Challenges of realizing market entry and rollout targets for telecommunications licensees in the local loop in Kenya

Peter Wafula Nyongesa

A Thesis submitted in partial fulfillment for the Degree of Master of Science in ICT Policy and Regulation in the Jomo Kenyatta University of Agriculture and Technology.

2010

DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

Signature: …… Date:……

Peter Wafula Nyongesa

This thesis has been submitted for examination with our approval as University Supervisors.

1. Signature:…….…….. Date:……

Dr. Maurice Sakwa

JKUAT, Kenya

2. Signature:….…….. Date:……

Professor G. S. Namusonge, Ph.D.

JKUAT, Kenya

DEDICATION

This work is dedicated to my family, because of the tireless sacrifice of their precious family time and the support they have given me in order to successfully complete this programme.

ACKNOWLEDGEMENT

This thesis has been successfully compiled through the support of many people, without which it would have been impossible to undertake and achieve. I therefore wish to acknowledge their assistance and support.

I would like to thank my university supervisors, Dr. Maurice Sakwa and Professor G. S. Namusonge, Ph.D., for their guidance, comments, suggestions and patience, through the entire research work. It has been a long process and I appreciate every second of your guidance and effort.

I would also like to acknowledge my various lecturers from JKUAT for the deep insight in the field of ICT Policy and Regulation and their invaluable contribution to my academic work and my class colleagues for their sustainable contributions, discussions and moral support that contributed immensely to my academic work.

I would also like to acknowledge my colleagues at the Communications Commission of Kenya. Finally to my parents and family for patience and understanding for giving them less time and support required. I believe I would not have reached this level without you.

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LIST OF ABBREVIATIONS

ASP	Application Service Provider
CCK	Communications Commission of Kenya
CEPT	European Conference of Postal and Telecommunications Administrations
ENUM	T**E**lephone **NU**mber **M**apping
GDP	Gross Development Product
GSM	Global System for Mobile communications
ICT	Information and Communications Technologies
ISP	Internet Service Provider
ITU	International Telecommunication Union
ITU-D	ITU – Telecommunication Development Sector
ITU-T	ITU – Telecommunication Standardization Sector
ITU-R	ITU – Radiocommunications Sector
LLO	Local Loop Operator
MCST	Ministry of Communications, Science and Technology, Botswana
NFP	Network Facility Provider
OECD	Organization for Economic Co-operation and Development
USF	Universal Service Fund
VoIP	Voice over Internet Protocol

WTO World Trade Organization

WIFI Wireless Fidelity

WIMAX Worldwide Interoperability for Microwave Access

DEFINITION OF TERMS

Frequency resource: Capacity of Radio-Communication spectrum available for use (CCK, 2008).

Interconnection: Interconnection is the physical link of the Communications Systems to enable users of one System to communicate with users of another Communications System (Newton, 2003).

Internet Service Providers: An entity licensed to provide Internet Access services (CCK, 2008).

ITU-T Recommendation E.164: This is an ITU standard that defines the structure of an international Telecommunications Number that contains the Country Code (CC), the National Destination Code (NDC) and subscriber Number in the format CC+NDC+SN (ITU, 1997).

Local Loop: The physical connection from the subscriber premises to the carrier's point of presence by wireless, optical fibre and other applicable technology (Newton, 2003).

Local Loop Licensee: An entity that is licensed to provide local basic telephone and data service in a defined

	geographical area and which interconnects with a national operator for the conveyance and delivery of the national and International traffic (CCK, 2008).
Local Loop Operator:	Any entity that provides local basic telephone and data service within the local loop (CCK, 2008).
Numbering resource:	This is the resource containing numbers, letters or a combination of the above is assigned to service providers to provide to end users and equipment, and which may is also be used for the purpose of identifying, charging and routing of traffic (ITU, 2005).
Network Facility Provider:	Is an operator that is allowed to own and operate any form of communications infrastructure (CCK, 2008).
Operational Dateline:	This is the twelve month period imposed on the licensee for the commencement of operation (CCK, 2008).
Point of Interconnection:	The geographical location where two networks interconnect and exchange traffic. (OECD, 2004).

Rollout targets:	These are agreed targets between the Licensee and the sector regulator in the provision of specified services and infrastructure (CCK, 2008).
Wireless Fidelity:	The name of a popular wireless networking technology that uses radio waves to provide wireless high-speed Internet and Network connections to devices (Newton, 2003).
WiMAX:	A standards-based technology enabling the delivery of last mile wireless broadband access as an alternative to cable technologies (Newton, 2003).

ABSTRACT

Developments in telecommunication and ICT have significant potential in transforming countries' economies into network economies. Network economies provide the foundation for an information society and a knowledge-based economy that enhances the creative potential and knowledge in people and the realization other social goals including ensuring universal service.

This thesis says that the national ICT policy objectives of 2006 that sought to ensure universal provision of telecommunication and other enhanced ICT services in support of the social and economic goals had not been adequately realized in Kenya. The purpose of this research thesis was to therefore examine the challenges faced by licensees in the local loop in the realization of market entry and rollout targets. It provides the information and analysis of issues that should assist policy makers, governments, regulators, operators, researchers, the academia and consumer advocates in the design of effective ICT market strategies, effective legal, regulatory and institutional structures that attracts investments in ICT services and the critical infrastructure while protecting consumers from the adverse effects of competition.

This research is based on a theoretical concept of identified independent and dependent variables. Questionnaire method was used to get the data from respondents drawn from industry operators and regulators. Descriptive statistical framework using the quantitative approach was used in the analysis and presentation of the data. This thesis finds that independence of operations and decision making processes of the sector regulator is a critical factor in Kenya that needs enhancements through a legal framework. It also finds that internalization of

transparency principles in the institutional operational framework, in line with World Trade Organizations recommendations, should jointly result in positive externalities in terms of new investments, innovative funding instruments and services.

CHAPTER ONE

1.0. INTRODUCTION

1.1. Background

The International Telecommunications Union (2006) in the World Telecommunication/ICT indicator report for the year 2006, says that telecommunication is one of the fastest growing sectors in the world and that the average service revenue recorded during the year 2006 accounted for 3-4% of the world GDP with Africa alone representing 5%. According to Roller and Waverman (2001), telecommunications industry provides substantial positive externalities to other industries particularly in reducing transaction costs for businesses and that there is a positive linkage between ICT infrastructure growth and economic development. They further say that in order to achieve social and economic benefits, effective communication sector reforms are necessary.

The 1980s and 1990s witnessed a lot of innovations and reforms in telecommunications and Information Technology. Many countries embarked on the path of privatization of the incumbent national carriers and licensing of competitors. Beesly and Littlechild (1996) say that during the same period, over 150 countries introduced or reformed their existing telecom legislation and that privatization of British Telecom (BT) in the United Kingdom, was probably the biggest privatization activity. The above pace of privatization and reforms, according to Beesly and Littlechild (1996), attracted a couple of private sector operators and entrepreneurs in the markets resulting in the injection of capital, skill, knowledge, technological

transfer and evolution of innovative products, services, and a tremendous increase in telecommunication subscriptions.

The gap of digital divide between developing and developed countries had continued to record significant reduction. According to Gray (2006), the gap had reduced from twenty seven (27) in the year1994 to four (4) in the year 2004 with the fixed line gap alone reducing from eleven (11) to four (4) during the same period, attributing to the reforms. But the ITU through its publication on Telecommunications/ICT Market and Trends in Africa of 2007 gives a different picture for Africa. It argues that though Africa accounted for a share of 14% of the world population, its Gross Domestic Product (GDP) accounts for less than 2%. It also says that, out of the world's 1,270 million main fixed telephone lines recorded in the year 2006, less than 2% are located in Africa while 3.8% accounted for Internet use. The publication however acknowledges a significant growth in the mobile segment of 7.2% though the market is far from being satisfied (ITU, 2007).

According to Gillwald and Lisham (2007), although some gains have been recorded in mobile segment, telecommunications sector performance across Africa had been undermined by own practices resulting in poor markets, weak institutional structures and political interference. The weak institutional structures and political interferences had constrained the independence of regulatory institutions further increasing uncertainty and stability necessary for private investment and capital injection. Gillwald and Lisham (2007) agree and add that, the above practices had resulted in a large proportion of the African population lacking access to both basic

and enhanced communication services necessary for effective participation in the Information Society.

The CCK annual report of 2007 on the status of ICT sector in Kenya reported significant growth in the number of mobile subscriptions and licenses issued across the market structures. The Director General of CCK in the report had also recognized the impact of ICT in support of the social and economic goals (CCK, 2007). The Kenya National ICT policy (2006) also recognized the potential of ICT in the realization of social and economic goals and the achievement of the information and knowledge-based economy. In order to harness the potential of ICT, the policy had identified the framework for realizing the policy objectives ranging from Infrastructure development, Human Resource development, public participation in governance, empowerment of the youth and disadvantaged groups, stimulation of investments, innovations in ICT , social justice, equity and the attainment of Millennium Development Goals.

The Kenya National Bureau of statistics (2006), in the Kenya economic survey for the year 2006 indicated that the sector grew by 10.6% contributing 9.7% to Kenya's GDP. The number of telecom subscriptions grew by 36.5% resulting in the creation of the highest number of jobs during the period (CCK, 2007). The CCK statistics report (2008) had also reported a significant growth in ICT in Kenya. It says that within the period of five years up to March 2008, the mobile telecommunications segment grew significantly by over 60% to 11,986,007 resulting in the penetration of over 35% as compared with the fixed market segment (1%) and the rise in mobile population coverage to 77% (25million). The report also indicated that the

geographical coverage was only 27%, meaning that 73% of the geographical landscape had not been covered, posing a major challenge in the realization of the Universal Service objectives as outlined in the National ICT policy of 2006.

On the total amount of revenue recorded, the revenue for mobile communication services had increased to 47billion, while the Average Revenue per User (ARPU) had dropped by 23% annually attributing to increased subscription among lower category of service consumers. The fixed line subscription had however declined by 6.1% between the year 2000 and 2007, representing a fixed Tele-density of 0.9% in 2007 despite the monopoly enjoyed by the incumbent operator in the provision of the fixed line services.

Nxele and Arun (2005) say that though the introduction of sector regulation in Kenya in the year 1999 recorded a marked increase of licensees, many of the licensees that would have made a difference on the market, did not manage to roll out the services as anticipated. Three telecom operators that had been selected, through competitive bidding, to roll out 300,000 new fixed lines in the rural market segment during the year 2000, two of them failed to rollout completely in addition to failing to pay the initial license fees. One managed to rollout services three years after the set dateline but wound-up after operating for only two years.

The introduction of the Local Loop Operators' infrastructure license category, to provide fixed line data and telephony services within a defined geographical zone into the Kenyan market in the year 2003, was meant to increase accessibility to ICT services, enhance competition, empower local entrepreneurs and stimulate investments in the sector. The operators were to apply suitable technologies within a

defined geographical zone while interconnecting with national communication carriers for the aggregation of the national and international traffic to end user in what is popularly referred to as the 'last mile'. This Local Loop operator category had realized eighteen (18) licenses by March 2008, eleven of which assigned the requisite numbering resources by the year 2007, to support of their rollout. By 2007, two local loop operator licensees had been operational. The internet service category, which was described as the least accessible services in the country, had realized seventy eight licensees, thirty five (35) of which were operational with 1.7 million Internet users recorded representing a 5% of the population. The introduction of new guidelines in the year 2004, had allowed Internet Service Providers to provide local telephony in line with the opportunities provided by technological convergence (CCK, 2008).

1.2 Statement of the Problem

The introduction of Local Loop license category in the Kenyan telecommunication market structure and the licensing of operators in this category provided a great opportunity for the country to realize its national ICT policy objectives particularly with regards to increasing availability and access to ICT services, consumer choice and universal service. According to the CCK statistics report of march 2008, there was an overwhelming response in this market category and particularly between the year 2003 and 2006, eighteen Local Loop operators had been licensed and eleven (11) of them issued with the required numbering resources to facilitate their rollout of voice and basic data services. Additionally, twelve (12) licensed Internet Service Providers had also expressed the interest in providing voice telephony within the

local loop and were subsequently issued with the relevant telecommunication numbering resources to facilitate the provision of the voice services.

Despite the above overwhelming response from applicants to invest in the new LLO market category, only two local loop licensees had managed to start the operations by the end of 2008 and not a single Internet Service Provider had rolled out the additional voice services despite being assigned the numbering resources (CCK, 2008). In the rural telecommunication market category, three operators were selected in the year 2000, through competitive bidding, to roll out 300,000 additional telephony and data lines in the rural areas. Out of the three selected operators, only one operator managed to begin operations three years after the agreed dateline. The two other operators completely failed to roll out and also failed to pay the statutory initial license fees required. The one operator that had managed to roll out the services also wound up its operations three years later (Nxele & Arun, 2005).

In the national fixed line market category, the incumbent operator's fixed line subscriber connections continuously recorded a 6.1% decline from the initial figure of 309,379 in the year 2000 to 264,882 subscribers in the year 2007despite the monopoly status enjoyed by the operator in the nationwide provision of the fixed line services (CCK, 2008).

This persistent failure by the licensees in the local loop, from realizing market entry and rollout targets, presents a problem that begs for answers.This study therefore investigates the challenges faced by the telecommunications licensees in the Local Loop from realizing market entry and rollout targets.

1.3 Objective of the Study

1.3.1 General Objectives

The broad objective of this study is to establish challenges of realizing market entry and rollout targets by telecommunications licensees in the local loop in Kenya.

1.3.2 Specific Objectives

1) To establish whether there are legal and Institutional aspects is a challenge in the realization of market entry and rollout targets of the telecommunication licensees in the local loop.
2) To establish whether financing aspects is a challenge in the realization of market entry and rollout targets of the telecommunication licensees in the local loop.
3) To establish whether some regulatory aspects provide a challenge in the realization of market entry and rollout targets of the telecommunication licensees in the local loop.
4) To establish whether technical and Infrastructure aspects is a challenge in the realization of market entry and rollout targets of the telecommunication licensees in the local loop.

1.4 Research Questions

This study is guided by the following Research Questions:

1) Are there legal and Institutional challenges that affect the realization of market entry and rollout targets of telecommunications licensees in the Local Loop?

2) Are there availability and accessibility challenges to efficient financing instruments in the realization of market entry and rollout targets of the telecommunication licensees in the local loop?

3) What are the regulatory challenges that affect the realization of market entry and rollout targets of the telecommunication licensees in the local loop?

4) Are there technical and Infrastructure challenges that affect the realization market entry and rollout targets of the telecommunication licensees in the local loop?

1.5 Justification

The study will help the sector regulator, CCK; with information that should assist in identifying possible hindrances to market entry and non realization of rollout targets by those that are licensed to provide services in the local loop. It will also help the sector regulator acquire information that can be used to update regulatory practices, approaches and procedures for the effective regulation of the market and the achievement of the highest level of market entry and rollout of services in line with policy objectives.

The existing operators and service providers of communications services and potential investors in the information and communication sectors stand to benefit from the findings by understanding and appreciating the Kenyan ICT market environment with the aim of making prudent investment decisions necessary for business success.

This study is will also help the National Communications Secretariat with information for the update of its policy advisory role, and the government of Kenya, through the ministry responsible for information and Communications in the formulation of effective policies and the enabling legal, regulatory and institutional frameworks.

1.6 Significance of the Study

This research will be used to update existing policies, laws, regulatory and licensing frameworks that will make the market efficient and in the long run contribute towards the achievement of the policy objectives in Kenya and the region.

The thesis is expected provide information for the ICT Consumer advocacy, ICT consumer empowerment and facilitate businesses and activities beneficial to the quality of life due to increased competition, choice, market vibrancy, innovation, quality of services etc, in addition to adding knowledge to existing research in this area and for identification of areas further research.

1.7 Scope of Study

The scope of this study covered respondents from amongst the Local Loop licensees, and Internet Service providers that had been assigned the required numbering resources to facilitate roll out of services in the local loop. This study also covered respondents from the Communication Commission of Kenya, which is the sector regulator in Kenya, infrastructure and wholesale interconnection suppliers who include the fixed and mobile operators.

1.8 Limitations

The research information received from respondents, though were conducted in a way to ensure the questionnaires were received, well understood and filled, however certain inconsistencies and inaccuracies could be ruled out. The secondary information particularly from the information acquired from some websites may not be up-to-date as to provide accurate information. Additionally, the numbers of questionnaires received from respondents was forty two percent out of the targeted sample of 101 respondents whereas this is representative but may provide a potential for limitations.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1. Introduction

This chapter provides a review of the various challenges that affect market entry and the realization of a vibrant market in the ICT environment. The review of past studies and best practices in the legal, policy, regulatory and Institutional frameworks that impact on markets are discussed. The impact of external factors like the availability of efficient project financing instruments and opportunities at both the local and international level, the efficient utilization of the available infrastructure resource, efficient management and administration of the scarce resources including frequency spectrum, telecommunications numbers and the rights-of-way are also discussed. Also discussed includes the impact of technological convergence, digitalization, intellectual property, equipment procurement challenges through effective regulatory practices.

This thesis notes that effective policies and regulations that ensure, among other things, the efficient utilization of the information infrastructure, interconnection regimes, scarce resources and protection of intellectual property. Market and institutional reforms driven by technological evolution and convergence, use of the electronic infrastructure in support of electronic businesses like e-commerce, e-government, e-health etc, ensuring universal service and protection of consumer rights, play an important role in shaping the environment for market entry and the incentives for investment (Melody, 1997).

This thesis also says that 'regulatory risk' is also considered a key factor by potential investors in ICT markets, in investment and strategic decisions (Melody, 1997). In addition, the degree of market vibrancy has a direct influence in ensuring availability of an efficient financial and venture capital market, with less vibrant markets attracting less financial support (James et. al., 2004).

2.2. Conceptual Framework

This research paper is represented in a conceptual framework in terms of dependent and independent variables as represented in figure 2.1.

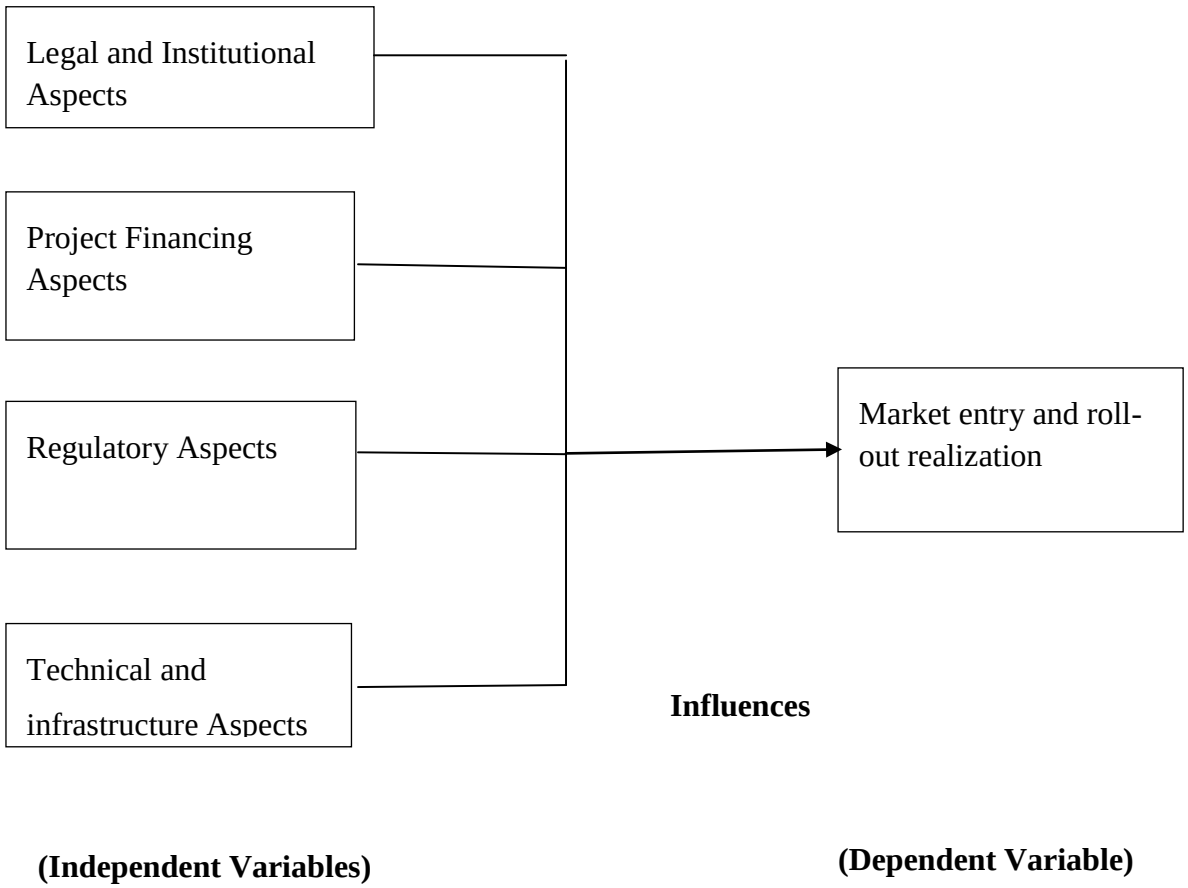


Figure 2.1: Conceptual Framework.

The above framework is based on the concept that any change in the independent variables results in the change of dependent variables (Kothari, 1990). The dependent variables in the framework of figure 2.1 represents the effective realization of the operational and rollout targets, and market entry, while the independent variables include legal and institutional aspects, project financing aspects, regulatory aspects and technical and infrastructure aspects.

Aspects of market entry and the realization of rollout targets is crucial to investors. This is affected by many other variables which range from the effectiveness of the regulatory environment, availability of efficient financial instruments in the market, the laws that ensure implementation of sector policies and the development of effective institutional frameworks.

The Legal and Institutional challenges that include aspects of policy, Legislation, Institutional structures, functions and scope can affect markets. It is said that an effective regulatory and institutional regime is founded in law to articulate aspects on authority, jurisdiction, duties and responsibilities. Proper legal and institutional frameworks should provide independence of operation and provide certainty.

Financing challenges includes availability of venture, costs and investment capital in support of the Communications sector; It is recognized that project financing can facilitate infrastructure activity to the extent of reducing business operational and development constraints including the cost of equipment from vendors, installation, operations and maintenance, provision of access and business sustainability is necessary market entry.

Regulatory challenges includes regulating the communication Infrastructure, Interconnection, regulation of the scarce resource, technological regulation and innovations, price regulation and social regulatory aspects like universal service, consumer protection , has the potential of affecting markets. Regulation is a government-imposed control on the business activity, including the task of monitoring and enforcement to ensure maximum benefits to consumers.

Technical and infrastructure range from equipment procurement processes, acquisition of the bandwidth and capacity from the national and international bandwidth providers and aspects of equipment Type Approvals. Whereas many aspects of technical regulation may be discussed under regulatory challenges, local availability of vendors and equipment costs, access to bandwidth and efficient infrastructure has the potential of affecting markets.

2.3. Past Studies in this Area of Study

This area discusses theories relating to the effective achievement of rollouts, the review, past studies and theories related to Legal and institutional aspects that affect market entry and the network and service rollouts, financing aspects that includes the availability of specific funding instruments in support of the ICT markets at both the local and international level, the technical, infrastructure and technological aspects that includes the available scarce resource that includes the Spectrum, the Numbers and the Right of Ways and finally, the regulatory aspects that ensure the efficient control, equitable distribution and utilization of the available infrastructure, technology and the scarce resources for the social and economic benefits of the consumers, investors and the country at large.

2.3.1. Theories related to market entry and effective achievement of Rollout

The success, certainty and credibility of regulations in the industry is judged by the effective rollouts, commitment towards the removal of market entry barriers, the realization of effective market players, lower costs to consumers and the achievement of the overall social objectives including universal service and access and that uunbundling of the Local loop is identified as a critical area that ensures easier market entry and competition (Umino, 2003).

Umino (2003) refers to Local loop unbundling (LLU), as the process in which incumbent carriers lease, wholly or in part, the local segment of their telecommunications network to competitors and that Unbundling, as a policy, is built on the recognition that incumbent carriers have a dominant position in the provision of local communication access by virtue of their control over the local loop, which in some OECD countries is considered as an essential facility that cannot be economically replicated by alternative operators (Umino, 2003).

Research has shown that whoever controls the local loop can have control over the provision of voice, data and broadband services to customers (Pierce, 2008). Buigues (2002) also says that incumbent telecom operators have always been the de facto monopolies in the provision of voice telephony and high speed internet access to residential customers and small-to-medium sized enterprises (SMEs) in the local loop within the European Union, apart from the few areas where Cable Television (CaTV) operators have emerged. He also adds that competition in the local loop can become more effective if competitors are allowed access to existing network

infrastructure, rather than building their own given the network infrastructure availability that only require to be utilized efficiently for better consumer prices.

