PARAMETERS FOR A SUCCESSFUL TECHNOLOGY PARK: A COMPARATIVE ANALYSIS OF KONZA ICT CITY AND INTERNATIONAL BEST PRACTICES

BY

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Declaration

I declare that this research project is my original work and has not been submitted for a degree award in any other university.

Signed ……Date **……..**

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This research project has been presented for examination with my approval as the university supervisor.

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Dedication

I dedicate this project to my parents, my greatest inspiration. For constantly reminding me that in whatever I do, the sky should always be the limit. For encouraging me to advance my studies by enrolling for a master's degree program and for standing with me throughout the entire journey; I salute you.

Abstract

The proposed Konza Technology City project by the Kenyan government and vision 2030 has had its fare share of criticism. A major concern has been its controversial cost of 1.2 trillion shillings and whether Kenya is mature enough to become Africa's silicon savannah. While infrastructure is one thing, one of the biggest challenges many ICT start-ups and initiatives within Africa have has to do with attracting the right kind of human capital with the right skill sets to support such initiatives.

This paper evaluates the generic parameters for development and management of a successful technology park and compares Konza Technology City with international best practice. This is to help evaluate whether Konza will succeed and lead to job creation and economic growth in Kenya. Some of these generic parameters include triple helix of government, university and industry, availability of skilled labour, image of the location, planning context and commercial survival of the park, relevant telecom facilities and a culture of risk taking entrepreneurship.

To achieve the research objectives, comparative case study research method is used. Guided interviews with key Konza Technology City stakeholders are done. Review of empirical studies for the selected Technology parks considered successful internationally namely; Smart Village in Egypt, Cyberjaya in Malaysia, Cyber City in Mauritius, International Technology City in India and Silicon Valley in USA is also done. Konza is then measured against these successful parks to establish how it compares with international best practice.

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CHAPTER 1: INTRODUCTION

1.1Background of the Study

The International Association of Science Parks (IASP,2000) defines Technology Parks as a property-based initiative, which has formal and operational links with universities or other higher educational institutions, or major centres of research; designed to encourage the formation and growth of knowledge- based industries or high value-added firms, normally resident on site, and has a steady management team actively engaged in fostering the transfer of technology and business skills to tenant organizations. Technology parks are also known as Science or research parks, or innovation and science centres. The term technology park usually donates a focus on technology innovation and tenant company involvement in applied science. There are currently about 700 science parks worldwide that meet the foregoing criteria. The first park was founded in California in 1951, at what is now the centre of the Silicon Valley –The Stanford University.

Most successful technology parks house incubation programs. A business incubator is broadly defined as a facility providing controlled conditions for the development of new companies. The controlled conditions include at least three types of resources: facilities support, administrative assistance and professional expertise e.g. management, marketing, accounting, financial and legal services. A business incubator is also referred to as innovation centre, enterprise centre and business and technology centre. A technology incubator is a business incubator that is focused on development of technology based-companies (Smillor and Gill, 2000).

1.1.1 Technology Parks and National Development

Technology parks are designed to facilitate the production and commercialization of advanced technologies by forging synergies among research centres, education institutions, and technology based companies (Malairaja and Zawadie, 2008). Tenants of technology parks are usually small companies at an early development stage pursuing an ambitious growth strategy based on the incubation of new ideas. To facilitate the successful adaption and take-up of these ideas in the market place, the technology park provides financial consulting and assistance in obtaining venture capital, Professional, technical, administrative and legal assistance, information and telecommunication services and Supportive business infrastructure (Petree and Petkov 2010).

By aiding the growth of tenant companies, technology parks play a significant role in the development of local economies. They help create new jobs, attract foreign capital, and increase local and national competitiveness. This developmental role is particularly important in transition economies, which must absorb a great deal of structural unemployment and catch-up with rapid technological development in the global economy.

A technology incubator is an integral part of most technology parks and a major contributor to their success. The incubator is considered one of the best means of promoting business growth by effectively linking talent, technology, capital and professional know-how (Lalkaka, 1996). It also helps overcome bureaucratic obstacles and provides affordable space and business facilities, thus reducing the costs of start-ups. Most importantly, it provides advisory, training and information services, management and marketing support, linkages to research facilities, and access to capital, there by greatly enhancing the chances of success of the early stage technopreneur.

1.1.2 Development and Management of Successful Technology Parks

Technology parks vary in the way they are established and managed. They can be founded as independent legal organizations by state and local governments, universities and research institutions, development foundations, private corporations or any combination of these (Petree and Petkov 2010). For the purpose of administering the park, its founders establish a managing company responsible for the day-to-day management of the park and have full authority over the parks infrastructure and development (Spiro, 2010).

The success of technology parks depends on how efficiently they create an environment conducive to business development (Link and Scott, 2003). Government policies and regulations can significantly contribute in this direction by simplifying the regulatory system to facilitate the registration costs and time for starting a business, encouraging the creation of flexible funding mechanisms including venture capital funds, loan-guarantee schemes, Providing tax incentives for corporate and co-operative research and venture creation, and by Strengthening the legal system to protect business rights and intellectual property.

The existence of well developed university and research facilities and strong technological talent is one of the conditions for the success of technology parks (Dinteren, 2007, 2009). Technology parks are intended to create an environment for business and knowledge institutions in which they can function well by making use of each other's facilities, and where they can meet each other informally and exchange knowledge. An attractive environment is a plus point for the knowledge worker, just as the presence of young student population can be attractive to the business. The concept is strategic partnership and the exchange of strategic knowledge.

1.1.3 Technology Innovation in Kenya and Konza ICT City

Kenya gave the world two ground breaking innovations in Technology: M-pesa, a mobile banking system and Ushahidi, a platform for crowd sourcing information during disasters. The country's M-pesa cell phone banking services is now being used all over the world for purchases and money transfer (US Times magazine, 2011). Ushahidi has been used in 128 countries to map everything from the 2010 earthquake in Haiti to the Japanese tsunami and the Arab Spring.

A wide range of approaches to technology transfer at universities exist in Kenya. The University of Nairobi has a rich history of technology transfer which has had a huge impact on the Kenyan economy (Gachigi, 2010). This has contributed to high quality human resource to the nation and also spun out technologies like seed development for Kenyan climatic conditions and other agricultural and food processing technologies. The University of Nairobi Technology Park presently operates from a rapid-prototyping centre called Fab lab (Fabrication laboratory) which is part of a worldwide network founded by Prof. Neil Gershenfeld of the MIT Media Lab.

Strathmore University too has launched ICT based incubation program dubbed SITT-Strathmore Innovation Technology Transfer program. The program is housed at Strathmore University and seeks to bridge failure of ICT start ups and IT organizations in the early stages of formation (Walela, 2010). The Strathmore Innovation Technology Transfer program is an initiative to establish a technology and business incubator within the Faculty of Information Technology. The long-term objective of the program is to establish self-sustaining technology and business incubation programs designed to accelerate the successful development of innovations and commercialization of technology through an array of support resources and services.

The proposed Nairobi Industrial Park (NIP) will be a Jomo Kenyatta University of Agriculture and Technology, Government of Kenya & private sector initiative. Its aim will be to facilitate transformation of innovations and research findings into sustainable enterprises by availing an incubation process, with priority sectors in Agro-processing, Agro- machinery, Electric and electronics, metal, Bio-technology, ICT and packaging (Mwirigi, 2010). NIP will stimulate and manage flow of knowledge and Technology from universities, R&D institutions and other innovation pools to the industry.

The Kenyan Technology and new media sector is vibrant since over 80% of citizens have access to mobile phone and internet connectivity is expanding across the country. Technology entrepreneurs are seizing the opportunity and are ready to develop their ideas and launch their products in Kenyan and global market. Luckily for many techpreneurs, funding to grow sometimes risky and complicated technology-based companies has been made easier by venture capitalists with first venture capitalists pitch event named Tandaa Tech Ideas funding challenge being held at the iHub in 2010.

