:

Table 1: Population coverage in respect of 3G, 4G and broadband

Coverage | Map | Demographics | Institutions | Grid Analysis | Spectrum Impact

Coverage | Infrastructure

		Population 3G Coverage			Population 4G Coverage			Broadband Population Coverage	People not covered			
		All	MTC	TN	All	MTC	TN	3G+4G	3G	4G	Broadband	
	Namibia	**88%**	**88%**	**70%**	**85%**	**85%**	**54%**	**90%**	**294,733**	**373,524**	**251,383**	
1	Kunene	51%	51%	34%	41%	41%	20%	52%	53,461	64,320	51,929	Go
2	Omusati	95%	95%	63%	95%	95%	24%	97%	12,414	12,964	7,269	Go
3	Oshana	99%	99%	89%	98%	98%	83%	99%	2,494	3,468	1,402	Go
4	Ohangwena	91%	91%	60%	93%	92%	41%	95%	25,015	20,378	14,358	Go
5	Oshikoto	80%	79%	55%	80%	80%	24%	86%	43,599	42,687	29,945	Go
6	Kavango East	94%	94%	63%	83%	82%	52%	95%	9,841	28,330	7,780	Go
7	Zambezi	92%	92%	52%	78%	78%	40%	93%	8,240	23,508	7,606	Go
8	Erongo	95%	95%	93%	94%	94%	89%	96%	9,924	12,630	9,581	Go
9	Otjozondjupa	82%	82%	63%	75%	75%	44%	83%	28,914	41,515	27,795	Go
10	Omaheke	62%	62%	41%	57%	57%	0%	66%	29,811	34,020	27,286	Go
11	Khomas	98%	98%	97%	97%	97%	95%	98%	9,924	12,346	9,547	Go
12	Hardap	82%	81%	66%	77%	76%	59%	82%	17,628	22,157	17,371	Go
13	!Karas	84%	83%	70%	81%	80%	52%	84%	14,476	17,194	14,230	Go
14	Kavango West	68%	68%	27%	59%	57%	14%	72%	28,992	38,005	25,282	Go

Source: CRAN, 2023b

The information in the table above will be examined in Chapter 5 of the research report in relation to the achievement and rollout of universal access and service national goals for Namibia and whether Namibia is lagging behind in terms of population broadband coverage.

4.2.3 The radio frequency spectrum situation in the telecommunications sector

Radio spectrum is the range of frequencies that forms part of the electromagnetic spectrum with frequencies from 1 Hz to 3 000 GHz. Radio spectrum or for that matter, radio waves, are used in technology more specifically in telecommunications and broadcasting and it serves as an enable for telecommunications services and sector development. The Namibian ICT regulator is responsible for the management and assignment of radio frequency spectrum in Namibia. Spectrum management is a process, consisting of technical and administrative procedures, to ensure the efficient use of radio frequency spectrum by all radiocommunication services without causing harmful interference (World Bank, 2020).

The International Telecommunications Union is a union established to promote international cooperation in the use and improvement of telecommunications of all kinds and is responsible for the coordination and allocation of radio spectrum international. The role of the ITU is to allocate radio spectrum for different radio transmission technologies and to ensure the rational, equitable, efficient, and economical use of the radio frequency spectrum (World Bank, 2020).

The Namibian regulator manages and regulates the spectrum resource in accordance with the ITU Radio Frequency Band Plans and Channeling Plans.

The table below shows the IMT spectrum licences issued by the regulator to date.

Table 2: IMT spectrum licences issued by the regulator

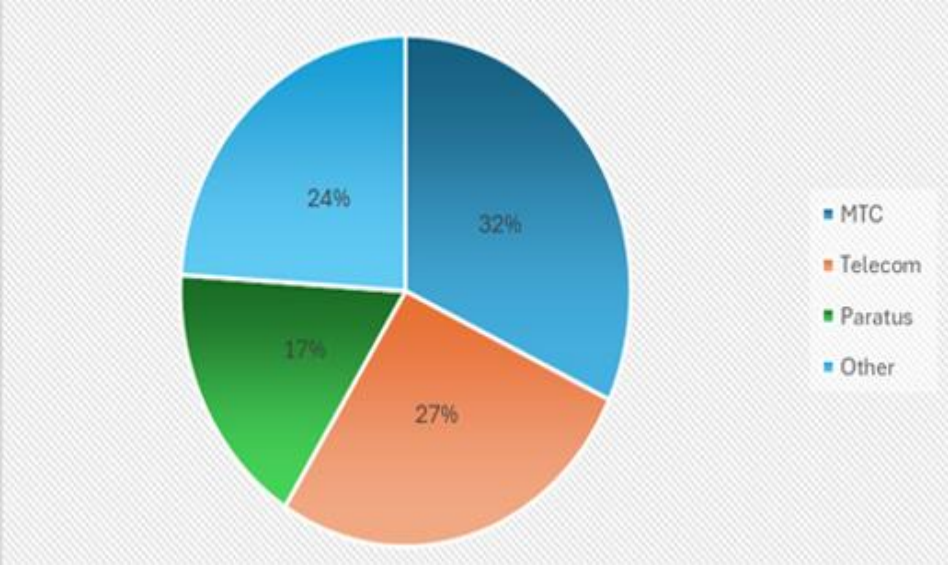
Licensee	Bandwidth (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Comment
MTC	18	885	903	FDD pair
MTC	18	930	948	
MTC	35	1,710	1,745	FDD pair
MTC	35	1,805	1,840	
MTC	20	1,920	1,940	FDD pair
MTC	20	2,110	2,130	
Telecom Namibia	12	903	915	FDD pair
Telecom Namibia	12	948	960	
Telecom Namibia	20	1,765	1,785	FDD pair
Telecom Namibia	20	1,860	1,880	
Telecom Namibia	5	1,965	1,970	FDD pair
Telecom Namibia	5	2,155	2,160	
Telecom Namibia	5	1,975	1,980	FDD pair
Telecom Namibia	5	2,165	2,175	
Telecom Namibia	40	2,308	2,348	TDD
Paratus	20	1,745	1,765	FDD Pair
Paratus	20	1,840	1,860	
Paratus	20	2,505	2,525	FDD Pair
Paratus	20	2,625	2,645	
MTN	20	1,940	1,960	FDD Pair
MTN	20	2,130	2,150	
MTN	10	2,387	2,397	TDD
MTN	20	3,570	3,590	TDD
Swakop Uranium	20	1,447	1,467	TDD
UNAM	20	1,447	1,467	TDD

Licensee	Bandwidth (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Comment
Total Allocated	460			
MTC share	32%			
Telecom Namibia share	27%			
Paratus share	17%			
MTN / UCOM share	15%			

Source CRAN, 2023c

Furthermore, MTC holds 32% of the assigned International Mobile Telecommunications (IMT) spectrum. Telecom Namibia holds 27% and Paratus 17% (CRAN, 2023c). The figure below illustrates this comparison:

Figure 5: IMT spectrum distribution among operators



Source: Davies, 2024

This means that MTC holds the majority of IMT spectrum in the market.

In October 2023, the regulator also issued the following group of frequencies, for purposes of IMT services (5G rollout) based on a spectrum auction held:

Table 3: Outcome of the spectrum auction held by the regulator for the 703-733 MHz paired with 758-788 MHz and 791-821 MHz paired with 832-862 MHz

LICENSEE	LOT	RESERVE PRICE	AUCTION PRICE	GROUP OF FREQUENCIES ASSIGNED	BANDWIDTH	COVERAGE AREA	SERVICE TO BE PROVIDED
Loc8 Mobile (Pty) Ltd	A	N$ 4,394,250.00	N$ 5,126,625.00	703-723 MHz paired with 758-778 MHz	2x 20 MHz	National	MOBILE (IMT)
Telecom Namibia Limited	B	N$ 5,126,625.00	N$ 15,427,125.05	723-733 MHz paired with 778-788 MHz, and 791-801 MHz paired with 832-842 MHz	2x 10 MHz 2x 10 MHz	National	MOBILE (IMT)
Mobile Telecommunications Limited	C	N$ 6,510,000.00	N$ 8,000,000.00	801-821 MHz paired with 842-862 MHz	2x 20 MHz	National	MOBILE (IMT)

Source CRAN, 2023d

The table therefore illustrates the distribution of spectrum in the 703-733 MHz spectrum band paired with 758-788 MHz and 791-821 MHz paired with 832-862 MHz which spectrum amongst the three operators. The spectrum was awarded by the regulator for the provision of mobile (IMT).

4.3 Benefits and shortcomings of the current ICT policy and legislative framework and regulatory approach (industry views)

4.3.1 Policy, regulatory and technological advancement

According to RB-1, Namibia has a forward-looking policy and legislative framework which allows the regulator to develop and issue regulations itself, as opposed to the Government, within 6 months. This is a major benefit for the industry in terms of sector development. Respondent RE-5 is of the view that the national ICT policies set clear goals for the sector, including increased access, affordability, and improved service quality, which provides a valuable framework for development.

The current ICT policies and legislation have a positive effect on the industry as they focus on connectivity, accessibility, affordability and consumer protection, however they need to be reviewed/amended to accommodate emerging trends (Respondent RM-1). Also, the Broadband policy is commendable because it focuses on expanding broadband coverage, particularly the target of 95% population coverage by 2024, and it stimulates demand for innovative services (Respondent RE-5).

However, all the interview participants were of the same view that the current ICT policy and legislative framework is outdated since the national ICT policies and legislation dates to 2009. According to Respondent RB-1, the Namibian ICT policies are outdated and therefore the communications legislation giving effect to the policies are also outdated. Furthermore, the sector changes and evolves rapidly and therefore policies and laws

should be reviewed and reformed constantly, without causing instability in the market. At the time, when the communications legislation was passed, the industry was familiar with 2G technologies only. Today, 4G and 5G technologies are dominating the digital revolution (Respondent RB-1). Respondent RB-1 was also of the opinion that the current policy and regulatory regime does not adequality address today's technological issues and demands and the fact that the legislation is outdated results in operators and services providers taking advantage of the gaps and loopholes in the legislation which is not necessarily in the interest of the sector. Respondent RE-2, on the other hand, is of the opinion that the telecommunications policy and legislation allow and encourages technological innovation even though it is outdated.

Respondent RE-3 pointed out that the national ICT policies in most respects, do not prescribe national objectives and targets or deadlines for the execution and achievement of some of the policy goals, in particular, the national Telecommunications Policy developed in 2009 (Respondent RE-3). This means that the policy goals for sector development are not "SMART" in that the goals are not measurable, timed and some goals are not even specific. This makes policy goals unclear, uncertain and difficult to monitor and track progress in terms of execution and achievement. Respondent RB-2 also commented that the socio-economic national development plans are also not in sync and aligned with national ICT policies and therefore harmonization of policy and development plans are critical.

One of the interview participants also shared his view on the internal governance structure of the regulator. He mentioned that the regulator has a very effective internal governance framework and a skilled Board that is competent in the execution of the regulator's mandate and ensures regulatory processes are efficient and in accordance with the regulatory framework. The Respondent also opined that the Communication legislation provides for a sufficient and adequate regulatory framework that ensures the ICT regulatory mandate and objectives are achieved (Respondent RB-3).