Convergence of technologies poses a new challenge to regulation. According to Melody (1997), convergence is basically means the ability of different networks to carry a range of services over a single network unlike the case where legacy systems applied separate technologies and infrastructure to deliver voice, data, broadcasting, content and multimedia. This convergence phenomenon, which merges the different modes of delivering the above multiple services into a single network and information infrastructure, forms the basis for the realization of the knowledge based economy and "information society" dreams, therefore influencing the way the above technologies and the entire sectors are regulated (Melody, 1997).

The ability for the ICT sector regulators to operate independently has a positive impact. According to Withers (1999) regulatory operational independence reduces the risk and susceptibility to political interference and regulatory capture, providing a good environment for the realization of effective regulation therefore increasing its effectiveness, the realization of new operators, industry investments and rollout of services and certainty. According to Nxele and Arun (2005), independence, is a matter of perception and a regulator has to pass the test of legitimacy by being seen to be independent by its stakeholders and those it regulates. They further argue that, legitimacy is not conferred by law, but earned by the regulators themselves through the transparent manner they execute their regulatory mandate, ethical practices, consultation with stakeholders in formulating policies, regulations and guidelines and clear rationale for its decisions and rulings.

‘Regulatory capture’ is said to be one of the principal causes for the failures of past policy and regulation in telecom (Melody, 1997). He says that political interference for a variety of reasons prevented most incumbents from operating efficiently, save for incumbents in the Nordic countries which operated with far minimal political interference. Other than political interference, Withers (1999) adds that the sources of funding and the process of acquiring the funds affect the independence of the regulator. OECD (2005), while quoting the United Nations report on Financial Mechanisms for ICT for Development, says that an enabling environment is critical in ensuring investments in the ICT sector. It further says that without the environment, investment will neither be realized nor effective in providing efficient services. It adds that governments have the responsibility for creating conditions that attract private sector investments by making laws, regulations and start-up processes that are simple, transparent and predictable (OECD, 2005).

2.3.2. Development of a legal framework

The legal and institutional framework is necessary for the overall socio-economic benefits of the ICT infrastructure including benefits of the scarce resources. According to Brown et. al. (2006), an effective regulatory agency should be created in law (preferably in a statute or primary law) that fully articulates its jurisdictional authority, powers, duties and responsibilities. They add that, the basic principles, regulation, procedures, and policies need to be followed and articulated in law preferably under a secondary legislation, and that laws so enacted on regulatory matters should be prospective in nature and none should have retrospective application.

Melody (1997) also says that the development of a legal framework for the communications sector generally begins with the formulation of a primary legislation, which is then followed by a set of separate guidelines, secondary or supplementary legislation or regulations that provide the legal basis for the fulfilment of the entity's regulatory mandate. According to Brown et. al. (2006), the legal powers given, should provide for authority and independence to make final decisions within its regulatory statutory domain without seeking approval of any other government agency. It should also possess the power to approve tariffs at the level that is beneficial to both the consumers and regulated entities, set binding technical, commercial and quality of service standards and make rules, regulations and guidelines within its legal authority. The independence in the decision making processes should also extend to all matters of personnel, budgets, expenditure, administrative, dispute resolution mechanisms and frameworks with respect to licensees and consumers, and the capacity for enforcement of the decisions, standards, rules, dispute resolution mechanisms and relevant public policy objectives through the developed transparency principles for the operations and decisions making. Intven and Tetrault (2000) also say that the laws, regulations and best practices should exhibit certain basic, common and critical features ranging from the overall regulatory design of the framework, its functional aspects, decision-making processes, accountability, consumer protection, dispute resolution and enforcement mechanisms and that the effective application of the above critical features provides the basis for the overall sector development and consumer good.

Melody (1997) further says that, the laws should respect Human Rights issues as per the articles 19 of the Universal Declaration of Human Rights and the International

Covenant on Civil and Political Rights (ICCPR) particularly with respect to access, receipt and conveyance of information. The laws should also provide for the separation of the roles of the industry regulation, the competition policy and consumer protection mechanisms required for the protection of consumers from the negative effects of liberalization. They should also provide effective utilization of the infrastructure for the overall socio-economic benefits and to ensure that technological regulations protects technological innovations, transfer and issues of sovereignty, culture, heritage, security and defence concerns. The laws should also provide for the implementation of the sector policy objectives; provide clarity and certainty for the attraction of foreign investment and capital necessary for the developments in the sector (Melody, 1997). In addition to having the critical features in the basic law, other international and regional organisations like United Nations (UN), the ITU, WTO, European Telecommunications Standards Institute (ETSI) etc also play a major role in shaping policies and regulations for the industry, in the area of technological innovations, standardisation, compatibility, regulatory best practices, performance and other policy issues for telecom development which also form part of the law (Melody, 1997).

Competition laws (also referred to as anti trust law) provide the basis for the operation of competition authorities, who have jurisdiction over regulating the entire economy and therefore not specific to communication sector. Countries with highly competitive ICT markets tend to apply competition laws more in regulating their markets. The methods of application of both Competition laws and regulations are generally different, because the applications of competition laws tend to be '*ex-post'* meaning that competition authorities enforcing the competition policy intervene only

after the anti-competitive practice has been committed (Intven & Tetrault, 2000). Blesser (2008) adds that competition laws tend to control anti-competitive forms of discriminatory behaviour like collusion among certain competing firms with the ultimate aim of increasing prices or to frustrate other firms from competing effectively on the market. The competition laws also prevent firms with significant market power (SMP) from abusing their dominant market position with the ultimate aim of removing competition, which ensures efficient and equitable mechanism for organizing, operating, and disciplining economic markets and the efficient distribution of resources.

Intven and Tetrault (2000) also say that the application of communication regulations tend to apply prior regulations on the market (`*ex-ante*`). These prior regulations are generally done by the issuance licenses and guidelines like interconnection guidelines. The application of *ex-ante* regulation is recognized as one of the most effective means of promoting competition in markets where competition is not effectively developed. They are also practiced in markets with an established tradition of *ex-ante* application of regulation and in conservative markets where the removal of the *ex-ante* regulation is found not necessary (Intven & Tetrault, 2000). On *Ex-post* regulation, Intven et. al. (2000) say that, the regulations are much more flexible and not as interventionist as *ex-ante* regulation because, the *ex-post* regulation tend to rely more on market forces to dictate the rules of the game. It is also said to be well equipped in dealing with discriminatory behaviour particularly with regards with the courts and competition authority decisions. `Ex-post` application is however criticised for applying only in the situation where

uncompetitive behaviour has already occurred, and that it is much more difficult to enforce, uncertain, costly and may be time consuming (Intven & Tetrault, 2000).

Berhin et. al. (2005) in the research findings on the future of sector-specific regulations in Europe had observed that there was no concrete indication that sector-specific regulation in Europe will end soon. It is said that, the competition laws have intrinsic limitations that lack the capacity for authorities in Europe to wholly rely on them for the smooth functioning of the electronic communications markets. They conclude that the European Union needs to maintain the sector-specific regulations as the ideal way of intervening in electronic communications markets if the non-economic and social objectives have to be realized.

There are various laws or primary legislations that play a central role in enforcing competition policy and regulation in the entire ICT sector in Kenya. These include the Restrictive Trade Practices, Monopolies and Price Control Act (1990) that enforces the sector wide competition policy in Kenya, the Kenya Information and Communication Act of 2009, the ICT sector specific legislation that regulates the social, economic and infrastructure activities in the ICT sector and the Kenya Industrial Property Act (2001) that promotes and protects inventions and innovative activities through the grant and regulation of patents, utility models, technovations and industrial designs. There are also other laws that have the potential to offer complimentary influences and/or conflicts to the sector-specific legislation. Technological evolution and developments in the ICT sector need to be protected by laws such as Intellectual Property Rights (IPR) in order to stimulate innovations. Other relevant laws that are applicable in ICT include those that relate to issues of

privacy, fraud, cyber crime and electronic signatures applicable in electronic commerce in order to promote the electronic business and to create confidence in the use of digital networks for business transactions (Intven & Tetrault, 2000).

The taxation laws, foreign ownership, and consumer protection laws are some of the laws that have the capacity to either facilitate or hinder the attainment of an enabling environment for the sector development. Melody (1997) says that taxation is very important source of income for governments; however excessive taxation has the potential of discouraging technological development and investments therefore retarding competition. Schwartz (2007), findings on taxation of mobile services in East Africa, commissioned by the GSM association, had said that excessive excise tax charged on mobile usage in Uganda, Tanzania and Kenya had the potential of retarding the growth of the mobile sub sector and a reduction the total tax collection in the long run. The foreign ownership policies in countries, is one of the key factors that may have an impact in attracting investment in ICT. There is the need for an optimal balance between restrictions for foreign ownership and the need for creating a favorable environment conducive to competition and development (Intven & Tetrault, 2000).

Consumer protection plays a key role in creating an environment that promotes public interest, confidence and participation in the ICT sector. According to Intven and Tetrault (2000), some countries have enacted consumer protection provisions in their communications legislation on issues like quality of service and universal service while others have general and separate consumer laws to protect consumer interests in the purchase of goods and services.

A regulatory environment requires the application of the licensing tools and other regulatory mechanisms and specific market interventions to ensure the realization of market objectives. Withers (1999) says that these tools and mechanisms are a creation of the law and may vary depending on historical roots, social, economic, political and legal foundations. In Europe, for example, majority of the telecommunication operators were once state owned, whereas in the United States of America, the majority were privately owned. Withers (1999) says that irrespective of the historical roots of the regulatory evolution, efficient regulation is judged by its effectiveness towards facilitating easier market entry, ensuring effective competition and adequate safeguards for consumer protection.

2.3.3. Development of an Institutional Framework

A clear jurisdiction and mandate for the regulator, an independent decision-making process and dispute resolution mechanisms, capacity for enforcement, appointments and removal procedures are other factors that promote regulatory practices. Transparency is one of the essential characteristics for good regulatory practices because of the high degree of clarity. The above degree of clarity is essential to ensure confidence, relevance, trust in the entire regulation (Withers, 1999).

Whereas the law provides the mandate for the regulator, withers (1999) says that regulatory initiative on the part of the regulator in the handling of its mandate is another important parameter and plays a major role towards the realization of effective competition on the market. It is said that, the regulator, under its own initiative, may unilaterally limit or broaden its scope within the confines of its jurisdiction. Some regulators may forebear from performing certain activities. They

may do that by encouragement self regulations on certain issues like infrastructure sharing, while other regulators choose to extend the scope by application of much stiffer regulations (Withers, 1999).

The other aspect for effective regulation is the relationships between the regulator and other government organization, civil society, industry players, international organizations, suppliers and consumers. One of these relationships is in the process of appointing members to the regulatory board or relationship with parliament. On the relationship between the regulatory agency and the consumer, the key objective is to protect the consumer by ensuring goods and services supplied are of good quality and value for money. This is achieved by maintaining good channels of communication with the market it regulates (Withers, 1999).

On the relationship with the Courts of law or the arbitrator, this provides an avenue for appeals against certain regulatory decisions and the enforcement of competition or anti-trust laws. Relationship between the regulator and the competition authority is necessary to collaborate to ensure that there is no uncompetitive behaviour on the market (Withers, 1999).

The task of constructing an initial regulatory process begins with the development of an ICT policy. Policy is a set of principles or broader course of actions that guide the behaviour of governments, individuals or entities. It is also forms the basis for the legislative and regulatory development in the realization of the vision. After the development of the policy, the next step is the translation of the policy into a primary legislation, the construction of a regulatory process and institutional framework that reflects the mandate, the independent funding and budgetary

provisions and establishment of regulatory procedures for the management of the process within the scope (Wild, 2006).

A communications licence authorizes an entity to operate telecommunications facilities and services. Licences also define terms and conditions of such authorization and the rights and obligations of a telecommunications operator (Intven & Tetrault, 2000). In many monopoly markets, Licensing had been done through a competitive bidding process while general authorization had been issued to entities that comply with the basic terms and conditions, in some other countries (Intven & Tetrault, 2000). Whereas Licensing had been recognized as an effective tool for ensuring market entry, technological developments and convergence has affected license categorization and regulatory jurisdictions. The traditional licensing categorization based on services and technology had been rendered obsolete due to technological developments and convergence. These technological developments had resulted in the evolution of a licensing regime which had generally followed some trend. This trend had begun with the introduction of technology-neutral licenses that combine services that show convergence tendencies. In Malaysia, this trend resulted in the convergence of 31 service-based licenses into four categories of technology-neutral licenses (Intven & Tetrault, 2000).

The second trend is the introduction of a Unified Licensing Framework where discrete licenses evolve into licenses covering a wide range of services and technologies. This approach had been followed in many developing countries including Kenya, Nigeria and India (Intven & Tetrault, 2000). In Kenya, the unified

and technologically neutral licensing regime, launched in 2008, managed to converge forty six licenses into three broad license categories (CCK, 2008).

The third trend in the licensing reform is the migration towards a much lighter licensing regime called general authorization or class licensing. In this approach, operators are allowed to provide services subject to the regulatory obligations, while the fourth licensing trend, cited forbearance from licensing of a service. The United States had one time decided not to licence certain services offered by Internet Service Providers by declaring them as unlicensed information services for the purpose of promoting the Internet (Intven & Tetrault, 2000).

2.3.4. Regulatory Challenges

Brown et. al. (2006) refer to regulation as the government-imposed controls on business activity and that the two universal tasks of regulation is the setting, monitoring and enforcement to ensure minimum tariffs and of maximum service standards. They further say that most regulatory systems are broader and formally designated with a combination of institutions, laws, and processes that enable the formal and informal control by government over operating and investment environment that supply infrastructure services (Brown et. al., 2006).

The availability and accessibility of an efficient telecommunication infrastructure has been recognized as effective in support of economic growth and essential for increased economic, commercial and administrative efficiency. Woroch (1998) says that in the era of increased globalization, telecommunications infrastructure is crucial in the realization of social goals including universal service, consumer protection and for the overall economic development.

The World Bank (1994) had noted that the provision of infrastructure services is one of the major challenges of economic development towards meeting the market demands and further says that in many of the surveys conducted by them, availability of reliable infrastructure had been cited by private investors as an important consideration in their investment decisions.

It is recognized that broadband services and the infrastructure on which they ride on, provide essential support for businesses. According to Cohen and Southwood (2008), online media use for advertising business, for example, will shortly exceed the television sector equivalent in a number of developed countries. However, Williams (2008), the senior economist, Global Information and Communication Technology (GICT) is worried that the current network infrastructure in Africa may not support the achievement of Information society and information based economy. He says that whereas the African infrastructure is extensive, it is predominantly low capacity, wireless-based and designed to carry mainly voice communication traffic that would not be able to carry volumes of traffic that would be generated if affordable broadband connectivity was available on a mass-market.

Bezzina and Terrab (2006) say that technological development trends have had a greater impact on Regulation. Digitalization trends, for example, resulted in the development of much efficient switching, radio, transmission and optical technologies, and software developments with newer modes of service delivery unforeseen by existing regulations. The capacity provided by optical fibre networks enables the delivery of multiple services over the same infrastructure therefore greatly affecting the existing market structures and regulations (Bezzina & Terrab,

2006). The use and deployments of some of these newer technologies brings another dimension with regards to optimal use and sharing of resources. The ability to lay optical fibre cables in the same ducts or electricity power lines enables infrastructure sharing leading to a wider disbursement and reach of optical fibre bandwidth and wireless technologies, facilitating the rollouts at reduced costs and market access for new entrants (Bezzina & Terrab, 2006). Schorr (2008) also acknowledges that the reduction of deployment for costs of broadband services is one of the greatest motivations for adopting infrastructure sharing.

In addition to reduction of the costs, Bezzina and Terrab (2006) say that, the impact on environmental concerns and architectural beauty may also be addressed by infrastructure sharing. They say that the common sight of communication masts belonging to different operators crammed within one area and the digging up city roads and highways to make way for similar infrastructure owned by different operators could be reduced by the application of the infrastructure sharing principle. Delays and unwillingness to provide co-location and infrastructure sharing facilities or providing the facilities on a non cost basis, without adequate intervention mechanisms may be a barrier to entry and rollouts.

Cohen and Southwood (2008) adds that encouraging the sharing of infrastructure helps in addressing two broad issues that often hamper speedy roll-out. One of the issues includes failure by dominant infrastructure operators to unbundle key infrastructure facilities and secondly, unwillingness by market players to invest in high-capacity infrastructure in the under and un-serviced areas. Those opposed to infrastructure sharing argue that the application of different vendors in the

development of own infrastructure, introduces some level of competition. The difficulty in implementing the specifications of the different applicable systems in infrastructure deployments and the deployment of inferior quality systems by some operators discourages those with superior systems from sharing. The high charges applied by the dominant infrastructure operators have also been discouraging infrastructure sharing and competition (Cohen & Southwood, 2008).

The space made available by incumbents in their switches for collocation of new entrants' switching and transmission equipment is another area that brings about many complains by new entrants (Buigues, 2002). This area is noted as a potential area that the incumbents may use to delay market entrants and local loop unbundling. Local Loop Unbundling regulatory practice may be applied to force competition within the access networks. The unbundling allows market access, encourages innovation, discourages unnecessary duplication of the network component, facilitates easier access to the rights of way by new entrants and provides for additional income to incumbents. In America, claims of inadequate space for collocating systems belonging to new entrants by incumbents were very common (Buigues, 2002). In response, the FCC conducted inspection that resulted in the removal of obsolete electro-mechanical switching equipment that were being used as the reason for non availability of adequate space for co-location of the new entrants' compact digital equipment (Buigues, 2002). Similarly, Umino (2002) says, claims of inadequate collocation space were cited commonly among incumbent operators in the OECD countries. Collocation procedures that were based typically on the first come, first served basis were also noted by the FCC as providing the potential for creating significant barrier to entry for late entrants. In response, the

FCC removed this procedure in view of its potential for creating a significant barrier for entry to late entrants who would otherwise incur high costs in the housing of their equipment outside the exchange room (Buigues, 2002).

Additionally, with regard to prices charged, the European Commission had considered price charged for collocation space as critical to market entry to the extent that, it had to place the responsibility for approving and monitoring prices charged and the related collocation conditions and requirements to the national regulatory authorities in order to ensure that the prices charged and applicable conditions do not become a barrier to new market entrants (Buigues, 2002).

In Sweden, the city of Stockholm established a city-wide fibre infrastructure project named Stokab fibre project. The project was implemented by laying the cables along the existing systems of subways, water and electricity pipes, sewer lines and ducts in the city. This project was aimed at making available the fibre optic cable capacity by leasing to the potential investors therefore stopping digging up the Stockholm city streets time and again. The City of Stockholm saw this approach as much cheaper and easier to implement by leasing to operators, rather than each operator building their own backbone network (stokab, 2007). The Stokab model is considered relevant and provides useful model for consideration by regulators and a wider category of operators in Africa (Cohen & Southwood, 2008).

Nigerian Communication Commission (2007) had issued guidelines for infrastructure sharing. The primary objective of infrastructure sharing, (that includes the use of rights-of-way, masts, poles, antenna masts, tower structures, ducts, trenches, space in buildings, electric power source etc) in Nigeria was to establish a

framework for negotiating sharing of infrastructure among operators, to minimize duplication of infrastructure, to protect the environment by reducing the proliferation of installations, to ensure fair competition through equitable access to the facilities of operators on mutually agreed terms and therefore freeing the extra funds for core network development and reduction consumer tariffs. Similarly, in Kenya, the communications regulator, CCK, initiated guidelines and code of practice for infrastructure sharing and collocation. The main focus of the CCK guidelines was on the perceived health concerns with regards to radiation emissions from the multiple communication facilities dotting the landscape (CCK, 2007).

City and other Local Authority in countries approves access to the Rights of Way by cable ducts and way leaves and erected masts constructed by users. Cohen and Southwood (2008) say that obtaining allocation for access to rights-of-way is one of the most critical, but frequently overlooked aspects of developing telecommunication infrastructure. Other approvals processes done by other bodies dealing with Environment Management, Radiation control and Civil Aviation may critically affect new entrants (Cohen & Southwood, 2008).

Pricing is another critical access factor where new entrants must pay for access of another provider's network. Regulatory intervention may become necessary to ensure cost based access to the unbundled component (Cohen & Southwood, 2008).

Difficulties in achieving Interconnection had been ranked by many countries as the single most impediments to the advancement of competition within telecom sub-sector. The World Trade Organization reference paper on basic telecommunications services describes Interconnection as linking users of telecommunication services

belonging to different suppliers of public telecommunications networks in order to be able to communicate with each other and access services provided by all the suppliers (ITU, 1998). The reference paper also says that the Interconnection facility must be provided at a technically feasible point in the network on a non-discriminatory and non-favourable basis and that the rates charged be cost based, transparent and sufficiently unbundled in order for charges to be done only for items that are actually consumed by the interconnected parties (WTO, 1997). The ITU also prescribes the same transparency and non-discriminatory principles in the provision of the efficient cost based interconnection regime in order to facilitate easier market entry. The above regulation of interconnection and ensuring equitable and non-discriminatory access and availability of bandwidths and leased lines from suppliers, transit network operators, carriers and peer operators to the Local Loop Operator for them to be able to transport or terminate traffic, is another crucial element in ensuring market entry (Cohen & Southwood, 2008).

Convergence of technologies and infrastructure provides another opportunity for market entry. Torre and Rush (2006) define technological convergence as the ability of different networks to carry similar services and also as the ability of one network to carry different services. The above environment for convergence is made possible by the ability to transport all forms of services including broadcast content, voice and text within the same packets of data. This mode of delivery blurs the traditional boundaries associated with the various sectors of broadcasting, telecommunications and internet. Policymakers and regulators around the world are already responding to the challenges posed by convergence. The Republic of Kenya (2009) gazette notice number 2 had operationalized an amendment to the Kenya Communication

Act of 1998, to fully adapt it to a converged environment and allow its economy to fully benefit from opportunities posed by convergence. The above amendment gives a greater opportunity easier market access, sector management and simplification of licensing procedures for telecommunications operators.

Woroch and Waltz (1998) say that, convergence also affects the actual business in telecommunications sector. For example, Congress and the Federal Communications Commission (FCC) took steps to remove cross-ownership restrictions and other public policies that limited telephone companies' abilities to provide video services and cable operators' abilities to provide telephone services with the objective of allowing a single company to offer a broad array of local distribution services, on a single integrated network or over several parallel networks. In Kenya, the introduction of new guidelines by CCK for ISPs to provide VoIP to end users in the local loop and at the same time opening the telephony numbering scheme for the VoIP services was in response to convergence (CCK, 2008).

Convergence has also made it possible to introduce technology neutral interconnection charging system based on capacity, instead of the traditional charging system that is based of time and distance. These newer interconnection schemes in a converged environment, makes it possible to interconnect with other operators regardless of the type of network. The above scheme, where any operator, regardless of network type, is obliged to interconnect with any other operator, also called symmetrical interconnection regime, is commonly applicable in the European Union (Katz & Woroch, 1997). The introduction of the above symmetrical interconnection regime is essential to establish a level playing field for inter-modal

competition because of the wider choice and non-discrimination on interconnection rights (Katz & Woroch, 1997).

Numbering policies and regulations were originally developed to address fixed voice telephony services, where telecommunication numbering was divided into geographic areas. With the advent of convergence, modifications of the existing numbering policies and regulations were found necessary (Milne, 2001). The proliferation of VoIP, which is one of the products of convergence, had introduced new challenges to numbering administrations with regards to whether traditional numbering plans and policies should be applied to VoIP providers. This has resulted in some administrations creating special numbering ranges within the existing geographical numbering ranges for VoIP services, in recognition of their nomadic nature while others continuing assigning numbers within the existing spectrum of the normal geographical numbers (Milne, 2001). Others like fixed-mobile convergence (FMC) raises a number of important questions for regulators with regards to numbering policies and number portability.The introduction of number portability, which involves users changing service provider, while maintaining the same telephone number is the product of technological developments and convergence (Onoe, 2006).