Kenya is now taking its technological talents to new heights through construction of a Technology park on a 5,000-acres piece of land, using the same company that designed Brooklyn's Barclays Centre in New York City- Shop Architects. Kenyan authorities want to transform Konza city into Africa's Technology hub, dubbed Silicon Savannah similar to California's Silicon Valley. In 2012, IBM set up its first African research lab in Nairobi, joining renowned American companies like Google, Microsoft and Intel that have their regional headquarters in Kenya. Konza is heavily influenced by similar new cities like Cyberjaya in Malaysia, Cyber City in Mauritius and Egypt's Smart Village.

Konza Technology city is a Kenya Vision 2030 flagship project, a national long-term development blue-print to create a globally competitive and prosperous nation with a high

quality of life by 2030. Konza city will offer world class communications infrastructure, thanks to The East African Marine Systems (TEAMS) submarine fibre optic cable instigated by the Kenyan government and the country's three other international fibre optic connections. The city will be located in Konza, Machakos County in Eastern province. The target is to create over 20,000 BPO/ITES jobs in the medium term period (2015) and over 100,000 by the year 2030 while sustaining an annual GDP growth rate of 10 %.

Konza is about 60 Km from Nairobi. Although it's argued that there will be high speed trains to mitigate the distance, there is the issue of getting to the terminals .People will still have to commute and this makes no logistical sense. There is also the issue of quality of life, commuting is a long and draining process (Demo Africa, 2013). Another problem is that, a company may want to move to Konza, but its customers might not move hence support, maintenance and business development teams would have to commute right back to the CBD they left in the morning and en route to Konza. In other words, Konza as a concept, laudable as it is depends on the success of many other small initiatives, many of which may not be apparent at first glance and will therefore take a while to properly actualize (Akunga, 2012).

The controversial cost of Ksh 1.2 trillion and whether Kenya is mature enough to become Africa's silicon valley are major concerns too (Technology Africa, 2013). Critics also argue that while infrastructure is one thing, one of the biggest challenges many ICT start-ups and initiatives within Africa has to do with attracting the right kind of human capital with the right skill sets to support such initiatives. The level of consultation for the project is also questionable with allegations that it was limited to financiers, planners and the management team, excluding education institutions and technology companies.

1.2 Statement of the Problem

Technology parks are sources of entrepreneurship, talent and economic competitiveness, and are key elements of the infrastructure supporting the growth of today's global knowledge economy (Peters and Monk, 2012). By providing a location in which government, universities and private companies cooperate and collaborate, science parks create environments for innovation by enhancing the development, transfer and commercialization of technology. The parks offer a number of shared resources such as incubators, programs and collaboration activities, uninterruptable power supply, telecommunications hubs and management offices offering considerable advantages to hosted companies. Key risk factors in setting up a technology park include demand for the project to justify massive land allocation, capacity to fund the project and planning which has big impact on the infrastructure

Although Konza technology city vision is clear and a project like this would be a milestone for the country, there is a concern on whether there is both government and private sector support needed to make it happen (Demo Africa, 2013). There is low interest from local investors in what is supposed to be an exemplary private-public partnership model. For the initial 500 acres of the project, only 40 % has been taken up by local sector. At the same time, critics ask how government can justify backing a project like this when there are other basic services in need of reinforcement.

A number of consulting and government reports have been written on various countries, especially for the case of US (Rosenberg, 2011) and India (Bong, 2005). However, most of these reports tend to focus on general competitive advantages of the countries, rather than specific conditions which made the technology parks a success, the structural conditions facing the parks location and what can be done to improve those conditions.

In Kenya, researches have been done on the iHub to help understand its success .The iHub is an independently-run and community owned-space with the community at the heart of all that happens at the iHub .The iHub's team is made of highly energetic and committed people coupled with its advisory board made-up of 4 influential and highly credible technology players from Nairobi. In order to sustain the iHub beyond the funding, it has taken iHub an experimental approach of iterating what works and killing ideas that don't fit, instead of creating a grand plan (Hersman, 2010). Export processing zones (EPZs) on the other hand have not been a success story for Kenya's innovation centres. EPZs failure reasons include poor management, unfair dismissal of workers after protests on delayed payments, poor work conditions and low remuneration to its employees (Mulama,2004), 'ECONOMY-KENYA: EPZs Failing to Deliver on workers'. (Kamungi and Ouma2004), 'The Manufacture of poverty: The Untold story of EPZs in Kenya '.

Internationally, the following parameters are critical for Technology Park success ; a region that has a large metropolitan, diverse and well established developed economy, a strong research base, a culture of entrepreneurship, pro-active and `entrepreneurial management and stakeholders including a University or research centre that are actively engaged in championing and delivering resources to establish the Science park (Bhagwati, 1994). Studies have also identified that a culture of risk-taking entrepreneurism, an autonomous park management, an enabling environment, a critical mass of companies, the presence of internationally renowned innovative companies, and a shared vision among technology park stakeholders are key success factors to Technology parks (Briggs and Watt 2001). Relevant telecom facilities are an important precondition for the success of the BPO/ ITES industry (Kurien, 2010).

Not notwithstanding, Konza appears to be proving sceptics wrong. So far, more than a dozen companies are expected to start setting up operations in Konza. The success of a Technology

Park can be predicted with a set of realistic assumptions by considering the planning context, commercial survival of the park, key parameters and main risks.

The parameters that support success of Technology Parks are becoming better understood. No documents on Konza have established how it compares with best performing BPO/ITES Parks. This study therefore seeks to find out; what are the parameters for a successful BPO/ITES Park and how does Konza compare with the best?

1.3 Research Objectives:

1. Establish the parameters for a successful Technology Park.
2. To compare Konza ICT city with international best practices for Technology parks.
3. To evaluate whether Konza city shall meet its objectives as set by vision 2030.

1.4 Value of the Study

This study will be important to the Kenyan government and other Key stakeholders of the Konza Technology city. It looks comparatively at other areas internationally where the concept is a success through a predictive model that clearly examines different parameters which have made ITES /BPO a success; establishing clear links between the evaluation on research objectives and summary findings derived from raw data to develop a frame work of the underlying structure of experiences or process that are evident in the raw data.

The study will also serve as a reference for justifying investment on this multi-billion project and to dispel the fear that some investors are suffering from. It also aims at finding out if the proposed project will be a success and if it will provide economic value to all stakeholders and dispute claims that the only beneficiary in this is the government and the wealthier outsourcing companies.

The results of the study will additionally be invaluable to researchers and scholars, as it will form a basis for further research. Students and academic's can use this study for discussions on BPO/ITES- science park concepts, development and their success.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter contains a review of Technology Parks globally and in developing countries and their success parameters. The chapter also looks at the theoretical perspective behind establishment and operations of Technology Parks through cluster theories and National Innovative System. It also looks at Technology Innovation centres & parks in Kenya, their success and failures.

2.2 Technology Parks in Developing Countries

Development of service sectors was traditionally assumed to be confined to developed countries that have mature markets and industrial sectors (Foray and Lundvall, 1996). It has recently been found that with the appropriate educational and other supporting bases, developing countries can also take this path. The rise of IT-enabled services (ITES) outsourcing or business process outsourcing (BPO) has allowed these countries to develop a new kind of export sector focused on business services.

Economists have long noted that services in general are cheaper in developing countries than in developed countries. This has been attributed mainly to an abundant supply of labour –the major input in the production of services in developing countries. Since the technology for producing services does not differ significantly from one country to another, lower wages result in lower cost (Bhagwati, 1994). Nevertheless, developing countries in general have been unable to benefit from this cost advantage mainly because most of the services are embodied in their provider and their export called for the trans-border movement of labour.

