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Services Sector Development and Impact on Poverty Thematic Working Group

Positioning the Western Cape Province as a Knowledge Hub: An Exploratory Study

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December 2009



indigenous growth

**University of Mauritius:
Positioning the Western Cape
Province as a Knowledge Hub: An
Exploratory Study**

December 2009

DRAFT REPORT



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Executive Summary

Introduction (Chapter 1)

In the era of globalisation, there is widespread recognition that knowledge-based industries have become a significant contributor to economic growth and development. To be internationally competitive in a global economy requires the creation of distinctive assets such as knowledge, skills, innovation and creativity. Knowledge has become an internationally recognized factor of production with the new form of capital being the capacity to generate, assimilate, disseminate and effectively use knowledge. Because knowledge forms the basis of technological progress, innovation and the enhancement of human capital, knowledge is recognized as a significant contributor to economic growth and development.

For developing and developed countries alike, knowledge as a service matters. The policy question that countries, governments firms and other organisations across the economy are currently engaging with is:

How to create an enabling environment that will facilitate the creation, use and dissemination of knowledge and ideas to foster economic growth and development?

International evidence suggests that the answer to this policy questions lies with understanding the dimensions of creating a knowledge hub. A knowledge hub has been defined by the University of Mauritius as an *“ensemble of knowledge-intensive institutions and organisations (public, private and overseas) that generate, store, transfer, apply and transmit knowledge through education and training with the overall objective of fostering economic and social development.”*⁷

Within a knowledge hub, higher education institutions have a central role to play as universities have the capacity to create, acquire and transmit knowledge for use by enterprises, organisations, individuals and communities. In addition, universities also create a ready pool of highly skilled talent that companies can draw from.

The particular benefits associated with the creation of a knowledge hub are:

- **Competitive advantage** – Firms within the knowledge hub (as well as intelligent firms outside the hub) can secure a competitive advantage by gaining rapid access to knowledge concerning the innovations, techniques and strategies of competitor firms.
- **Incubators of future economic development** - Knowledge hubs should aim to mainstream new concepts in innovation, science, technology and management development.
- **Developmental benefits** – There can also be significant developmental benefits if an equitable and developmental approach to growing the knowledge hub is pursued.

Because of the above mentioned benefits, the main objective of the research was to assess whether the Western Cape Province (hereafter referred to as Western Cape) possesses the critical success factors to become an internationally competitive knowledge hub that can contribute towards economic growth, employment creation and poverty reduction.

To this end, the study sets out to tackle the following **core research questions**:

1. What are the critical success factors for creating an internationally competitive knowledge hub?
2. What kind of institutional framework is required to support the development of a knowledge hub?
3. What positive international experiences of building knowledge hubs can be replicated in South Africa?
4. What are the key constraints and obstacles in the Western Cape to creating a knowledge hub?
5. What are the potential areas for establishing competitive advantages of knowledge hub in the Western Cape?

Methodology (Chapter 2)

The research process for this study was grounded in two core research phases: baseline desktop research and qualitative stakeholder interviews. The desktop research developed an understanding of the international dimensions of knowledge-based economies and of the issues and processes involved in creating an educational hub. In addition, the desktop research also investigated best practices of successful knowledge and innovation hubs. The Western Cape was benchmarked against four successful knowledge hub models: the Science Hub in Singapore, the Knowledge Village in Dubai, the Media City in the United Kingdom, and the Technology Hub in Australia.

In addition, semi-structured interviews were conducted with key actors and stakeholders concerned with issues in the knowledge and innovation policy arena in the Western Cape. The respondents included representatives of business and labour unions, representatives of higher education institutions as well as national, provincial and local government officials.

Research Findings (Chapter 3 - 6)

Based on the evidence collected (desktop research, international benchmarking and stakeholder interviews), it can be argued that there are at least seven critical factors that are crucial to building successful knowledge industries. These are:

- 1. Institutional framework - the power of the triple helix:** Previous experience highlights the need for strong support and commitment to the knowledge sectors across what is commonly known as the “triple helix” – government, business and higher education institutions.
- 2. The presence of strong, quality, research driven internationally reputable higher education institutions:** What is required is a pool of education excellence in general but specifically within higher education. Universities should also have the ability to not only attract but also retain top students and staff.