Traditional telephony and Internet are separate markets regulated separately at both the national level and at the global level. The regulation of telephony by the ITU globally has generally followed a relatively stable and predictable model and market structures. The Internet, on the other hand, has rapidly evolved from a globally competitive marketplace that is substantially free of government regulation and

investment (McNamee & Satuli, 2003). Similarly, the traditional numbering plans for telephony are based on a combination of digits that form the number while the Internet is based on names and Internet Protocol (IP) addresses. The convergence of the Internet and Public Switched Telephony Network (PSTN) results in Numbering, Naming and Addressing in a converged environment made possible by the development of a technical protocol that maps the PSTN numbers with Internet based Internet Protocol (IP) addresses called ENUM (electronic mapping of telephony numbers with Internet Addresses) which defines the future direction of numbering policies in a converged environment (McNamee & Satuli, 2003).

Many telecommunication equipment suppliers and vendors are based abroad and delay in the configuration and customization to the local technical and regulatory requirements through the process of Type Approval, may require effective coordination with the potential for causing delays (Hawkins, 1993). Regardless of the existing procurement structures, procurement of public network equipment in a multi-vendor environment makes more economic sense in the digital environment because the scope of technical choices in the non-traditional vendor and supplier markets is increasingly becoming wider than in the traditional closed public network markets (Hawkins, 1993). In the digital environment, liberalisation of equipment supply markets has benefits for incumbents as well as new entrants. Incumbent operators have therefore the potential of reducing the costs of upgrading their equipment with easily and locally available digital equipment modules, from specialised, competing suppliers. Equally so, the public network equipment manufacturers can expand beyond their traditional national operator markets,

expand their revenue base and mitigate against escalating research and development (R&D) costs of digital technologies, in order to remain competitive (Mansell,1993).

In an environment where there is scarcity of spectrum, deployment of new wireless technologies can be hampered. This therefore calls for prudent spectrum management policies and strategies that support increased availability and deployment of infrastructure. Technical and network aspects of interconnection that include switching, transport, signaling, interfaces, numbering and quality of service, Network interoperability, Operational and maintenance, billing and safety considerations are important technical aspects that ensure easier access to market by the Local Loop operators and other interconnecting operators (Mansell, 1993).

One of the main WTO rules governing interconnection states that procedures and reference interconnection offers (RIO) must be published and publicly available and that any disputes arising must be resolved preferably by a regulator within a reasonable time frame (WTO, 1997). In order to ensure efficient market competition and the provision of services across all networks, WTO (1997) also says that prices should be published, unbundled, non-discriminatory and cost based and that the cost of interconnections be determined from past and current accounting records and also by use of the long-run incremental costing (LRIC) approaches. The LRIC approaches provide the starting point for determining the economic cost of interconnection necessary for establishing economically efficient interconnection prices. The LRIC modeling broadly encompasses two separate approaches; the Top-down approach and the bottoms-up approach, but generally, the LRIC model has two major fundamental characteristics. These characteristics include, Forward-

looking cost analyses that attempt to identify costs that will be incurred during some real or theoretical future period, avoiding the pitfall of including excessive embedded costs in rates imposed on end users or competitors, and also *Incremental cost*, which is the extra cost, added to an existing base of costs, required to provide a defined additional increment of a given service. The incremental cost of establishing interconnection is often seen as the most economically efficient means of determining the impact of a competitor's interconnection on the incumbent operator's costs of service (Bezzina & Terrab, 2006).

In the top-down approach, the costs of a basket of services incurred in producing each product is taken from the existing cost structures of accounting records. This usually leaves a large amount of common costs to be allocated to each product, using various cost-causation methods (what product causes what cost), while in the bottom-up approach, the actual accounting data is not used, but rather the estimated costs of producing each product using the current and estimated future technology, the model considered most efficient (Bezzina & Terrab, 2006). Although incremental cost analysis is fundamentally forward-looking, in reality, such analyses use the existing data of the costs of facilities and services as a starting point. The existing actual recorded costs must then be modified downwards in line with changing trends in underlying cost factors due partly to technological innovations. In telecommunications, the average unit costs takes a downward trend of the absolute decrease in technology costs and increasing utilization of equipment and networks (Bezzina & Terrab, 2006). Chang (2009) says that cost-based pricing methods in providing interconnection to improve and sustain efficiency and competition is well justified, however, says that the issues

of the way costs are measured, used and how the common costs (or overhead costs) are allocated in the process of pricing the interconnection regime need to be well addressed.

Unbundling ensures that the network elements used by an interconnecting party are isolated and allocated costs and that the prices charged should reflect the isolated elements for efficiency because effective competition that can only be sufficiently realized if service costs are sufficiently unbundled (WTO, 1997). Additionally, the Reference Interconnection Offer (RIO), required to be made available by interconnection suppliers, should provide a transparent reference on issues concerning interconnection traffic, traffic route capacities, tariffs, the level of interconnection, the transmission technologies, billing and signaling protocols and all other technical issues that are necessary for the efficient conveyance of traffic between interconnection providers with those seeking interconnection. In addition, issues of Quality of service that includes the Grade of Service (GoS) offered during busy hour, the Answer – Seizure ratios (ASR), transmission loss and delays, noise and distortions, echo, cross-talk and bit error rate etc, need to be addressed because of the effects on all including the consumers, applications, communication systems and providers. For example, availability of inadequate traffic routing capacity at the interfaces results in the occurrence of congestion which has an exponential effect to the entire network due to repetitive attempts made by the end users (WTO, 1997).

2.3.5. Project Financing Challenges

It is recognized that project financing can facilitate more effective and large-scale infrastructure activity including reduction of business operational constraints

particularly in the cases where large financial resources are required. Funding of telecommunications programs may cover the cost of equipment procurement from vendors, installation, operations and maintenance, provision of access and business sustainability necessary market entry (Sohaimi et. al, 2002).

It is recognized that, the involvement of entrepreneurs and venture capitalists in the economic process of financing ICT companies and investments is important in view of the fact that the entry of ICT companies into markets is strongly influenced by external factors that include the financial environment and market vibrancy and that shortage of the financial instruments is commonly associated with less vibrant markets (Sohaimi et. al., 2002). The success of ICT operations, in the Malaysia Multimedia Super Corridor (MSC), for example, had attributed to the availability the above financial instruments on the market (Sohaimi et. al., 2002). Sohaimi et. al. (2002) further say that, official development aid and bilateral donor investment support in telecommunications infrastructure had shrunk since the 1980s attributing the shrinking to the shift of telecommunications ownership from public to private hands and therefore the need to avoid market distortions. The gap in the official development support had however been replaced by private investments and that the World Bank had actually increased finance availability for ICT operations through the International Finance Corporation (IFC) private sector financing wing, despite the reduction in bilateral and other official development aid (Sohaimi et. al., 2002). The IFC had been funding private sector based projects, especially at their early stages, to enable private operators to penetrate markets. However, high risk levels, high start-up costs and the concern that the projects may not generate profit for several years has been cited by other financiers as the cause for the lack of adequate

financial instruments (Michel, 2005). James et. al. (2004) say that, access to financing as start up capital and for expansion is the biggest problem for entrepreneurs in the East African region. The banks in the region had tended to insist on full collateral like real estate assets and that the banks were generally not lending against income. Awuondo (2004), the Chief Executive Officer of Commercial bank of Kenya, also admits that the stringent evaluation criteria applied by banks and the insistence on short term financing had discouraged investment opportunities in ICT, despite recognizing its role in enhancing operational efficiency, its research support capabilities particularly with regards to use of the Internet, skill and software development.

2.3.6. Technical and Infrastructure Challenges

Although telecommunications services and equipment are changing rapidly, there is the tendency for by incumbent operators to play the safe options by providing well known services using familiar technologies, despite the benefits and availability of new technologies. The intellectual property rights instruments are used by regulators to correct the behaviour by rewarding innovation, therefore benefiting consumers in terms of new innovative and technological solutions. However, Iversen (2000) argues that in the environment of rapidly evolving information and communication technologies, this area of technical standardization is getting highly protected in terms of intellectual property rights (IPRs) and that Patents and other IPRs owned by some individual developers of technology may undermine the collective pursuit of technical standardization that seeks to serve the common interests of the industry. He further argues that the co-evolution of standards by the standards development

organizations (SDOs) and IPRs that was initially complementary in the innovation process is likely to graduate into tension between the individual pursuit of the IPRs and the public interest as the pace of digital innovations increases. Armstrong and Ford (2006) on their part also say that digital technologies and international networks provide an exciting avenue for students or researchers to access unparalleled amounts of information on which to build and innovate. The Internet also provides an opportunity to slash the costs of academic publishing, allowing academics, researchers and scholars to engage in a continual process of self-publishing and interactive editing. They add that despite these developments, many of the opportunities afforded by the application of the new technologies are being limited by a system of copyright that emphasizes the protection of content by distributing to a limited fee-paying audience or imposing highly restrictive conditions for access and use even when the content is publicly-funded or of greater public-interest content.

Type an Approval process, which sets and ensures standards for the industry including support for service and network interoperability, compatibility, minimization of interference, as well as protection and maintenance of the network integrity, should closely support advancement of new technologies and services. An effective management of the type approval process should therefore ensure a ccredible telecommunication networks, public safety, minimum interference incidences amongst wireless network operations, safeguard and preserve the network integrity and eliminate dumping of inferior or sub-standard equipment in the market (Hawkins, 1993).

2.4. Critical review of major issues

This section critically reviews the literature on key regulatory issues that ensures effective economic and social benefits which are critical to market entry and network development. The regulatory issues discussed include aspects of Interconnection, Administration of the scarce resources, regulation of quality of service regulation (QoS) and consumer protection issues, Technical Regulations, social regulatory issues universal service/access, Compliance and Enforcement, privatization and competition

2.4.1. Interconnection

Without an efficient interconnection regime, the market becomes uncompetitive and a barrier market entry. Interconnection that entails connecting wholesale interconnection suppliers with retail networks is therefore a regulated entity to facilitate call origination, conveyance and termination (Intven & Tetrault, 2000). Wholesale interconnection suppliers that also provide services to end users may be tempted to discriminate in favour of traffic that originates from its own end-customers and against traffic that originates from customers of interconnected networks. The interconnection provider may not even have the incentive to offer quality service to the interconnected 'customer' network. WTO and ITU prescribe rules to guide commercial inter-party agreements as well as provide regulatory interventions. These basic rules work to establish and manage an effective and cost-effective interconnection regime that enables the operators to build and sustain a viable business model. As a pre-emptive measure towards the attainment of the above objectives, certain principles have to be adhered to including the presence of

the Point of Interconnection (POI) at the nearest, technically feasible points and the conclusion of interconnection agreements within the set time period (Intven & Tetrault, 2000). The consultancy services for the Development of Rural Telecommunications Strategy developed for Botswana Telecommunications Authority had recommended a maximum period of 60 days before the automatic intervention of the regulator for adjudication and where necessary, the imposition of the cost based Interconnection fees (MCST, 2006).

2.4.2. Administration of Scarce Resources

The efficient provision of telecommunications services require that there is an efficient management and administration of scarce resources that include spectrum, numbers and rights of way. Policies and regulations with regards to utilization of telecommunications numbers and spectrum have been undergoing changes in view of the challenges of convergence and the need to ensure their efficient utilization (Intven & Tetrault, 2000). Melody and Møller (2006) also say that access and use of the rights-of-way, which is the privileged use of streets, corridors, public and private property for public services and normally granted by municipal, city authorities, public utility operators and transport operators (including telecom, electricity, gas, water, cable television and rail to facilitate the provision of a public service), play a fundamental role in the implementation of telecom reforms, market entry and infrastructure development. Sarrocco and Ypsilanti (2008) adds that new entrants face great challenges especially with respect to access of rights of way, in order to penetrate new markets. The largest percentage of costs in rolling out new infrastructure is construction costs related to rights of way. This therefore gives

incumbent operators significant advantages because of their control over the rights of way and ducts. In the United States of America, the vast majority of telecom network infrastructure investment costs are in the local distribution network and that the major long distance companies pay to the tune of 40-60 percent of their revenues to the local telecom operators for use of their local distribution networks to access end users (Melody, 1997).

The report to OECD forum further says that owners of the rights of way like the municipal and city councils and other regional bodies, have the tendency of prescribing difficult terms of access to the rights of way for new entrants. Sarrocco and Ypsilanti (2008) further say that, in view of this impact to new entrants in the construction of ducts and other civil works, it is recommended that that fair terms for access and use of rights of way, granting of authority over the administration of the rights-of-way, coordination and dispute resolution mechanisms, harmonization of administrative procedures and consistency in the application of procedures across the country, reduction of fees, prescription of minimum conditions to owners of ducts with regards to maintenance, encouragement or obligating incumbent communication companies, utilities and municipal councils, with regards to infrastructure sharing and access to the rights of way , the application of the principles of public-private partnerships in the deployment of infrastructure, consideration for regulatory measures that impose pre-wiring and sharing of internal wiring of new residences etc (Sarrocco & Ypsilanti, 2008). It further says that in order to reduce costs with regards to delays in rolling out networks and to ensure predictability and certainty, the timelines for providing permits require to be put in place and that the principle of infrastructure sharing be encouraged to minimize

multiple excavations and other civil works along and across streets, in building especially for telecommunications cabling and other utilities. Melody (1997) says that some key telecommunications operators indeed, evolved from a negotiated use of the Rights of Way of other public utilities companies. In the United States of America, the telecom operator, Sprint, evolved from the communications division of the parent Southern Pacific Railway Company to a long distance communication carrier in the United States largely because of the use of the rights of way infrastructure of the parent company, following the introduction of competition in national long distance services in 1971. MCI on its part made its entry into the telecommunications market mainly by laying the fibre cable network alongside Amtrak rail infrastructure. In the UK, Mercury used the British Rail infrastructure to penetrate the UK market, while British Telecom used the fibre cables laid along the Netherlands state railway in order to penetrate the European Market (Melody, 1997). Similarly, some Cable television operators entered telecom markets by use of their own rights of way. Energis of UK and Tokyo Electric Power Company of Japan entry into telecom market was largely due the direct connection they had with residences and business customers (Melody, 1997). Melody (1997) says that methods of accessing the rights of way needs to be reformed to allow non-discriminatory access and to avoid situations which require individual negotiating skills on the part of the new entrants and that access to the rights of way should apply the same principles of transparency and non-discriminatory access applicable in the case of assignments of the spectrum and numbering resources to multiple operators.

The Administration of ttelecommunications numbering resources are standardized by the ITU in accordance with the ITU-T Recommendation E.164 (ITU, 2005). Despite the above standardization, Milne (1995) says that telephone numbers have enormous value and support for competition. The prescribed uniform dialling procedures among operators and enabling of the users to retain telephone numbers while changing service providers provides an environment for enhanced competition (Milne, 1995). Additionally, recent developments in telecom market showed that numbers can get exhausted if not properly managed. In some countries, the use of Toll-free services have been known to have the greatest danger of getting exhausted potentially hampering the growth of service and innovation (Milne, 1995).

Radio-communications spectrum is a scarce resource that supports many applications that were traditionally been licensed based on specific discrete services such as for cellular mobile operations, terrestrial, satellite, long distance and space broadcasting. Arnbak (1997) says that although technological advancements have continued to expand the spectrum in terms of capacity and faster development, they have introduced complex challenges with regards to the use and management of the spectrum. The trend of licensing, allocations and pricing of spectrum is among the areas that provides the challenge. One such challenge is, for example, in the transfer of an allocation or part of the allocation to other licensed users and entities without prior approval from the regulator (Arnbak, 1997). The other newer approach is in the pricing of spectrum where the application of auctioning and administrative pricing principles is applied in order to ensure efficient utilization of spectrum (Torre & Rush, 2006). Arnbak (1997) says that newer spectrum management policies are required to accommodate the newer technological neutrality approaches in spectrum

management, and faster deployments (eg. in-band migration from analogue to digital spectrum or moving to the third generation (3G) services) and flexibility on spectrum use. The need to rip the benefits and flexibility of wireless technologies in the provision of communications services, calls for newer policies and efficient licensing approaches in order to give certainty to investments in communication services necessary for the attraction of capital needed for long-term capital infrastructure investments. The development of initiatives like the third Generation (3G) technologies and beyond, adopted by the ITU in the year 2000 and World Radiocommunication Conference 2007, and development of other networking standards like Wireless Fidelity (WIFI) and WiMAX that support local area networking for nomadic devices such as computer laptops, huge data streams and other spectrum dependent devices are among the global initiatives that require developments of newer policies (Arnbak, 1997).

2.4.3. Quality of Service regulation (QoS) and consumer protection

Milne (2004) says that, the motivation for regulating Quality of Service is because, any reduction in quality of service is like increasing the price using the back-door. This ‘back-door’ increase may be applied in order to achieve intended target prices for regulated services. In a fully competitive environment, where comparable QoS figures are published, users of the services are empowered to make informed decisions. The study conducted by the European Commission had identified key quality of service indicators they considered necessary for regulatory intervention including the speed of service provision, fault repairs, call connection rates, voice transmission quality, payphones, billing and operator services (Milne, 2004).

2.4.4. Technical Regulations

Technical regulations are normally applied to technical areas affecting network security, quality, policy, legal, and national security implications. In most countries, issues of radio spectrum, electromagnetic compatibility and protection, radiation control and terminal equipment type-approval specifications, all tend to be governed by mandatory regulations. The ITU issues regulations on sharing the radio spectrum, standardization and the harmonization of international public network operations, among other things, which when accepted, their use becomes binding. In telecommunications, majority of the technical regulations are done for interoperability and agreed by consensus, and administered by ITU telecommunications standardisation bureau (Hawkins, 1993).

2.4.5. Universal Service/Access

"Universal Service" was first used by Theodore Vail, the President of AT&T, describing the telephone system as the system that should be universal, interdependent and intercommunicating, affording opportunity for subscriber belonging to different exchanges to communicate (Intven & Tetrault, 2000).

ITU defines Universal Service as the objective of making communications facilities available to every member of society on an individual or household basis. The concept also ensures affordability of the ICT services. In essence, universal service refers to having an affordable phone service in every home with a defined minimum level of quality of service. This definition and concept of universal access has however been changing due to technological innovations, convergence and the need for market efficiency. According to Garnhan (2006), the definition of affordability

and reasonableness should be removed from the overall definition of Universal Service arguing that, it has the potential of encouraging cross subsidization which can distort the overall market efficiency, the overriding consumer preferences and consumption patterns.

Within the context of the information society, where the internet, mobile, broadband and other value-added services suffice, there is debate as to whether the scope of Universal Service should include broadband services and other knowledge-based services crucial in the realization of information and knowledge based society (Torre & Rush, 2006). For example, the emergency of VoIP operators and whether these operators with converged services should have universal service obligations included among the licence conditions, the way applicable to the traditional operators, is the question which is yet to have a global consensus. Some jurisdictions do not impose universal service obligations on such providers due to concerns that this would inhibit their development and the development of new technologies. However, as more traffic shifts from the legacy Public Switched Telephony networks to the Internet Protocol (IP) based networks, the above trend is changing to obligate all operators in providing universal services and contributing towards the Universal Service Fund, due to the realities of convergence of communication infrastructure and the need to foster the use of new and innovative technologies to achieve future universal service goals (Torre &Rush, 2006).

Universal Access concept generally means access to publicly available communication network facilities and services such as pay telephones, community telecentres on a shared, rather than individual basis. Intven and Tetrault (2000) say

that ‘availability’, ‘accessibility’ and ‘affordability’ are key parameters of universality and the continued reliance of the Internet and telephony for the delivery of goods and services is continuously being viewed by policy makers as a basic right of all citizens and every individual should have the right to access information - regardless of disability, economic situation, or geographic location.

2.4.6. Compliance and Enforcement

Sector Regulators have the responsibility of ensuring compliance to license conditions. They also have the responsibility of ensuring compliance to regulated frequency power parameters, quality of service parameters, standards, Type Approval, dialing formats, scope of the license, billing parameters, provisions for emergency services, compliance to universal service obligations etc in support of fair competition and protection of Consumers (Intven & Tetrault, 2000).

2.4.7. Privatization and Competition

Privatization is a measure that can contribute towards an easier market entry and encouragement of competition, by enhancing market forces and efficiency (Beesley & Littlechild, 1996). Bishop et. al. (1996) identifies three factors, including Finance, Information and control, to justify privatization. Through privatization, governments may raise the required finance by dispensing of its assets, private firms may raise finance from capital markets and information necessary for setting of prices. Bishop et. al. (1996) also says that though competition ensures that prices are consistent with efficient allocation of resources and low costs of supply, even in the absence of effective competition, privatization may be applied to encourage greater efficiency.

Beesley and littlechild (1996) also adds that competition is a very important mechanisms for maximizing consumer benefits and for limiting monopoly power, and that artificial barriers to entry like access to the scarce resource, airspace routes and other routes, rights -of-ways, landing rights, land etc, must be removed, in order to maximize the benefits. Wallsten (1999) says that whereas regulators apply several methods generally to regulate the market and specifically to support innovation, to ensure standards, interoperability and the release of the scarce resource, competition is the most effective method for promoting improvements in the telecom sector. Wellenius (1992) complements the above arguments on competition by stating that a single monopoly operator, whether state or private-owned, will always be unable to react to the large, varied, and rapidly changing demands of the users, and that competition is the most likely application that could make the above monopolistic operators put more focus and attention on customer service, accelerate network expansion, reduce costs and prices.

While privatization can result in great improvements, it must be combined with effective regulation. Ambrose et. al. (1990) noted that by simply moving a monopoly public operator to the private sphere does not result in competitive behavior. They further say that private investors had demanded independent regulators because of the fear of politicization of processes. Megginson et. al. (1994), in the study done in Latin America on comparing pre- and post-privatization financial and operating performance of sixty one companies (including telecommunications) from eighteen countries, found that, the firms, after being privatized, increased real sales, became more profitable, increased their capital spending and their work forces, and improved their operating efficiency. Petrazzini

and Clark (1996), while studying the effects of competition in Latin America and Asia, also found that, cellular and mainline penetration in a competitive market is much higher than in noncompetitive markets.

2.5. Gaps that require filling in the study area

There are studies that support the claim that facilities-based entry stimulates investments. Competition amongst facility service providers is argued as a principal method of ensuring efficient attraction of investments in local exchange infrastructure. Therefore consideration for the removal of artificial restrictions to facilities-based entry and on incumbent investments in advance and the benefits that accrue out of investment opportunities from the healthy interaction of incumbent and new entrants should support competition and the growth of a more advanced communications infrastructure (Woroch, 1998). Pierce (2008) also identifies unbundling of the Local loop as a critical area that ensures easier market entry and competition. There is no research, to date, that has been conducted to establish the reasons for the non realization effective market entry and rollout targets in the ICT sector in view of the fact that many operators have been licensed to rollout services in the local loop environment in Kenya.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1. Introduction

This chapter describes the methodology that has been used in the study. It also describes the population of interest, sampling design and techniques used to select the sample size and the procedure which was used for data collection and analysis.

3.2. Research Design

Descriptive research design was used in this study and given the objectives of this study; the research was quantitative in its approach that results in the generation of quantitative data. This design was seen as appropriate for this research because it examines the situation the way it is, and no changes or modification of the situations under investigation was done (Kothari, 1990). Additionally the targeted respondents were allowed to enumerate their independent views, knowledge and experience as sector professionals, causes and challenges they had encountered or continued to encounter in the process of entering or ensuring entry into the local loop markets for the provision of ICT services and the mechanisms that are in place to ensure efficient rollout. Descriptive research design is used where the question under study is defined and where the field survey is undertaken by getting information directly from the respondents about the problem as it is (Mugenda & Mugenda, 1999).

3.3. Target Population

This research targeted a total of 101 respondents. The respondents targeted were employees of atleast of middle level, from the areas responsible for the sales,

marketing, operations, maintenance, legal and regulatory, product development, project planning and implementation work from the licensed operators in the local loop, including Internet Service Providers in Kenya that had been issued with numbers.

Also targeted were respondents responsible for the Frequency regulations, compliance, core network, Access network planning, Trunk network planning, Interconnection negotiations, Radio network site planning, transmission network planning, billing and validation and interconnect revenue from fixed and mobile operators, Network Facility providers and wholesale interconnection providers and finally, respondents drawn from Licensing, Compliance, Standards, Consumer Affairs, Frequency Spectrum management, Competition, tariffs and Markets and Universal Service departments of Communications Commission of Kenya, as the sector regulator.

3.4. Sampling

A census enquiry of the population was done for all the targeted respondents. This census enquiry was found feasible and was motivated by the need for the presentation of a more accurate position with regards to the questions under study.

The targeted population and sample size are as shown in Table 3.1.