India's technology service success owes largely to the cumulative investments made by the Government over the past five decades in building up a National Innovative system. This laid the foundation for the development of skill and technology intensive sectors such as IT

software and related services. This include a system of higher education in engineering and technical disciplines, the creation of an institutional infrastructure for Science and Technology, policy making and implementation, building centres of excellence , a national information infrastructure and numerous other institutions for technology development among other initiatives.

2.3 Critical Success Parameters for Technology Parks

The success of a Science and Technology Park, and the contribution that it can make to its regional economy are not the same (Main et al, 2005). A Science and Technology Park is more likely to be successful if its founded in a region that has a large metropolitan, diverse and well established developed economy, a strong research base, a culture of entrepreneurship, pro-active and `entrepreneurial management and stakeholders including a University or research centre that are actively engaged in championing and delivering resources to establish the Science park.

Generally, a technology park is an area where innovation is key. It is a physical place that supports university-industry and government collaboration with the intent of creating high technology economic development and advancing knowledge. Science and technology parks are supported by universities in order to bring in industry with which they can collaborate, and by local government, in order to improve the prosperity of the community. Incentives attract companies to the area often offered as part of the entire package.

The success of Silicon Valley was enabled not just by the triple helix of government, University and industry in its role as knowledge consumer. Two other significant and generally less well known phenomena that defined the success of Silicon Valley are an entrepreneurial ecosystem driven by venture capitalists and consumers that benefitted from the new product development, policies of large corporations and the presence of national corporate research labs (Adams, 2012).

The emergence of Bangalore as an IT hub of India can be attributed to significant knowledge and talent flow from its high-tech labs (Valroization: Tangible benefits from STPs, 2012). Bangalore housed both defence and corporate research labs including Electronics and Radar Development Establishment, Hindustan Aeronautics ltd, Indian Telephone Industries ltd and Bharat Electronics Limited long before IT industry took roots in that city. On the other hand, Electronic city as an IT company hub was set up only when the government sensed there were some infrastructural challenges, especially in communication bandwidths.

Singapore started its activities with a Science Park built next to National University of Singapore. Singapore's National Research Foundation designed a framework that allows for top down and bottom up approaches towards creating comprehensive virtual or distributed Science and Technology Parks across the entire nation ((Adams, 2012).The top down approach supports strategic research programs and national innovation challenges considered important to Singapore's future while allowing for future focus through the National Innovation challenge programme. The bottom up approach supports creation of campus for research excellence and technological enterprise and competitive research programs funding scheme.

Given the potential importance of technology parks, their complexity in terms of the scope of required investment and the growing interest of governments to use them as tools for creating sustainable development, there is need for better understanding of the critical success factors of these entities (Briggs and Watt 2001). However, many technology parks and the factors driving innovation success are still a mystery. Studies have identified that a culture of risk-taking entrepreneurism, an autonomous park management, an enabling environment, a critical mass of companies, the presence of internationally renowned innovative companies, and a shared vision among technology park stakeholders are key success factors to Technology parks(Briggs and Watt 2001).

Relevant telecom facilities are an important precondition for the success of Technology Parks. The Indian government has taken numerous steps to improve the telecom infrastructure in the country. The international bandwidth situation has improved dramatically over the last 3 years (Kurien, 2010). The privatization of the telecom industry has resulted not only in significant drop in rates but also better services. The telecom costs have dropped by about 85% in 3 years. Similar changes have been observed in the power sector and infrastructure as well. Power availability has improved dramatically over the last few years. This has gone a long way in ensuring uninterruptable power supply to the ITES destinations like Bangalore, Delhi, Chennai, Bombay, Pune and Calcutta. The overall roads and highways infrastructure scenario in India has also witnessed major improvements over the last few years with the arena of multi lane highways. Most of the cities and towns are connected and interlinked to each other. Major investments have gone into the development of highways, both on the side of the central and state Governments.

Egypt too has emerged with a strong value position to take advantage of this new era in ITES. Key to Egypt's success has been its ability to provide in addition to lower costs and higher quality both graduates with multilingual skills, and a location offering geographical and cultural affinities to its client's (Sforzi, 2002). These factors have become increasingly important as the industry has matured and Egypt is proving it can achieve the task head on. Just some of Egypt's key BPO success so far include a 600 seat global resource centre for IBM; a global application support centre for Oracle with approximately 500 engineers; 1,736 call centre agents for Vodafone who serve the middle East, Australia, UK and New Zealand; and both a global innovation centre (one of only two in the world) and call centre for Microsoft.

With this abundant talent pool of multi-talented technologically savvy graduates, its low cost of operations; high quality infrastructure and strong government support, Egypt is expertly

placed to create this sense of innovation in its offer, and further grow and develop its positioning as leader in global ITES industry. In 2009, ITIDA (Egypt's Information Technology Industry Development Agency), won the prestigious offshoring destination of the year award by the National Outsourcing Association, an award that is also won in 2008. On the A.T, KEARNEY Index of 2009, the country ranks sixth as a global offshoring destination ahead of competitors like morocco, Israel and Jordan.

These kinds of awards and rankings are indicative of the type of progress that Egypt has made it becoming a premier ITES hub. The government expected this industry in Egypt to earn $1.1 billion in 2012 and double that by 2013. Companies like Microsoft, Teleperformance, Google, Vodafone, Xceed, ECCO and E Group have already established contact centres in Egypt. ITIDA, which is affiliated with Egypt's ministry of communications and Information Technology, has been aggressive in promoting Egypt as an outsourcing destination. Not only does it train 3,000 students every year as call center representatives, but ITIDA is offering to match the difference if any other market offers lower costs. Egypt has proved that it can make costs just as competitive as those of India or Philippines. In addition, it boasts of multi-lingual workforce fluent in Arabic, English, German, Spanish and Italian. As well, the country is just four hours away by flight to many places in Europe, and its time zone overlaps European business hours better than India or the Philippines. What's more, Egypt works on Saturdays and Sundays, offering quality outsourcing even on those traditionally weaker days.

2.4 Theoretical Perspectives on Science and Technology Parks

This section looks at two theories that best explain Technology parks establishment and operations namely the cluster theory and National Innovation Systems. Clusters are geographic concentrations of interconnected companies, specialized suppliers, service

providers and associated institutions in a particular field that are present in a nation or region (Porter, 1998)

Recent decades have seen a shift from an earlier focus on innovation sources confined to a single institutional sphere, whether product development in industry, policy making in government or the creation and dissemination of knowledge in academia, to the interaction among these three spheres as the source of the new innovative organisational designs and social interactions(Etzkowitz and Leydesdorff, 1995). This shift entails not only various mechanisms of institutional restructuring of the sources and development path of innovation, but also a rethinking of main models for conceptualizing innovation, including innovation systems (national, regional, sectoral, technological etc) and the triple helix, a novel analytical concept that systemizes the key features of university –industry- government interactions addressed as a framework into an innovation system.

The construction of parks has been identified as an important incentive and as an infrastructural investment, capable of attracting enterprises from outside and creating jobs, while clusters emerge as generators of new forms from inside (Bekes, 2011).Clusters are geographical concentrations of interconnected companies and institutions in the particular field (Porter 2000). Clusters are not fixed flows of goods and services, but are rather dynamic arrangements based on knowledge creation, increasing returns and innovation in a broad sense (krugman, 1991).

The cluster success can be explained by the social relations among community members (Becattini, 2001). This can include shared culture, use of the same language in technical terms and development of trust relations between cluster members. Social capital has a major impact in the development of the cluster. This type of capital is difficult to build using artificial techniques as in the case of technological capital that can be acquired and is an

important advantage in facilitating the communication and the collaboration specific to cluster models.