Reflections

Some participants argued that the Namibian ICT policy and legislative framework is forward-looking whilst others were of the view that the current policy and legislative framework is outdated in that the framework does not encourage and accommodate emerging trends. This was identified as one of the shortcomings of the framework. An outdated policy and legislative framework discourages technological innovation and requires enhancements so that it caters for emerging trends.

It is also evident from the interview data that the ICT policies do not prescribe milestones and timelines for the achievement of policy goals. This makes it very difficult, for the policy maker and regulator, to measure the achievement of policy goals and implementation monitoring becomes a challenge. The lack of timelines, for the achievement of

telecommunications policy goals, also makes it difficult to measure progress against policy objectives in respect of the development of the sector.

4.3.2 Regulatory processes

Another shortcoming that was identified, amongst the interview participants, was the tedious and lengthy regulatory processes prescribed by the regulator. According to Respondent RE-4, the licensing application processes by the regulator takes too long and this holds back progress in market development, investment, and business operations. In terms of the Regulations regarding Licensing procedures for telecommunications and broadcasting service licences and spectrum use licence (CRAN, 2011b), the regulator has sixty days within which to decide on the award of a telecommunications service licence. However, if the regulator is unable to make a decision within the prescribed time, then it may extend the decision date with another 60 days at its discretion. This process is too long and influences the progress of market and business operations (Respondent RE-4). Respondent RB-1 and RE-2 is also of the opinion that the regulatory processes for awarding of license and type approvals for telecommunications equipment are too long and this frustrates the operators and might result in losing investments. Respondent RE-5 was also of the view that complex and lengthy regulatory procedures can hinder market entry and impede the rollout of new services. Respondent RB-3 averred that the weakness of the regulations developed by the regulator lies in the implementation processes set by the regulations.

With regard to compliance and enforcement requirements and processes imposed by the regulator, Respondent RE-5 was of the view that the current legal and regulatory framework focuses too much on compliance and the enforcement of non-compliance as opposed to encouraging experimentation and risk-taking in the market and industry in respect of different technologies and services and innovative ideas, for example spectrum sharing, which are critical for innovation and market development.

Reflections

Lengthy and unnecessary delayed licensing and regulatory processes seem to be one of the impediments for sector development.

The industry participants identified the lengthy licensing application and regulatory processes prescribed by the regulator as one of the shortcomings and disadvantages for the development of the telecommunications sector. On average, a licence application takes six months to be approved by the regulator. It is the industry's opinion that the six months are too long, and it influences the progress of market and business operations, and it may result in the loss of investments. This delay in licence considerations by the regulator also discourages entry into the telecommunications market and hinders the rollout of new services and technologies. The regulator agrees that the licensing process takes too long and causes frustration in the market. Delays in licence approvals, especially type approvals, may also result in exorbitant costs incurred by importers of

telecommunications equipment at the borders for keeping equipment hostage due to the type approval delays.

4.3.3 Market development and competition

Respondent RB-2 is of the view that both policies and legislation are outdated and misaligned. Reference was made to telecommunications policies with goals and policy objectives in respect of converged services and technologies however, the communications legislation restricts converged services between telecommunications and broadcasting technologies and services, and this further restricts innovation and market development in the sector (Respondent RB-2). Respondent RB-2 explained that the national ICT policies, including the national Broadband policy, are outdated, and not aligned with the communications legislation. The legislation encourages the liberalization of the telecommunications market and the introduction of new innovative technologies however, the licensing regime prescribed by the legislation does not allow for a converged licensing structure between telecommunications and broadcasting services and technologies.

According to Respondent RB-3, there is a serious misalignment between the provisions of the Communications legislation, and the regulations made in terms thereof. This leads to insufficient regulatory processes that do not achieve the objectives of the Communications legislation. A clear example is the difference between the licensing model provided in the Communications legislation and the one provided in the regulations (Respondent RB-3).

Regarding the issue of convergence alluded to, Respondent RB-2 also reasoned that the lack of a converged licence regime results in operators and service providers having to apply for a separate licence for the provision of separate services i.e., telecommunications services separate from broadcasting services – as opposed to one licence allowing the provision of such converged services. He argued that this arrangement is not ideal for the development and expansion of the Namibian telecommunications market. Most of the telecommunications service providers are in the position to provide both telecommunications and broadcasting services however, they are restricted because of the current licensing framework (Respondent RB-2). Respondent RE-4 and Respondent RE-2 were of the same view. Respondent RE-2 argued that ICT technology and service convergence can open the telecommunications market to more competition.

Respondent RB-3 indicated that the Overarching ICT Policy for Namibia, 2009, was adopted for the main purpose of facilitating the rapid development and encourage convergence of the technologies utilised by the telecommunications, broadcasting ad postal sectors. The main theme of the policy is convergence. However, this theme was lost when the policy was translated into law through the Communications legislation, 2009. The legislation provides a framework whereby telecommunications, postal and broadcasting services require different licenses for the provision of each service. These limitations to technology and services have not facilitated the attainment of the objectives of the policy very well (Respondent RB-3).

Another market and competition aspect raised by both the regulator and industry interview participants was the fact that the Namibian government holds shares in both dominant mobile operators in the country. This was a concern for the interviewees. Respondent RB-1 highlighted that the two dominant mobile operators, which are the only two mobile operators in the market, are wholly owned by the Government which poses a major challenge for the regulator in respect of market competition and development. This also creates competition challenges that may result in litigation. Therefore, privatisation of the two state-owned mobile operators is necessary for effective and healthy market competition (Respondent RB-1). Respondents RB-2 and RB-3 also shared the same sentiments. Respondent RE-4 pointed out that the two dominant mobile operators in the market are owned and regulated by the Government and therefore, there is unfair competition in the telecommunications market because these two operators are the monopolies and dominate the market. Respondent RB-1 also argued that the government, owning the two biggest mobile operators, indirectly controls the market in terms of price determination. If this dilemma is not addressed, then the telecommunications market will never achieve fair competition and sufficient market and socio-economic development (Respondent RB-1). Respondent RB-3 is of the opinion that there is no competition in the market because of the Government, being the shareholders of the two dominant mobile operators. The trends, in respect of product offers and prices, are also set by these two operators.

Respondent RB-2 argued that small telecommunications operators suffer in the market because of the two mobile operators dominating the sector. This is because the two mobile operators own the larger share of telecommunication network infrastructure, holds most of the niche IMT spectrum and are in a financial position to afford regulatory and licensing levies and fees. Moreover, there is an unwillingness from Government to embrace the private sector to provide services and allow the private sector to contribute to the development of the telecommunications sector (Respondent RB-2). Respondent RE-5 was of the view that the dominance of the state-owned operators creates an uneven playing field, hindering competition and potentially stifling innovation. He also alluded that recent policy decisions, like suspending new licences, further discourages new entrants to join the market. The interview participant did not wish to elaborate on the policy decisions taken that he was referring to. Respondent RE-5 also stated that the current regulatory approach does not adequately address the challenge of fostering a truly competitive market environment because of the dominant operators dominating the market.

According to Respondent RE-3, another obstacle that stands in the way of market development is the ownership restrictions imposed by the Communications legislation. In terms of section 46 of the legislation, no licensee may be controlled by any person that is not a Namibian citizen or Namibian company and no more than 49 percent of the shareholding in any licensee may be owned by persons that are not Namibian. Respondent RE-3 and RE-1 believed section 46 poses a barrier to the market and therefore, is not beneficial for the development of the market and sector. These Respondents advised that the Minister should relax the ownership restrictions imposed by section 46.

Another common contention amongst the interview participants were the sharing of telecommunications infrastructure amongst service providers. Respondent RB-3 is of the opinion that the infrastructure regulations are not effective because matters relating to the sharing of infrastructure in the sector ends up in court litigation and therefore needs to be improved. Respondent RE-4 is also of the opinion that infrastructure sharing is not regulated effectively because the dominant and big operators are not willing to share spare capacity, on their telecommunications infrastructure, to the smaller telecommunications operators. Respondent RB-1 advised that the infrastructure regulations should be reformed based on a regulatory impact assessment that must first be conducted to understand and appreciate the challenges and the impact of the regulations on the market. Respondent RE-1 indicated that infrastructure sharing is not where it should be in Namibia compared to other markets and needs improvement. The ineffective regulation of infrastructure sharing will result in competition issues and will restrict competition in the market. In most instances, some operators are favoured over others in the sharing of infrastructure especially in terms of pricing (Respondent RE-2). The current regulatory approach is thriving but lacks enforcement when it comes to infrastructure sharing which is critical for the development of the sector (Respondent RM-1). Currently, there is a case pending in the Namibian High Court based upon a disagreement between the regulator and one of the mobile operators on whether the operator has spare capacity for sharing or not. This case has been pending for some time and as a result, the whole industry is kept hostage because of the case (Respondent RE-4). Infrastructure sharing is a means for smaller telecommunications operators to enter and compete in the market. However, some of the smaller operators cannot afford the leasing of spare capacities from the bigger and dominant operators. This also hampers effective competition in the market (Respondent RE-2). Respondent RB-3 argues that the regulator is unable to adequately enforce the sharing of infrastructure amongst operators because the regulations are ineffective because it does not allow the imposition of reference orders to be approved by the regulator for dominant operators. Also, the regulator is not authorised to approve or determine infrastructure sharing fees unless a dispute has been declared between telecommunications operators. However, the operators are hesitant to declare disputes on the sharing of infrastructure because of the fear of retaliation by the dominant operators (Respondent RB-3).

As far as the telecommunications market is concerned, the market grew since 2009 with the implementation of the Communications legislation and services have been rolled out in the rural areas but not sufficiently (Respondent RE-1). Moreover, telecommunications services today are more affordable and innovative compared to ten years ago. The market has significantly expanded considering the current market dynamic with over fifty telecommunications operators making competition “tighter” (Respondent RE-3).

Reflections

According to the interview data, the misaligned licensing regime, government shareholding in the dominant mobile operators, the licensing ownership restrictions imposed, and the

regulation of infrastructure sharing are all factors and or impediments that have an effect on the development of the telecommunications sector.

The Namibian licensing framework does not make provision for converged licenses which would allow operators to provide both telecommunications and broadcasting services under one licence. Based on the current licensing regime, operators require two separate licences in this regard i.e. a telecommunications service licence and a broadcasting service licence (commercial / community). The extent to which the current licensing framework affects the development of the telecommunications sector will be assessed in Chapter 5 of the research report.

Government shareholding in the two mobile operators, ownership restrictions imposed for licences and infrastructure sharing all seem to be contentious issues amongst the operators and even the regulator. It has been fifteen years since the establishment of the Namibian policy and legislative framework and up till now the government has not diluted its shareholding in the two mobile operators. This was identified, by interview participants, as a major disadvantage for competition and for the development of the telecommunications market in Namibia. It also seems that the smaller telecommunications operators are discouraged from entering and competing in the telecommunications market due to the government owning both the dominant mobile operators.

The ownership restrictions imposed for licences and the way infrastructure sharing is regulated are both seen as impediments for the development of the telecommunications sector. The former requires that the ownership of a telecommunications licence must be 51 percent Namibian. This requirement may discourage foreign investment and hold back the market. The latter impediment is premised on the opinion of industry participants that the dominant players in the market are not willing to share infrastructure to the smaller operators and as such the smaller operators will not survive the competition in the market. The view of the ICT ministry is that infrastructure sharing is critical for the development of the sector.