Table 3.1: Sample Population

Respondents	Target Population	Ratio	Sample size
From non-operating ISPs with numbers and LLO	27	1	27
From operating Local Loop Operators	6	1	6
From network facility operators including mobile operators and wholesale interconnection suppliers	40	1	40
From Communications Commission of Kenya.	28	1	28
Total	**101**	**1**	**101**

3.5. Data collection instruments

A questionnaire was used in the collection of data for this study. The questionnaire included both open-ended and closed questions. The questionnaire had been designed to target independent and professional views of the respondents, including their experiences, challenges and useful information from the industry professionals from the targeted operators and respondents the sector regulator.

A questionnaire was structured to capture information beginning with background information of the respondents with regards to name, the company, gender, industry experience, the type of license provided by the sector regulator and the position held in the company by the respondent. The rest of the Questionnaire was divided into four sections with each section representing an objective.

There was also secondary data on the list of licensees. This data was quoted from the CCK website. The list of key contact persons from among the licensed companies was also received from CCK.

3.6. Data collection procedure

The questionnaires were delivered directly to the respondents, by the researcher with the assistance of a research assistant. Four Questionnaires were sent by Email with prior arrangement with the respondents. The questionnaires were followed up with the respondents by phone and in some cases physically, with appointments, to ensure that they were filled within the period of four weeks as per the timelines in the appendix and to ensure clarity and accuracy in the filling of the questionnaires. The questionnaires were picked whenever the respondents had completed filling them. One was filled online and sent back by Email.

3.7. Data Analysis

Forty six responses were received and the raw data obtained were examined to ensure minimum errors and omissions with regards to consistency, proper and clear data entry. The useful data was analyzed and the open ended and closed questions were quantitatively and qualitatively analyzed respectively The analysis of the closed-ended questions was done with the assistance Statistical Packages for Social Sciences (SPSS) software, while the views from responses from the open ended questions in the questionnaire were put together in a table form to check for commonality.

3.8. Data Presentation

The data output of the data analyzed was mainly percentages, mode and to a lesser extent frequency distribution. The findings were presented in a form of bar charts and tables. Microsoft excel package was mainly used in the generation of tables and bar charts, and calculation of percentages.

CHAPTER FOUR

4.0 RESEARCH FINDINGS AND DISCUSSIONS

4.1. Introduction to research findings

The broad objective of this study was to establish challenges of realizing market entry and rollout targets of telecommunications licensees in the local loop in Kenya.

This chapter, therefore, presents the findings from the analyzed data collected from the field and which is presented in a form of bar charts and tables.

4.2. Background

In the background of the Questionnaire, questions related to the company and personal details of the respondents in terms of gender, industry experience, company, category of the license and main business category, were asked. The analysis is as shown in Tables 4.1 and 4.2.

4.3.1. Distribution of respondents according to gender

The distribution of respondents according to gender is indicated in Table 4.1.

Table 4.1: Distribution of respondents according to gender

Gender Category	Frequency	Percent
Female	5	11
Male	41	89
Total	**46**	**100**

From the above analysis, eighty nine percent of the respondents were from the male gender while eleven percent from the female gender category. This indicated that

most professionals in the ICT industry that participated in this research were of the male gender category.

4.3.2. Distribution of respondents according to industry experience

Table 4.2: Distribution of respondents according to industry experience

DISTRIBUTION OF INDUSTRY EXPIERIENCE		
Period of Experience	Frequency	Percent
2 Years	1	6
3-5 Years	5	31
6-8 Years	2	13
9-11 Years	2	13
12-14 Years	1	6
15-17 Years	0	0
18-20 Years	3	19
Over 20 Years	2	13
Total	**16**	**100**

On industry experience, out of sixteen respondents that had indicated their industry experience, Ninety four percent of the respondents had more than two years experience in the industry. This level of industry experience indicates that the views expressed are reliable.

4.3.3. Distribution of respondents according to company

Distribution of respondents according to company and license category is indicated in Table 4.3.

Table 4.3: Distribution of respondents according to company

DISTRIBUTION OF RESPONDENTS COMPANIES AND RESPONDENT DISTINCT UNITS			
Company	Frequency	Percent	Number of distinct units
Africa spinoff	1	2	1
Africa online	1	2	1
Broadband	2	4	2
CCK	16	35	13
Kenya Data Network	1	2	1
Royaltel	1	2	1
Safaricom	3	7	3
Sahannet	1	2	1
Sovaya	1	2	1
Telkom kenya	16	35	7
VSL	1	2	1
Web engineering	1	2	1
Zain	1	2	1
TOTAL	**46**	**100**	**34**

From the analysis in table 4.3, thirty five percent of the respondents who participated in this research, were from incumbent operator, Telkom Kenya. The incumbent operator provide the bulk of professionals that are distributed in various entities ranging from providing access to infrastructure, the rights of way and

interconnection supply that is of direct impact to the local loop operators, the Internet service providers and other entrants.

4.3.4. Distribution of respondents according to market categorization

Table 4.4: Distribution according to market categorization

DISTRIBUTION ALONG MARKET CATEGORY			
Institution and Licence category	**Frequency**	**Percent**	**Departments or distinct units**
Regulator	16	35	13
ISP	4	9	4
Local Loop Operators	4	9	4
Facility Service Provider	22	47	13
TOTAL	**46**	**100**	**34**

Distribution along the market category

The analysis indicate that forty eight percent came from facility service providers, who includes mobile and fixed operators and infrastructure and interconnection providers, thirty five percent from the sector regulator and nine percent from each of the Internet Service Providers and Local Loop operators. The respondents from the Facility Service Providers and the Sector Regulator were distributed in thirteen distinct units or departments within the organizations, giving an average of two respondents per distinct unit for the case of Facility Service Providers and an average of one respondent per unit, for the case of the Sector Regulator. The above distribution is uniform and therefore results in an objective census.

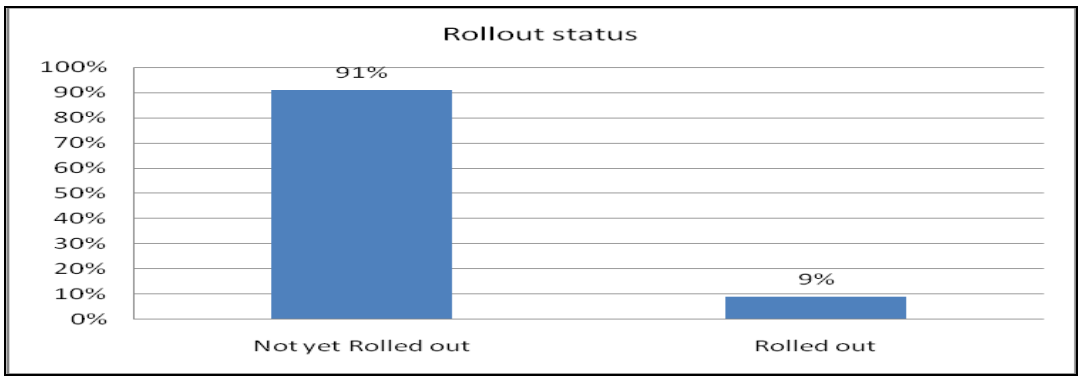
4.3. REGULATORY CHALLENGES

One of the objectives of this research was to establish the regulatory challenges that affected the realization of market entry and rollout targets of the telecommunication licensees in the local loop. In trying to establish the views on the regulatory challenges, the respondents' views were sought on the following issues.

4.3.1. The operational status of local loop and ISP licensees

The responses from local loop and ISP licensees on their operational status are summarized in the Table 4.5.

Table 4.5: Indication of whether the licensees had rolled out services

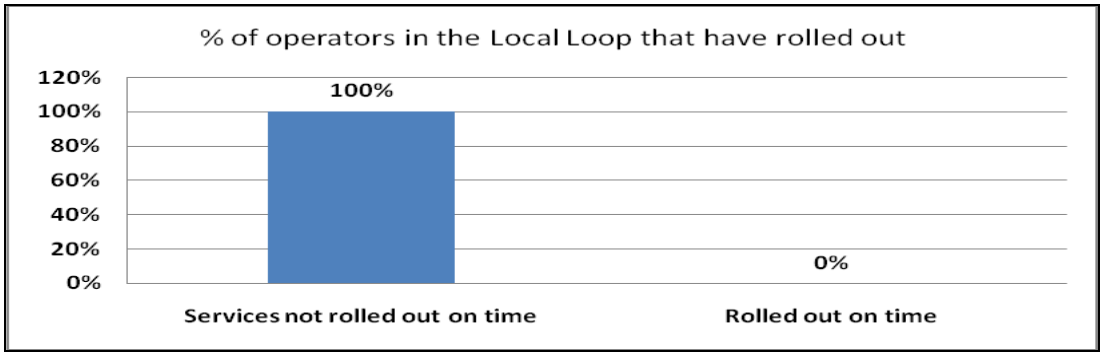


As indicated in Table 4.5, ninety one percent of the respondents from the local loop and internet service category had not managed to rolled out at all.

4.3.2. Whether those operators who had rolled out the services, had done so within the agreed time frames

On the question whether the operators who had rolled out the licensed services had done so within the stipulated time frames, Table 4.6 summarizes.

Table 4.6: Whether licensees were operational within the agreed time frames

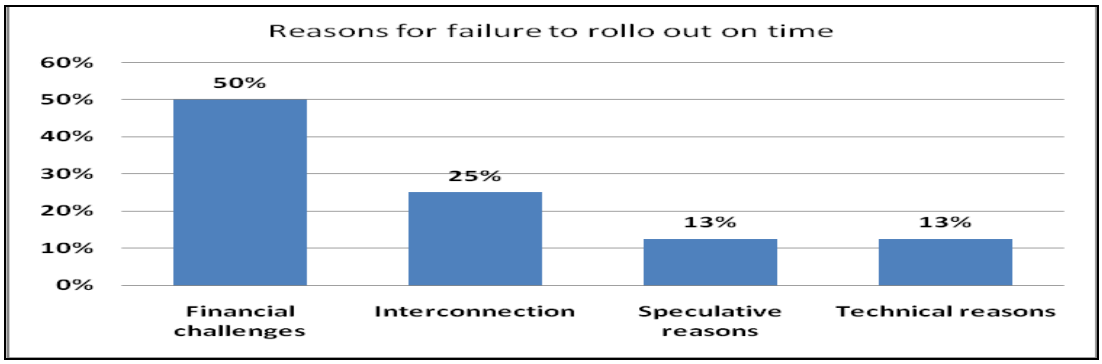


The analysis of table 4.6 indicates that all the Local Loop licensees that were operational, did not roll out within the stipulated times.

4.3.3. The reasons for failure to operate within the agreed time frames

The reasons cited by respondents from the LLO and ISP category as the cause for the failure to roll out the services within the agreed time frames are as shown in the Table 4.7.

Table 4.7: The reasons for failure to operate within agreed time frames



Fifty percent of the respondents cited financial challenges as the main reason that caused the inability to rollout on time while twenty five percent cited interconnection challenges. Thirteen percent of the respondents cited the reason for

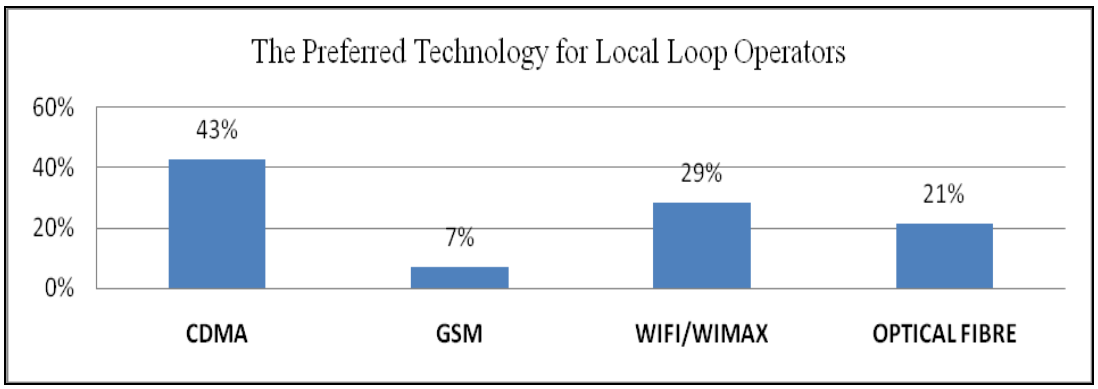
not rolling out on time as due to speculative reasons by some investors while another thirteen percent cited technical reasons.

From the above findings, access to interconnection and financial challenges, were cited by seventy five percent of the respondents as the main causes for the failure to realize rollout datelines by local loop operators and internet service providers.

4.3.4. Preferred Technology in the rollout

On the question of which technological application was the most preferred, in the local loop rollout, the views are as indicated in Table 4.8.

Table 4.8: Preferred technology in the rollout by licensees in the local loop

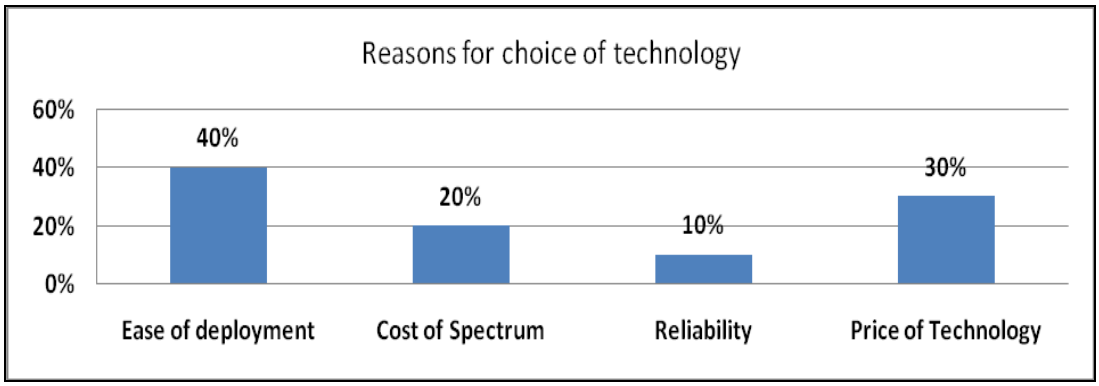


As indicated in Table 4.8, forty three percent of the respondents preferred the application of Code Division Multiplex Access (CDMA) technologies, for voice and data while twenty nine percent preferred the combination of WIFI and WIMAX technologies. Twenty one percent preferred the optical fibre technologies while seven percent preferred the application of Global System for Mobile (GSM) technologies in the local loop.

4.3.5. Greatest reason that influenced the choice of technology

Table 4.9 indicates the reasons that influenced the choice of technology in the rollout of the licensed services.

Table 4.9: Greatest reason that influenced the choice of technology for rollout

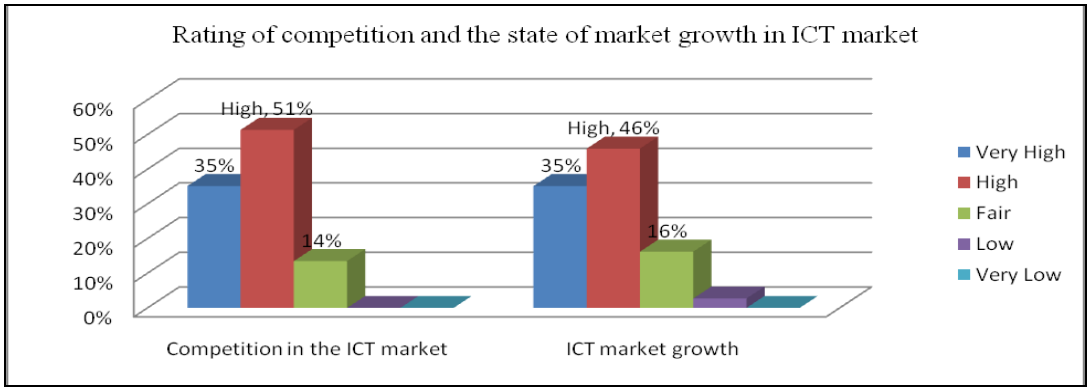


As indicated in Table 4.9, forty percent of the respondents said that the greatest reason that influenced the choice of the technology is the ease of deployment. Thirty percent indicated the price of the technology, twenty percent indicated the cost of spectrum and ten percent indicated technological reliability.

4.3.6. Competition in the ICT market and market growth

Table 4.10 illustrates the view on the state of ICT market growth and competition.

Table 4.10: The state of competition in the ICT market



a) Level of Competition in ICT

Fifty one percent of the respondents were of the view that competition in the ICT market is high while thirty five percent were of the view that it is very high. From the above analysis, eighty six percent of the respondents indicated Competition as being high. This may be seen by the way operators in ICT are innovative prices and technological solutions to consumers including mobile money transfer and mobile banking services, among others.

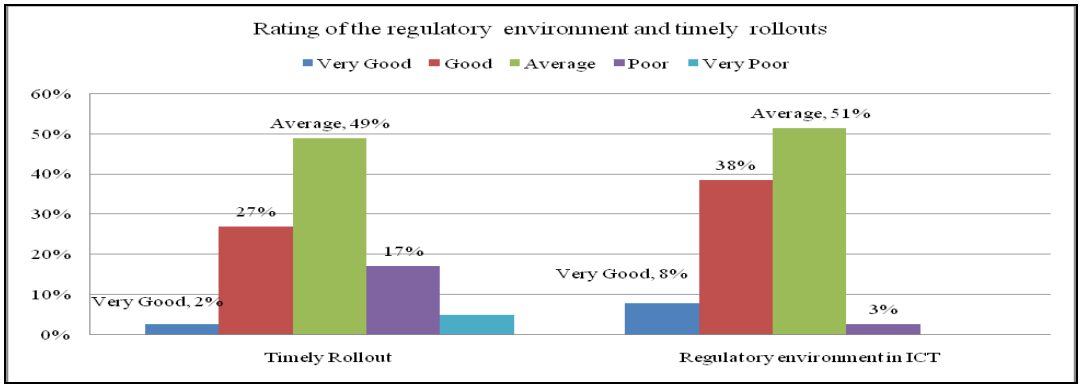
b) Level of ICT market growth

On the level of ICT market growth, a total of eighty one percent of the respondents rated the ICT market growth as high while sixteen percent indicated an average growth. Only 3% considered the market growth as low. These findings concur with the CCK statistics report findings for the year 2008 which indicated the ICT market growth rate as high (CCK,2008).

4.3.7. The regulatory environment and timely rollout in ICT market

On the state of regulatory environment, timely rollout and fairplay amongst operators in the ICT, Table 4.11 summarizes.

Table 4.11: The state of regulatory environment and timely rollout operators



a) Timely rollout

On the state of timely rollout, two percent of the respondents are of the view that, the state of timely rollout is very good. Twenty seven percent of the respondents view the state of timely rollout as good. A total of twenty two percent of the respondents were of the view that the state of timely rollouts is poor while a total of forty nine percent indicated 'timely rollout' as average. On the overall, twenty nine percent of the respondents view the state of timely rollout as good. The analysis of table 4.11 indicates that the state of timely rollout is neither good nor poor.

b) Regulatory environment

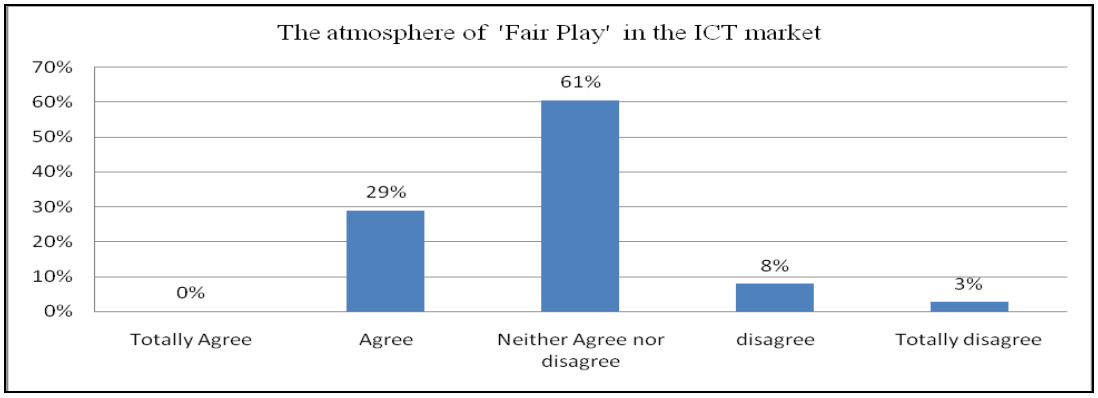
On the regulatory environment, a total of forty six percent of the respondents regard the regulatory environment as good while fifty one percent rated the regulatory environment as fair. Three percent regarded the environment as poor.

This indicates confidence in the regulatory environment; however a lot of improvement is required to be done on order to increase investments in ICT.

4.3.8. Rating of ‘fair play’ amongst operators in the ICT market

Table 4.12 presents the findings on the rating for ‘Fair Play’ in the ICT market.

Table 4.12: Rating of ‘Fair Play’ amongst the operators in the ICT market



From the analysis indicated in Table 4.12, a total of twenty nine percent of the respondents agree that there is ‘Fair Play’ amongst competing operators in the ICT market. Eight percent disagree while three percent totally disagree. Sixty one percent of the respondents neither agreed nor disagreed that there is the atmosphere of ‘Fair Play’ in the ICT market.

This rating shows that, there is a lot that requires to be done to ensure there are no uncompetitive practices in the ICT market. This rating compares well with the regulatory environment and timely rollout, as indicated in Table 4.11, which was viewed as average, despite the high growth rating in ICT and the competitive environment as indicated in table 4.10.

4.4. PROJECT FINANCING

One of the objectives of this research is to establish whether financing aspects provide a challenge in the realization of market entry and rollout targets of the

telecommunication licensees in the local loop. In trying to establish the views on the financing challenges in the rollouts, the respondents' views were sought on the following issues.

4.4.1. How the Licensees had planned to finance their network

The respondents were asked on how they had planned to finance their networks. Table 4.13 provides the summary of the findings.

Table 4.13: Planned network development financing options

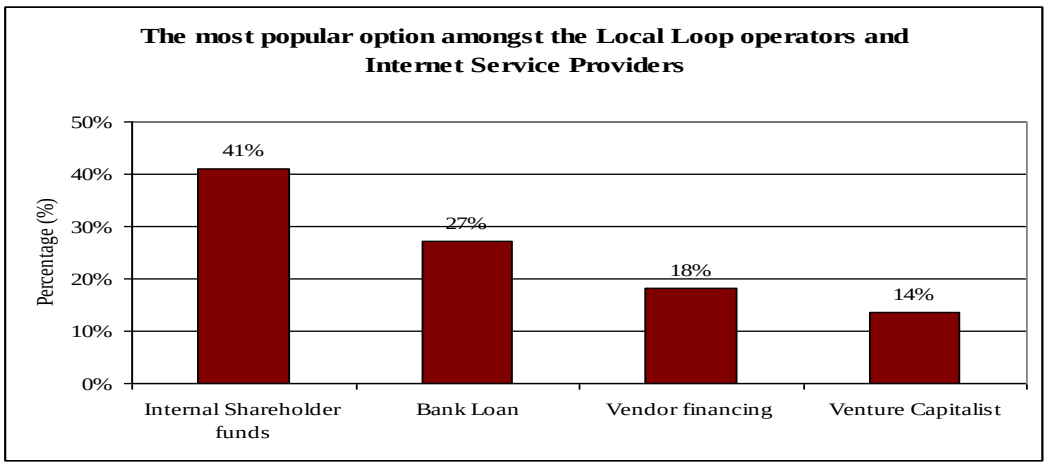
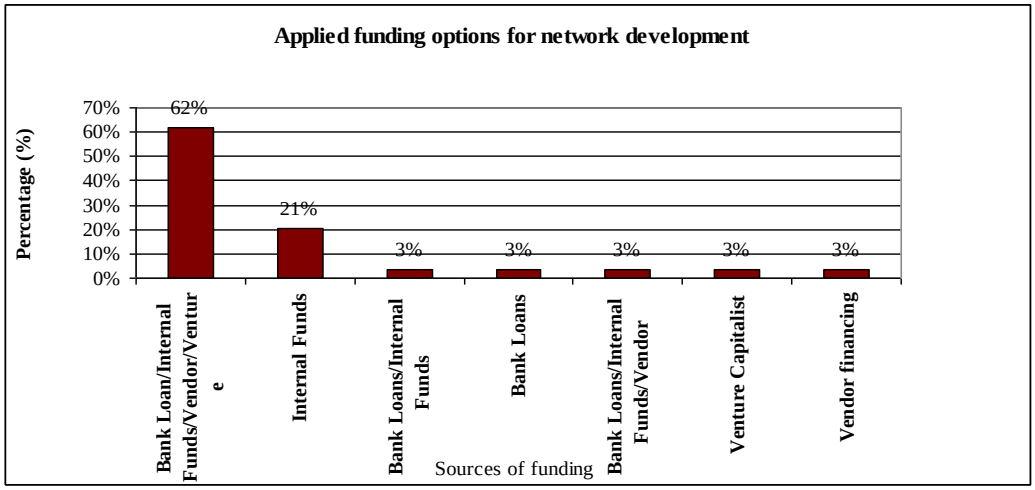


Table 4.13 shows that forty one percent of respondents had planned to use internal shareholder funds to finance the rollout of services. Other than the preferred internal shareholding funding option, twenty seven percent of respondents preferred using the bank loan option while eighteen percent planned to use vendor financing.