The proximity of firms in the same industry allows an exchange of knowledge and ideas through direct contact and free movement of labour, and also imposes on firms a high pace of innovation and higher productivity (Baptista and swann, 1998). This advantage is determined by the existence of homogeneous environment in terms of knowledge, the proximity to other companies and direct contact with people in the same field .This also leads to reduced risks and durations of the innovation process because of direct or informal information transfer between partners, companies and their clients or between firms and research institutions (Malmberg, Solvell and Zander, 1996)

National innovation systems perspective brings in a broader set of factors and institutions as shaping the innovation process (Kayal 2008). Many scholars believe that the National Innovation capability can be measured through many aspects such as human resources, knowledge creation, knowledge dissemination & application as well as innovative finance (Commission of European communities, 2003). The National Innovation System is supposed to cover six subsystems, including science and technology policy, innovation strategy, technical human support services, technical support services, mobilization of financial resources and international cooperation (Kayak 2008).

2.5 Technology Innovation Centres and Parks in Kenya

Kenya Information and Communication Technology (ICT) Board is a state cooperation within the Ministry of Information and communications. Its overall purpose is to market Kenya as an ICT destination through developing and promoting Kenya's Outsourcing industry, developing, launching and sustaining a compelling Kenya ICT brand and building technology and incubator parks (Kukubo, 2012). Kenya ICT broad vision is to see Kenya

become top ten global ICT hubs. The vision is set against Kenya vision 2030 plan for wealth and employment creation –to market Kenya a middle class, highly competitive nation by the year 2030.

One of Kenya's successful innovation centres is the iHub. The iHub is a working space and business incubator that was started in Nairobi in March 2010 by Erik Hersman, a renowned blogger and entrepreneur. The iHub provides a space where young entrepreneurial members can receive mentorship, Internet connectivity and possibility of venture funding through connections with the international venture capital community .The space is a tech community facility with focus on young entrepreneurs, web and mobile phone programmers, designers and researchers.

The success of iHub has come from a strong foundation of advisors and community members who understand their city, their peers and their region. iHub is an independently-run and community owned-space. Secondly the community is the heart of all that happens at the iHub with emphasis that a space like the iHub needs to be put together by someone from the community of techies who understands at a basic level the needs and has the credibility within it to make it happen (Hersman, 2010). The iHub's team of highly energetic and committed people coupled with its advisory board made-up of 4 influential and highly credible technology players from Nairobi, including Erick, made the greater community appreciate that they were being represented well. In order to sustain the iHub beyond the funding, they took a very experimental approach, iterating on what worked and killing ideas that didn't fit, instead of creating a grand plan.

Export processing zones (EPZs) on the other hand have not been a success story for Kenya's innovation centres. EPZs were started in 1990 to attract export oriented investment that could among others, increase foreign currency earnings and provide employment. Companies that

setup shops in EPZ s were offered incentives such as tax holidays, duty and tax free access on imported inputs and capital equipment and expeditious processing of work permits for essential expatriate workers. However, EPZs have been on the limelight for all the wrong reasons including poor management, unfair dismissal of workers after protests on delayed payments, poor work conditions and low remuneration to its employees (Mulama, 2004) , 'ECONOMY-KENYA: EPZs Failing to Deliver on workers'. In light of this, EPZ's are seen as adding little to Kenya's economy, as they are not sparking development and industrialization in Kenya. Yes they have provided labour (jobs), but labour that is paying poverty wages. (Kamungi and Ouma 2004), 'The Manufacture of poverty: The Untold story of EPZs in

Outsourcing services are growing rapidly in Kenya with local companies signing deals with international firms for back office services like transcription and data entry. Kenya aims to be in a better position to train its employable talent pool specifically for the offshore outsourcing industry. (Luzuriaga and Waema, 2010). The offshore outsourcing industry presents an opportunity for emerging countries like Kenya to focus on the employability of its labour pool which make the country more marketable to multinational companies and in particular, service providers and buyers of outsourced services.

2.6 Summary of Literature Reviewed

To identify the critical success factors that underlie ITES industries in developing countries, this has to be in terms of policy and institutional environment, legal and regulatory considerations, incentives , infrastructure &bandwidth requirements, human capacity needs & capacity building requirements, criteria for choice of BPO destination and types of BPO operations (Were, 2011).

A Science and Technology Park is more likely to be successful if its founded in a region that has a large metropolitan, diverse and well established developed economy, a strong research base, a culture of entrepreneurship, pro-active and `entrepreneurial management and stakeholders including a University or research centre that are actively engaged in championing and delivering resources to establish the Science park. The triple helix of government, University and industry in its role as knowledge consumer are also key for a Science and Technology park success. Science and technology parks are supported by universities in order to bring in industry with which they can collaborate, and by local government, in order to improve the prosperity of the community. Incentives attract companies to the area often offered as part of the entire package

Studies have identified that a culture of risk-taking entrepreneurism, an autonomous park management, an enabling environment, a critical mass of companies, the presence of internationally renowned innovative companies, and a shared vision among technology park stakeholders are key success factors to Technology parks. However, technology parks and incubation programs are not always a success (Sun, Ni and Leung, 2007). Technology parks in specific context might be a technology fantasy (Bakouros, Mardas and Varsakelis 2002).

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology which was used to achieve the objectives of the study outlined in chapter one. Further, the chapter will discuss the following aspects of research that the study has utilized: research design, selection of cases, data collection and data analysis.

3.2 Research Design

This paper is a comparative case study (Pare, 2001), therefore it has combined both primary and secondary data collection methods to produce a wider scope of coverage and give a fuller picture of success parameters for Technology Parks. The source of qualitative evidence was in from of empirical studies and academic reports on Technology Parks Success Parameters globally as discussed in the literature review. This was then followed by administration of in-depth interviews to a few selected key stakeholders to the Konza Technology City project to evaluate how Konza compares to global best practice.

3.4 Selection of Cases

There are currently 700 Technology Parks in the world that meet the definition of a Technology Park by The International Association of Science Parks (IASP, 2000). This research has focused on selected Technology Parks considered successful in developing countries as well as globally. These are Smart Village in Egypt (Technology Innovation and Entrepreneurship Strategy, 2011), Cyberjaya in Malaysia, (Hashim, 2012), Cyber City in Mauritius (Ujodha, 2011), International Tech City in India (Bong, 2005) and Silicon Valley in USA (Rosenberg, 2011). There were interviews with five experts from Kenya vision 2030, Kenya ICT board, Konza city, a well known business leader in ICT business and an official from the ICT infrastructure in the Ministry of Information and Communication in Kenya.

3.5 Data Collection

The research has used both primary and secondary data to carry out the study. Primary data was collected by way of personal in-depth interviews with 5 key stakeholders to Konza Technology City. A brief interview guide was used to facilitate the collection of data from the respondents who were; an official from Konza city to help understand Konza's development and management plan on paper, official from Kenya vision 2030 to elaborate on the city's objectives, official from Kenya ICT board which has been on the fore front when it comes to marketing the project to investors , a well known business leader in ICT and an official from the Ministry of Information and Communication to help understanding the ICT infrastructure in Kenya.

Secondary data was collected from published empirical and academic reports on the selected Technology Parks to establish the parameters for success and how they rate in the different parks on a scale of 1 to 5.

3.6 Data Analysis

Considering the comparative nature of the study, secondary data was used to outline identified key success parameters in a matrix format and calculate an average score on the different selected Technology Parks. The average formed the global best practice. This was followed by use of chi-square statistics technique for comparison purpose to determine whether Konza measurers up to international best practice. The analyzed data was thereafter interpreted with respect to the research objectives of establishing key parameters for development and management of a successful Technology park and evaluate Konza to determine whether it will meet its objectives and lead to economic growth in Kenya.