4.4 Level of responsiveness of the current policy and legislative framework to technological innovation and sector evolution (industry views)

4.4.1 Policy, regulatory and technological advancement

Respondents RE-1, RE-2, and RE-3 alluded that Namibia is behind in the rollout out and implementation of 5G technology compared to other SADC countries. Namibia has started with the preparations for the rollout of 5G and developed 5G strategy however, the implementation and digital transformation is slow paced (Respondent RE-1). Respondent RE-3 also highlighted that there are no national 5G policy guidelines in place which leaves a gap in the national goals and objectives for 5G in the country. Respondent RB-3 pointed out that 5G technology would require major investments in infrastructure for the success of its implementation.

According to Respondent RB-3, apart from high connectivity prices, and inadequate competition in the market, the Namibian telecommunications sector is lagging in terms of innovation. This is because there are no digital solutions in addition to those offered by over-the-top platforms such as WhatsApp, Instagram, Facebook, Twitter etc. Furthermore, the telecommunications sector is yet to introduce products that integrate technology into the Namibian people daily activities such as financial services and applications. Respondent RE-3 also indicated that there is a need to leverage digital technology across all sectors and communities in the country.

Given that the ICT Policies and legislation are technology neutral, they are somewhat flexible to accommodate the technological and innovation evolution, however due to the fact that they are outdated, it becomes a challenge to respond to all emerging trends (Respondent RM-1).

According to Respondent RE-5, the current ICT policy and legislative framework exhibit limited responsiveness to the fast-paced nature of technological innovation and sector evolution. Policies tend to be revised infrequently, making it a challenge to keep pace with rapid technological advancement and evolving market demands. The Respondent also commented that the current framework focuses primarily on existing technologies and services, with limited anticipation and preparation for emerging trends and disruptions (Respondent RE-5).

Respondent RE-2 and RB-2 are of the opinion that the sector also lags in terms of digital government services. Most government services such as passport and identity card applications and processes, renewal of drivers and vehicle licenses are not digitalized yet. This also has a negative impact on the economy. The government services that are in fact digitalized require improvement and optimization in terms of functionality and system efficiency (Respondent RB-2).

On broadband demands, Respondent RB-2 stated that the national Broadband policy of 2018 prescribes the minimum broadband download speed, to be provided by service providers, at 2Mbps. This does not provide the quality of broadband service as expected based on the needs and demands of the sector and the advancement of digital technologies and services (Respondent RB-2).

The interview participants also expressed their views on the regulatory approaches adopted by the regulator including aspects of light-touch regulation, collaborative regulation, sector inclusivity and capacity building.

According to Respondent RE-3, RE-2 and RE-4, the regulatory framework lags in terms of the different approaches to regulating the telecommunications sector. The framework does not make provision for self-regulation or light-touch regulation in respect of certain areas that do not require strict regulation. These Respondents believed the regulator should allow for self-regulation or light touch regulation in respect of broadband and internet service provision.

According to Respondent RB-2, another aspect that is lagging is inclusivity. The Respondent elaborated that the regulator and Ministry should take an inclusive approach for digital development in the country by involving all sector parties since digital transformation and development cuts across all sectors in the country including health, education, mining, financial and banking and tourism. It is imperative that the government and economy sectors should implement initiatives for sustainable digital transformation (Respondent RE-2). Respondent RE-5 advised that the regulatory framework should foster collaboration between telecos, the academia, research institutions to share knowledge and resources which are crucial for innovation.

With regard to the issue of inclusivity within the sector, Respondents RE-3 and RE-4 pointed out that the regulations developed do not completely consider the views and inputs of industry and operators despite consultative meetings and hearings conducted on new regulations. Some regulations also do not consider the needs and demand of the operators like the Price Cap regulations that are imposed on the operators. The Price cap regulations are in favour of the consumer; however, it will be detrimental to the operators in terms of losing profits and revenue as a result of the capping of data prices (Respondent RE-4).

Respondent RE-1 indicated that the regulator should implement capacity building and awareness initiatives in respect of regulations that are issued especially for the new entrants in the telecommunications market. Such initiatives may include seminars, webinars, training /workshops on the different regulatory requirements and obligations imposed (Respondent RE-1).

The issue of emerging legislation was also raised by Respondent RB-2. According to the Respondent, Namibia is still lagging in terms of data protection laws and cybercrime and cyber security laws. These two laws have not been enacted yet which poses great threat to the protection of data and cybersecurity. Furthermore, key sections of the Electronic Transactions Act have also not been enacted yet including e-signatures and accreditation. This causes a stumbling block and barrier for electronic transactions which is the gateway to digital transformation.

Reflections

It is event from the data presented that broadband demand, the regulatory approaches adopted, collaborative regulation and sector inclusivity, the lack of data protection and cyber security laws– are contributory factors to the development of the telecommunications sector.

5G technology, the different digital solutions and platforms including digital government, broadband demands, regulatory approaches adopted by the regulator, and collaborative regulation are all critical components that contribute to the responsiveness of the ICT framework to technological innovation and sector evolution. The rollout of 5G has become critical for technological innovation and digital solutions and is essential for the development of all sectors in the country.

It appears that digital transformation is also an issue in terms of sector development in Namibia. According to the data collected, Namibia is behind on digital government services and other digital solutions. There is therefore a need to leverage digital technology across all sectors and communities in the country.

Industry is also of the view that the regulator does not take a collaborative approach when it comes to regulation. Some of the industry participants raised their concern that they are excluded when it comes to the development of regulations for the sector. The regulator unfortunately did not comment on this aspect during the interview process. The regulator also raised the concern that the minimum broadband download speed prescribed, which is 2Mbps, does not provide the quality of broadband service as expected based on the needs and demands of the sector and the advancement of digital technologies and services. This might be an impediment for the development of the sector considering today's technological demands, 5G technology and the rollout of digital technology and service as per universal access and service initiatives.

4.4.2 Market development and competition

On market development, Respondent RB-2 believed the current Communications legislation, to a certain extent, is responsive to technological innovation and sector evolution due to the service-and technology neutral licensing regime it has adopted. This means that licensees may provide any telecommunications services under such a licence framework and the rollout of new technologies whatsoever. However, it does not allow converged telecommunications and broadcasting services (Respondent RB-2). Moreover, the Internet of Things and 5G technology are supported by the current regulatory framework. Also, the current infrastructure sharing framework and Quality of Service regulations are outdated and do not respond to technical innovation and sector evolution.

Reflections

The same views as expressed above were aired by interview participants under the discussions relating to the shortcomings of the telecommunications policy and legislative framework. It seems that the lack of a converged licensing regime in Namibia is a common concern for industry players. This aspect will be further examined in Chapter 5 of the research report.

4.4.3 Universal access and service

According to Respondents RE-4, RE-2, RE-1 and RB-3, another aspect that seems to be lagging in the telecommunications sector is the implementation of the universal service fund since the universal fund has not been established yet. The universal service fund is crucial for the development of the telecommunications sector and the rollout of broadband services (Respondent RE-2). According to Respondent RE-1, Namibia did well in rolling out broadband services in Namibia. However, this has been the full responsibility of the

operators due to the absence of a universal service fund to incentivize the rollout of infrastructure and broadband services. At the moment, telecommunications operators are required to fund the rollout of services in rural areas which is not very sustainable (Respondent RE-1). Respondent RE-5 is of the opinion that Namibia has made strides in infrastructure development however, mobile broadband and fixed line internet penetration rates are still lower compared to our regional neighbouring countries which affects digital adoption in Namibia.

The telecommunication sector has definitely evolved but has not fully achieved the ICT policy goals. There is notable increase in infrastructure development and connectivity however, there is still a lot to be done in terms of connectivity throughout the country and bridging the digital divide between rural and urban areas (Respondent RM-1). The policy objective on affordability of ICT services has not been achieved as the high cost of both data and devices are higher which inhibit the uptake of ICT services. The regulator's inability to establish the Universal Service Fund due to litigations inhibits the collection of regulatory levies to rollout services in unserved and underserved areas (Respondent RM-1).

There were also respondents that were of the opinion that Namibia lags in respect of digital literacy, digital skills, and digital education which will render the rollout of telecommunication services and technology futile. Respondent RB-1 pointed out that the Namibian population, especially the rural society, lacks in digital skills and literacy which may hold back the development of the sector because what would be the point of making broadband, mobile devices, digital applications, and computers accessible to the people in the rural communities, but these communities are unable to use the technologies and the services due to digital illiteracy. According to Respondent RE-5, the regulator should implement targeted programs to address the digital divide and equip citizens with the skills required to participate in the digital economy. There should be concentrated efforts by all stakeholders in the industry in equipping citizens of all age groups with digital skills (Respondent RM-1).

Reflections

Without a doubt, universal access and services is a critical enabler for the development of the telecommunications sector. The Namibian universal service fund has not been operationalized since 2009. The fund is one of the biggest enablers for sector development and socio-economic development for a country such as Namibia. The rollout of digital technologies and services to unserved and underserved areas is one thing but whether the underserved and unserved communications will be able to use the services is another issue. In this regard, issues such as digital skills, literacy and affordability of mobile devices become a challenge. The ministry still feels there is a lot to be done in terms of connectivity throughout the country and bridging the digital divide between rural and urban areas.

The way infrastructure sharing is regulated in the country has also been raised as shortcoming for development of the telecommunications market and competition.

Infrastructure sharing is also one of the biggest enablers for sector development and it affords smaller telecommunications operators the opportunity to enter and compete in the market. The unwillingness of the dominant operator to share infrastructure is a major concern and should be addressed by the regulator.

4.4.4 Spectrum management

Spectrum management was also a subject considered by the interview participants. Respondent RB-3 explained that frequency spectrum is a scarce national resource that must be assigned by the regulator in a way that contributes to the attainment of national development goals and plan. Respondent RE-1 agreed that spectrum is an enabler for sector development and should be managed and administered efficiently.

Respondent RE-4 believed most of the spectrum is held by the major operators in the market. This is because these operators can easily afford the use of niche spectrum which the smaller operators cannot afford. This results in unfair competition as it gives an unfair advantage to the bigger operators. Some of the operators also hoard unused spectrum which also constitutes unfair practices in the market (Respondent RE-1). Spectrum hoarding takes away the opportunity from other operators to be awarded spectrum for the provision of telecommunications services (Respondent RE-2).

Respondent RE-1 is of the opinion that the regulator is assigning spectrum fairly and consistently to the operators. Some operators have more spectrum than others, but this is due to legacy issues. The mobile operators dominate the spectrum because they have the most spectrum in the market (Respondent RE-1). Respondent RE-5 is also of the view that the new entrants in the market often face challenges accessing the spectrum due to the dominance of existing players and the application of spectrum pricing procedures that favour existing players.

According to Respondent RE-5, the current approach to spectrum management raises concerns regarding its responsiveness to sector development, markets or consumer behaviour traits and ever-changing service delivery mechanisms. He was of the opinion that lengthy and bureaucratic spectrum allocation processes delay the deployment of new technologies and services, hindering market expansion and innovation.

The efficient use of spectrum is critical for the development of the telecommunications sector (Respondent RB-1). Spectrum should be managed and assigned in a competitive way and not based on who has more money to afford it. It should also be allocated in terms of geographical area and not on a national basis to ensure efficient use of spectrum as a scarce resource (Respondent RB-1).