3. **Social cohesion and equality:** Persistently high levels of racially defined inequality – reflected in social and economic indicators such as poverty, social alienation, unemployment, public health, housing and income distribution – pose a serious threat to social stability of any society. Successful knowledge hubs are diverse, multicultural and vibrant creative spaces.
4. **Excellent infrastructure, connectivity and social networks:** Excellent infrastructure and connectivity is a prerequisite in any knowledge hub. Connectivity speaks to physical connectivity, virtual connectivity as well as the social networks, linkages and clusters that exist between knowledge infrastructure and institutions.
5. **Enabling environment - incentives and marketing:** To support of the constituents within the triple helix, a comprehensive package of incentives is required to entice and retain talent, attract capitalist and investment as well as obtain buy in from the public sector. Once the comprehensive incentive packages is agreed, this then needs to be marketed through a coherent, well connected and coordinated promotion and marketing campaign.
6. **Economic specialization:** The emergence of a knowledge hub requires enormous resources and funding and therefore a strategic approach needs to be employed in the investment of funding.
7. **Quality of life:** The quality of life has increasingly become an important consideration in attracting and retaining skilled workers. These soft location factors have become important in making decisions about where to live and work.

These critical success factors provide a framework against which Western Cape's strengths and constraints have been identified. The table below is a summary of strengthens and constraints facing the Western Cape in terms of creating a viable knowledge hub. A more detailed analysis is provided in Chapter 6.

Table 1: Summary of the Strengthens and Constraints facing the Western Cape in terms of creating a Knowledge Hub

Critical Success Factors	Strengths	Constraints
Institutional framework	<ul style="list-style-type: none"> Emergence of a collaborative institutional framework. 	<ul style="list-style-type: none"> Amongst the constituents of the triple helix there is no institutional memory of working collaboratively. In addition these relationships are still in embryonic stage.
Higher education institutions	<ul style="list-style-type: none"> Relatively well endowed and high performing schooling and higher education system. 	<ul style="list-style-type: none"> Unequal distribution of quality higher education and education in general. Skills shortage and skills mismatch with labour market requirements.
Social cohesion and equality	<ul style="list-style-type: none"> Linkages and clusters that exist between knowledge infrastructure and institutions. In the Western Cape there are 18 cluster initiatives. 	<ul style="list-style-type: none"> Unequal social fabric with persistently high levels of poverty, unemployment and inequality.
Infrastructure, connectivity and social networks	<ul style="list-style-type: none"> Relatively developed infrastructure & high levels of connectivity. 	<ul style="list-style-type: none"> The need for better infrastructure, connectivity and stronger social networks.
Enabling environment	<ul style="list-style-type: none"> Diversified economic structure and enabling environment. 	<ul style="list-style-type: none"> The need for better incentives and marketing with a focus on small micro and medium enterprise development.
Economic specialization	<ul style="list-style-type: none"> High concentration and existing base of knowledge industries & high skills base. Existence of key areas of competitive advantage. 	<ul style="list-style-type: none"> A more focused and strategic approach to building and developing key sectors is required.
Quality of life	<ul style="list-style-type: none"> High quality of life and unique environmental resources. 	<ul style="list-style-type: none"> Unequal distribution of quality of life, heavily influenced by the legacy of apartheid.

Strategic Issues for Consideration (Chapter 7)

If the Western Cape is to succeed in using knowledge activities to drive economic and social development attention must be given to a number of strategic issues. These are:

- ❑ **Vision and leadership:** The ingredients for the triple helix are there but these need to translate into a formal economic development strategy. In other words, the dialogue has begun but the focus needs to shift to planning, strategising and investing.
- ❑ **Incentives structure:** A lot more can be done to encourage the creation of knowledge and innovation, in particular the range of incentives that can be made available to Small Medium Micro Enterprises. It is therefore encouraging to note that policies and systems of Barcelona Activa are to be imported to the Western Cape. In addition, incentives should also be centred on the creation of research and development teams through collaboration.
- ❑ **Improved Infrastructure:** There is no escaping the fact that for the knowledge hub to be competitive, huge infrastructure investment needs to be made. All international case studies survey boost of 24/7 connection with seamless and efficient transport systems.
- ❑ **Social cohesion through pro-poor development:** The persistently high levels of racially defined inequality pose a serious threat to the Western Cape's social stability and make a mockery of its global ambitions. Four targeted areas to enhance social cohesion are:
 - The introduction by the state of targeted bursaries and loans in the identified priority field to learners who are members of the previously discriminated against population.
 - Once priority areas have been identified it is important to develop a sector specific strategy in a manner that is labour-intensive that will absorb the high levels of unemployed young people in the Western Cape into the job market.
 - The knowledge hub should concentrate on producing socially responsible and relevant research that has a direct impact on the lives of people and responding to the development challenges facing South Africa.
 - It is advisable to undertake consultations and surveys within community in the Western Cape to ensure that the citizens of the province are able to influence social transformation