4.4.1. How the Licensees actually financed their network developments.

The respondents were asked how they had actually financed their networks. Table 4.14 provides the summary of the findings.

Table 4.14: Financing that was applied in the rollout of their networks

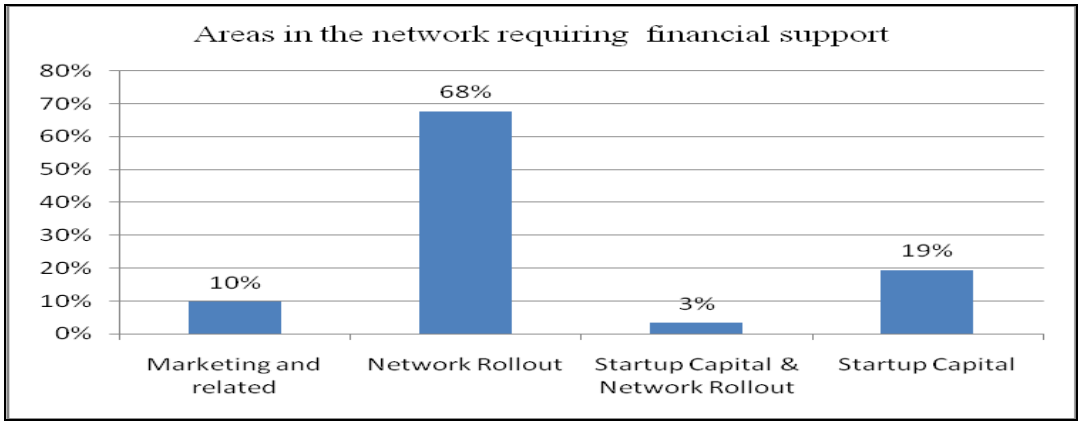


Sixty two percent of the respondents had actually applied a combination of all funding options ranging from vendor financing, venture capitalist, use of internal funds and bank loans in the realization of market entry and rollout. The preference for a combination of funding options was attributed to the unavailability of specialized funding option tailored for funding ICT investments on the market.

4.4.2. The areas of the network that required the highest financial input

The respondents' views on the areas of the network that require the highest external financial input, the results are summarized in Table 4.15.

Table 4.15: Elements of network rollout that had the greatest financial inputs

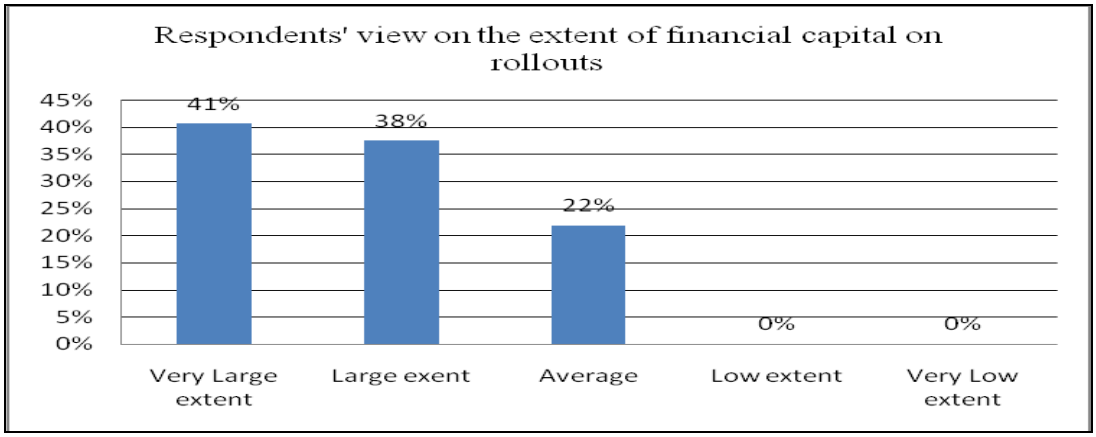


Sixty eight percent of the respondents had indicated that network rollouts constitute the area of the network development that requires the greatest financing. This finding suggests that whereas startup capital for equipment procurements, installations, provision of access is necessary, the majority of the funding support is required for the continuous process of network development.

4.4.3. The extent by which financial capital impacts on network development

On the question to respondents on the extent financial capital affect rollouts and network development, Table 4.16 summarizes the responses.

Table 4.16: The extent by which financial capital impacts on network development



Forty one percent of the respondents had indicated that financial support was critical to a very large extent in support of market entry and network developments, while thirty eight percent to a large extent. Twenty two percent were of the view financial support was neither critical to a large extent nor critical to a low extent. The analysis show that a total of seventy eight percent of the respondents are of the view that financial support in critical to a large extent. No respondent had indicated that financial support was critical to a lower extent.

These findings support the views expressed by James et. al. (2004), that access to financing as start up capital and for expansion is the biggest problem in the East Africa region because of banks policy on investments in ICT as of high risk.

4.4.4. Suggested options to overcome financial challenges affecting the sector

Tables 4.17 and 4.18 summarize the views made by respondents on how to overcome the financial challenges that affect the sector. Table 4.17 summarizes the suggestions related to funding while Table 4.18 on suggestions related to regulatory and infrastructure. A total of sixteen respondents made suggestions on how to overcome these financial challenges.

a) Suggested funding related approaches to overcome financial challenges.

Table 4.17: Funding related approaches to overcome financial challenges

	Suggested funding related approaches	**Number**	**Percent**
1	Use of part of the Universal Service Fund	2	22
2	Application of Public-Private partnerships to generate funding for infrastructure development	3	34
3	Use of stock market as an alternative source of funding for networks	1	11
4	Existing funding institutions need to study and understand the opportunities in ICT	1	11
5	Joint ventures	1	11
6	Establishment of a venture revolving fund to be managed by the ICT Board	1	11
	Total	**9**	**100**

On the aspect of funding, the suggestions ranged from the application of public-private partnerships, establishment of a revolving fund through the initiative of universal service funds or venture fund under the management of the ICT board, joint venture approach and the use of the stock market as possible sources for funding.

b) Suggested regulatory approaches for overcoming financial challenges

Table 4.18: Regulatory approaches for overcoming financial challenges

	Suggested regulatory and infrastructure approaches	**Number**	**Percent**
1	Reduction of taxes for ICT core equipment and accessories	2	30
2	A predictable regulatory environment on licensing and interconnection	1	17
3	Subsidizing provision of bandwidth on common links	1	14
4	Investment in Infrastructure	1	14
5	Ensuring equitable access to infrastructure	1	14
6	Reduction of regulation	1	14
	Total	**7**	**100**

On regulatory and infrastructure, views included a predictable regulatory environment, privatization, encouragement of joint venture business practices, government subsidy or reduction on spectrum and bandwidth rates and reduction of unnecessary sector regulations in favour of self regulations in certain aspects should go a long way in realizing funding for the sector. On infrastructure, investments in infrastructure and ensuring equitable access to the infrastructure, was seen as able to realize funding for the sector.

4.5. INFRASTRUCTURE CHALLENGES

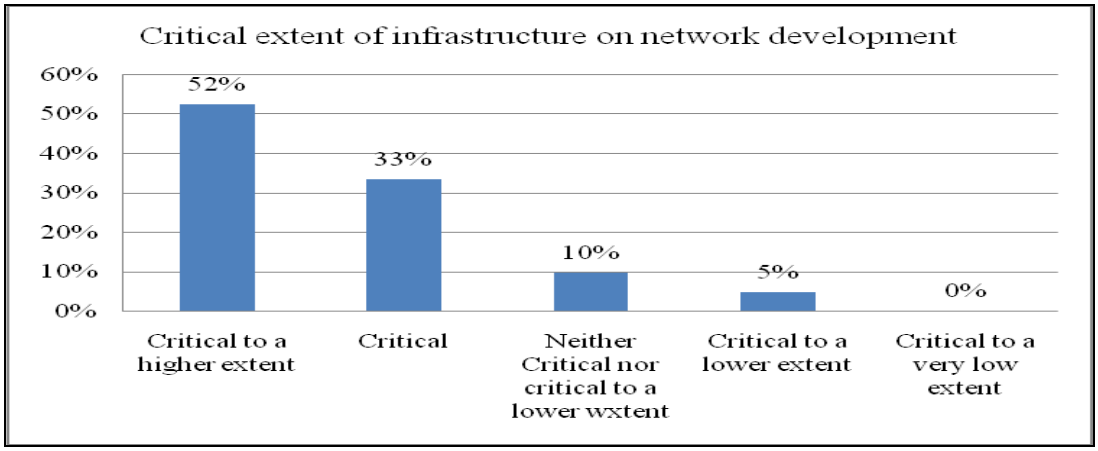
One of the objectives of this research was to establish whether technical and Infrastructure aspects is a challenge in the realization of market entry and rollout

targets of the telecommunication licensees in the local loop. Respondents' views were sought on the following issues.

4.5.1. Critical extent of access to infrastructure in ICT markets

The respondents' view on the critical extent of access to infrastructure in market entry and rollouts is summarized in table 4.19.

Table 4.19: Critical extent of infrastructure in market entry and rollout.



As illustrated in Table 4.19, fifty two percent of the correspondents were of the view that access to infrastructure is very much critical in market entry and network rollouts, while thirty three percent see access to infrastructure as critical. Ten percent view infrastructure as averagely critical while five percent view access to infrastructure as critical but to a lower extent.

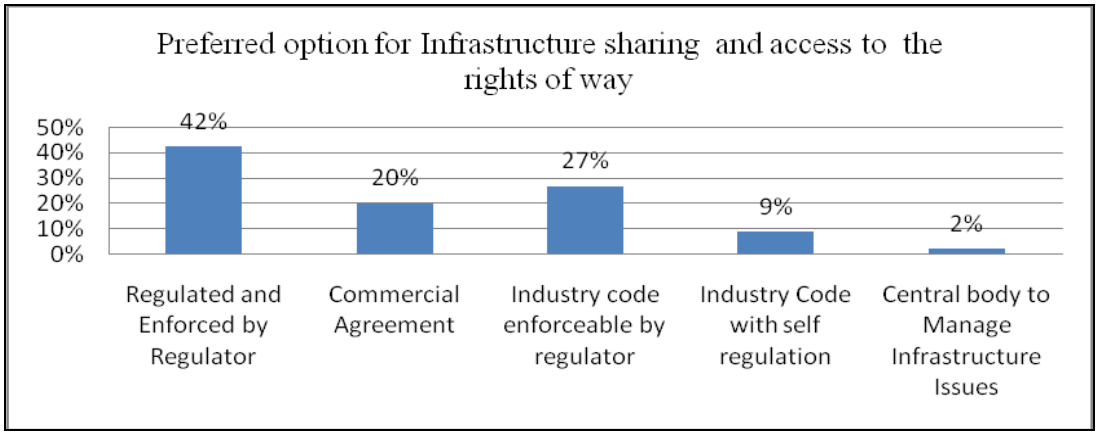
From the analysis above, a total of eighty five percent of the respondents view access to infrastructure as critical, while a total of five percent view access to infrastructure as critical but to a lower extent. These findings are in consistent with the findings on funding, in table 4.15 above, which showed sixty eight percent of the respondents as of the view that network developments constitute the area that needs

the highest percentage of funding support. This is in order because to access new markets and increase coverage, access or investments in infrastructure is required.

4.5.2. Best option for sharing infrastructure and use of the rights of way

In order to ensure fair market entry, the respondents' view on best option for infrastructure sharing, collocations and the use of the rights-of way, is as summarized in Table 4.20.

Table 4.20: Best option for sharing infrastructure and accessing rights of way



Forty two percent of the correspondents were of the view that access of infrastructure resource should be regulated and enforced by the regulator, while twenty percent view commercial agreement between the infrastructure providers and those seeking access to the infrastructure as the preferred option for accessing the infrastructure sharing and access of the rights of way.

Nine percent of the respondents were of the view that access of infrastructure sharing and rights of way require an industry code, developed and regulated by the industry operators themselves in a form of self regulation. Twenty seven percent were in favour of an industry code developed by operators themselves, incorporated

into existing regulations and enforced by the industry regulator. Two percent suggested a central body, other than the industry regulator, to manage all aspects of sharing infrastructure and accessing the rights of way.

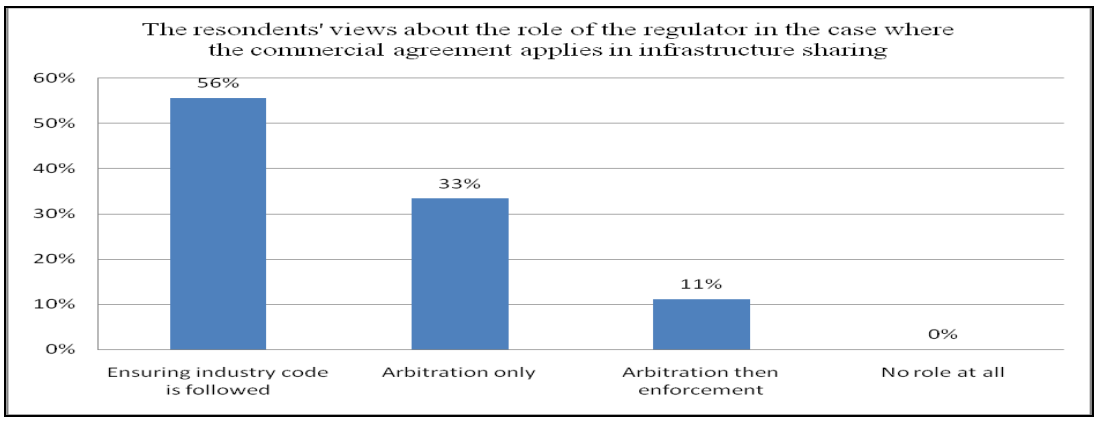
Further analysis show that sixty-nine percent of the respondents said sharing and access infrastructure should be regulated and enforced by the industry regulator, however the only difference being whether the regulations should be derived from the industry code or the set regulations or guidelines.

In view of the critical nature of infrastructure in accessing new markets, building own infrastructure is not cost effective and might delay network expansion programs, regulated access should ensure predictable, easier and faster access to sharing infrastructure and collocation space.

4.5.3. Role of the regulator where commercial agreement option is preferred

The respondents' views on what the role of the regulator should be where access to the infrastructure, access to the rights of way and collocation is mutually negotiated and agreed under a commercial agreement, is as summarized in Table 4.21.

Table 4.21: Views on the role of regulator in commercial agreements

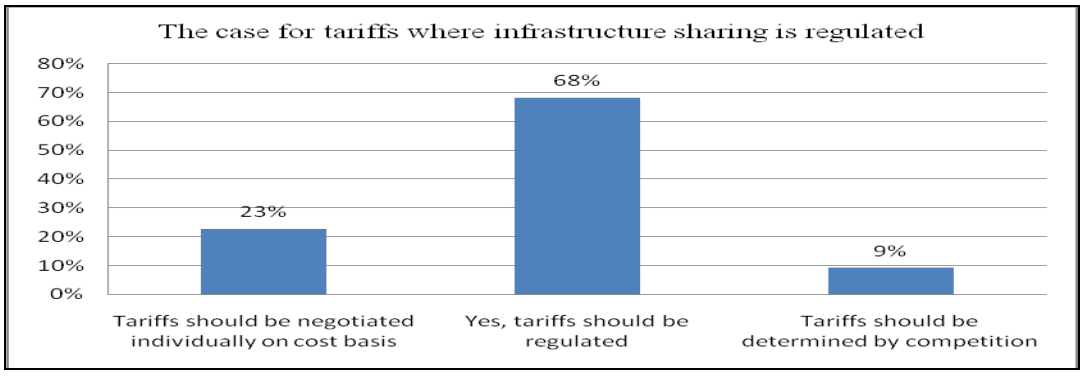


Fifty six percent of the respondents, who were of the view that commercial agreement is the best approach to be used for access of infrastructure sharing and collocation, were of the view that the role of the regulator should only be to ensure industry code is followed. Thirty three percent indicated that the role of the regulator should be limited to arbitration while eleven percent favoured arbitration but followed by enforcement of the arbitration agreement. From the above findings, it is unanimous that the industry regulator should always have a role in aspects of infrastructure access, collocation and access to the rights of way including the case where commercial agreement is applicable in order to ensure agreements are implemented, for the promotion of market access and fairplay.

4.5.4. Whether tariffs for sharing infrastructure should be regulated

Respondents who were of the view that sharing infrastructure and accessing rights of way of should be regulated, were also asked whether tariff for accessing the infrastructure should be regulated as well, as a way of ensuring easier market access. The results are summarized in table 4.22.

Table 4.22: Tariffs for sharing infrastructure, collocation and the rights of way

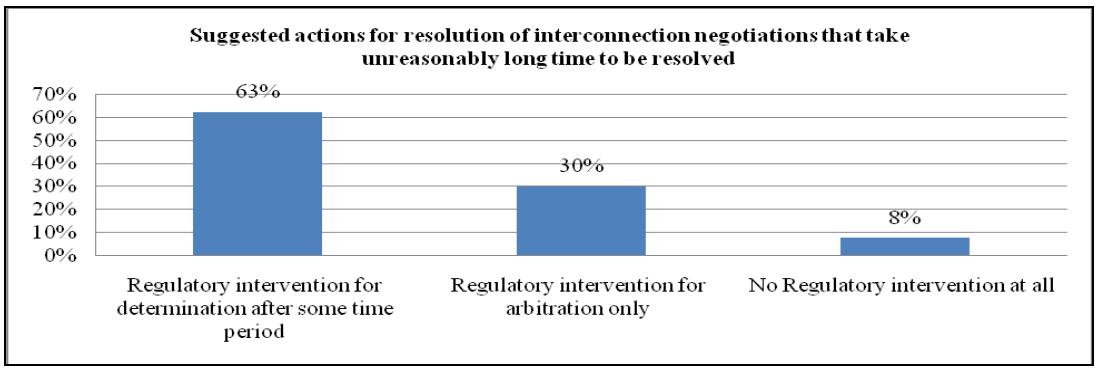


Sixty eight percent of the respondents, who were of the view that access to infrastructure and the rights of way of competing operators and other entities should be regulated, were of the view that the tariffs for accessing the above infrastructure, should be regulated, while twenty three percent indicated that the tariffs be negotiated individually but on a cost basis. The above findings mean that, both access to the infrastructure and determined tariffs should be regulated based on costs for effective and equitable access.

4.5.5. Suggestions for resolving interconnection issues that take a long time

Respondents were asked the preferred approach where interconnection negotiations take an unreasonably long time to be concluded. The results are summarized in Table 4.23.

Table 4.23: Suggested actions for resolving interconnection issues that take long.



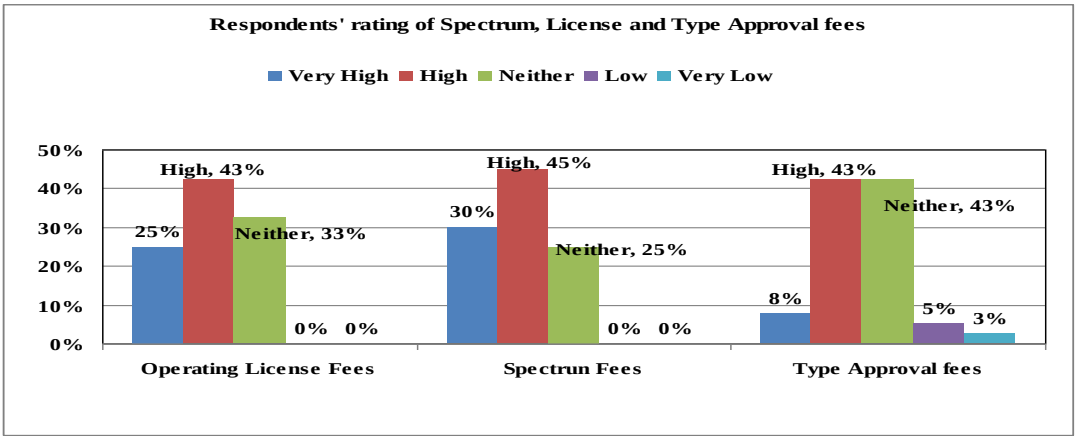
Sixty three percent of the respondents were of the view that regulatory intervention is required to determine the interconnection rates on cost basis, while thirty percent favoured regulatory intervention but for arbitration only. Eight percent said that no regulatory intervention should be applied at all. These findings show that, despite the fact that interconnection agreements are negotiated by the parties concerned,

there should also be set time limits in the regulations or guidelines, beyond which regulatory intervention is necessary to ensure efficient market entry.

4.5.6. The overall rating on License and Approval fees

Table 4.24 summarizes respondents' views on License and Type Approval fees.

Table 4.24: Rating of licensing and Type Approval fees



The above analysis shows that, twenty five percent of the respondents indicated that the operating license fees are very high, while forty three percent indicated that the fees are high. Thirty three percent indicated that the charges are neither high nor low. No respondent indicated a low rating or a very low for operating license fees. Detailed analysis show that a total of sixty eight percent of the respondents view telecommunication fees as high

For frequency spectrum fees, thirty percent of the respondents indicated that the spectrum license fees are very high, while forty five percent indicated that the fees are high. Twenty five percent indicated that the charges are neither high nor low. No respondent indicated a low rating or a very low for spectrum fees. A total of seventy five percent viewed spectrum fees as high.

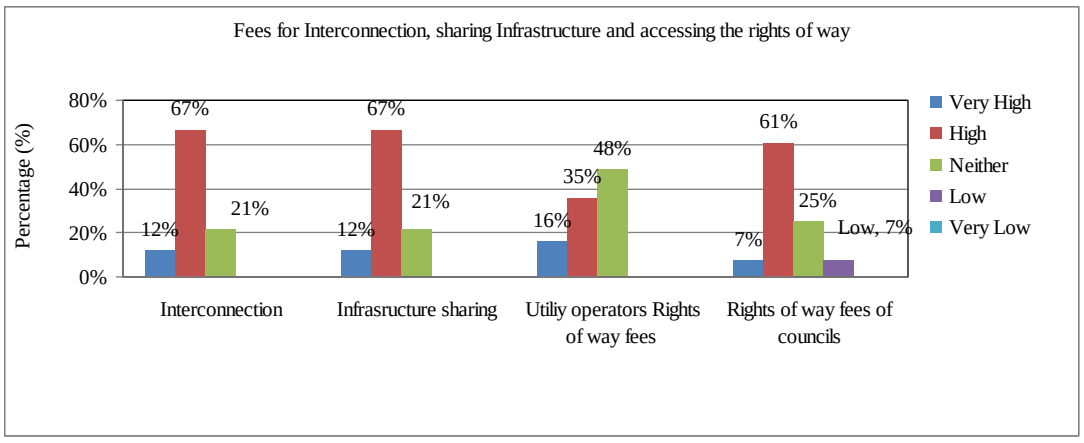
Eighty percent of respondents viewed Type Approval fees for equipment compliance with standards as very high, while forty three percent indicated that the fees are high. Another forty three percent indicated that the charges are neither high nor low. Five percent indicated low while three percent very low.

Detailed analysis indicate that, a total of fifty one percent consider the Type Approval fees for conformity testing as high and a total of eight percent as low. This implies that, on the average, telecommunications and spectrum license fees are high.

4.5.7. Rating of Interconnection, Infrastructure and environmental fees

The respondents' view on Interconnection and termination rates, rates for sharing infrastructure, collocation space and for accessing the rights of way of local authorities and utility operators, is summarized in Table 4.25.