According to Respondent RB-2, there is insufficient spectrum below 1GHz spectrum to meet the demands of the industry. More spectrum is required in this band to ensure the growth of mobile technologies and services and to cater for 5G and broadcasting. (Respondent RB-2). Respondent RE-3 is of the opinion that the regulator manages

spectrum efficiently and makes sure that it is also used efficiently since it is a scares resource. The regulator also issued a spectrum assignment strategy to ensure efficient use and management of spectrum (Respondent RE-3).

Respondent RE-5 suggests an improvement on the current transparent and fair spectrum allocation processes that are inherently designed to be investment-centric while considering the needs of new entrants and promoting efficient utilization. The regulator should explore innovative approaches like spectrum sharing, spectrum trading and leasing to make spectrum accessible and more affordable for new players in the market and to attract more investments in the industry (Respondent RE-5).

Reflections

Spectrum is the ultimate enabler for market and sector development and sector evolution especially with the rise and demand for technologies such as 5G, the IoT and AI.

Namibia does not have policy objectives for the regulation of spectrum in the country, the regulator is fully mandated by the law to manage and assign spectrum. Unfortunately, the portfolio ministry did not comment on this aspect during the interview process. Spectrum is a scarce resource and should be assigned in a fair and transparent manner and efficient use therefore is imperative for the development of the sector. Spectrum is crucial for sector development, and it requires the regulator to implement innovative approaches to ensure it is used efficiently, allocated fairly and managed effectively.

4.5 Conclusion: Participant recommendations for sector development

The interview Respondents proposed that the following should still be done to ensure that Namibia transitions more progressively towards a digital economy:

- Regular review of policies to reflect evolving technological realities and market demands (Respondent RE-5).
- National policies should be revised and improved to accommodate the latest digital technologies and services (Respondent RB-3).
- The digitalization of government services and working towards sustainable digital transformation (Respondent RB-2 and RE-2).
- The government should provide funding for the universal service fund and ensure its operationalization and to ensure more meaningful digital connectivity (Respondent RB-3).
- The reduction of regulatory levies and universal service fund levies because at the moment the levies are not sustainable for the operators (Respondent RE-2).
- The Communications legislation and regulations should be amended to allow for convergence across telecommunications and broadcasting services and technologies (Respondent RB-2 and RM-1).

- The regulator should develop regulations that focus on outcomes rather than specific technologies, allowing for greater flexibility and adaptability to innovation (Respondent RE-5).
- The Government should open international investment in telecommunications infrastructure and services and do away with the Namibian ownership restrictions imposed by section 46 of the Communications legislation (Respondent RE-1, RE-4 and RM-1).
- Government should prioritise investment in the ICT sector (Respondent RM-1).
- The Government should develop implementation plans for national policy and strategies for better implementation monitoring and progress tracking in terms of sector and socio-economic development (Respondent RE-4).
- The regulator should conduct more regulatory impact assessments to assess the impact of regulations on the industry and the economy of the country (Respondent RE-2).
- The regulatory framework should be revised to allow for self-regulation or light touch regulation in certain areas that do not require strict regulation (Respondent RE-3).
- The government should develop a national, all sector inclusive, digital transformation policy for a digital economy (Respondent RB-2).
- The government and regulator should implement measures like tax breaks, rants and sandboxing mechanisms to incentivize R&D and support the development of innovative products and services.
- The regulator should encourage liberalization by facilitating the entry to new players through transparent licensing regulations and processes and addressing dominance issues of existing operators (Respondent RE-5).
- Infrastructure sharing regulations should be implemented vigorously (Respondent RM-1).

Chapter 5: Analysing the effect of the current ICT policy and legislative regime on telecommunications sector development

5.1 Introduction

Chapter 5 provides the interpretation, discussion and analysis of the data presented in Chapter 4. The analyses followed Saldana (2016) streamlined code-to-theory model described in section 3.2.3 of Chapter 3. The Chapter is structured according to the research questions posed in Chapter 1 and also in the context of the conceptual/theoretical framework that guides this study. The main research question for this research is how the ICT policy and legislative regime affects the Namibian telecommunications sector from 2009 to 2024. The sub-research questions are as follows:

(a) How has the telecommunications sector evolved in light of the national ICT policy vision and goals, and global trends?
(b) What are the benefits and shortcomings of the current ICT policy and legislative framework and regulatory approach?
(c) How responsive are the current policy and legislation to technological innovation and sector evolution?

The Chapter will analyse the data presented based on the analytical concepts constructed in Chapter 3 and aligned with the research questions.

Section 5.2 of this Chapter sought to answer sub-question (a), using the data collected under section 4.2, relating to the current state of development of the sector, and the relevant policy goals and objectives derived from the policy framework set out in sections 1.6.1 to 1.6.3 in Chapter 1. This section will focus on the three research focus areas namely market development and competition, universal access and services and spectrum management.

Section 5.3 will analyse the effects that the identified benefits and shortcomings of the current ICT policy and legislative framework and regulatory approach have, in relation to sub-question (b) on the development of the telecommunications sector – based on the data presented in section 4.3.

Finaly, part 5.4 of this Chapter will answer sub-question (c) based on the data presented under section 4.4 and in relation to telecommunications sector development.

5.2 The evolution of the telecommunications sector based on policy vision, goals and global trends (2009-2024)

5.2.1 Market development and competition

The telecommunications sector, as at March 2023, holds sixty-eight telecommunications service licensees inclusive of mobile operators, internet service providers, MVNO’s and

telecommunications infrastructure and network facilities licensees (CRAN, 2023a, p.13). Of the 68 licensees, two are mobile operators, namely Mobile Telecommunications Limited and Telecom Namibia Limited, and both are owned by the Namibian government. This was one of the major concerns raised by the interview participants in this research, as an impediment for the development of the telecommunications sector.

In 2009, the government of Namibia undertook to dilute its shareholding in the commercial ICT public enterprise operators, activities, or productive asset (privatization) (MICT, 2009b) and that competition should be further encouraged by diluting Government shareholding in telecommunications public Enterprises (MICT, 2009a). To date, the two biggest mobile operators in the country, are still wholly owned by the Namibian government. Both operators are subsidiaries of Namibia Post and Telecom Holdings Limited (NPTH), who is 100% owned by the government. It has been fifteen years since the policy directive was passed, and the Namibian government has still not diluted its shares in these two entities. The effect that this would have on sector development will be assessed under section 5.3 of this Chapter.

In 2009, the government also undertook to lower barriers to the ICT market, to allow third parties to compete with established providers of ICT products and services (MICT, 2009b) and create an equitable, fair, just, and competitive environment based on the principles of the free market and open unfettered access to products and services (MICT, 2009a). Unfortunately, still today there are barriers to market entry and competition challenges in the Namibian telecommunications market. Some of these barriers include ownership restrictions imposed by legislation for licence holders which discourages foreign investment and thus discourages the smaller telecommunications operators from entering the market as they will be unable to compete with the dominant larger market operators.

As already discussed in Chapter 4, 8% of the market is made up of ECNS licences and 58% is made up of ECS & ECNS licensees which includes the two dominant mobile operators. Also, 11% of the market is made up of the class network facilities licensees. This means that the market is underdeveloped in terms of class network facilities licensee holders. More of these licensees are required in the market to share their infrastructure to the smaller telecommunications operators in the interest of market expansion and allow more operators to enter the market. The ECNS market is doing well considering the total population size of Namibia.

Infrastructure sharing is also one of the barriers to market entry and competition as identified by some of the interview participants. This relates to the dominant players', with the larger market share, and their unwillingness to share spare capacity on their telecommunications networks and infrastructure to other smaller ISP operators. Also, some dominant operators charge very high lease prices for infrastructure sharing which the smaller businesses cannot afford. The lack of a universal service fund and the distribution of frequency spectrum among market players also constitutes barriers for the market and competition. These barriers will be discussed in more detail in sections 5.3 and 5.4 of this report.

The government also committed in 2009 to move towards a service and technology neutral licensing approach (MICT, 2009a) and encouraged foreign participation in the telecommunications sector (MICT, 2009a). Namibia, as of 2009, adopted a service-technology neutral licensing regime which allows licence holders to provide any telecommunications and network services. It also encourages integrated network platforms and promote effective competition in the market and sector growth (MICT, 2009, p.13). The government policy goal relating to the encouragement of foreign participation seems not to have been achieved due to the ownership restrictions imposed by the Communications legislation. The legislation requires that 51% i.e. majority of a licensed telecommunications operator should be Nambian owned (Republic of Namibia, 2009). This goes against the policy objective and creates a barrier to foreign participation and investments in the market.

5.2.2 Universal access and service

According to the statistics presented in Table 1 in Chapter 4, 88% of the population is covered by 3G and 85% are covered by 4G as at 2023. According to the universal access and service policy, Namibia is to achieve 95% coverage in respect of telephony, and broadband services within a period of 10 years or less (Republic of Namibia, 2013) i.e in 2023. This has not been achieved. Therefore, Namibia is lagging with 10% 4G coverage. From the fourteen regions in Namibia, three regions are covered below 60% 4G coverage. Also, 90% of the Namibian population should be covered by broadband infrastructure by 2022 (NNPC, 2017). From the figure below, Namibia has achieved 88% coverage as at 2023 which means the policy goal has relatively been achieved. 100% of the Namibian schools should have 10 Mbps broadband speed and 80% schools at 100 Mbps broadband speed by 2020 (MICT, 2018) and 100% Broadband Infrastructure coverage for schools by 2022 to allow for e-learning (MICT, 2018). As at March 2024, 82% of Namibian schools have 4G coverage. Table 4 below shows Namibia's broadband targets to 2023:

Table 4: Namibia's broadband targets to 2030

Target	Penetration measure	Baseline (2015)	By 2017	By 2020	By 2030
Broadband access in Mbps (user experience)	% of population	21.2% Internet access (256k to 2Mbps); 38% over mobile broadband	50% at 2Mbps	90% at 3Mbps 50% at 100Mbps	100% at 10Mbps 80% at 100Mbps
Schools	% of schools	25% connected	50% at 10 Mbps	100% at 10Mbps 80% at 100Mbps	100% at 1Gbps
Health facilities	% of health facilities	13% connected	50% at 10Mbps	100% at 10Mbps 80% at 100Mbps	100% at 1Gbps
Public sector facilities	% of government offices		50% at 10Mbps	100% at 10Mbps	100% at 100Mbps

Source: MICT, 2018

5.2.3 Spectrum management

The assignment and management of spectrum vests with the regulator (MICT, 2009a). According to national policy, the regulator should assign radio frequency spectrum in accordance with the high-level principles of diversity, competition and open markets, transparency, consistency, and balance in decision making and regulation (MICT, 2009b). Moreover, the Regulator must focus on future processes that are required for continuous ICT sector reform, including spectrum assignment and must establish a regulatory framework that will, amongst other things: encourage a spectrum policy that is flexible to ensure availability and affordability of spectrum to telecommunications in support of universal access and service (Republic of Namibia, 2013).

The national policies do not lay down specific goals and policy objectives for the regulation of spectrum in the country. However, it provides guidelines, to the regulator, for the establishment of a framework that supports a flexible spectrum policy. The regulator published a Spectrum Assignment Strategy for 2022-2024 in 2022 (CRAN,2022b) with the objectives to, amongst other things, ensure the availability of spectrum for use as a tool to develop communications services as a basis for socio-economic development, to promote competition and promote efficient use of spectrum within the digital divide, to free up spectrum bands to cater for emerging technologies and to ensure fair assignment of frequency spectrum between operators. The effect of spectrum management by the regulator on sector development will be examined in more detail under section 5.4.4 of this research report.