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List of Acronyms

ATP	Australian Technology Park
BBC	British Broadcasting Corporation
CHEC	Cape Higher Education Consortium
CPUT	Cape Peninsula University of Technology
CTRF	Cape Town Functional Region
DKV	Dubai Knowledge Village
GDP	Gross Domestic Product
HE	Higher Education
HEI	Higher Education Institutions
ICT	Information Communication Technology
KEI	Knowledge Economy Index
MEDS	Micro-economic Development Strategy
OECD	Organisation for Economic Corporation and Development
PGWC	Provincial Government of the Western Cape
R&D	Research and Development
RWA	Redfern Waterloo Authority

SMME	Small and Medium Micro Enterprise
SADC	Southern African Development Community
UCT	University of Cape Town
UNISA	University of South Africa
US	University of Stellenbosch
UWC	University of Western Cape
UAE	United Arab Emirates
WCED	Western Cape Education Department

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1. INTRODUCTION

1.1 Purpose of the Study

The aim of this study is to assess the potential of positioning the Western Cape Province (hereafter referred to as Western Cape) in South Africa as a knowledge hub in a globalising world economy. In particular, the study explores whether the Western Cape possesses the critical success factors to become an internationally competitive knowledge hub that can contribute towards South Africa's national economic goals of economic growth, employment creation and poverty reduction.

To this end, the study sets out to tackle the following core research questions:

- What are the critical success factors for creating an internationally competitive knowledge hub?
- What kind of institutional framework is required to support the development of a knowledge hub?
- What is the nature and extent of collaboration and partnerships between the government, private sector and higher education institutions regarding the goal of promoting the Western Cape as a globally competitive hub?
- What are the key constraints and obstacles in the Western Cape to creating a knowledge hub?
- What are the potential areas for establishing competitive advantages of knowledge hub in the Western Cape?
- What positive international experiences of building knowledge hubs can be replicated in South Africa?
- How can knowledge industries in the Western Cape contribute to the government's policy goals of economic growth, employment and poverty reduction?

In addition to these core research questions, the study also attempts to address the following subsidiary questions:

- What kinds of incentives are being offered currently by the Western Cape government to steer higher education institutions towards quality, efficiency and equity?
- What kinds of incentives are being offered currently by the Western Cape government to mobilise private sector participation in and support for a knowledge hub?

- What kinds of incentives are being offered currently by the Western Cape government to entice professional and student talent to the province?
- What is the share of foreign revenues is accounted for by the higher education sector in the Western Cape?
- What is the share of employment, as a proportion of provincial employment, is accounted for by the higher education sector in the Western Cape?

1.2 Rationale for the Study

In the era of globalisation, there is widespread recognition that knowledge-based industries have become a significant contributor to economic growth and development. To be internationally competitive in a global economy requires the creation of distinctive assets such as knowledge, skills, innovation and creativity.

Knowledge clusters are seen as creative industries or institutions that are grouped together and are primarily responsible for the production of knowledge. Nestled within these knowledge clusters are knowledge hubs. Knowledge hubs represent communities within a cluster that are recognised as creative, innovative and knowledge-intensive. Knowledge hubs perform three central functions which are generating, transferring and transmitting knowledge to other individuals or organisations through education and training.ⁱⁱ The notion of a knowledge hub refers to an “ensemble of knowledge-intensive institutions and organisations, public, private and overseas, involved to generate, store, transfer, apply and transmit knowledge through education and training with the overall objective of fostering economic and social development.”ⁱⁱⁱ

There are several benefits associated with the creation of knowledge clusters and hubs:

- **Competitive advantage** – Firms within the knowledge hub (as well as intelligent firms outside the hub) can secure a competitive advantage by gaining rapid access to knowledge concerning the innovations, techniques and strategies of competitor firms.
- **Increased transfer of knowledge** –The improved exchange of data, information, and knowledge create a knowledge base and expertise that increase the capabilities of institutions and organizations within the hub.
- Increased **investment in education and research and development** with the capacity to attract **high-income, skilled personnel**; and

- **Incubators of future economic development** - Knowledge hubs should aim to mainstream new concepts in innovation, science, technology and management development^{iv}

1.3 Report Structure

The report is divided into seven parts. The first section describes the methodology used to gather data for this study. This is followed by an exploration of the services sector as a catalyst for economic growth and social development. Section 3 also provides the theoretical and statistical evidence in favour of knowledge-led growth. Section 4 provides an environmental analysis of the Western Cape by discussing the policy, legislative and institutional contexts of knowledge industries in the Western Cape. In addition, Section 4 identifies international best practices in establishing a knowledge hub. Section 5 discusses the critical success factors recognised generally as key to establishing a knowledge and innovation hub. This is followed in Section 6 by the elaboration of a framework that gauges the prospects and constraints for the Western Cape of creating a viable knowledge hub. Section 7 highlights some strategic issues that must be addressed by policymakers if the goal of building a knowledge hub in the Western Cape is to succeed.

2. METHODOLOGY

The research process for this study was grounded in two core research phases: baseline desktop research and qualitative stakeholder interviews.

2.1 Desktop Research

This research phase involved comprehensive background desktop research. The desktop research developed an understanding of the international dimensions of knowledge-based economies and of the issues and processes involved in creating an educational hub. In addition, the desktop research also investigated best practices of successful knowledge and innovation hubs. The Western Cape was benchmarked against four successful knowledge hub models: the Science Hub in Singapore, the Knowledge Village in Dubai, the Media City in the United Kingdom, and the Technology Hub in Australia.

The research has demonstrated that the move towards developing knowledge industries in these countries was triggered largely by three factors: a crisis; competition; and a quest for survival. A crisis can act as a spur to implement radical reforms that would have been unthinkable in calmer times.^v Countries also enact reforms as a response to competitive pressures in order to ensure their survival in an unpredictable and hostile global economy. Moreover, countries create knowledge hubs as a driving force for urban renewal and urban regeneration.

These explanations apply to the benchmark countries in this study. In the wake of the 1997/8 Asian financial crisis, Singapore, like other Asian countries was forced to re-evaluate its growth strategies. In order to retain its economic competitiveness, policy makers in Singapore decided to diversify the economy into a knowledge economy – with the creation of the Science Hub as the hallmark of this initiative.

The Australian Technology Park was born out a desire to foster commercial opportunities for local business in the Redfern-Waterloo area. For its part, the MediaCity knowledge hub in the United Kingdom was created to overcome social decay and economic stagnation. The impetus for Dubai's ascendancy, on the other hand, was a resolve to survive under conditions of oil dependency and an undiversified economy.

2.2 Stakeholder Interviews

Given that the creation of a successful and effective knowledge and innovation hub requires a high degree of partnerships between governments, higher learning institutions and industries, semi-structured interviews were conducted with key actors and stakeholders within the knowledge and innovation policy arena. The respondents included representatives of business and labour unions, representatives of higher education institutions as well as national, provincial and local government officials.

The interviews played a key role in informing the content of the exploratory study, particularly in terms of ascertaining the needs of various industry actors and gauging the level of support for a knowledge hub. In addition the interviews also helped to shed light on the opportunities and obstacles to creating a viable knowledge hub in the Western Cape. (See the full list of interviewees and questions asked in the Appendix)

3 THE SERVICES SECTOR AS A CATALYST FOR ECONOMIC GROWTH AND SOCIAL DEVELOPMENT

To be internationally competitive in a global economy requires the creation of distinctive assets such as knowledge, skills, innovation and creativity. For developing and developed countries alike, services matter. The growth of the global services sector is testament to the sector's increasing importance. Between the mid-1980s and 2000, services were identified as the fastest growing component of world trade.^{vi} It is estimated that the services sector accounted for two-thirds of global output, one third of global employment, and nearly 20 per cent of global trade in 2008.^{vii} During the period 2000-2005, services contributed 47 per cent of growth in Sub-Saharan Africa, while secondary industry contributed 37 per cent and agriculture only 16 per cent.^{viii} On average, developing countries export more than 60 services to more than 30 different markets.^{ix}