CHAPTER 4: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the summary of the analysed data. The results are presented based on the objectives of the study, which aims at establishing parameters for developing and managing a successful Technology Park and comparing proposed Konza Technology City with international best practice to see if it will meet its objectives. Data analysed is tabulated in a matrix format and an average parameters score for the selected Technology Parks calculated to form global best practice. Chi-square test was then used for comparison purpose to evaluate Konza's score in comparison to the selected internationally known successful Technology Parks. After this, qualitative analysis of in-depth interviews was done

4.2 In-depth Interviews

For qualitative data analysis, in-depth Interviews were conducted. All the targeted 5 representatives from Konza City, Kenya ICT board, Kenya vision 2030, ICT Business leader and an official from the Ministry of Information and Communication in Kenya were interviewed, thus representing 100 % response. A questionnaire return rate of above 50 % is considered good for a study (Peil, 1995). The interviews were approximately 2 hours long, with short summary notes from responses for each interview question. Thematic content analysis was used to pinpoint patterns across the responses that are associated to a specific research question.

4.3 Parameters Matrix

From Literature reviewed, 14 generic parameters were identified as key for development and management of a successful Technology Park. These are triple helix of government, university and industry, availability of skilled labour, proximity of universities, geographical location, reachability, image of the location, planning context and commercial survival of the

park, strong research base, relevant telecom facilities, diverse and well established economy, autonomous management of the park, culture of risk taking entrepreneurism, shared vision among stakeholders and National Innovative System.

These parameters have been used to define their applicability in five Internationally recognized Technology Parks using a scale of 1 to 5; where 1 (Very Poor) is the least score and 5 (Very Good) is the highest score. These chosen parks are Cyberjaya in Malaysia, Cyber City in Mauritius, International Tech Park in India and Silicon Valley in the USA.

Test of independence

Chi square (χ^2) statistics was then used to investigate whether distribution of parameter variables differ from one Technology Park to another.

The chi square formula is as below:

$$\chi^2 = \sum \frac{(0_{ij} - E_{ij})}{E_{ij}}, \quad Eij = \frac{r_i c_j}{n}$$

Where:

χ^2 = Chi square

$\sum$ = summation of parameters

n= Sample size (Total Count)

E_{ij} =Expected outcome

$r_i c_j$=represents total

0_{ij} =Actual Outcome

Test of Independence

H_0- Konza parameter values are similar to a give Technology Park.

H_A-Konza parameter values are different a give Technology Park.

Table 1: Generic Parameters for Chi square Test

Below tabulated generic parameters were identified as key for a Technology Park's Success and they were used to define their applicability in various parks using below scale of 1 to 5 ;

√Very Good (5) √Good (4) √ Average (3) √ Poor (2) √ Very poor (1)

Parameters	Konza Tech City (Kenya)	Smart village (Egypt)	Cyberjaya (Malaysia)	Cyber City (Mauritius)	International Tech park (India)	Silicon valley (USA)
1. Triple helix of government, university and industry	1	4	4	4	4	5
2. Availability of skilled labour	2	3	3	4	5	5
3. Proximity of universities	1	2	3	4	4	5
4. Geographical location	1	3	4	4	4	5
5. Reachability	1	3	4	4	4	5
6. Image of the location	1	3	4	5	4	5
7. Planning context and commercial survival of the park	3	4	4	4	4	5
8. Strong research base	2	2	3	4	5	5
9. Relevant telecom facilities	2	3	4	5	5	5
10. Diverse and well established economy	2	3	4	4	4	5
11. Autonomous management of the park	3	4	3	5	4	5
12. Culture of risk taking entrepreneurism	4	3	4	4	5	5
13. Shared vision among stakeholders	3	4	3	3	4	5
14. National innovative system	2	4	4	4	5	5

Chi square statistical hypothesis requires a minimum of 5 scores per cell. To achieve this, similar parameters were pooled together and their values summed to generate the table below:

Table 2: Pooled Parameters for Chi square Test

Parameters	Konza Tech City (Kenya)	Smart village (Egypt)	Cyberjaya Malaysia	Cyber City Mauritius	International Tech park (India)	Silicon valley (USA)	Global best practice
1. National innovativeness and governance	6	12	11	13	13	15	13
2. Geographic Location and availability of skilled labour	5	12	15	17	17	20	16
3. Proximity to universities and culture of risk taking entrepreneurism	7	7	16	14	14	15	13
4. Planning concept and commercial survival of the park	5	7	8	9	9	10	9
5. Autonomous management of the park and well established economy	5	7	7	8	8	10	8
χ^2		0.738	0.428	0.428	0.327	0.421	0.428
df		4	4	4	4	4	4

The parameter values on both tables were achieved by scoring the different Technology parks on a scale of 1-5 using Silicon Valley as the benchmark with all its scores at 5. The values are specific to a particular Technology park's success story from literature reviewed.

4.3.1 Silicon Valley -USA

Table 3: Konza vs. Silicon Valley

Observed range

	Konza	Silicon Valley	Total (r)
	6	15	21
	5	20	25
	7	15	22
	5	10	15
	5	10	15
Total (c)	28	70	98

Expected range

6	15
7.1	17.9
6.3	15.7
4.3	10.7
4.3	10.7

Test of Independence

H_0- Konza parameter values are similar to Silicon Valley

H_A-Konza parameter values are different to Silicon Valley

$\chi^2 = 0.853358$

df = 4

Chi critical from Chat: 0.421

Decision: H_A - Konza parameter values are different to Silicon Valley.

From secondary data analysed, it was evident that Silicon Valley emerged as a result of Stanford University's development strategy as an entrepreneurial university (Weil, 2009). Located on a perfect site surrounded by thousands of acres of scrub where valley turned into hills, Stanford took a proactive stand in creating industry to support academic development from its founding. Silicon Valley's rise was supported by triple helix university- industry government relationships (Lee, 200). The valley has expanded from a local generator of new technologies and industries into the key node of a global network with multi-national firms, countries, regions and universities maintaining outposts to market or source advanced technologies.

Key to Silicon Valley's top competitive advantage is its highly skilled pool of talent which is essential for businesses that require a steady stream of talent (Sturgeon, 2000). High quality of life, including beautiful weather, excellent schools, and the ability to live and work in the suburbs is an advantage, making CEO's want to locate their companies there and attracting talented workers and their families. Proximity to savvy customers, both business and consumer is another advantage, as it facilitates sales and aid in product development. Behind contemporary Silicon Valley where success as well as failure is celebrated as a learning experience, there is a history of indigenous academic entrepreneurship, governments support for R&D, as well as importation and reinterpretation of ecosystems like the venture capital firms that ensure access to capital, especially for start-ups that are an important driver of the region's economy.

Konza compares poorly with Silicon Valley. The geographical location is unattractive to most ICT companies with reachability from Nairobi where most of their customers are based being a major concern. With over 100,000 jobs expected to be generated in the initial stages through BPO centres, skilled workforce is a major concern. Although Kenya boasts of well educated labour force, majority of this fall far behind what the multinationals would expect to employ. Lastly, triple helix university- industry government is missing on this project.

4.3.2 International Technology Park Bangalore- India

Table 4: Konza vs. International Technology Village

	Observed range			**Expected range**	
	Konza	International Tech	Total (r)		
	6	13	19	6.0	13.0
	5	17	22	7.0	15.1
	7	14	21	6.6	14.4
	5	9	14	4.4	10.1
	5	8	13	4.1	10.0
Total (c)	28	61	89		

Test of 1ndependence

H_0- Konza parameter values are similar to International Technology Village.

H_A-Konza parameter values are different to International Technology Village.