Reflections

The purpose of this section was to assess the current state of development of the telecommunications sector in respect of market development, universal access and services and spectrum management against national policy goals and the achievement or non-achievement, for that matter, of the relevant policy goals and objectives. The effect of this on sector development will be examined in the sections below.

It was also observed that some of the national policy goals and objectives are not measurable, timed and not specific. This makes policy goals unclear, uncertain and difficult to monitor and track progress in terms of execution and achievement of policy aspirations.

5.3 How the benefits and shortcomings of the current ICT policy and legislative framework affects telecommunications sector development

5.3.1 Policy, regulatory and technological advancement

Forward-looking policy and legislative framework

It has been said that the Namibian ICT policy and legislative framework is forward-looking, despite it being outdated, and therefore, is beneficial for telecommunications sector development. The regulator has the authority to develop and issue regulations itself, as opposed to the Government. Upon assessing the framework, the national policies are forward-looking setting national telecommunication goals for the future as far as the year 2030. It also caters for digital transformation, technological innovation, emerging technologies and convergence. However, Namibia is still in need of a digital transformation policy and strategy as a centralised national aspiration that would focus on policy directives and strategies ensuring digitalisation of government, health, education, tourism and agricultural services and which would also in return give effect to the current national ICT policies.

5.3.2 Regulatory processes

It has been identified that the regulatory and licensing processes prescribed by the regulator influences sector development.

Section 40 of the Communications legislation prescribes that the regulator must develop regulations that would prescribe open, non-discriminatory and transparent procedures for the submission and consideration of licence applications by the regulator and processes that relates to the withdrawal and renewal of licences. These procedures must make provision for the applications to be published by public notice to afford the public an opportunity to comment and must specify the time periods within which the regulator must consider and make decisions on applications, including applications for renewal (Republic of Namibia, 2009, p. 29). These procedures have been prescribed by the regulator in Licensing Procedure Regulations dating back to August 2011. According to the regulations, the regulator is required to make a decision on a licence application within sixty days from the date of the last comment made by the public on the application. However, if the regulator is unable to decide on the application within the sixty days, it may extend such period for a further maximum period of sixty days i.e. bringing it to a total of hundred and twenty days (CRAN, 2011b, p.10).

Both the regulator and industry participants argued that this process takes too long, and holds back progress in market development, investment, and business operations causing frustration and possible investment losses. Delayed licensing application procedures can also create a barrier for market entry and delay the rollout of new services which will affect

competition and development in the market. The duration for the approval of a service licence for a new market entrant may affect how quickly these operators can commence operations and contribute to the sector's growth. Moreover, complex and tedious regulations may impose additional costs on operators, which can adversely affect smaller players and favour established operators with more resources to navigate the regulatory space. It is therefore important that the regulator streamline its regulatory and licensing application processes in order to foster a regulatory environment that is susceptible to growth and innovation.

5.3.3 Market development and competition

Misaligned licensing regime

The misaligned licensing regime has been determined as one of the factors that influence the development of the telecommunications sector in Namibia.

As already mentioned, Namibia adopted a service technology neutral licensing regime that allows licence holders to provide any telecommunications and network services under one licence however, the regime is still based on a service-specific approach. The Namibian ICT legislative regime does not provide for a converged licencing framework even though such framework is encouraged and supported by national policy (MICT, 2009b, p11 and 25). According to the Namibian Overarching Information and Communication policy, convergence relates to the merging of different industries that have operated independently from one another, but networks along a specific value chain or bundling from different services at the applications end (MICT, 2009b). This means that a converged licensing framework caters for new converged developments such as OTT that can be delivered over both telecommunications and broadcasting platforms. Furthermore, the Namibian government has undertaken to implement a new framework in respect of the ICT sector in order to promote and facilitate convergence of telecommunications, information and communications technology and media services related to the evolution of these technologies (MICT, 2009b, p.8). Unfortunately, this has not been achieved.

Upon a review of the communications legislation, the law allows for the provision of telecommunications and broadcasting services separately and independently from one another (Republic of Namibia, 2009). The definition of “communications”, for regulation, provided for in the legislation means electronic communications and communications by means of postal services. The flaw is that the legislation does not define “electronic communications”, for purposes of regulating, that would include networks, satellite systems, fixed systems, broadcasting systems, fiber optic systems and other transmission systems used for convergence of telecommunications and broadcasting. Therefore, the definition of what constitutes communications in the legislation falls short of a converged digital environment. This also serves as an indication that the legislation is outdated and requires reform. There is also a serious misalignment between national policy and legislation in this respective. The policy strongly encourages convergence however the

legislation falls short hereof. The current framework places a barrier for market entry and market expansion which is not beneficial for the growth of the sector and the economy. A converged licensing framework would allow flexibility and encourage the growth of the new applications and services and would make it easier for new players to enter the market. It will also promote competition among telecommunications and broadcasting services providers as opposed to sector specific competition.

Under the current regime, operators who intend to provide both telecommunications and broadcasting services and solutions would require two different licences and therefore, will be regulated pursuant to two different sector regulations and requirements imposing a burden on operators which may affect the success of the business. Operating under two different types of licences may also be costly for the operators.

According to Roux (2002), policies and legislation should be dynamic and flexible and should consistently relate to current and future issues and challenges in society and should continuously be modified to adapt to the impact of environmental variables and influencing factors. Phamodi et al (n.d.) also advises that ICT policy and legislation should be relevant and should cater for the needs and demands of a country considering user demands, availability of infrastructure and regulatory imperatives.

Benjamin and Speta (2015) argue that the fundamental problem of contemporary ICT law and regulation is the actual convergence of technology whereby different digital services, whether by voice, video, or data, can be delivered over multiple platforms using different technologies. The lack of a convergent licencing framework could pose a challenge for telecommunications operators in terms of regulatory compliance and high costs that is associated with acquiring more than one licence. This is because current compliance obligations and requirements are based on sector specific and service-specific regulation as opposed to a converged framework. In the current digital era, the regulator must address technological convergence while taking into account the demands and changes in technology across the various digital platforms and sectors.

Government shareholding in dominant mobile operators

Government shareholding in the dominant mobile operators has also been identified as one of the impediments that influence telecommunications sector development. Contrary to policy directives, the Namibian government owns the only two mobile dominant operators in the country and therefore, competition in the mobile market is diluted as a result and may lead to litigation if not effectively managed by the regulator. This also means that the Namibian government indirectly controls the mobile market and has the upper hand in as far as product and service offering and price determination is concerned. MTC and Telecom Namibia, being wholly owned by the government, have an advantage over private companies as far as access to resources and support from the government is concerned. They also have the larger share of telecommunication network infrastructure. This, therefore, makes it extremely challenging for the smaller telecommunications

operators and ISPs to compete in the market. The industry participants were of the view that the dominance of the state-owned operators creates an uneven playing field, hindering competition and potentially stifling innovation. Consequently, inefficient competition may impede the advancement of technology and services, leading to higher pricing for consumers.

Based on the information provided in Chapter 4, MTC has a 90% mobile market share in Namibia's telecom industry. The growth of the telecommunications industry may be significantly impacted by this concentration of market share, both positively and negatively. Economies of scale may be attained by dominant operators, allowing them to make significant investments in innovation and telecommunications infrastructure, which may result in improvements in services and technology. Operators that hold a substantial portion of the market are in a good position to make investments in new technology, which may result in the faster rollout and consumer availability of cutting-edge services.

The government control of the mobile operators gives other operators less of a competitive edge and therefore innovation may suffer as a result. As such, there may be no to little incentives to invest in new technology or to improve services, which could cause the industry to stagnate. Additionally, it is possible that government-owned telecommunications operators may put political goals ahead of business productivity and efficiency, which could result in poor operational choices and resource allocation.

It is important to balance substantial investments that may come from dominant state-owned telecommunications operators in the telecommunications market with initiatives that will encourage and promote fair competition and prevent negative outcomes such as high prices for consumers, reduced innovation and sub-standard quality of service.

According to Stoyanova (2008), pricing is largely considered as the central point in determining the level of competition in a market measured by the price trends, pricing behaviour and pricing patterns of operators (Stoyanova, 2008, p.XVII). The pricing decisions of significant market power operators, such as MTC and Telecom which is owned by the government, therefore have a significant role to play in the determination of the level of competition in a market and consequently consumer welfare (Stoyanova, 2008, p.XXI). Based on data published by the Namibian regulator in 2022, the price of the cheapest product for 1GB prepaid data per month costed 128 Namibian Dollars for MTC and about 150 Namibian Dollars for Telecom Namibia in 2018. These prices remained high until the first quarter of 2023 and was significantly reduced to 60 Namibian Dollars for 1GB prepaid data excluding VAT. The price reduction was as a result of a public consultation held by the regulator in the beginning of 2023. The inadequate competition between the two dominant mobile operators, as a result of the government shareholding in the market, resulted in the high data prices during 2018 and 2023 (CRAN, 2023e. p.13).

Ownership restrictions

According to the regulator and industry participants, the ownership restrictions imposed by legislation constitutes a barrier for the development of the telecommunications sector.

Section 46 of the Communications legislation prescribes that no licensee may be controlled by any person that is not a Namibian citizen or Namibian company and no more than 49% of the shareholding in any licensee may be owned by persons that are not Namibian. It is the view of the interview participants that section 46 restricts investment in the market and therefore, is not beneficial for the development of the market and sector.

As mentioned before, the state-owned operators currently dominate the telecommunications sector both in terms of infrastructure and market share. Smaller ISP operators that wish to enter the market might require financial support from investors to set up their own networks and infrastructure or to start their own telecommunication service and network businesses in order to compete with the dominant operators. Setting up such businesses in the industry is very expensive and requires significant capital. It would appear that the two mobile operators, owned by the state, have easier and cheaper access to capital from the government and this would place the private sector players at a disadvantage. Access to capital is therefore restricted to 51% local ownership imposed by the Communications legislation for private telecommunications sector participants. Investors would usually require majority management control over their investment and therefore the shareholding limitation would not always be viable for significant investments. A private local operator, that has an international partner and investor, will have access to cheaper capital and equipment as well as access to technologies and skills.

Foreign direct investment has always been a source of economic development. According to the OECD (2002, p.9), studies have proved that foreign direct investment contributes to factor productivity and income growth in the host countries, over and above what local investment would cause. Furthermore, local private telecommunications companies could gain access to global markets which could leverage their ability to compete and grow. Encouraging foreign investment in Namibia can also promote innovation in the sector as operators would pursue to distinguish themselves and offer exclusive services and technologies. It can also provide financing options to local businesses that Namibia itself cannot provide, which will enable them to expand and cultivate their businesses. Foreign investment will most certainly also increase competition in the telecommunications market which would in turn lead to improved quality of service and lower prices for consumers.

Opening up the telecommunications market to foreign investment might also have adverse consequences for the sector. It could result in the loss of control over the direction in which the sector is steered, and also foreign companies would dominate the market which may result in anti-competitive activities or abuse of dominance in the market.