The services sector in the South African economy consists of five broad categories: (1) wholesale and retail trade and hotel and restaurant, (2) transport, storage and communication, (3) finance real estate and business services, (4) general government services and (5) community social and personal services. South Africa has over the past 13 years been moving away from primary to tertiary sector industries.^x Since 2001, the South African economy has been dominated by services and in 2008 the services sector contributed 74 per cent of South Africa's GDP and 72 per cent of employment.^{xi} In total, about 160 000 companies fall within the services sector, with more than 140 000 of these being small, micro and medium enterprises.^{xii}

In line with international and national trends, the Western Cape has also been moving away from a commodity and manufacturing economy to one based on services. In recent years, the Western Cape along with Gauteng, has recorded the highest growth rate per region. In 2007, the province recorded 5 - 7 per cent growth, with the services sector accounting for the bulk of the growth. Moreover, services are a dominant generator of employment. In 2005, an estimated 67 per cent of all workers were employed in the tertiary sector with the largest contributors to employment being wholesale and retail trade (24 per cent), community, social and other personal services (18 per cent), and financial and business services (13 per cent).^{xiii}

The services sector can make a direct contribution to a country's economy by contributing to gross domestic product (GDP), foreign exchange and job creation. Trade in services can improve a country's comparative advantage, economic performance and provide a range of domestic and export opportunities. Services also provide crucial inputs and public services for the rest of the economy. For example, telecommunications, transportation and financial services are critical for the development of agriculture and manufacturing. Services sub-sectors such as health, education, water and sanitation are also directly relevant to achieving social development objectives, including poverty alleviation and creating a healthy, productive and well-trained workforce. Moreover, services facilitate transactions and provide access to finance for investment – making them, therefore, a key part of the investment climate of an economy.^{xiv} In addition, there can also be significant developmental benefits if an equitable and developmental approach to growing the services sector is pursued.^{xv}

Education, as a service, is central to situating the service sector in the context of development as it builds individual and collective capabilities that are a prerequisite for poor households or individuals to escape poverty.^{xvi} In 2003 the Asian Development Bank went so far as to state that knowledge is the single most important resource in maintaining regional competitiveness.^{xvii}

This statement is reinforced by the changing nature of the global economy. In the last part of the twentieth century the world economy, supported by the creation of information communication and technology (ICT) applications, has witnessed an enormous increase in knowledge generation. The applications that accompany ICT have, for example, facilitated a “reconfiguration of work organization, within the firm, among firms, among all market participants and between government and the rest of the economy.”^{xviii} Activities such as open source software, open innovations or common knowledge associations have all given rise to new models for sharing knowledge and collective production of ideas and innovations.^{xix} Globalisation has underscored the growing importance of information dissemination, knowledge, innovation and creativity.^{xx}

The capacity to generate, assimilate, disseminate and effectively use knowledge forms the basis of technological progress, innovations and the enhancement of human capital. The adoption of new technologies and the enhancement of human capital have the potential to enhance economic performance in two ways. Firstly, by increasing factor productivity. Secondly, by driving economic growth and

development.^{xxi} Open software, for example, can be used as an efficient channel for rapid diffusion of knowledge to less advanced countries.^{xxii}

This theoretical relationship is reinforced by econometric tests that reveal a statistically significant causal relationship between the level of knowledge accumulation and the future economic growth. To measure knowledge accumulation, the World Bank has constructed a Knowledge Economy Index (KEI) based upon the four elements considered to be the pillars of a knowledge economy. These pillars are listed in the table below.^{xxiii}

Table 1: World Bank’s Four Pillars of a Knowledge Economy^{xxiv}

PILLAR 1 Economic and institutional regime	PILLAR 2 Education and skills	PILLAR 3 Information and communication infrastructure	PILLAR 4 Innovation system
The country's economic and institutional regime must provide incentives for the efficient use of existing knowledge, the acquisition of new knowledge, and the application of both to economic activity—to improve productivity, to raise quality, to innovate, and to launch new enterprises.	The country's people need education and skills that enable them to create and share knowledge, and to use it well.	A dynamic information infrastructure is needed to facilitate the effective communication, dissemination, and processing of information.	The country's innovation system—firms, research centers, universities, think tanks, consultants, and other organizations—must be capable of tapping the growing stock of global knowledge, assimilating and adapting it to local needs, and creating new technology that underpins the development of new products and processes that can compete in export markets and meet needs at home.