$\chi^2 = 0.873861$

$df = 4$

Chi critical from Chat: 0.327

Decision**:** H_A-Konza parameter values are different to International Technology Village.

International Technology Park Bangalore (ITPB) was conceptualised in 1992 to provide a complete work –live-play environment for IT and technology-related business and to support the development of India's Business Process Outsourcing industry (Goh, 2000). As the country's first Technology Park, ITPB is renowned for setting the benchmark for the design and master planning of Technology Parks in India. ITPB continues to push the boundaries, evolving into an integrated community that seamlessly amalgamates high-quality office space, hospitality, and retail components with environmentally sustainable features and interactive collaborative spaces to create a vibrant, lively community offering an international business lifestyle.

India as a country has aggressively pursued policies to encourage the IT industry. The dramatic increase in the size of the industry over the last one decade is not merely coincidental. Factors like skilled Indian workforce and involvement from national institutions have highly contributed to this increase (Bong, 2005). Indian government has identified and tried to harness resources in three segments to encourage the industry: an integrated Science and Technology bureaucracy to coordinate government administration; software Technology Parks to encourage cooperation between government, business and universities and a set of policies that exploit connections with successful Indian Diaspora. By incorporating these

three strategies into national policy, India has been able to reap the economic benefits of the IT industry.

ITPB houses more than 160 international and domestic companies and over 27,000 working professionals. The 69-acre lushly landscape park provides a total of 2.3 million sq ft of prime IT business space, seamlessly integrated with a 200- room five star business hotel, a 450,000 sq ft Park Square retail mall, and a wide range of amenities which include a business centre, an outdoor sports arena and banks. Over 27 acres of land within ITPB is designated as IT/ITES special economic zone and earmarked for development of multi-tenanted and built-to-suit buildings (Bong, 2005).

Konza compares poorly with International Technology Park, firstly because Kenyan government does not have an ICT policy that supports growth of IT industry. Secondly, lack of consultation in the initial planning stages with national institutions to get their full support for the idea right from the beginning rather than selling the final plan and expecting them to adapt to it.

4.3.3 Smart Village- Egypt

Table 5: Konza vs. Smart Village

	Observed range			**Expected range**	
	Konza	Smart Village	Total (r)		
	6	12	18	6.9	11.0
	5	12	17	6.5	10. 5
	7	7	14	5.4	8.6
	5	7	12	4.6	7.4
	5	7	12	4.6	7.4
Total (c)	28	45	73		

Test of Independence

H_0- Konza parameter values are similar to Smart Valley

H_A-Konza parameter values are different to Smart Village

$\chi^2 = 0.794113$
df = 4

Chi critical from Chat: 0.738

Decision**:** H_0 **-** Konza parameter values are similar to Smart Valley.

Egypt has mainstreamed ICT as part of its national socioeconomic development strategy over the last decade. The government formulated an ICT master plan in 2000 to ensure effective deployment and use of ICT for the benefit of all citizens Egypt (Technology Innovation and Entrepreneurship Strategy, 2011). This plan succeeded in building the necessary infrastructure and ensured the transference of technology and knowhow into Egypt. Egypt's ICT sector benefited from a number of deregulation and liberalization policies during the past decade with the private sector encouraged to play a larger role in the market. In parallel, the price of many ICT goods and services decreased tremendously stimulating a culture of innovation at the national and firm level. Key to Egypt's success in the ICT sector include branding Egypt's ICT sector as well as celebrating innovation and entrepreneurship, establishing innovative clusters and offering common infrastructure and creating a business environment that facilitates innovation and entrepreneurship practices.

Smart village as a Technology Park offers an abundant technically skilled and uniquely multilingual talent pool, sustainable low costs, a reliable and scalable infrastructure, government support, competitive cost of operations, conducive business environment, and an attractive location at the crossroads of Europe, Africa and Asia (Egypt IT Development Agency, 2012).

Kenya compares closely to Egypt, the Kenya ICT board whose mission is to rapidly and innovatively transform Kenya through the promotion of ICT for socio-economic enrichment has recently had an aggressive tour across the world to market Kenya as an ICT destination.

The Kenyan government too has in the past scrapped VAT on ICT goods as an effort to mainstream ICT as part of its national socioeconomic development.

4.3.4 Cyberjaya –Malaysia

Table 6: Konza vs. Cyberjaya

	Observed range			Expected range	
	Konza	Cyberjaya	Total (r)		
	6	11	17	6.06	11.0
	5	15	20	7.1	12.9
	7	10	17	6.0	11.0
	5	8	13	4.6	8.4
	5	7	12	4.3	7.7
Total (c)	28	51	79		

Test of Independence

H_0- Konza parameter values are similar to Cyberjaya

H_A-Konza parameter values are different to Cyberjaya

$$\chi^2 = 0.83501$$
$$df = 4$$

Chi critical from Chat: 0.4282

Decision**:** H_A-Konza parameter values are different to Cyberjaya

Cyberjaya is located in the district of Sepang, Selangor and is situated about 50 km south of Kuala Lumpur, the capital of Malaysia. Spanning an area of about 28.94 square kilometres (7,000 acres), the town is the nucleus of the Multimedia Super Corridor (MSC), now known as MSC Malaysia.

The site for Cyberjaya was primarily undeveloped land consisting of oil palm plantations. It has since then seen extensive building activities including a boutique hotel, numerous

commercial buildings, offices for MSC status companies, universities, a community club and the headquarters for the local authority. A number of companies who qualify for MSC incentives have relocated their operations to Cyberjaya. Among them are T-systems, Dell, HP, DHL, Satyam, Wipro, HSBC, Ericsson, Motorola, BMW, IBM, Shell IT and Response Centre for the Money Laundering Network. Currently, over 500 MSC status companies have located their operations here, making the township a rapidly growing area. Today, Cyberjaya is home to several government agencies such as Malaysia department of Public Service and Sepang Municipal council.

An early component of Cyberjaya was the Multimedia University, known locally as MMU. Faculty departments include Engineering, Information Technology, Creative Multimedia and Management (Hashim, 2012). MMU campus opened in Malaysia's first intelligent city of minister, as a centre of learning and research for the MSC, a 750 square KM area designated as the country's high-tech research and industrial area. There is also a National secondary full Boarding School for girls, as well as 3 primary and secondary public schools. As an emerging township, Cyberjaya has a police station and a fire station. Apart from that, other public amenities which are complete include small recreational park just next to Multimedia University, the Cyberjaya Community Club, the sports arena, bus shelters and more than 700 free parking bays.

Konza compares poorly with Cyberjaya as this concept did not evolve from a learning or research institution as the key driver. It's a Kenya vision 2030 initiative, seeking to attract learning and research institutions as well as other supportive sectors like banks, hotels and recreational facilities to make the city attractive to work and live in.

4.3.5 Cyber City –Mauritius

Table 7: Konza vs. Cyber City

Observed range

	Konza	Cyber City	Total (r)
	6	11	17
	5	17	22
	7	12	19
	5	9	14
	5	9	14
Total (c)	28	58	86

Expected range

5.5	11.5
7.2	14.8
6.2	12.8
4.6	9.4
4.6	9.4

Test of Independence

H_0- Konza parameter values are similar Cyber City

H_A-Konza parameter values are different to Cyber City.

$\chi^2 = 0.85932$

$df = 4$

Chi critical from Chat: 0.428

Decision**:** H_A-Konza parameter values are different to Cyber City.

Cyber city is a government owned infrastructure whose construction began in November 2001, with the city being promoted as new Information Technology Hub for Mauritius and as a link between Africa and Asian markets. Cyber City is a cable landing point of the SAFE high-speed submarine communications cable between South Africa and Malaysia. Situated in a residential zone of about 10 Kilometres south of PortLous, the country's capital, Cyber city is part of a plan by the Government of Mauritius to develop information and communications technologies as a fifth pillar of the nation's economy (Oolun, Ramgolam and Dorasami, 2012).