Regulation of infrastructure sharing

The regulation of infrastructure, according to interview participants, also affect telecommunications sector development. Some interview respondents were of the opinion that infrastructure sharing is not regulated effectively due to the dominant and larger operators' unwillingness to share spare capacity, on their telecommunications infrastructure. The ineffective regulation of infrastructure sharing will result in competition

issues and would restrict competition in the market. Infrastructure sharing is crucial for the development of the telecommunications market because it serves as a means for smaller telecommunications operators to enter and compete in the market and can assist in reducing the costs of building and maintaining network infrastructure especially in low population density areas. However, some of the smaller operators cannot afford the leasing of spare capacities from the larger and dominant operators.

The Namibian Communications legislation imposes the sharing of infrastructure on dominant operators / carriers only. Section 50 of the legislation prescribes that a dominant carrier must lease any infrastructure to any other carrier or must allow other carriers to connect telecommunications equipment on such infrastructure or to use such infrastructure – then it will promote competition (Republic of Namibia, 2009, p.36). As mentioned earlier, infrastructure sharing can also lower the barriers to entry in the market for new telcos, expand the market, increase competition, improve quality of service, attract investment and assist with the expansion of network coverage and narrow the gap in the digital divide. Moreover, it can also contribute to the overall improvement of service quality and network coverage, promoting inclusive access to digital services in Namibia.

The lack of infrastructure sharing can also delay the deployment of new technologies and services to the unserved and underserved Namibian communities. This may be as a result of the operators' unwillingness to invest in next-generation networks if the return on investment is uncertain due to the high costs for setting up infrastructure and telecommunications towers. The regulator should implement stringent measures that would encourage the sharing of infrastructure and align such measures with the broader socio-economic and sustainable development goals and objectives.

5.4 How responsive is the current policy and legislation to technological innovation and sector evolution

5.4.1 Policy, regulatory and technological advancement

Framework not aligned to technological innovation

The misaligned ICT framework to technological innovation was also determined as one of the shortcomings that hinder the development of the telecommunications sector. Interview participants were of the view that Namibia is behind in the rollout out and implementation of 5G technology compared to other SADC countries and lags in terms of sector innovation and digital transformation. Views were also expressed that the current ICT policy and legislative framework exhibit limited responsiveness to the fast-paced nature of technological innovation and sector evolution.

As mentioned before, Namibia does not have a digital transformation policy and strategy in place that would focus on the transformation to digital government, health, education, tourism and agricultural services and align the different sectors with technological

innovation and emerging technologies and trends. The lack of such strategies might be due to the different sectors not collaborating to achieve digital transformation. According to Chen (2019), governments should put in place clear, coherent rules to facilitate digital economic activities to respond to the new market players and business models.

The digitization of societies, the rapid rise in the need for digital connectivity, artificial intelligence, big data and the IoT all demand strategies that would enable affordable and quality digital services and connectivity and that would address the cyber and data protection risks that goes with digital transformation and digital online services.

As cited in Chapter 2, the ITU (2020) encourages collaborative regulation, among all sectors, to achieve sustainable development goals and to facilitate digital markets universally on the way to digital transformation and a knowledge-based economy.

Martin and Finucan (2016) also proposes that national policy-makers should be well informed about the different types of digital technologies for providing broadband, its costs, benefits, and technical competencies to understand the services that it would enable for citizens and how regulatory frameworks will enable, hinder, or jeopardise current access to evolving digital technologies or continued innovation. They furthermore advise that national policies and plans should aim for technological neutrality, to allow for the rollout and future evolution of various services and the development of innovative business models. If the Namibian ICT regulatory framework does not keep up with a technologically innovative environment, it will result in regulatory challenges for the regulator, cyber security issues, and poor quality of services and unprotected consumers.

Regulatory approaches

Regulatory approaches by the regulator also have an effect on innovation.

According to interview respondents, the regulatory framework lags in terms of the different approaches to regulating the telecommunications sector and does not make provision for self-regulation or light-touch regulation in respect of certain areas that do not require strict regulation.

Self-regulation, if effectively applied, can result in increased flexibility, rapid adaptation to technological advancements, and reduced bureaucratic overhead. On the other hand, light-touch regulation, which imposes limited government and regulatory intervention, can allow the telecommunications industry to operate with greater independence. However, the increased flexibility and freedom associated with self-regulation and the limited intervention with light-touch regulation can lead to anti-competitive market dynamics, unprotected consumers and abuse of dominance in the market. Therefore, a balance is required between self-regulation and effective oversight by the regulator to ensure fair competition in the market and consumer protection.

These different approaches to regulation require careful consideration of various factors, including consumer protection, market dynamics, and technological innovation. While

these regulatory approaches can provide many benefits, they must be implemented considerately to ensure they contribute positively to the sector's development and to the overall socio-economic development of the country.

The telecommunications regulatory framework should encourage the reform of the telecommunications sector through reregulation. Reregulation entails the reintroduction or adjustment of regulations to address issues and challenges that arise as markets develop and evolve (Katz, 2021). It is therefore the process of revising and updating regulatory frameworks, after a period of deregulation, to address emerging issues and adapt to changing markets. The main purpose of reregulation is to correct market failures, managing new technologies, ensuring fair competition, and protecting consumer interests. This process often involves updating rules on spectrum management, market access, and consumer rights (OECD, 2023). It also means the updating of national telecommunications policies to ensure that all regions in the country, including underserved areas, have access to essential telecommunications services (World Bank, 2023). However, it should not stifle but encourage innovation, creativity and convergence. This may either be good or bad for the sector depending on how its implemented. It can also border on command-and-control regulation which is not effective for the sector and may potentially stifle digital innovation and sector development.

ITU and The World Bank (2020a) advises that policy-makers and governments should develop policy and legislation which may include deregulation, self-regulation, or co-regulatory approaches and methods. Such regulatory approaches would result in better innovation, easier deployment of new and emerging technologies, incentivize investment, and it will result in a more focused and collaborative approach to regulation.

Collaborative regulation and inclusivity

Collaborative regulation and inclusivity were identified as one of the factors that also influence the development of the sector. Interview participants were of the opinion that the regulator and Ministry should take an inclusive approach for digital development in the country by involving all sector parties since digital transformation and development cuts across all sectors in the country including health, education, mining, financial and banking and tourism. Also, the regulator should take industry into consideration and its views when developing regulations for the sector. Therefore, collaboration and inclusivity are key for sector development and is currently being done inadequately. The leveraging of the different knowledge, skills, R&D and innovation across all sectors of Namibia can be beneficial for sector development to breach the digital gap and achieve 100 percent rollout of technology and services to all Namibian communities through a collaborative approach.

According to the ITU and The World Bank (2020b), collaborative regulation supplements formal processes to place more emphasis on sector and multisector government agencies for competition, consumer protection, and data protection among other sectors. Such an approach would effectively promote the development of digitalisation. Furthermore,

collaborative regulation will provide for more flexible regulatory governance frameworks that will eliminate and avoid burdensome regulation that could hold back innovation.

Collaborative regulation, which involves various stakeholders working together, can also result in the leveraging of government and industry resources for socio-economic development and it shifts the regulatory focus to market impact and success ensuring effective competition and consumer protection. Moreover, it allows for transparent regulation and will force the regulator to address the needs, demands and challenges of the operators especially the smaller competitors. The lack of collaborative regulation can lead to corruption and favoured interests, where the interests of only a few stakeholders may dominate the market, potentially stifling competition and innovation.

Lack of data protection and cybersecurity laws

The lack of data protection and cybersecurity laws are one of the shortcomings of the ICT framework that effects the development of the telecommunications sector.

Namibia's data protection law and cybersecurity laws are both in draft. In a nutshell, data protection is defined as the law designed to protect one's personal data (Privacy International, 2018). It is premised on the requirements of handing over personal data when entering into contracts, shopping online, corresponding via electronic mail, engaging in electronic transactions etc. Data protection laws therefore seek to protect personal data from being disseminated without authorization or from being abused and exploited. Namibia's Data Protection Bill seeks to provide for the governing of the processing of information that relates to individuals in order to protect the fundamental rights and freedoms of such individuals, and specifically, their right to privacy, as guaranteed by the Namibian Constitution (article 13) concerning the processing of such information.

The lack of data protection legislation is definitely a concern for Namibia. With the rise in digital services and solutions and technological innovation, the protection of personal data is critical more than ever. Individuals share their personal data on different platforms on a daily basis whether it be at own free will or mandatory. Data protection legislation builds trust in digital tools and systems by establishing rights that protect the public against the misuse of their personal data and also impose obligations on organisations to ensure that the use of data is fair, transparent and accountable manner (World Bank, 2021; Bhaskar and Chaturvedi, 2017; World Economic Forum, 2019). The absence of data protection laws in Namibia could result in the underutilisation of digital services and applications, like for example online shopping services, and also lead to regulatory uncertainty which can hinder useful data innovation by both the public and private sectors. There is also the risk of under-regulation, which can lead to privacy breaches and misuse of personal data, potentially restricting innovation and growth in the sector (Mungan, 2019).

Cyber security laws seek to safeguard against a number of cyber threats and security breaches such as computer hacking, identity theft, accessing unauthorised data, sexual exploitation of children, and online harassment. The lack of cybersecurity laws in Namibia

can leave infrastructure vulnerable to cyber threats. When hackers infiltrate and access an organisation's IT system, it can lead to shutting down of that entire company's IT infrastructure and business critical systems and it may take weeks or months to recuperate from the damage if company's do not have disaster recovery strategies in place. As the Namibian telecommunications sector innovates and evolves, the enforcement of cybersecurity legislation will be critical in ensuring the protection of digital identities and the security of interconnected communication systems.

5.4.2 Market development and competition

Misaligned licensing regime

The misaligned licensing regime was also addressed by interview participants in relation to the licensing framework that is not responsive to technological innovation and sector evolution. The participants argued that even though Namibia adopted a service-technology neutral licensing regime, it does not allow converged telecommunications and broadcasting services. The assessment made under section 5.3.2 can be reiterated herein. A converged licensing framework encourages sector evolution and keeping up with the trends. Such a framework is also one that is aligned with technological innovation as technologies and services are becoming more and more converged.

5.4.3 Universal service and access

The lack of a universal service fund in Namibia was determined as one of the impediments for sector development. The Namibian universal service fund has not been operationalized yet since the promulgation of the Communications legislation in 2009. According to the legislation, the regulator may impose a universal service levy to be paid to the fund. The funds are to be used for purposes of paying subsidies to licensees to subsidize the provision of services or the provision of infrastructure for purposes of providing universal service (Republic of Namibia, 2009, p. 41). The universal service fund is crucial for the development of the telecommunications sector and the rollout of broadband services to the unserved and underserviced communities. According to the data presented under section 5.2.2, 85% of Namibia's population is covered by 4G with the Kunene region having 41% and Omaheke region 57%. Namibia also achieved 88% 3G population coverage. Despite not having an operationalised universal service fund, Namibia still made very good strides in terms of population broadband coverage due to rollout initiatives from the operators and rollout obligations imposed by the regulator with the issuance of spectrum use licences. However, according to the ICT ministry, there is still a lot to be done in terms of connectivity throughout the country and bridging the digital divide between rural and urban areas. The lack of a universal service fund is an impediment in terms of achievement of development goals for the Namibian telecommunications sector. 15% of the Namibian population is left without 4G coverage and therefore there is room for improvement. The regulator's inability to establish the Universal Service Fund is due to litigation challenges on the collection of regulatory levies and as such, the levies for universal service could not

legally be collected from operators. Also, despite the progress made with broadband rollout, there are still the challenges of high data process, access to smart phones and digital illiteracy in Namibia.