Table 4.25: Rating of Interconnection, Infrastructure and rights of way fees



a) Interconnection fees

Twelve percent of the respondents indicated that interconnection rates are very high while sixty seven percent indicated that the rates are high. Twenty one percent indicated that the rates were neither high nor low. No indication was given by

respondents for very low and low rates. Detailed analysis show that a total of seventy nine percent of the respondents view interconnection rates are high.

b) Fees for Infrastructure sharing

Sixty seven percent of the respondents indicated that the rates for sharing infrastructure of are high, while twelve percent indicated as very high. Twenty one percent indicated as neither high nor low. No indication was given for low and very low rates. Detailed analysis indicates a total of seventy nine percent of the respondents view the rates for sharing infrastructure as high.

c) Fees for allowing use of the rights of way for utility operators

Sixteen percent of the respondents indicated that the rates charged by utility operators for access of their rights of way as very high, thirty five percent as high and forty eight percent indicated as neither high nor low. No indication was given for very low and low rates. Detailed analysis gives a total of fifty one percent of the respondents indicated that rates for access of the rights of way of utility operators are high, while there was no indication for short or a very short rating.

d) Rates for accessing the rights of way of local authorities

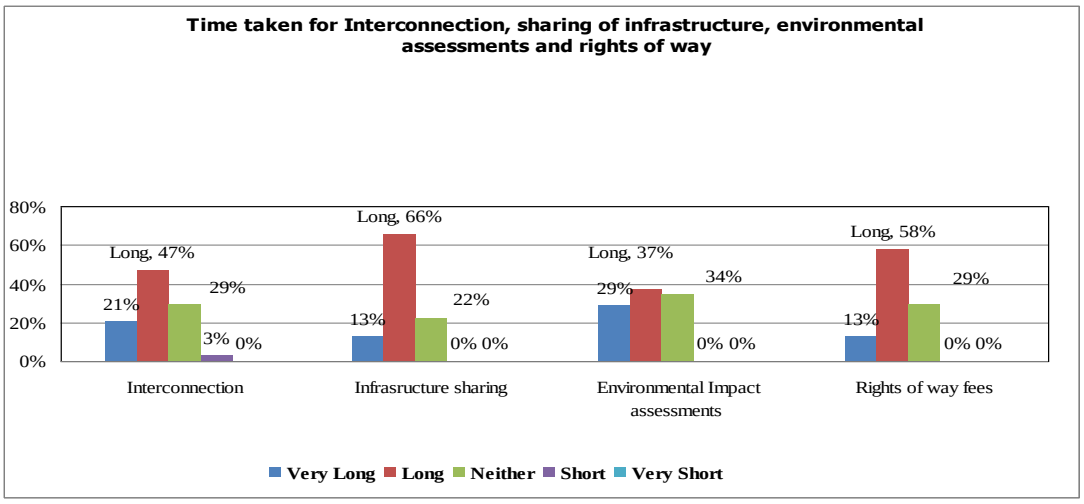
Seven percent of the respondents indicated that the rates charged by the city and other local authorities for access of their rights of way are very high, sixty one percent indicated as high and twenty five percent as neither high nor low. Seven percent indicated that the rates are low. There was no indication on very low rates. Detailed analysis show that sixty eight percent of the respondents indicated that rates for accessing the rights of way of city, municipal and other local authorities are high,

while there was no indication for short or a very short rating. The above findings show that interconnection rates, rates for sharing infrastructure and accessing the rights of way of utility and local authorities are high.

4.5.9. Time for accessing infrastructure facilities and scarce resources

The respondents were asked on what they rate as the time it takes to get interconnection from wholesale interconnection providers, sharing infrastructure of other operators, environmental concerns from the National Environmental Authority and approvals for use of the rights of way of the city, municipal, local authorities and utility operators. The findings are summarized in Table 4.26.

Table 4.26: Time for accessing the infrastructure and environmental concerns



a) Time for providing Interconnection

Twenty one percent of the respondents indicated that the time taken to access interconnection facility is very long while forty seven percent indicated that the time taken is long. Twenty nine percent indicated that the time as neither long nor short. Three percent indicated the time taken as short and no indication given by

respondents for ‘very short time’. Detailed analysis show that a total of sixty eight percent of respondents indicated that the time taken for providing access to interconnection is long.

b) Time for approving Infrastructure sharing

Sixty six percent of the respondents indicated that the time taken for sharing the infrastructure of other operators is long, while thirteen percent said the time is very long. Twenty two percent of the respondents indicated as neither long nor short. No indication was given by respondents for ‘neither short nor very short time’. Detailed analyses show that a total of seventy nine percent of the respondents indicated that the time for accessing the infrastructure of other operators as long.

c) Time taken for approval of use of the rights of way

Thirteen percent of the respondents indicated that time taken to access the rights of way of local authorities and utility operators is very long; fifty eight percent indicated the time taken was long and twenty nine percent indicated as neither long nor short. There was no indication given for short and very short time. Detailed analysis shows that a total of seventy one percent of the respondents indicated that the time taken to get authorization for access of the rights of way is long.

d) Time taken for environmental impact assessments

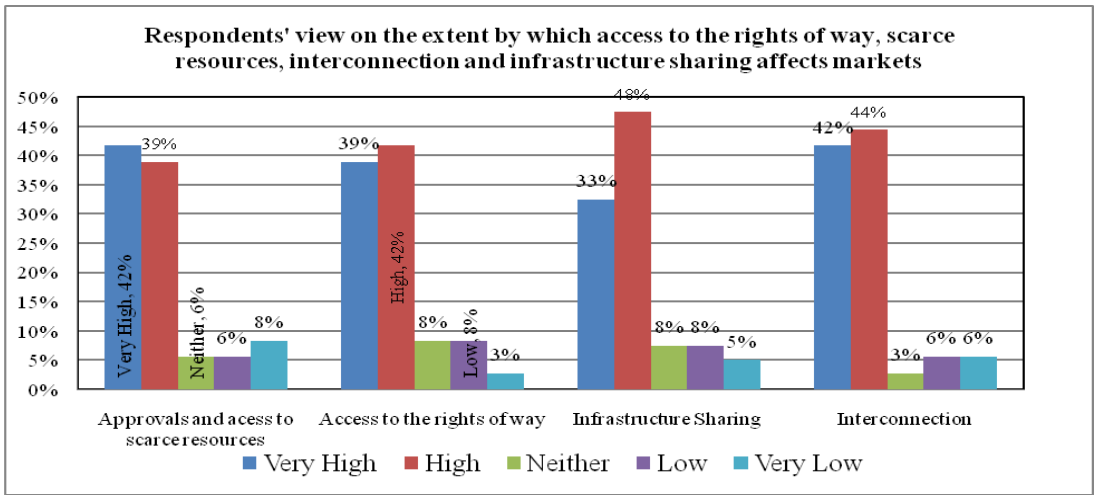
Twenty nine percent of the respondents indicated that the time it takes for environmental impact assessments from the National Environmental Management Authority is very long. Thirty seven percent indicated the time as long while thirty four percent indicated the time as neither long nor short. No respondents gave the

rating for very low or very low. Detailed analyses show that a total of sixty six percent of the respondents indicated that the time taken for getting regulatory approvals on environmental impact assessments is long.

4.5.10. Impact of accessing the scarce resource, interconnection and infrastructure on market entry

The extent by which respondents agree that timely approvals, access to the scarce resources, interconnection, sharing infrastructure and the rights of way has an impact on the realization of market entry and network rollouts, is shown in Table 4.27.

Table 4.27: Impact of infrastructure, interconnection and the scarce resource



a) Impact of access to the scarce resource on market entry and rollouts

Forty two percent of the respondents totally agree that the process of approvals for the use of the scarce resource including spectrum and numbers, have a critical contribution in the realization of market entry and rollouts, while thirty nine percent agree. Eight percent and six percent strongly disagree and disagree respectively. This implies that, a total of eighty one percent of the respondents agree that access to

approvals for use of the scarce resource from CCK has a critical impact on markets, while a total of fourteen percent disagree.

b) Impact of access to the rights of way of way on market entry and rollouts

Thirty nine percent of the respondents totally agree that the process for authorization for the use of the rights of way of local authorities and utility operators, have a critical contribution in the realization of market entry and rollouts, while forty two percent agree. Three percent and eight percent strongly disagree and disagree respectively. This shows that, eighty one percent of the respondents agree that providing authorization for the access and use of the rights of way of the authorities has a critical impact on ICT markets, while a total of eleven percent disagree.

c) The impact of sharing infrastructure market entry and rollouts

Thirty three percent of the respondents totally agree that sharing of the infrastructure and collocation space of other operators has a critical impact in the realization of market entry and rollouts, while forty eight percent agree. Eight percent and five percent strongly disagree and disagree respectively. The analysis show a total of eighty one percent of the respondents agree sharing infrastructure and collocation is critical in realizing market entry, while a total of thirteen percent disagree.

d) Impact of interconnection market entry and rollouts

Forty two percent of respondents totally agree that the process of accessing interconnection of wholesale interconnection providers has a critical impact in the realization of market entry and rollouts, while forty four percent agree. Six percent disagree while another six percent totally. The above analysis show that a total of

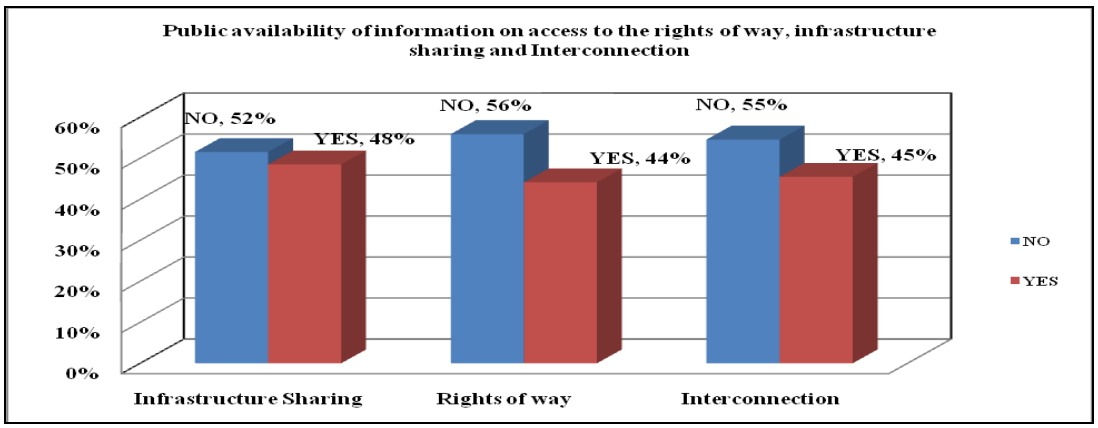
eighty six percent of the respondents agree that interconnection is critical on the market performance, while a total of twelve percent disagree.

From the above, access of the scarce resource, sharing of the infrastructure, interconnection and rights of way, is viewed as critical in the realization of market entry and rollouts.

4.5.11. Public availability Information on infrastructure access

Table 4.28 summarizes respondents' view on public availability of information regarding available infrastructure for sharing, interconnection and rights of way.

Table 4.28: Public availability of infrastructure access information



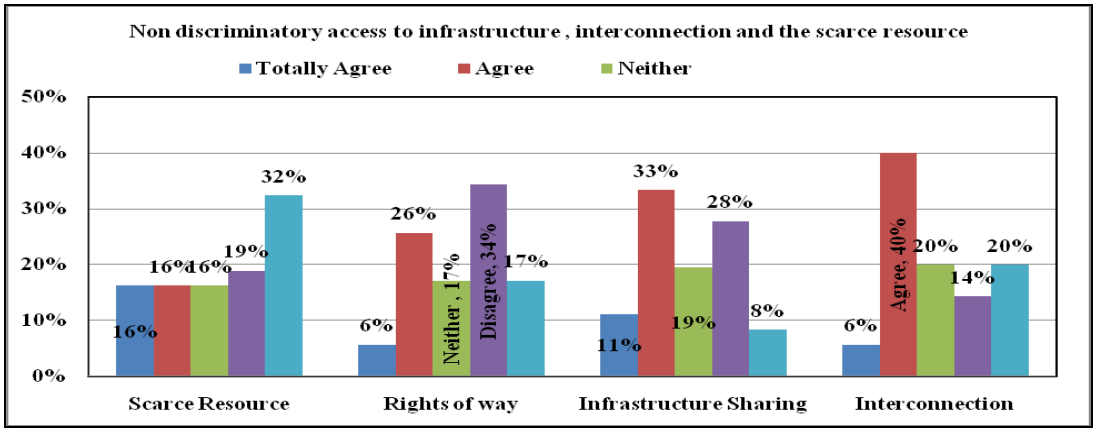
Fifty two percent and fifty six percent of respondents are of the view that information and procedure for sharing infrastructure and rights of way respectively, is not publicly available to potential applicants, while on interconnection, the fifty five percent are of the view that the reference interconnection offer (RIO) is not publicly available to the potential applicants. This is critical, in view of the fact that, public availability of procedures and information is fundamental in ensuring transparency and non-discriminatory access in line with World Trade Organization

requirement on access that states that procedures and reference interconnection offers (RIO) must be published and /or publicly available (WTO, 1997).

4.5.12. Non discriminatory access to infrastructure and scarce resources

The extent by which respondents agree that access to the scarce resources (i.e spectrum and numbers), rights of way, interconnection and sharing infrastructure, had been administered in a non-discriminatory manner, is as shown in Table 4.29.

Table 4.29: Non-discriminatory access to infrastructure and scarce resources



a) Access to the scarce resource

Thirty two percent of the respondents totally disagree and nineteen percent disagree that access to the scarce resource that includes Numbers and Frequency Spectrum is done in a non-discriminatory manner. Sixteen percent of the respondents agree and sixteen percent totally. The above analysis show that a total of thirty two percent of the respondents agree that spectrum and numbering resources had been administered in a non-discriminatory manner. A total of fifty one percent disagree. Sixteen percent neither agree nor disagree, implying that the administration of the scarce resource is done discriminatively.

b) Access to the rights of way of utility and local authorities

Seventeen percent of the respondents totally disagree and thirty four percent disagree that access to the use of the rights of way of the local authorities and utility operators is accessed and administered in a non-discriminatory manner. Twenty six percent and six percent of the respondents agree and totally agree respectively. The above analysis show that a total of thirty two percent of the respondents agree that access to the rights of way is done in a non-discriminatory manner. A total of fifty one percent disagree while seventeen percent neither agree nor disagree, implying that access to the rights of way is done in a discriminatory manner.

c) Access to the infrastructure sharing and collocation facility of other operators

Thirty three percent of the respondents agree and eleven percent totally agree that sharing of infrastructure of other operators and collocation of facilities is done in a non-discriminatory manner. Twenty eight percent disagree and eight percent totally. Nineteen percent neither agree nor disagree. The above analysis show that a total of forty four percent of the respondents agree that access to infrastructure of other operators is done a non-discriminatory manner. A total of thirty six percent disagree, showing that access to sharing of infrastructure of other operators had been done in a discriminatory manner.

d) Access of Interconnection from wholesale interconnection providers

Forty percent of the respondents agree and six percent totally agree that access to Interconnection facility of wholesale interconnection providers is done in a non-discriminatory manner. Fourteen percent disagree and twenty percent totally disagree and twenty percent neither disagree nor agree. The above analysis show

that a total of forty six percent of the respondents agree that access to infrastructure of other operators is done a non-discriminatory manner. A total of thirty four percent disagree. This shows that access to the interconnection had been done in a discriminatory manner.

4.5.12. The suggested actions to overcome the infrastructure challenges

The following suggestions, tabulated in Table 4.30, 4.31, 4.32 and 4.33, were given by the respondents on how to overcome infrastructure challenges. The suggestions are categorized in terms of infrastructure, regulatory, legal and institutional related solutions.

Table 4.30: Infrastructure solutions for overcoming infrastructure challenges

INFRASTRUCTURE ASPECTS	Frequency	Percent
Regulator to work more closely with Local authorities for efficient and non-discriminatory access to rights of way owned by the authorities	5	83
Investment in Infrastructure development	1	17
Total	**6**	**100**

On the suggestions of how to overcome infrastructure challenges as shown in table 4.30, eighty three percent suggested that regulator should work with Local authorities to ensure efficient and non-discriminatory access to rights of way owned by the authorities.

Table 4.31: Suggested Legal approach in overcoming infrastructure challenges

LEGAL ASPECTS	Frequency	Percent
Enhancement of the regulatory independence in the Act	1	100

On the legal aspects, as shown in table 4.31 above, respondent cited the existing ICT laws as requiring enhancement to ensure regulatory independence.

Table 4.32: Regulatory approaches in overcoming infrastructure challenges

REGULATORY ASPECTS	Frequency	Percent
Ensure equitable, non-discriminatory and transparent access to ducts, rights of way, interconnection and other scarce resources; and publication of the available resources and reclamation of the un-used resources	8	61
Development of an industry Code of practice for incorporation in the regulations	1	8
Establishment of an Industry Lobby to advise on access and use of scarce resources	1	8
Establishment of a clearing house for exchange of interconnection costs	1	8
Licensing of Independent operators that provide masts on which to install and share infrastructure	1	8
Licensing of carriers that only provide interconnection	1	8
Total Respondents	**13**	**100**

On aspects related to regulations, as shown in table 4.32 above, sixty one percent of the respondents were of the view that that regulations to ensure equitable, non-discriminatory and transparent access to the ducts, rights of way, Interconnection and the scarce resources including publication of the available resources and reclamation of the un-used resources for efficiency.

Table 4.33: Institutional approaches in overcoming infrastructure challenges

INSTITUTIONAL ASPECTS	Frequency	Percent
Enhancement of spectrum monitoring to avoid interference	4	29
Enforcement of Interconnection regulations including refiling of agreements	4	29
Determination and enforcement of cost based interconnection and spectrum rates	2	14
Enhancement of Internal processes of the regulator	1	7
Convening of regular industry meetings that includes Infrastructure providers	1	7
Reduction of regulations and regulatory forbearance of certain requirements	1	7
Enhancement of Consumer education	1	7
Total	**14**	**100**

On institutional aspects, as shown in table 4.33, a total of fifty eight percent of the respondents wanted enhancement of Spectrum monitoring function activities to minimize interference and enforcement of Interconnection regulations. Fourteen percent wanted determination and enforcement of cost based interconnection and spectrum regime.

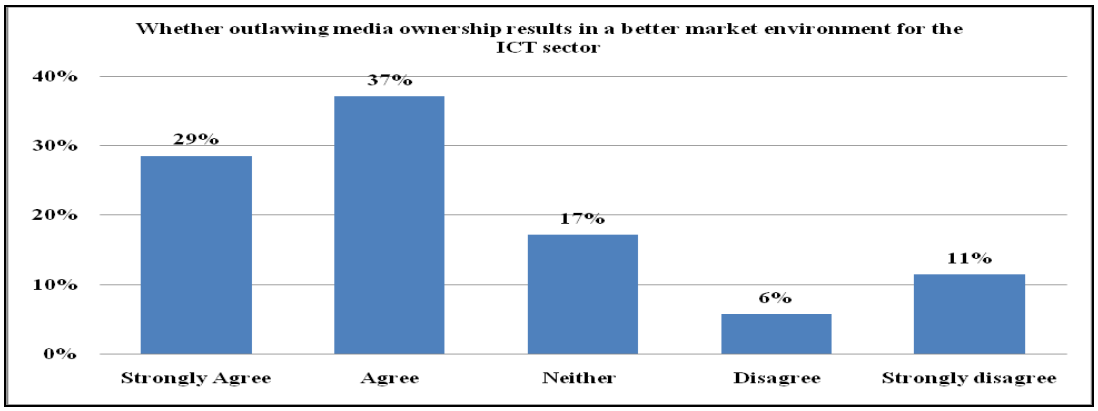
4.6. LEGAL ASPECTS AND INSTITUTIONAL CHALLENGES

One of the objectives of this research is to establish whether the Legal aspects that is a challenge in the realization of market entry and rollout targets of the telecommunication licensees in the local loop. In order to establish the objective, the respondents' views were sought on the following legal issues.

4.6.1. Respondents' views on outlawing cross media ownership

The respondents' extent, by which they agree with the statement that outlawing cross media ownership results in a better ICT market environment, is summarized in Table 4.34.

Table 4.34: Cross media ownership in the ICT market environment

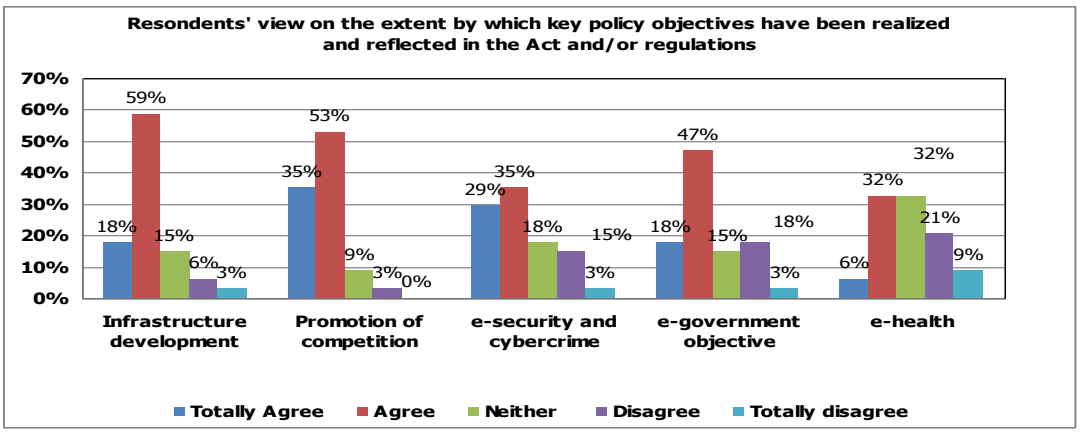


Twenty nine percent of the respondents totally agree and thirty seven percent agree that outlawing cross media ownership results in a better ICT market environment. Six percent disagree and eleven percent strongly disagree. This implies that a total of sixty six percent agree with view that outlawing cross media ownership results in a better ICT market environment while seventeen percent disagree and another seventeen percent neither.

4.6.2. The extent of reflection of key policy objectives in the ICT statutes

The extent by which the following key policy objectives in the national ICT policy of 2006, have been reflected in the Kenya ICT laws and Regulations, is indicated in Tables 4.35 and 4.36.

Table 4.35: Reflection of infrastructure, competition, e-security objectives.



a) Policy objective on infrastructure development in support of an information based society.

Fifty nine percent of the respondents Agree and eighteen percent Totally Agree that the policy on infrastructure development that aims at supporting the realization of an information based society is adequately realized and reflected in the relevant ICT Acts or competition laws and regulations. This implies that a total of seventy seven percent of the respondents agree that the objective on infrastructure development had been adequately realized, while a total of nine percent disagree. Another nine percent neither. This analysis indicates that the objective on infrastructure development in ICT had been adequately realized and reflected in the Acts and regulations.

a) Policy objective for the promotion of competition

Fifty three percent of the respondents agree and thirty five percent totally agree that the policy on promotion of competition, as indicated in the national ICT policy of 2006, has been properly reflected in the ICT law, competition policy and regulations. Nine percent disagree and three percent totally.

This is a total of eighty eight percent who agree that the objective of promoting competition in the industry had been adequately realized and reflected in the statutes, while a total of three percent disagree and nine percent neither agreeing nor disagreeing. The above analysis indicates that the objective on the promotion of competition in ICT had been adequately realized and reflected in the ICT laws and regulations.

b) Policy objective on privacy, e-security, electronic signatures in the ICT laws

Thirty five percent of the respondents agree and twenty nine percent totally agree that the policy objective on issues of privacy, e-security, electronic signatures, ethical and moral policy, had been adequately reflected in the relevant ICT laws. The analysis indicate that a total of sixty four percent of the respondents agree that the objective has been adequately reflected in the ICT laws, while a total of eighteen percent disagree. The other eighteen percent neither agree nor disagree.

The above analysis shows that, the objective that ensures privacy, e-security, electronic signatures, ethical and moral issue had been adequately realized and reflected in the ICT laws.

c) Policy objective in support for e-government programs

Forty seven percent of the respondents Agree and eighteen percent totally agree that the policy objective for supporting e-government programs in line with global trends, are realized and reflected in the relevant ICT laws, competition laws and Regulations. Eighteen percent disagree while three percent totally disagree. Fifteen percent neither agree nor disagree.