Mauritius as a country took various steps to develop the ICT sector. These include liberalization of the telecommunications sector in 2003, partnership with India in the development of the first Cyber city project and legislative reforms to encourage technology advancement (Ujodha, 2011). Mauritius also ensured connection to the submarine optical fibre route linking Europe to Asia via South Africa, and development of a National ICT strategic plan in 1998. Mauritius acknowledged demand for skilled round-the-clock workforce required of the international telecommunications field and accordingly aligned its university curriculum.

Konza compares poorly with Cyber, Kenya as a country has not aligned its university curriculum to focus on engineering and ICT sciences. Secondly Kenya has never had a National ICT strategic plan as a sign of aiming to develop ICT sector as a pillar for economic growth.

4.3.6 Konza City –Kenya

Table 8: Konza vs. Global Best Practice

	Observed range			**Expected range**	
	Konza	Global best Practice	Total (r)		
	6	13	19	6.1	12.9
	5	16	21	6.8	14.2
	7	13	20	6.4	13.6
	5	9	14	4.5	9.5
	5	8	13	4.2	8.8
Total (c)	28	59	87		

Test of Independence

H_0- Konza parameter values are similar to global best practice.

H_A-Konza parameter values are different to global best practice.

$$\chi^2 = 0.899739$$

$$df = 4$$

Chi critical from Chat: 0.639

Decision: H_0- Konza parameter values are similar to global best practice.

4.4 Qualitative Analysis and Discussion

From data analysed, it is evident that the planning concept for Konza city is well in place with the initial feasibility and concept master plan prepared jointly by Deloitte and Pell Frischmann, a UK based design consultancy and funded by the International Finance Corporation. Initial plan was limited to a Technology Park of 700 acres with BPO/IT business as its core. During the feasibility study, Pell Frischmann proposed to make the Technology Park a more viable destination. The Kenyan government has agreed and commissioned a new master plan for a city of 5000 acres. World class infrastructure, sustainability and growth were key drivers of this new master-plan.

> *"…When it comes to connectivity, Konza Technology City is offering world class communications infrastructure, thanks to The East African Marine Systems (TEAMS) submarine fibre optic cable instigated by the Kenyan government. …'' Respondent 1*

The brand identity of Konza Technopolis as the Silicon Savannah and supporting promotional materials by Pell Frischmann and Urban Graphics has crystallised the Kenyan Governments vision of creating a world class city, powered by a thriving IT sector and generating 100,000 jobs by 2030. The Konza Technopolis Development Authority (KOTDA) will lead the development and operations of Konza under the aegis of the Cabinet and the Ministry of Information and communications.

Advisors to the project include the International Finance Corporation (IFC) which has been providing transaction support to the project since 2009, Master Delivery Partner1 (MDP1) which has been procured for creating the business and master plan for phase 1 of Konza

(August 2012-February 2013) and Master Delivery Partner 2 (MDP2) which will be procured to lead the construction phase 1 infrastructure and establish initial real estate development partnerships (June 2013-December 2017)

Konza technology city construction will begin with a 400-acre first phase with 1.5 million square meters of initial real estate development , this will include the development of US $ 750 million of on-site infrastructure and US $ 310 million of off-site infrastructure. Full build out phase 1 (2013-2017) is expected to attract 30,000 residents, 7,500 knowledge workers and 16,700 total workers. It is recognized that attracting companies will require a strategy rooted in urban development best practices.

Konza Technopolis Development Authority (KOTDA) will usher the development and operations of Konza. It will be focused on building infrastructure, securing real estate deals, and providing world-class services. Incentives will be provided to companies that align with job creation and technology sector growth goals. Sustainable and reliable infrastructure will provide the foundation for growth and be delivered through public-private partnerships. Active public realm and mixed use will be the hallmark of Konza's design, creating a high quality of life allowing people live, work and play within walking distance of their home.

> *"…Currently, the plan is for a compact city with a distinct semi-circular footprint within a triangular area of grassland. A network of roads will fan out radically from the centre of the notional circle, with the Central Business District, complete with district hospital located in the midst of the development. Some 35,000 homes will be scattered throughout the city, while a science park and two technology parks will be created to the north and south. There will be a number of green spaces, including corridors along the protected seasonal rivers already at the site. Schools, universities, convention centres, hotels, mosques and churches are also planned…" Respondent 2*

State-owned Kenya Railways intends to connect Konza city at 180km/h (110 mph) rail network between Mombasa and Malaba. Construction will take place in four phases, meaning Konza will be brought on line a stage at a time. As for the effect on the natural environment, Konza city will cause loss of habitat and grazing area and the displacement and disturbance of wildlife currently located onsite; with migratory wildebeest, antelope and zebra identified among species likely to be hit. A 2km (1.25 mile) buffer zone and 6.2 sq km (2.4 sq mile) Wildlife corridor are intended to minimize the negative effects, though the priority is development over biodiversity conservation.

Meeting the city's estimated water demand of 100 million litres per day will not be easy. The in-progress Thwake water and sanitation projects has been redesigned to accommodate Konza city, which will require 60 KM (37 miles) of water pipeline, a section of which will require pumping over the Kilungu Hills. Around two million litres per day will be provided by local boreholes, the drilling of which is presently underway. The completed city is expected to have a peak electoral demand of 675 MVA (so at least 675 MW). It is suggested that the city can be supplied via the planned high voltage between Mombasa and Nairobi. There are plans for an electronic manufacturing plant, an international financial centre and a convention centre.

The targeted sectors which will drive the growth of the city include BPO, Software Development, Data Centres, Disaster Recovery Centres and Light Assembly Manufacturing Industries. The proposed Government Data Centre will complement the existing facility, which currently links Government Ministries, departments and agencies. As part of the existing vision 2030 blueprint, a new Government Data Centre will boost service delivery and efficiency through a centralized platform. Given the existing information and technology security threats, both the proposed and existing Government Data Centres have helped to

promote the security of the Government Information through a harmonised and centrally managed model.

> *"…The government is offering tax breaks to companies as an incentive to move and invest in Konza technology city…" Respondent 3*

> *"…Konza Technology Park seems not to be attracting investors despite massive campaigns by the government to market it. It was expected that the hub would bring innovators together, in one big city, surrounded by every possible resource they could ever need. It was thought innovators would fight each other for the opportunity to be part of this, after all the incentives were there: Faster Internet speeds, tax breaks, cheap labour. …" Respondent 4*

This could be attributed to the level of consultation. Konza took a red-tape approach. Not all stakeholders were consulted and this led to a simple result, apathy. Similar successful projects like iHub, when it was being formulated the level of consultation was unprecedented. Valid stakeholders were consulted and consultations were not limited to the financiers and planners and the management team, but also interested parties like developers, business and marketers.

> *"Excluding innovators at the planning stage meant that if they were requested to start getting involved later they did not have anything to do. From the larger local development firms to the small developers, they did not have a key central role that would work for them, but rather would have to fit into this predefined plan. Nobody bothered to ask if a local, well-established firm, already securely located within CBD, would move to a remote city on the middle of nowhere …" respondent 5.*

Challenges that may Hinder Construction of the Technology City

With over 100,000 jobs expected to be generated in the initial stages through BPO centres, the question of skilled workforce that Kenya plans to use cannot be wished away. Though Kenya boasts of well educated labour force, majority of this fall far behind what the multinationals would expect to employ. A majority of technology companies in Kenya today are hiring expatriates due to the shortage of local qualified and skilled personnel.