The lack of a universal service fund can leave remote and rural areas disadvantaged, resulting in underdevelopment due to the lack of or inadequate connectivity and also the inability to use the technology and services. This can have far-reaching consequences, affecting education, healthcare, and economic opportunities, as telecommunications services are essential to technological innovation and digital activities.

Even though Namibia made progress in the rollout of services, digital illiteracy, and affordability of devices, services and data remain a challenge and therefore restricts access to ICTs especially by the poorer communities. If this is not addressed, then the ideal purpose and function of universal access and service is futile. These challenges also affect sector development. There is no use in providing connectivity and access to communities in Namibia who cannot afford and utilise digital services and who are, as a result, excluded from the digital ecosystem. Sector development is also reliant on the influx of consumers who can access and use technology and digital services and participate in the digital evolution.

5.4.4 Spectrum management

Spectrum management was also identified as one of the factors that influence telecommunications sector development. According to interview participants, most of the spectrum is held by the major operators in the market. This is because these operators can easily afford the use of niche spectrum which the smaller operators cannot afford. This results in unfair competition as it gives an unfair advantage to the bigger operators.

As mentioned earlier in the report, MTC holds 32% of the assigned International Mobile Telecommunications (IMT) spectrum. Telecom Namibia holds 27% and Paratus 17% (CRAN, 2023c). This means that the dominant operators hold the most spectrum in the market.

Assigning spectrum on an auction basis might not seem to be fair for all industry players. If one considers the reserve prices imposed by the regulator, as per Table 3 of the research report, most of the smaller MVNO operators who lease infrastructure from the larger operators might not be in a position to afford spectrum. The dominant operators with the larger market share could easily afford this spectrum. Spectrum assigned to the dominant operators on an auction basis might be good for sector development overall, but it does not give the smaller operators an opportunity to compete fairly in the market. These operators may find it difficult to access the spectrum needed to provide telecommunications services, either due to unavailability of spectrum or high spectrum process. However, once again, those operators with substantial spectrum can achieve economies of scale, which can lead to more efficient use of the spectrum and potentially

lower costs for consumers. They may also have the financial stability to invest in advanced technologies, such as 5G, which can bring benefits to the economy as a whole.

The effective management of spectrum would depend on the independence of the regulator, its expertise, available resources and whether the regulator is transparent in the assignment of spectrum. The regulator's capacity to enforce its regulators will also determine how effective spectrum is managed in the country.

It is important for the regulator to implement strategies that can promote fair competition through the use of spectrum and prevent a single entity from having disproportionate control over the spectrum. Such strategies may include spectrum caps, spectrum sharing, spectrum auctions based on beauty contests and infrastructure sharing directives. Spectrum sharing among operators can make spectrum more accessible and affordable for new players in the market and attract more investments in the industry.

Chapter 6: Conclusion and recommendations for telecommunications sector development and reform

6.1 Introduction

This chapter will conclude the research report, summarise the key findings of the research and provide recommendations for more innovative and effective telecommunications sector development.

6.2 Summation of the key findings in relation to the research questions

6.2.1 The status of telecommunications sector evolution in Namibia in light of the national ICT policy vision and goals and global trends

Market development and competition

The telecommunications sector in Namibia has undergone significant growth and diversification, through the adoption of a service- and technology-neutral unified licensing framework. This has led to the issuance of various types of licenses, including ECNS, ECS, class comprehensive ECS & ECNS, and class network facilities licenses. The sector comprises sixty-eight licensees, including mobile operators, internet service providers, MVNO's, and infrastructure and network facilities licensees. 8% of the market is made up of ECNS licences and 58% is made up of ECS & ECNS licensees which includes the two dominant mobile operators. Also, 11% of the market is made up of the class network facilities licensees. This means that the market is underdeveloped in terms of class network facilities licensee holders. More of these licensees are required in the market to share their infrastructure to the smaller telecommunications operators in the interest of market expansion and allow more operators to enter the market. The ECNS market is doing well considering the total population size of Namibia. The industry's commitment to innovation is reflected in the sector's structure and composition, as outlined in the regulator's Integrated Annual Report.

The telecommunications landscape in Namibia is dominated by Mobile Telecommunications Limited (MTC) and Telecom Namibia Limited, both majority-owned by the Namibian government. This creates competition challenges for Namibia. MTC's extensive national network coverage and high market share position it as a key player in the market. Telecom Namibia's investment in infrastructure and submarine cable systems has strengthened Namibia's global connectivity. Paratus Namibia Holdings Limited provides comprehensive voice, internet, and cloud solutions, despite its smaller infrastructure. Nampower's expansion into fiber-optic broadband services through 'The Grid Online' has also boosted Namibia's telecommunications bandwidth.

The government also committed in 2009 to move towards a service and technology neutral licensing approach (MICT, 2009a) and encouraged foreign participation in the telecommunications sector (MICT, 2009a). Namibia, as of 2009, adopted a service-technology neutral licensing regime which allows licence holders to provide any

telecommunications and network services. However, the sector has not yet adopted a converged licensing framework to enable sector development.

Universal access and service

Namibia's universal service fund has not been operationalised yet. This creates a serious barrier for sector development and bridging the digital divide. As at 2023, 88% of the population is covered by 3G and 85% are covered by 4G. According to the universal access and service policy, Namibia is to achieve 95% coverage in respect of telephony, and broadband services within a period of 10 years or less (Republic of Namibia, 2013) i.e in 2023. This has not been achieved. Therefore, Namibia is lagging its policy goal by 10% 4G coverage. From the fourteen regions in Namibia, three regions are covered below 60% 4G coverage. Namibia has achieved 88% coverage as at 2023 which means the policy goal has relatively been achieved. 100% of the Namibian schools should have 10 Mbps broadband speed and 80% schools at 100 Mbps broadband speed by 2020 (MICT, 2018) and 100% Broadband Infrastructure coverage for schools by 2022 to allow for e-learning (MICT, 2018). As at March 2024, 82% of Namibian schools have 4G coverage.

Spectrum management

The national policies of Namibia do not lay down specific goals and policy objectives for the regulation of spectrum in the country. However, it provides guidelines, to the regulator, for the establishment of a framework that supports a flexible spectrum policy. The regulator published a Spectrum Assignment Strategy for 2022-2024 in 2022 (CRAN,2022b) with the objectives to, amongst other things, ensure the availability of spectrum for use as a tool to develop communications services as a basis for socio-economic development, to promote competition and promote efficient use of spectrum within the digital divide , to free up spectrum bands to cater for emerging technologies and to ensure fair assignment of frequency spectrum between operators.

6.2.2 Key findings on how the benefits and shortcomings of the ICT policy and legislative framework and regulatory approaches affect telecommunications sector development

Effects of the identified shortcomings

The table below provides a synopsis of the key findings of the research in relation to how the shortcomings of the ICT policy and legislative framework and regulatory approaches affect telecommunications sector development:

Table 5: Summation of key findings: How the shortcomings of the ICT policy and legislative framework and regulatory approaches affect telecommunications sector development

Shortcoming	Effect	Result on sector development
Misaligned licensing regime (lack of converged licensing framework /outdated framework)	• Inadequate technological advancement • High costs to acquire more than one licence • Slow market expansion • Impede the rollout of innovative services and technologies • Less global competitiveness • Regulatory burden on operators	The sector is unable to develop adequately and adapt to technological innovation because the licensing framework does not allow for digital convergence. This also slows down digital transformation for Namibia.
Government shareholding in dominant mobile operators	• Inefficient competition in the market • Slow market expansion • Stifling innovation • Makes it extremely challenging for the smaller operators • Higher pricing for consumers. • Faster rollout and consumer availability of cutting-edge services	This results in a barrier for market entry and market expansion which is crucial for sector development. This also results in inefficient competition which impacts quality of service, consumer protection and slows down innovation which are all influencers for sector development.
Ownership restrictions imposed by legislation	• Slow market expansion • Inefficient competition • Market entry barrier • No investment opportunities	The Namibian telecommunications sector cannot adequately develop without investment opportunities. This also results in barriers for market entry by new operators to grow the market and develop the sector.
Ineffective regulation of infrastructure sharing and inadequate sharing of infrastructure	• Restricted competition • Delayed technology and service deployment • Lack of investment • Widened digital divide • High costs for smaller operators for infrastructure rollout	The rural communities and unserved / underserved areas will be left without access to technology and services. Sector development is reliant on consumers making use of digital services and platforms. It will also result in barriers for market entry for new operators that are unable to afford the rollout of their own infrastructure. This is turn will lead to slow market expansion.
Cumbersome and lengthy Regulatory processes	• Delayed rollout of business operations • Investment losses • Delayed rollout of service and technology	Delayed rollout of service and technology will slow down sector development.

Framework not aligned to technological innovation	• Delayed rollout of 5G technology • Slow sector innovation and digital transformation • Regulatory challenges for regulator • Poor services to customers • Lack of consumer protection	5G technology is an enable for sector development and therefore without it, the sector will not develop adequately.
Regulatory approaches (strict regulation as opposed to self or light touch regulation)	• Increased flexibility • Rapid adaptation to technological advancements • Reduced bureaucratic overhead • Allow telecommunications industry to operate independently. • Anti-competitive market	Self and light touch regulation will either result in rapid adaption to technological advancement or abuse of dominant positions in the market.
Lack of Collaborative regulation & inclusivity	• Regulatory capture • Abuse of dominant position in the market • Stifling competition and innovation • Fragmented markets • Communities lagging in technology and access to services.	All sectors should collaborate and work together to achieve the development goals. Failure which, digital transformation will not be harmonised across the sectors and some sectors will develop more than others
Lack of data protection and cybersecurity laws	• Under-regulation • Privacy breaches and misuse of personal data • Restricted innovation • Distrust in the use of digital platforms and technologies • Increased cyber threats • Vulnerable IT systems and infrastructure • Lack of consumer protection	This will result in the under utilisation of digital servo ices and platforms which will slow down sector development and innovation. It also results in IT infrastructure being vulnerable to privacy breaches and cyber threats which may shut down telecommunications systems.
Lack of universal service fund	• Notable digital divide • Underdevelopment in rural communities • Digital illiteracy • Unaffordability of services and devices	The rural communities and unserved / underserved areas will be left without access to technology and services. Also, these communities will not be able to afford digital services and devices. Digital illiteracy will also increase.
Ineffective spectrum management	• Unfair competition • Unfair advantage to the bigger • Inability to access spectrum due to cost • Inefficient use of spectrum • Abuse of dominant position in market • Lack of investments • Spectrum hoarding • Lack of innovation	This can result in abuse of dominant position in the market making the sector vulnerable to predatory pricing, lack of consumer protection and dominant control. It will also result in small operators failing and not succeeding in the market. This also causes a barrier for market entry.

Source: Davies, 2024

The telecommunications sector in Namibia is hindered by a misaligned and outdated licensing regime. The current service-specific approach creates barriers for market entry and expansion, imposing unnecessary burdens and costs on operators. The lack of converged licensing framework not only hinders technological advancements but also deters investment and affects market competitiveness. To foster a dynamic and robust telecommunication sector, Namibia must reform its legislation and adopt a flexible and technology-neutral licensing regime that aligned with the principles of convergence and supports the evolving digital landscape.