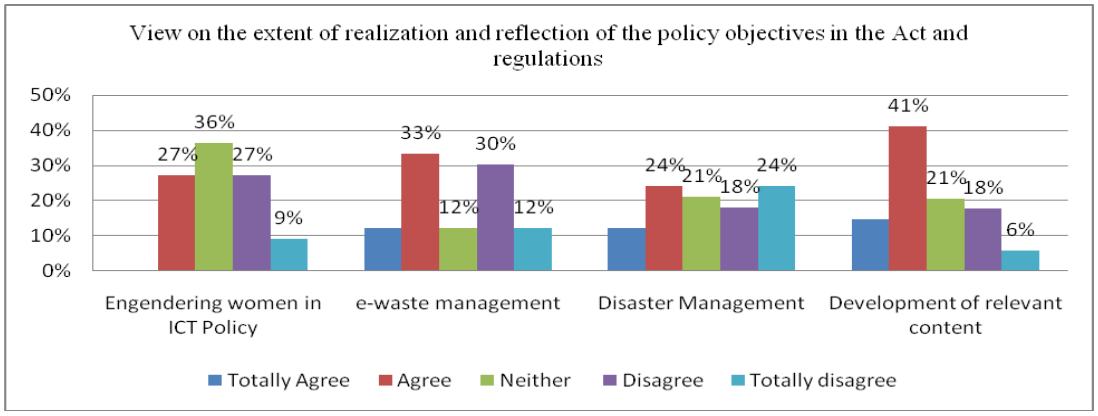
A total of sixty five percent of the respondents agree that aspects of e-government have been adequately realized and reflected in the ICT Acts, a total of twenty one percent disagree. Fifteen percent neither agree nor disagree. These analyses indicate that the e-government objective had been adequately realized and reflected in the ICT Acts for implementation.

d) Policy objective for institutional framework to champion e-health and e-agriculture programs

Thirty two percent of the respondents agree and six percent totally agree that the objective for e-health and its institutional championship as stated in the National ICT Policy 2006, had been properly reflected achieved and reflected in the relevant legislation.

A total of thirty eight percent of the respondents agree that the policy objective has been adequately realized and reflected in the ICT Acts and regulations, thirty percent disagree. Thirty two percent neither agree nor disagree. This analysis indicates that, this objective on e-health had not been adequately realized due the number that agree and the thirty two percent of respondents that neither agreed nor disagreed.

Table 4.36: Reflection of gender, e-waste, content development objectives



The respondents' view about the extent by which the policy of engendering women in ICT policy formulation and implementation at all levels, e-waste management, disaster management objective and development of relevant content as indicated in the national ICT policy of 2006 has been reflected in the Kenya ICT Act and the Kenya Communications Regulations 2001, is indicated in Tables 4.36.

a) Engendering of women in ICT policy formulation at all levels

No respondent totally agree that this policy objective with regards to engendering of women in ICT policy formulation at all levels, has been adequately realized and reflected in the relevant Acts and regulations. Twenty seven percent however agree. Another twenty seven percent disagree with nine percent totally disagree. Thirty seven percent neither agree nor disagree. The above analysis indicate that a total of twenty seven percent agree, thirty six percent disagree and thirty seven percent neither agree nor disagree, meaning that this particular policy objective that seeks to engender women in ICT policy formulation at all levels, had not been realized and adequately reflected in the ICT laws and regulations.

b) The reflection of e-waste management objective in the ICT laws.

The extent by which respondents agree or disagree that issues of environmental impact due to infrastructure developments and e-waste management, as stated in the national ICT policy 2006, had been adequately reflected in the relevant ICT laws and Regulations is as shown in table 4.36.

Thirty four percent of the respondents agree and twelve percent totally agree, while thirty percent disagree and twelve percent totally disagree. Twelve percent neither agree nor disagree. The above analysis indicate that a total of forty six percent agree, thirty two percent disagree and twelve percent neither agree nor disagree, meaning that there is limited consensus that the policy objective that seeks to promote environmental management due the effects of infrastructure developments and e-waste, had been adequately realized and reflected in the ICT laws and regulations.

c) The realization of disaster management objective in the relevant ICT laws.

Twenty five percent of the respondents agree and twelve percent totally, that the issues of disaster management as stated in the National ICT Policy 2006, have been properly realized, and reflected in the relevant Acts and regulations, while eighteen percent disagree and twenty four percent totally. Twenty one neither. Detailed analysis show that a total of thirty seven percent agree, forty two percent disagree and twenty one percent neither, meaning that this particular policy objective on disaster management, had not been realized and adequately reflected in the ICT laws and regulations.

d) The realization of policy on the development of relevant local content

The analysis indicate that, forty percent of the respondents Agree and fifteen percent totally agree that the issues of content development, had been realized, and reflected in the relevant ICT Acts and regulations. Eighteen percent disagree and six strongly. From this analysis, the local content development objective had been realized and adequately reflected in the ICT laws and regulations.

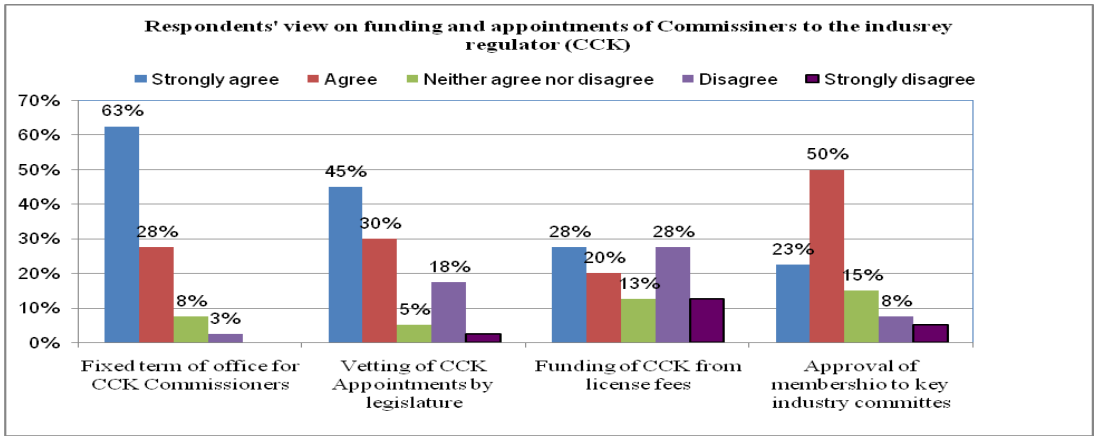
4.7. INSTITUTIONAL ASPECTS

One of the key aspects to be established in this research is whether there are institutional aspects that provide a challenge in the realization of market entry and rollout targets of the licensees in the local loop. The respondents' views were therefore sought on the following institutional issues.

4.7.1. Funding of CCK operations and appointments of Commissioners

The extent by which respondents' agree that there is required a legal provision for a fixed term of office for Commissioners and the CEO of CCK, the vetting of appointments of the Commissioners by the relevant legislative committee and removal of the provision for funding of CCK operations from licence fees of regulated companies, enhances the performance of the ICT sector, is summarized in Table 4.37.

Table 4.37: Funding sources for CCK and appointments of Commissioners



a) Fixed term of office for Commissioners of CCK.

Sixty three percent of the respondents totally agree that the provision for a fixed term of office for the Commissioners of CCK and related institutions in the statutes enhances the performance of the sector while twenty seven percent agree. The analyses indicate that a total of eighty nine percent of the respondents agree. Three percent disagree while eight percent neither agree nor disagree.

b) Provision for approval of industry commissioners' appointments by legislature

Forty five percent of the respondents strongly agree while thirty percent agree with the provision that appointments of the industry commissioners be approved by the relevant parliamentary committee. This gives a total of seventy five percent of the respondents that agree with this provision. Eighteen percent disagree with this provision and three percent strongly disagree. Five percent neither agree nor disagree.

c) Legal provision for vetting of appointments to the membership of key ICT committees

On the provision for vetting of appointments to the membership of key ICT committees including Universal Service Fund, Universal Service Advisory Council, Appeals tribunal etc, as provided for the ICT Act of 2009 by the legislature, twenty three percent of the respondents totally agree with this provision while forty none percent agree. This results in a total of seventy two percent of respondents that agree with this provision. Eight percent disagree with this provision and five percent strongly. Fifteen percent neither agree nor disagree.

d) Provision that funding sources for CCK operations should not be from license fees paid by regulated companies.

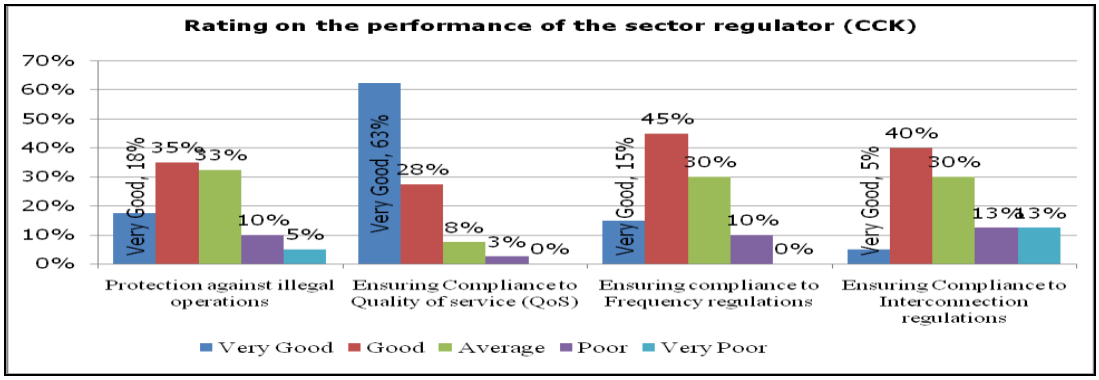
On the provision for funding of CCK operations, twenty eight percent of the respondents strongly agree with this provision that funding for CCK operations should not be from license fees paid by regulated companies in order to avoid influence from the operators that pay huge license fees ('regulatory capture'), while twenty percent agree with this provision. This results in a total of forty seven percent of respondents that agree with this provision. Twenty seven percent disagree with this provision and thirteen percent strongly constituting a total of forty percent that disagree. Fifteen percent neither agree nor disagree.

On this provision, there is no clear consensus that this provision should increase sector performance by reducing the adverse influenced from regulated companies that pay very high license fees against the public interest.

4.7.2. CCK institutional performance in ensuring legal operations, infrastructure and quality of service

The respondents' view on institutional performance of CCK in the protection of licensees against illegal operations, ensuring compliance to Quality of service (QoS), regulation of spectrum and Interconnection, is as shown in Table 4.38.

Table 4.38: Performance in ensuring legal operations, infrastructure and QoS



a) Performance on protection from illegal operations

From the analysis above, twenty three percent of the respondents gave a very good performance rating to CCK as very good in the protection from illegal operations while thirty four percent gave a good performance rating. This results in a total of fifty two percent of respondents that gave CCK a good rating. Ten percent gave a poor rating and five percent a very poor. Thirty three percent gave an average rating.

b) Performance on ensuring compliance to Quality of Service (QoS) parameters

Sixty three percent of the respondents gave a very good rating to CCK with regards to ensuring compliance to Quality of Service targets, while twenty eight percent gave a good performance rating. Further analysis indicated that ninety one percent of respondents that gave CCK a good performance rating to CCK on ensuring quality

of service to end users. Three percent gave a poor rating. No respondent gave a very poor rating, indicating that CCK performance with regards to ensuring Quality of Service by operators and service providers is good.

c) Performance on ensuring compliance to frequency regulations

Performance with regards to ensuring compliance to frequency spectrum regulations and resolution of frequency related problems, fifteen percent of the respondents gave a very good performance rating, forty five percent a good performance rating, amounting to a total of sixty percent that gave a good rating. Thirteen percent gave a poor rating while another no respondent gave a very poor rating. Thirty percent gave an average rating.

It may be concluded that, there is a general consensus among the respondents that the performance on ensuring and resolution of frequency related problems is good, however, the thirty percent average rating indicates that a lot is required to be done to improve performance in the area of frequency spectrum regulations.

d) Performance on ensuring compliance to interconnection regulations

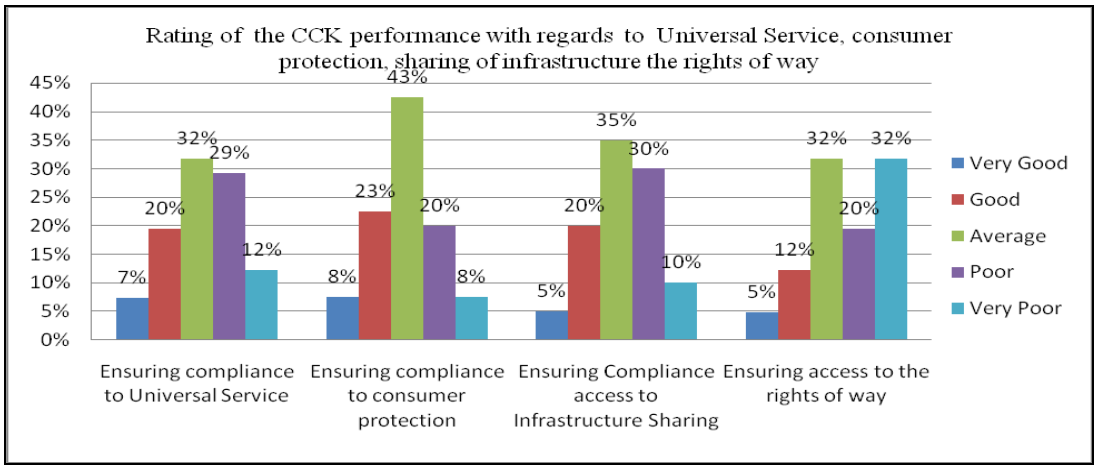
Performance with regards to ensuring compliance to Interconnection regulations and resolution of Interconnection related problems, five percent of the respondents gave a very good performance rating, thirty nine percent gave a good performance rating, amounting to a total of forty four percent that gave good rating. Thirteen percent gave a very poor rating while another thirteen percent gave a poor rating giving a total of twenty six percent said the performance in the area of regulating interconnection as poor. Thirty percent gave neither a good rating nor a poor rating. From the above analysis, it may be concluded that the performance of CCK with

regards to ensuring and resolution of Interconnection related problems requires improvement due to the forty four percent that gave a good approval rating, the thirty percent that said that it was neither good nor poor and the twenty six percent that gave a poor performance rating.

4.7.3. CCK institutional performance on ensuring universal service, consumer protection, infrastructure sharing and the rights of way

The views of the respondents on the performance of CCK with respect to ensuring compliance to universal service, consumer protection, sharing of infrastructure and access to the rights of way, is as summarized in Table 4.39.

Table 4.39: Performance of CCK on ensuring USO and consumer protection



a) Performance on ensuring compliance to Universal Service

Seven percent of the respondents gave a very good rating to CCK in ensuring compliance to universal service by operators, twenty percent indicated a good performance, twenty nine percent gave a poor rating while twelve percent gave a very poor rating. Thirty two percent gave an average rating. The above analysis indicated that, a total of twenty seven percent of the respondents gave a good

performance rating, thirty two percent gave an average rating and forty one percent gave a poor performance rating, meaning that aspects of Universal Service in ICT have not been adequately articulated by CCK.

b) Performance on ensuring consumer protection

Eight percent of the respondents gave a very good rating to CCK in ensuring consumer protection; twenty three percent were of the view that CCK performance is good. Twenty percent indicated a poor performance rating while eight percent indicated that, the performance as very poor. Forty two percent gave an average rating. From the above analysis, a total of thirty one percent gave a good performance rating, forty two percent gave an average rating and a total of twenty eight percent gave a poor rating. From the above figures, it is apparent that issues of consumer protection in ICT need to be enhanced by CCK.

c) Performance on ensuring infrastructure sharing and collocation

Respondents were asked on how they rate CCK performance with regards to ensuring sharing and collocation of infrastructure. As indicated in table 4.38, five percent of the respondents gave CCK a very good rating in ensuring sharing and collocation of infrastructure amongst operators, twenty percent gave good performance rating; thirty gave a poor rating while ten percent gave a very poor rating. Thirty five percent gave an average rating. From the above analysis, a total of twenty five percent therefore gave a good rating; thirty five gave an average rating and a total of forty percent a poor performance rating. From the above summary, there is a general consensus by respondents that CCK require to enhance compliance to infrastructure sharing by licensees.

d) Performance on ensuring access to the rights of way

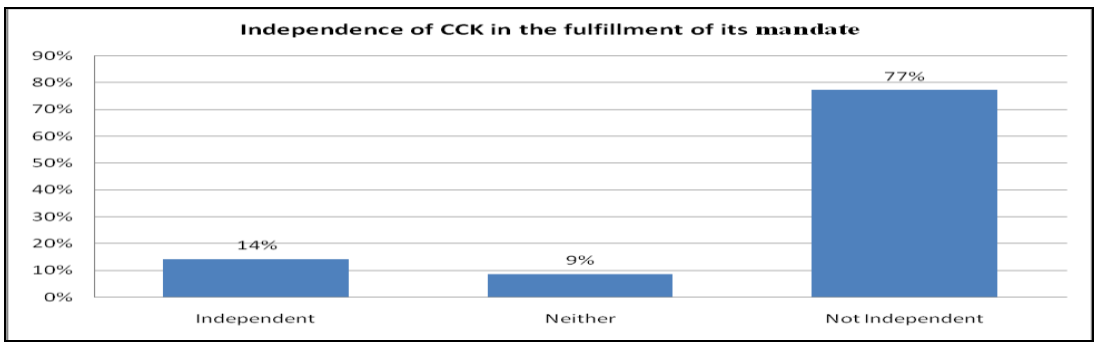
Respondents were asked to give the rating on the CCK performance with regards to ensuring access to the rights of way of local authorities and utility operators. As indicated in table 4.38, five percent of the respondents rated the CCK performance in ensuring access to the rights of way of utility operators and local authorities, as very good, twelve percent indicated the rating as 'good', twenty percent gave a poor rating while thirty two percent gave a very poor performance rating. Thirty two percent gave an average rating. From the above analysis, it may be summarized that, a total of seventeen percent gave CCK a good performance rating, thirty two percent an average rating while a total of fifty one percent gave a poor rating.

From the above, respondents view the performance of CCK in ensuring access to the rights of way as not adequate and therefore requiring enhancing.

4.7.4. Institutional capacity of CCK to operate independently

The respondents' view as to whether CCK has the capacity and independence to withstand external interference, under the existing institutional and legal framework in the fulfillment of its mandate, is as shown in Table 4.40.

Table 4.40: Independence of CCK in the fulfillment of its mandate.



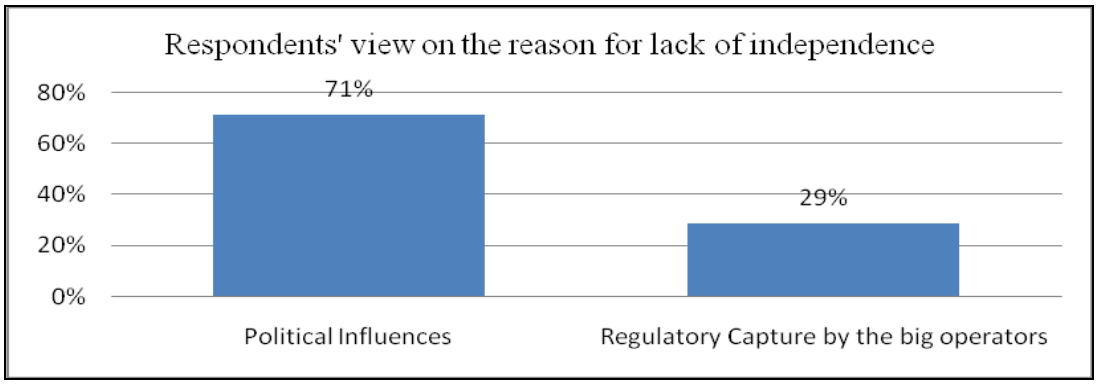
Seventy seven percent of the respondents were of the view that, CCK does not have the institutional capacity to operate independently, in the fulfillment of its mandate.

4.7.5. Causes for the lack of capacity of CCK to operate independently

The results of respondents' view on the main cause for lack of independence in the operation and decision making of the CCK are summarized in Table 4.41.

Seventy one percent of respondents who were of the view that CCK is not independent in the fulfillment of its mandate attributed this to political interference while twenty nine percent attributed this to interference from some influential regulated companies.

Table 4.41: Causes for the lack of independence of CCK

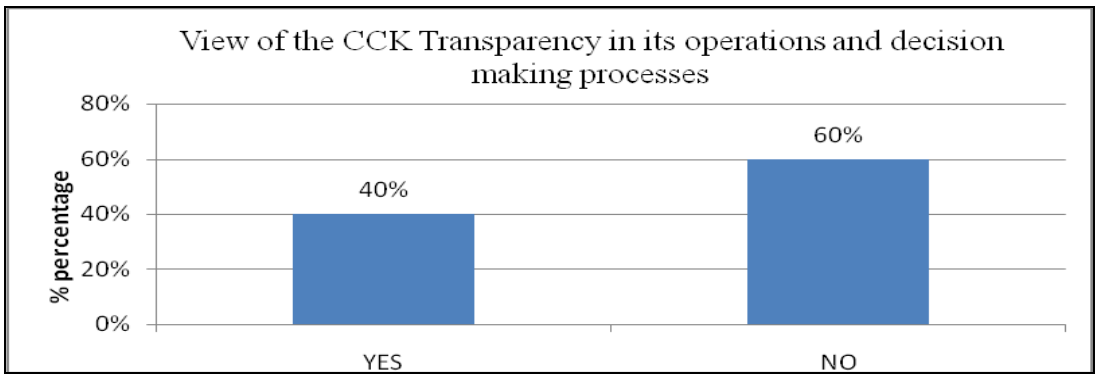


From the above analysis, the respondents have the view that CCK does not operate independently and neither the institutional capacity to operate independently. The most common area of interference is political.

4.7.6. Transparency, in the operations and decision making of the regulator

Table 4.42 summarizes respondents' view as to whether the CCK's regulatory operations, rulings and decision making processes are done in a transparent manner.

Table 4.42: Whether CCK actions are done transparently



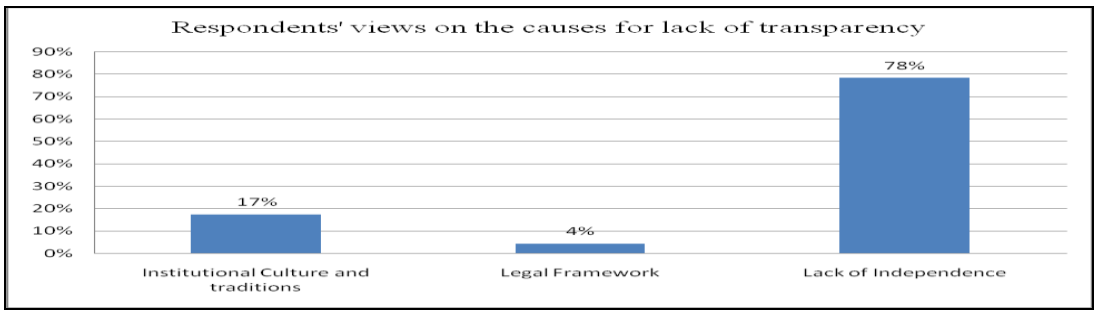
Sixty percent of the respondents hold the view that CCK operations and decision making processes are not done transparently.

4.7.7. The reasons for lack of transparency in the CCK operations

Reasons cited for lack of transparency in the CCK operations and decision making processes are shown in Table 4.43.

Seventy eight percent of the respondents who indicated that CCK lacks transparency in its operations and decision making, were of the view that, the main cause for the lack of operational transparency is due to the lack of Independency.

Table 4.43: Reasons for lack of transparency in the CCK operations



This analysis shows that the enhancement of the level of operational and institutional independence has a direct impact in the entire sector in terms of making

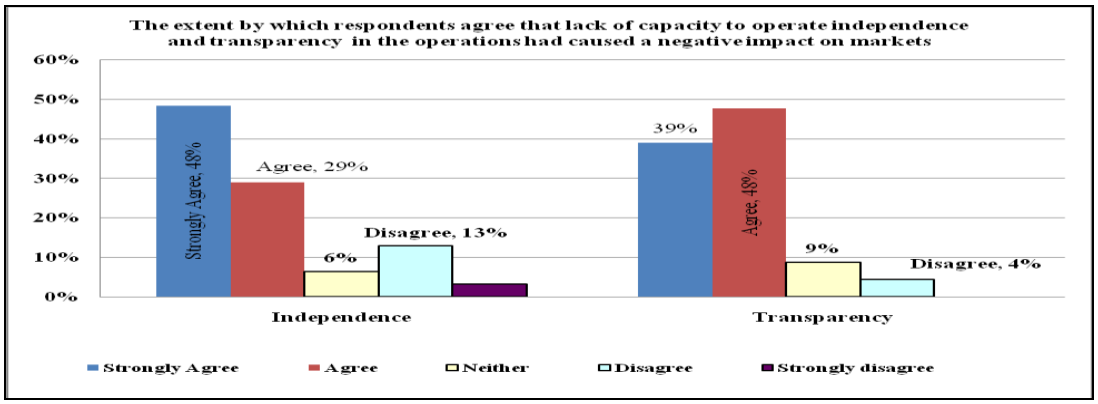
available financial instruments, increased investments, market entry, innovative services and network developments.