Another challenge will be the incorporation of a suitable water source. Konza region, in common with most of Kenya faces a considerable water shortage. Limited ground water sources are however available close to site. Konza will need to be incorporated within a bulk regional water scheme including construction of new dams and pipelines to supplement and reinforce supplies from existing dams and water transfer schemes in the region.

The growth of the city will result in the creation of large amounts of construction , commercial and house hold waste, if this is not disposed off appropriately then it could result in a moderate negative impact on the environment inform of air, ground and water pollution. Konza Technology city therefore should include the provision of waste transfer, sorting and recycling centres and measurers for the promotion and education of workers and residents in the means of reuse, and reduction of waste. This calls for the need to explore alternatives means of waste disposal other than conventional landfill in quite good time.

CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter highlights the outcome of the investigation of the study in relation to the research objectives. It highlights key parameters necessary for development and management of a successful Technology Park and how the proposed Konza Technology City compares to evaluate whether it will succeed in meeting its objectives. This chapter therefore brings out the summary of findings, conclusion, limitations of the study, recommendations drawn from the analysed results and finally suggestions for further research.

5.2 Summary of Findings

The purpose of this study was to establish the parameters for development and management of a successful Technology Park and evaluate how the proposed Konza Technology city measurers to international best practice. This would help to evaluate if Konza Technology City will meet its objectives and lead to job creation and economic growth in Kenya. Some of these key parameters include triple helix of government, university and industry, availability of skilled labour, image of the location, planning context and commercial survival of the park, relevant telecom facilities, culture of risk taking entrepreneurism and autonomous management of the park.

From this study, it was evident that geographical location for Konza Technology City is unattractive to most ICT companies with reachability from Nairobi where most of their customers are based being a major concern. Few view the location as strategic, arguing that once the proposed infrastructure is setup, it would minimize congestion within major towns and would be ideal for expansion given the vast un-occupied land surrounding the proposed location. With over 100,000 jobs expected to be generated in the initial stages through BPO centres, the question of skilled workforce that Kenya plans to use cannot be wished away. Although Kenya boasts of well educated labour force, majority of this fall far behind what the

multinationals would expect to employ. A majority of technology companies in Kenya today are hiring expatriates due to the shortage of local qualified and skilled personnel.

As far as connectivity is concerned, Konza city is offering great communications infrastructure, thanks to The East African Marine Systems (TEAMS) submarine fibre optic cable instigated by the Kenyan government. Konza Technopolis Development Authority (KOTDA) will usher the development and operations of Konza, focusing on building infrastructure securing real estate deals, and providing world-class services. Although Kenya's economy is not diverse and well established, there is a culture of risk taking entrepreneurism which would be advantageous when it comes to new start-ups at Konza Technology City.

5.3 Conclusion

Based on above analysis and findings, it is evident that Konza Technology city vision and plan is clear and a project like this would be a major milestone for the country. Although the location seems un-attractive, with the proposed infrastructure in place the location would offer high quality of life making CEO's want to locate their companies there and attract talented workers and their families. Konza City stakeholders however have a major task of marketing Konza and winning over some of the key stakeholders who feel they were left out in the planning stage of the project like universities and ICT firms. This as a whole would provide competitive parameters for Konza's success.

The government too has a key role to play in implementation of ICT policies that support this initiative. These policies will play a big role and in the long run contribute to Konza's success in meeting its objective of economic growth.

Although there is a great plan and implementation strategy on paper, there seems to be no drive to push the project to actual implementation. Konza seems to be more of a blue print project aimed at showcasing that Kenya can do what others have done but no drive to push it to its final implementation.

5.4 Recommendations of the study

This study makes a few recommendations for the benefit of all key stakeholders to the Konza Technology City project. Firstly, for the objectives of the proposed Konza Technology City to be achieved, SMEs and local ICT companies should participate in the business setup of the City together with other key stakeholders. With the Kenyan government financing only 5 % of the project, financing of the infrastructure and businesses that will operate there should be a key focus area. Equity funds, particularly venture capital needs to be incentivised as these are critical for start-ups, an area which banks are unable to finance. Lastly Konza Technology City must be ultimately private sector driven.

5.5 Limitations of the Study

This research paper had one major limitation in that the topic of Technology Parks is relatively new hence limited academic papers were available for reference. Secondly, most ICT business Leaders in Kenya seemed not to be well conversant with the idea of development and management of Technology Parks, this required taking them through the topic for them to be able to give relevant feedback. Lastly Kenya lacks well structured ICT policies to support initiatives like the proposed Konza Technology City which would play a big role and in the long run contribute to their success.

5.6 Suggestions for Further Research

From the research results and limitations, this paper suggests further research on local ICT firm's view of Konza Technology City and business models for Technology Parks

comprising dimensions of choices of a park. Area of new media sector in Kenya needs to be studied as it offers good potential towards National Innovative Systems. Lastly, a study on Kenya's ICT policy and how it has impacted the ICT sector should be done to help in revising or redrafting of new ICT policy to support brilliant initiatives like the proposed Konza Technology city.

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Appendices

Appendix 1: Introductory Letter

Anne Mutindi Makau

C/o University of Nairobi

P.o. Box 30197- 00100

Nairobi, Kenya

TO WHOM IT MAY CONCERN

Dear sir/Madam

REF: MBA RESEARCH STUDY

I am a student pursuing a Master's degree in Business Administration at the University of Nairobi. In partial fulfilment of the requirements to the award of the Masters degree, I am required to carry out a research and write on ''Parameters for a successful BPO/ITES Technology Park in Kenya: A comparative analysis of Konza city and international best practices. ''

I kindly request your assistance by availing your time to respond to the questionnaire. The information will be treated with utmost good faith and a copy of the final report will be made available to at your request.

Thank you.

Yours faithfully,

Anne M. Makau

Sign …….

Appendix 11: Parameters Table

Parameters	Konza Tech City (Kenya)	Smart village (Egypt)	Cyberjaya (Malaysia)	Cyber City (Mauritius)	International Tech park (India)	Silicon valley (USA)
Triple helix of government, university and industry	1	4	4	4	4	5
Availability of skilled labour	2	3	3	4	5	5
Proximity of universities	1	2	3	4	4	5
Geographical location	1	3	4	4	4	5
Reachability	1	3	4	4	4	5
Image of the location	1	3	4	5	4	5
Planning context and commercial survival of the park	3	4	4	4	4	5
Strong research base	2	2	3	4	5	5
Relevant telecom facilities	2	3	4	5	5	5
Diverse and well established economy	2	3	4	4	4	5
Autonomous management of the park	3	4	3	5	4	5
Culture of risk taking entrepreneurism	4	3	4	4	5	5
Shared vision among stakeholders	3	4	3	3	4	5
National innovative system	2	4	4	4	5	5

Appendix 111: Interview Guide

1. Name of the respondent (optional) **…….**
2. Which sector do you represent?
    - Konza city
    - Kenya ICT board
    - Kenya vision 2030
    - ICT Business leader
    - Official from the Ministry of Information and Communication in Kenya.

3. How long have you worked in above mentioned sector (question 2)
    - Less than 5 years
    - 5 - 10 years
    - 11 - 15 years
    - Over 15 years

4. Do you think Konza Technology City shall meet its objectives as set by vision 2030

(Please give details to your answer)?

5. How does Konza compare with Internationally Successful Technology Parks with regards to geographical location, image of location and Reachability?

6. Do you think Konza City will succeed and benefit the country (please give details to your answer)?

7. What is the Government of Kenya's Perception on Konza City?

8. Please give your general views and comments about Konza Technology City

Appendix IV: List of Interviewers

1. Respondent 1 – Official from the Ministry of Information and Communication in Kenya.
2. Respondent 2 - Official from Konza city.
3. Respondent 3- Official from Kenya vision 2030.
4. Respondent 4- Kenya ICT board
5. Respondent 5- ICT business leader