The flaw is that the legislation does not define “electronic communications”, for purposes of regulating, that would include networks, satellite systems, fixed systems, broadcasting systems, fiber optic systems and other transmission systems used for convergence of telecommunications and broadcasting. Therefore, the definition of what constitutes communications in the legislation falls short of a converged digital environment. It is also recommended that Namibia ensures that its ICT policy and legislation are relevant and should cater for the needs and demands of the community taking into account user demands, availability of infrastructure and regulatory imperatives.

The Namibia telecommunications sector also faces significant challenges due to the dominance of government-owned mobile operators, hindering competition and sector development. Despite the government's commitments to privatization, lowering barriers, and encouraging foreign participation, ownership restrictions and infrastructure sharing barriers persist. The market's underdevelopment in class network facilities licensees and the lack of universal service fund further impede market expansion. Addressing these barriers is crucial to creating a fair and competitive environment that fosters growth and allows for the entry of smaller telecommunications operators. The government's ownership of the dominant mobile operators in Namibia has also created a significant impact on the telecommunications sector. The concentration of market share by state-owned operators like MTC and Telecom Namibia has led to limited competition, hindering innovation and potentially leading to higher prices for consumers. While this dominance may enable substantial investments and advancements, it is crucial to ensure fair competition and prevent negative outcomes such as reduced innovation and sub-standard services to customers. Balancing government ownership with measures to promote fair competition is essential for the sustainable development of the telecommunications sector. It is therefore recommended that the government dilute its shareholding in the mobile operators to ensure a more effective competitive market and a level playing field.

The current ownership restrictions in the Namibian telecommunications sector, as outlined in section 46 of the Communications legislation, present significant barriers to market development and investment. While foreign direct investment has the potential to stimulate economic growth, promote innovation, and enhance competition, it also raises concerns about loss of control and potential anti-competitive activities. Finding a balance between promoting foreign investment and safeguarding local market interests is crucial for the

sustainable development of the telecommunications sector in Namibia. It is recommended that the legislative requirement is relaxed to a certain extent to allow and encourage foreign investment but at the same time, impose directives to guard against anti-competitive behaviour and abuse of dominance in the market.

Furthermore, the regulation of infrastructure sharing in the Namibian telecommunications sector is crucial for promoting competition and market development. The imposition of infrastructure sharing on dominant operators is a key aspect of the Namibian Communications legislation, aiming to reduce costs and improve service quality. Shared infrastructure can support the rapid deployment of broadband networks, bridging the digital divide and ensuring inclusive access to digital services. To encourage infrastructure sharing, the regulator must implement stringent measures aligned with broader socio-economic and sustainable development goals, ultimately benefiting the unserved and underserved Namibian communities.

As far as the regulatory and licensing processes are concerned – these processes are crucial for sector development in Namibia. The prescribed procedures for licence applications and decision-making timeframes play a significant role. However, concerns have been raised about the lengthy and complex nature of these processes. Streamlining these processes is essential to foster growth and innovation. It is therefore important that the regulator streamline its regulatory and licensing application processes in order to foster a regulatory environment that is susceptible to growth and innovation.

The regulatory approaches applied in the telecommunications sector impact its development and require consideration of consumer protection, market dynamics, and technological innovation. While self-regulation and light-touch regulation offer benefits like flexibility and reduced bureaucratic overhead, they also pose risks such as anti-competitive market dynamics and consumer vulnerability. Balancing self-regulation and effective oversight by the regulator is crucial for fair competition and consumer protection. Policy-makers and governments should consider deregulation, self-regulation, or co-regulatory approaches to promote innovation, technology deployment, and collaborative regulation for positive sector development. These different approaches to regulation require careful consideration of various factors, including consumer protection, market dynamics, and technological innovation. While these regulatory approaches can provide many benefits, they must be implemented considerately to ensure they contribute positively to the sector's development and to the overall socio-economic development of the country.

The absence of data protection and cybersecurity laws in Namibia poses significant risks to the telecommunications sector and the digital landscape as a whole. The lack of data protection legislation raises concerns about the misuse and dissemination of personal data, potentially hindering the utilization of digital services and impeding innovation. The absence of cybersecurity laws leaves infrastructure vulnerable to cyber threats, posing risks to businesses and the telecommunications industry. Namibia must enact robust data

protection and cybersecurity laws to safeguard personal data and ensure the secure operations of digital platforms.

The universal access and service fund is crucial for Namibia's socio-economic development goals. The establishment of a universal service fund, as mandated by the Namibian Communications Act, 2009, is essential for increasing access to digital and ICT technologies and services for the unserved and underserved communities. Despite the current challenges with litigation, it is imperative for the regulator to overcome these obstacles in order to ensure affordability, accessibility, and availability of digital and ICT services for all Namibians. Moreover, Namibia's progress in achieving universal access to telephony and broadband services has been mixed. While the country has made significant strides in 3G and broadband coverage, the 4G coverage lags behind the policy goals, with 10% shortfall. Particularly concerning are the three regions with less than 60% 4G coverage, indicating disparities in infrastructure development. However, the achievement of 88% broadband coverage as of 2023 shows promising progress towards the policy goal. Efforts are needed to bridge the gap in 4G coverage and ensure equitable access to high-speed internet, especially in schools, to facilitate e-learning. Even though Namibia made progress in the rollout of services, digital illiteracy, and affordability of devices, services and data remain a challenge and therefore restricts access to ICTs especially by the poorer communities. If this is not addressed, then the ideal purpose and function of universal access and service is futile. These challenges also affect sector development. There is no use in providing connectivity and access to communities in Namibia who cannot afford and utilise digital services and who are, as a result, excluded from the digital ecosystem. Sector development is also reliant on the influx of consumers who can access and use technology and digital services and participate in the digital evolution. It is recommended that the regulator implement the universal service fund in order to cater for the rollout of services and technology in those areas that are less viable and profitable for the operators.

The management and assignment of radio frequency spectrum in Namibia is overseen by the regulator in accordance with the ITU Radio Frequency Band Plans and Channeling Plans, ensuring efficient and interference-free usage. The International Telecommunications Union (ITU) plays a key role in coordinating and allocating radio spectrum internationally, promoting equitable and efficient use. Overall, spectrum management is essential for the development and maintenance of telecommunications services, enabling global connectivity and technological advancement. The regulator's focus on future processes, such as spectrum assignment, aims to support universal access and service, promote competition, and cater to emerging technologies. The Spectrum Assignment Strategy for 2022-2024 outlines objectives to ensure the availability, efficient use, and fair assignment of spectrum, reflecting the regulator's commitment to socio-economic development and sector growth. Spectrum management plays a crucial role in shaping the telecommunications sector. The dominance of major operators in holding spectrum leads to unfair competition, affecting smaller operators. Auction-based spectrum allocation, while beneficial for sector development, creates barriers for smaller

players. However, effective spectrum management strategies like spectrum sharing can promote fair competition and attract investments. The regulator's independence, expertise, and transparency are vital for successful spectrum management. Implementing measures to prevent disproportionate control over spectrum is essential for fostering a competitive and innovative telecommunications industry. It is important for the regulator to implement strategies that can promote fair competition through the use of spectrum and prevent a single entity from having disproportionate control over the spectrum. Such strategies may include spectrum caps, spectrum sharing, spectrum auctions based on beauty contests and infrastructure sharing directives. Spectrum sharing among operators can make spectrum more accessible and affordable for new players in the market and attract more investments in the industry.

Effects of the identified benefits

One of the significant benefits found to have an effect of telecommunications sector development is the forward-looking ICT policy framework. The regulator has the authority to develop and issue regulations itself, as opposed to the Government. Upon assessing the framework, the national policies are forward-looking setting national telecommunication goals for the future as far as the year 2030. It also caters for digital transformation, technological innovation, emerging technologies and convergence. However, Namibia is still in need of a digital transformation policy and strategy as a centralised national aspiration that would focus on policy directives and strategies ensuring digitalisation of government, health, education, tourism and agricultural services and which would also in return give effect to the current national ICT policies.

Another beneficial aspect for telecommunications sector development is the imposition of universal access and service rollout obligations by the regulator with the issuance of spectrum use licences. This initiative by the regulator is commendable since the universal service fund is not yet operationalised in Namibia. The imposition of telecommunications service and network rollout obligation in the underserved and unserved areas in Namibia makes up for the unfortunate set-back caused by the lack of a universal service fund.

6.2.3 Responsiveness of the current ICT policy and legislation to technological innovation and sector evolution: recommendations for sector development

Namibia's telecommunications sector faces challenges due to a misaligned ICT framework and a lack of digital transformation policy and strategy. The country lags behind in implementing 5G technology and sector innovation compared to other SADC countries. Collaboration among sectors is crucial for achieving digital transformation and establishing clear, coherent rules to facilitate digital economic activities. Additionally, strategies are needed to enable affordable and quality digital services, address cyber and data protection risks, and promote technological neutrality to support the evolution of innovative business models.

The development of the digital sector in Namibia requires a collaborative and inclusive approach involving all stakeholders. Collaborative regulation, as highlighted by the ITU & World Bank (2020b), is essential for promoting competition, consumer protection, and data protection, and for eliminating burdensome regulation that could hinder innovation. Without collaborative regulation, there is a risk of regulatory capture, fragmented markets, and hindrance to the deployment of new technologies like 5G. Therefore, embracing collaborative regulation is crucial for fostering effective competition, innovation, and socio-economic development in the digital sector. The leveraging of the different knowledge, skills, R&D and innovation across all sectors of Namibia can be beneficial for sector development to breach the digital gap and achieve 100 percent rollout of technology and services to all Namibian communities through a collaborative approach.

The Namibian government, policy makers and regulator should consider the following recommendations in order to achieve a more improved level of telecommunications sector development:

- The Namibian government should put in place clear, coherent rules to facilitate digital economic activities to respond to the new market players and business models.
- National policy-makers should ensure they are well informed about the different types of digital technologies for providing broadband, its costs, benefits, and technical competencies to understand the services that it would enable for citizens and how regulatory frameworks will enable, hinder, or jeopardise current access to evolving digital technologies or continued innovation.
- National policies and plans should aim for technological neutrality, to allow for the rollout and future evolution of various services and the development of innovative business models.
- Policy-makers and governments should develop policy and legislation which may include deregulation, self-regulation, or co-regulatory approaches and methods. Such regulatory approaches would result in better innovation, easier deployment of new and emerging technologies, incentivize investment, and it will result in a more focused and collaborative approach to regulation.
- Both the government and regulator should leverage the different knowledge, skills, R&D and innovation across all sectors of Namibia. This can be beneficial for sector development to breach the digital gap and achieve 100 percent rollout of technology and services to all Namibian communities through a collaborative approach.
- ICT Policy should address technological convergence and the ever-changing roles of ICT in the economy and society.
- Policies and regulations for the ICT sector should be developed optimally to fast-track digital transformation.
- Digital regulators are required to conduct research and studies to determine and understand why new telecommunications business entrants fail in the market and develop strategies and regulations.

- Digital regulations should be adaptive to change; regulatory sandboxes; outcome-based regulation; risk-weighted regulation; and collaborative regulation.
- The government and regulator should embrace a more collaborative approach to policy making, policy implementation and regulation. Collaboration in this context is crucial for fostering effective competition, innovation, and socio-economic development in the digital sector.

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