4.7.8. The impact of lack of institutional capacity to operate independently on ICT markets.

Table 4.44 summarizes the extent by which respondents' agree or disagree that the lack of the capacity of the sector regulator to operate independently from external interference had a negative impact in the realization of effective market entry and network rollouts.

Forty eight percent of the respondents strongly agree that reduced capacity of CCK to operate independently had affected the ICT market entry and operations, and twenty nine percent agree. Fourteen percent disagree and three percent strongly disagree. This implies that seventy seven percent agree that the reduced independence had caused the non-realization of effective rollouts.

Table 4.44: level of transparency and independence and ICT market entry



4.7.9. The impact of inadequate operational transparency in ICT markets.

On the extent by which respondents agree or disagree that lack of transparency in the operations and management of the regulatory processes had caused the unavailability of efficient financial instruments in support of ICT investments necessary in the realization of market entry and rollouts, table 4.44 also shows.

Thirty nine percent strongly agree and forty eight percent agree that lack of transparency in the operations and management of the regulatory processes had caused the unavailability of efficient financial capital instruments in support of ICT investments necessary in the realization of new market entrants and rollout targets, while five percent disagree.

4.8. SUMMARY AND RANKING OF CHALLENGES

Each respondent identified five key challenges, ranked them in the order of degree of the impact in the realization of market entry and network development, beginning with the one with the highest impact. The results are as summarized in Table 4.45.

Table 4.45: Identified challenges and ranking affecting the realization of Markets

Challenge	Number of Respondents	Percent	Ranking
Access to Frequency spectrum resource	36	78	1
Process of Environmental Impact assessments	26	57	2
Interconnection challenges	24	53	3
Funding challenges from external sources	22	48	4
Level of Independence of the regulator in the realization of its mandate	21	46	5
Acquisition and Leasing of sites	19	41	6
Approvals from City and other Local Authorities	18	39	7
Procurement and installation of the core equipment from vendors	15	33	8
Challenges of sharing and collocation of Infrastructure from Infrastructure operators	11	24	9
Transparency of operations and decision making processes of the regulator	10	22	10
Equipment Type Approval/conformity assessment process	7	15	11
Access to Telecommunication Numbering resources	4	9	12
Consultation with neighbourhood Communities in relation to wireless equipment deployments	1	2	13
Total	**46**	**100**	

Out of the forty six respondents, seventy eight percent cited access to the spectrum as the greatest challenge, followed by environmental Impact assessments from Environmental Management Authorities, which was cited by fifty seven percent of respondents, fifty two percent cited interconnection as the third challenge. Funding was cited by forty eight percent of respondents as the fourth challenge. The level of independence was the fifth most commonly frequent challenge cited by forty six percent of the respondents.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. INTRODUCTION

In this chapter the major findings, conclusion and recommendations of the study are discussed. This targeted the answers to questions as indicated in section 1.4, on the challenges of the licensees in the local loop in the realization of market entry and network development targets.

5.2. SUMMARY

This study was guided by four research questions and the following is the summary of findings that this research identifies as challenges affecting the realization of market entry and rollout targets of telecommunications licensees in the Local Loop.

The process of appointing commissioners and chief executive officer of CCK was identified in this research as a challenge in the realization of market entry and rollout targets of telecommunications licensees in the Local Loop. The Kenya Communication (Amendment) Act of 2009 confers powers to appoint the chair to the CCK board to the president of the republic, while the minister for communications is appoints the Chief executive officer and other CCK commissioners. These appointments are done for a renewable three year period, however, the appointees tenure of office is at the pleasure of the appointing authorities. However, in the research findings, eighty nine percent of the respondents were of the view that providing a security of tenure and parliamentary approval for industry Commissioners including the chief executive officers of CCK in the statutes

serves to enhance the performance of the sector. Additionally, seventy four percent said that political interference is the greatest challenge to industry operations and a total of seventy seven percent said the sector regulator lacks the capacity to operate independently in the fulfillment of its mandate, due to the political interference.

Additionally, sixty percent were of the view the operations and decision making processes of the industry watchdog are never done transparently and seventy one percent of them attribute this to lack of independence in the fulfillment of its mandate.

A total of seventy four percent were of the view that the lack of capacity to operate independently had negatively affected the ICT market entry and rollouts and another eight five percent said that lack transparency in decision making is the cause for the unavailability of efficient financial instruments in support of the ICT industries.

From the above analysis, the current process of appointing the industry Commissioners and the chief executive officers, provides room for political interference, which is identified in this research as the greatest challenge to the realization of transparency principles as recommended by WTO and global best practices.

In order to address the above legal challenge, a legislation amendment provision is required in the relevant statutes in order to provide for a security of tenure of industry Commissioners, approval of the same by the relevant legislative committee; in order to give more independence to the sector regulator in the fulfillment of its mandate and allow for transparency of the decision making processes.

On making available adequate lending instruments, a total of seventy eight percent of the respondents had indicated that financial support affects market entry and network developments to a large extent while a total of eight five percent said that the lack of transparency in regulatory operations and decision making, had caused unavailability of an efficient financial instruments in support of the ICT sectors. In order to address the above challenge on access of funding, the proposal for providing fixed tenure of office of the industry commissioners and approval of the same by the relevant legislative committee, as suggested above, enhances the independence of the regulator and regulatory certainty, a key requirement that encourages investments in the market and making available adequate and efficient financial instruments.

The time taken for licensing, approval processes and supply interconnection and other infrastructure facility and the fees charged, was identified by the respondents as a key challenge. A total fifty one of the respondents indicated that the time taken for Licensing, Approvals and for the access to the scarce resources is long while forty three percent indicated the time as neither long nor short, despite the fact that a total of eighty percent of the respondents agree that the process of approvals and access to the scarce resource critically affect markets in terms of entry and rollouts. Similarly fifty nine percent of the respondents said it takes a long time to access interconnection facility provided by the wholesale interconnection suppliers despite eighty five percent saying that access to interconnection facility is critical to market realization. Sixty eight percent of the respondents indicated that the operating license fees were high while seventy five percent saw frequency fees as high.

In order to address the regulatory challenges on time and fees charged, the regulations and policies on access to the Interconnection and other infrastructure need to provide for clear timeframes beyond which regulatory interventions becomes necessary. Additionally, the fees charged for interconnection, licensing, spectrum, approvals, infrastructure sharing and collocation should be regulated in a way as to reflect costs, based on the global best practices and costing models.

On the public unavailability of information and procedures for access of infrastructure and the scarce resource, fifty five percent of the respondents were of the opinion that there is lack of adequate public information on interconnection procedures including information in the Reference Interconnection offers (RIO) to potential, despite eighty five percent of the respondents agreeing that the process of accessing the interconnection facility is critical in the realization of market entry.

On Infrastructure sharing and the rights of way, fifty two percent and fifty six percent of the respondents respectively indicated that information on available infrastructure resources for sharing and rights of way is not also publicly available to potential users despite the fact that seventy nine percent of the respondents agree that the sharing infrastructure facility, collocation and the rights of way is critical, in the realization of market entry and rollouts.

In order to address the regulatory challenges, on ensuring public availability of information on available interconnection, other infrastructure and the scarce resource, the regulatory policies should make it mandatory for infrastructure and interconnection operators and rights of way providers to provide information to potential applicants.

On non-discriminatory access to infrastructure and the scarce resource, provided by local authorities, a total of eighty one percent of the respondents agree that the process of accessing the rights of way has a critical impact on markets, despite a total of fifty one percent of the respondents saying that the access and use of the rights of way is not administered in a non-discriminatory manner. Prescribed time periods for delivery and public availability of information on available interconnection and infrastructure facilities, frequency spectrum and other scarce resources, approvals for environmental concerns need to be certain and transparent to potential applicants in line with the WTO requirements.

A total of eighty five percent of the respondents were of the view that access to infrastructure has a critical impact on markets and a total of sixty two percent said that access to infrastructure required to be regulated and enforced by the industry regulator and sixty eight percent of those that felt access to infrastructure and access to the rights of way should be regulated, also felt that the tariffs charged for the access be regulated. In order to address the above infrastructure challenges, the government ICT policy needs to address aspects of administration and management of right of ways resource managed by local authorities and other utilities to ensure the faster realization of approval and non-discriminatory access.

5.3. CONCLUSION

The issue of process and terms of appointments of Commissioners of the ICT industry regulator has is critical in ensuring independence and transparency of operations. Operational independence and transparency enhances confidence, guarantees investments and hence competition on the market, faster realization of

market entry, reduction of costs and the availability of innovative products necessary for the realization of information based society as stated in the ICT policy.

5.4. RECOMMENDATIONS

Based on the above research findings, the researcher makes the following recommendations.

5.4.1. Appointments of CCK Commissioners and ICT committees

It is recommended that the relevant ICT Acts be amended to make provision for a fixed term appointments of all commissioners, the chief executive officer and members of related ICT committees and approval of the appointments with the relevant legislative arm in order to give more independence in the fulfillment of its mandate, and to allow for transparency of the decision making processes in line with WTO recommendation and global best practices.

5.4.2. National framework for accessing the rights of way

The national ICT policy requires to be enhanced in order to make necessary provisions for the faster realization of approvals and non-discriminatory access to the rights of way of the local authorities and utility operators.

5.4.3. Enhancement of Interconnection Regulations

Regulations governing interconnection needs to make provision for timeframes within which the regulator has the right to interfere in negotiations that take very long time to be resolved and that information and procedures for access of Interconnection, scarce resource including spectrum and numbers, access and use of the rights of way of local authorities and utility companies and sharing of the

infrastructure need to be made publicly available to potential applicants to ensure transparency and in line with global best practices.

5.4.4. Clear time frames for delivery of licenses and Approvals

Time frames for delivery of interconnection, frequency spectrum, approvals, including approvals for environmental concerns, infrastructure sharing, collocations and access to the rights of way of local authorities and utility operators, need to be short and certain in order to ensure faster market entry and network development and rollouts and that the rates charged reflect costs based on modern costing approaches.

5.4.5. Enhancement of institutional transparency principles

Transparency principles need to be institutionalized in the processes for decision making and rulings, in order to send the right signal to investments and for attraction of innovative funding instruments required in ICT markets.

5.5. AREAS FOR FURTHER RESEARCH

Due the limitations on time in which the research was conducted, it is also recommended that further in depth research is necessary in the area of ICT markets to establish whether there is sufficient institutional capacity to effectively handle competition and fairplay in the market.

It is also recommended that further studies need to be undertaken to establish whether the rates charged for spectrum in Kenya is high to the point of affecting wireless technological solutions and innovations in Kenya.

Research also need to be done to establish the whether the increase in level of institutional independence and transparency of operations and decision making processes of regulatory authorities, increases the level of market activity in terms of increased availability of financial instruments and investments in the market.

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APPENDICES

APPENDIX 1: LETTER OF INTRODUCTION

Dear Sir/Madam,

RE: REQUEST FOR RESEARCH DATA

I am a post graduate student at the Jomo Kenyatta University of Science and Technology, pursuing a course leading to a Master of Science in ICT Policy and Regulation. As part of fulfillment of this program, I am conducting a research on the challenges of licensees in the Local Loop in the realization of Market entry and the rollout targets in Kenya.

The information provided shall be used purely for academic interests. It may also be used to advise relevant authorities and as a tool to develop effective strategies and policies that ensures the efficient market and operational environment. This information will therefore be treated with utmost confidentiality.

You have been selected as part of the study and I wish to request you to assist in providing this information in the attached questionnaire.

Your assistance and co-operation will be highly appreciated.

Yours sincerely

Peter W. Nyongesa

RESEARCHER

APPENDIX 2: QUESTIONNAIRE

CHALLENGES OF REALIZING MARKET ENTRY AND ROLLOUT TARGETS FOR TELECOMMUNICATIONS LICENSEES IN THE LOCAL LOOP IN KENYA.

Kindly please tick (□) the box that matches your answer to the questions and list the answers in the spaces provided as appropriate.

1. GENERAL INFORMATION

1.1	Name of respondent	
1.2	Name of the organization	
1.3	The position held (eg. Director, Manager etc)?	
1.4	Gender	M ☐ F ☐
1.5	Department/section	
1.6	Years of industry experience	
1.7	The organization main activity in the ICT market (eg. Regulator, operator etc)	
1.8	The type of operating license issued by the ICT market regulator, where applicable. (eg. Local Loop Operator (LLO), Internet Service Provider (ISP), Application Service Provider (ASP), Facility Service Provider (FSP) etc.)	FSP ☐ ASP ☐ CSP ☐ LLO ☐ ISP ☐ OTHER ☐ Specify----

2. REGULATORY ISSUES

2.1 Has the organization you work with deployed the licensed services to the public? Already Rolled out ☐ Not yet Rolled out ☐ Rolled out but closed down ☐

2.2 In the case where the choice is 'Already Rolled Out' in 2.1 above, were the licensed services rolled out on time?

YES ☐ NO ☐

2.3 In the case where the answer is 'NO' in 2.2 above, what was the reason for not managing to roll out within the targeted time?

_____

_____

2.4 In the case where the answer in 2.1 is *'Not yet Rolled out'*, what is the reason for not being able to roll out the licensed services up to now?

_____

_____

2.5 In the case where the answer in 2.1 is '*Rolled out but closed down'* in 2.1, what caused the closing down of the operations after rolling out the services?

_____

_____

2.6 What is/ was your most preferred technology for rolling out your services to end users?

CDMA ☐ GSM ☐ WIFI/WiMax ☐ Optical fibre ☐ Copper cable ☐ Other technologies ☐ Please specify …….

2.7 What is / was the major reason that influenced your preference for the technology in Question 2.6 above?

Ease of deployment ☐ Availability of Spectrum ☐

Cost of spectrum ☐ price of the technology ☐ Reliability ☐

Other ☐ Please specify ……

2.8 How would you describe the ICT market environment in Kenya as guided in the table below?

	The ICT Market environment	Very good/ high	Good/ high	Average/ Fair	Poor/ low	Very Poor/ low
A	Competition in ICT market					
B	ICT Market growth					
C	Fair Competition amongst operators in the ICT market	Very much Fair ☐	Fair ☐	Neither ☐	Not Fair ☐	Totally not Fair ☐
D	Timely Rollout for licensees					
E	ICT Regulatory environment					

3. PROJECT FINANCING

3.1) How did you/ do you plan to finance your network developments?

Internal Shareholder Funds ☐ Venture Capitalist ☐

Bank Loans ☐ Vendor Financing ☐

Combination of the above ☐ other (specify)…… ☐

3.2) In your view, which area of the ICT project development requires the most immediate capital support?

Start-up capital ☐ Network rollout ☐ Marketing and related strategy ☐ Other (specify) _____ ☐

3.3) To what extent does access to financial capital affect your rollout in Kenya

Very large extent ☐ large extent ☐ Average ☐ Lower extent ☐

Very Low extent ☐

3.4) What do you think needs to be done to overcome these financial challenges in the ICT sector?

_____

_____

4. INFRASTRUCTURE ASPECTS

4.1) To what extend is access to infrastructure of other operators critical to rollout in Kenya?. Critical to a very large extent ☐ Critical to a large extent ☐ neither critical to a larger extent nor to a low extent ☐ Critical to a low extent ☐ Critical to a very low extent ☐

4.2) In order to ensure fair market entry, what do you think is the best option for infrastructure sharing(masts, way-leaves, ducts etc), collocations and the use of the rights-of way?

Regulated & enforced by regulator ☐ Commercial Agreement ☐

Industry Code enforceable by regulator ☐ Industry Code with self regulation ☐ Other (specify) _____ ☐

4.3) If ***'Commercial Agreement'***, option is preferred in 4.2 above, for access of infrastructure and use of the rights-of way, what should be the role of the regulator in Kenya?

Arbitration only ☐ dispute resolution and ensuring industry code ☐

No role at all ☐ Other (specify) ☐ _____

4.4) In your answer in 4.2 is '***Regulated & Enforced by regulator'***, should the price charged or tariff for the services be regulated as a way of ensuring easier access?

Yes, tariffs charged be regulated ☐ No, tariffs should not be regulated ☐

Tariff should be negotiated individually ☐ other (specify)…… ☐

4.5) If your view, what is the best option where Interconnection negotiations take an unreasonably longer period to be concluded?

Regulatory intervention for determination within time frame ☐

Regulatory intervention but for arbitration only ☐ No Regulatory intervention at all ☐ Other (specify) _____ ☐

4.6) Licenses and Approvals issued by sector regulator (CCK), approvals and access for the use of rights-of-way provided by the City/Municipal councils and utility operators, the National Environmental Authority for environmental concerns and access of infrastructure & wholesale interconnection supply provided by infrastructure operators, are fundamental in the realization of market entry and rollout targets.

a) What is your overall view about the charges for Licenses, Approvals and Access by the said institutions and operators? *(Key: Very high (5), High (4), Fair (3), Low (2), very low (1)).*

	Rates charged	Very high	High	Fair	Low	Very Low
1	Telecommunication License fees					
2	Frequency Spectrum license fees					
3	Type approval or conformity assessment fees					
4	Interconnection rates					
5	Infrastructure sharing and access fees					
6	Fees for access of the rights of way provided by municipal and/or city councils and utility operators					
7	Fees charged for environment Impact Assessment approvals by Environmental Agencies.					

b) What is your view about the **time** taken for the delivery or receipt of the licenses, approvals and access? (Key: Very Long (5), Long (4), Fair (3), Short (2), Very short (1)).

	Time taken for the approvals and services	Very Long	Long	Fair	Short	Very Short
1	CCK, for licenses, approvals and use of scarce resource etc,					
2	Interconnection from interconnection providers					
3	Access to Infrastructure of other operators					
4	Access of the rights of way provided by municipal and/or city councils					
5	Access of ducts, way-leaves, and the Rights –of- ways from utility operators eg. Electricity, Pipeline, Rail etc where applicable					
6	Environment Impact Assessments and approvals from National Environmental Authorities					

4.7) Please indicate whether you Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2) or Strongly Disagree (1) that the processes listed in table **below** critically contributes in the realization of market entry and rollout targets in Kenya?

	Access to the following	Strongly agree	Agree	Neither Agee nor disagree	Disag ree	Strongly disagree
a	Approvals and access to the scarce resource provided by CCK					
b	Access of the rights of way of municipal and city councils					
c	Access of infrastructure and collocation space of other Infrastructure operators					
d	Access of interconnection from interconnection providers					

4.8) Please indicate in the table below whether the **information** and **procedures** for interconnection and access of infrastructure are publicly available to other operators.

	Public availability of the following information	**YES**	**NO**	**Other (specify)**
a	Information of access and sharing of infrastructure and collocation from other operators			
b	Information on access to rights of way of by the municipal/city councils			
c	Information on procedures for access to Interconnection by the Interconnection providers			

4.9) Please indicate the extent you agree or disagree that approvals to access the scarce resources, infrastructure and interconnection indicated in the table below are done in a non-discriminatory manner. (*Key: Strongly Agree (5), Agree (4), Neither Agree nor Disagree (3), Disagree (2) or Strongly Disagree (1).*

	Access to the following	Strongly agree	Agree	Neither Agee nor disagree	Disagree	Strongly disagree
a	The scarce resources (spectrum and numbers).					
b	The rights of way of local councils					
c	Sharing infrastructure					
d	Wholesale interconnection from interconnection providers					

4.10) What do you think needs to be done to overcome these Infrastructure challenges facing the sector like Interconnection, access to infrastructure and aspects of the scarce resource including spectrum, numbers and the rights of way, in the ICT sector?

	Challenges	Resolutions
1		
2		

5 LEGAL ASPECTS

5.1. To what extent do you agree or disagree that the following ICT policy objectives listed in table below, as stated in the national ICT policy for 2006, have been realized and reflected in the relevant ICT statutes, competition laws and Regulations?

		Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a	Infrastructure development in support of information based society.					
b	Promotion of competition					
c	Support for privacy, e-security, electronic signatures, ethical and moral issues.					
d	Support for e-government					
e	Development of specific institution to champion e-health and e-agriculture					
f	Engendering Women in ICT policy formulation and implementation at all levels.					
g	Impact of infrastructure development and e-waste to the environment					
h	Disaster Management					

5.2. Please indicate to what extent you agree or disagree, whether outlawing cross media ownership results in a better ICT market environment?

Totally Agree ☐ Agree ☐ Neither agree nor disagree ☐

Disagree ☐ Strongly disagree ☐

5.3. What do you think needs to be included or excluded in the legal framework in order to overcome the legal and institutional challenges that affect the ICT market environment?

Legal aspects	**What needs to be done**

6. INSTITUTIONAL ASPECTS

6.1. Please indicate to what extent you agree or disagree, whether the following legal provisions in the ICT law, enhances the performance of the ICT sector.

	Legal Issues	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
a	Provision for a fixed term of office for Commissioners and the CEO to the board of the sector regulator					
b	Vetting appointments of the Commissioners to the board of the sector regulator by the relevant legislative committee.					
c	Funding sources for the sector regulator, should not be from license fees paid by regulated companies in order to avoid the potential for influence from the operators that pay huge license fees ('regulatory capture')					
d	Vetting appointments by parliament, to the membership of key ICT institutions like the Universal Service Fund, policy Advisory etc.					

6.2. How would you rate the performance and enforcement of the following critical regulatory aspects by CCK in Kenya? (Please indicate with a tick, or Mark in the right box).

	Measuring the effectiveness in the performance and enforcement of regulations	Very good	Good	Average	Poor	Very poor
a	Protection of the licensees from illegal operations					
b	Enforcement of compliance to Quality of Service					
c	Ensuring compliance to frequency regulations and resolution of frequency related problems among operators,					
d	Ensuring compliance to interconnection regulations and resolution of Interconnection related problems.					
e	Ensuring compliance to universal service.					
f	Ensuring compliance to Consumer protection					
h	Ensuring access and sharing of Infrastructure, and collocation.					
i	Ensuring access to the rights-of-way.					

6.3. In your view, do you think CCK is Independent enough or has the capacity to withstand external interferences in the fulfillment of its regulatory mandate?

YES ☐ NO ☐

6.4. If the answer is 'NO' in 6.3 above, what do you think is the cause?

Political Interference ☐ Influence of the larger regulated industry players ☐

Other (specify) ☐ _____

6.5. If the answer is 'NO' in 6.3 above, do you agree that the reduced independence had caused the non-realization of effective rollouts in the local loop?

Yes, Totally Agree ☐ Agree a little ☐ neither agree nor disagree ☐

Disagree ☐ Strongly disagree ☐

6.6. In your view, do you think CCK actions, operations and decision making processes are done in a transparent manner?

YES ☐ NO ☐

6.7. If the answer in 6.6 is 'NO', what do you think the lack of transparency is as a result of?

Legal Framework ☐ Institutional culture ☐

Level of Independence ☐ Other (specify) ☐ _____

6.8. If the answer in 6.6 is 'NO', to what extent do you agree or disagree that the lack of transparency in the operations and management of the regulatory processes had caused the unavailability of efficient financial capital instruments in support of ICT investments and industries necessary in the realization of new market entrants and rollout targets?

Yes, Totally Agree ☐ Agree ☐ Neither agree nor disagree ☐

Disagree ☐ Strongly disagree ☐

7. SUMMARY

The following challenges/activities, listed below, play a role in the realization of market entry and rollout targets. Please **tick** any five of the challenges/activities that you think have or had a **major** impact on the ICT markets and **rank** them by putting (1) next to the one with the greatest impact, (2) next to the one with the second greatest impact, (3), (4), through to 5 (with the least impact).

Please tick as applicable.	Tick	Rank
▪ Frequency Spectrum Assignment	☐	☐
▪ Interconnection supply	☐	☐
▪ Access, collocation/sharing of the Infrastructure of other operators	☐	☐
▪ Funding from external sources	☐	☐
▪ Approvals from local authorities	☐	☐
▪ Approvals from NEMA, civil aviation and government	☐	☐
▪ Procurement and installation of the core equipment from vendors	☐	☐
▪ Equipment Type Approval from CCK	☐	☐
▪ Acquisition and Leasing of sites	☐	☐
▪ Independence of the regulator	☐	☐

- Transparency of operations and decision making ☐ ☐
- Assignment of Numbers ☐ ☐
- Consultation with neighbourhood Communities in relation to wireless equipment deployments ☐ ☐
- Any Other(s) _____ (Please specify) ☐ ☐