Using the four pillars as a framework the KEI summarizes each country’s performance on 12 variables (see Table 2) with the KEI being a measure of the overall level of preparedness of a country or region for the knowledge economy.^{xxv}

Table 2: Knowledge Economy Index

Pillar	Indicator
Economic and institutional regime	<ul style="list-style-type: none"> Tariff and non-tariff barriers Regulatory quality Rule of law
Education and skill of population	<ul style="list-style-type: none"> Adult literacy rate Gross secondary enrollment rate Gross tertiary enrollment rate
Information infrastructure	<ul style="list-style-type: none"> Telephones per 1,000 people Computers per 1,000 people Internet users per 1,000 people
Innovation system	<ul style="list-style-type: none"> Royalty payments and receipts, US\$ per person Technical journal articles per million people Patents granted to nationals by the U.S. Patent and Trademark Office per million people

Using this index, Figure 1 below, demonstrates that holding all other factors constant, there is positive relationship between a country's average future growth rates and their stock of knowledge.

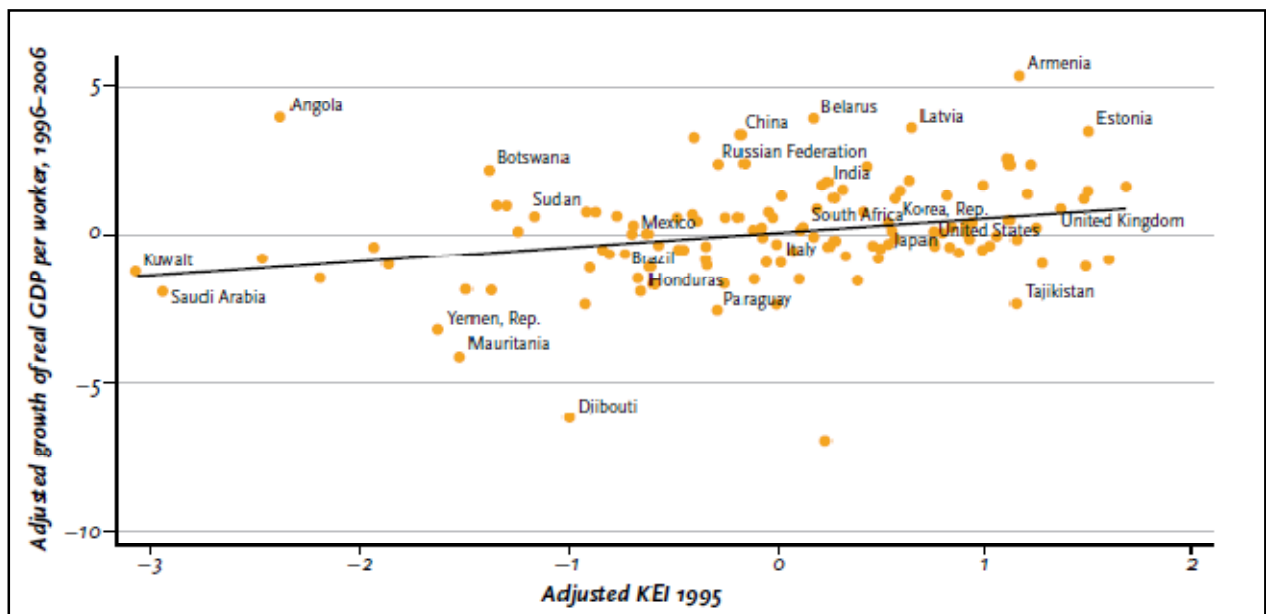


Figure 1: Relationship between Future Economic Growth and an Economy's Stock of Knowledge^{xxvi}

As the Figure 1 demonstrates, higher KEIs are positively associated with higher rates of future economic growth. Holding all other factors constant, a one-unit improvement in the KEI was found to have led to a 0.46 percentage point increase in economic growth. The statistical evidence is proof that larger stocks of knowledge can indeed be associated with higher levels of economic growth and development. When one compares the KEI of African countries the following picture emerges.

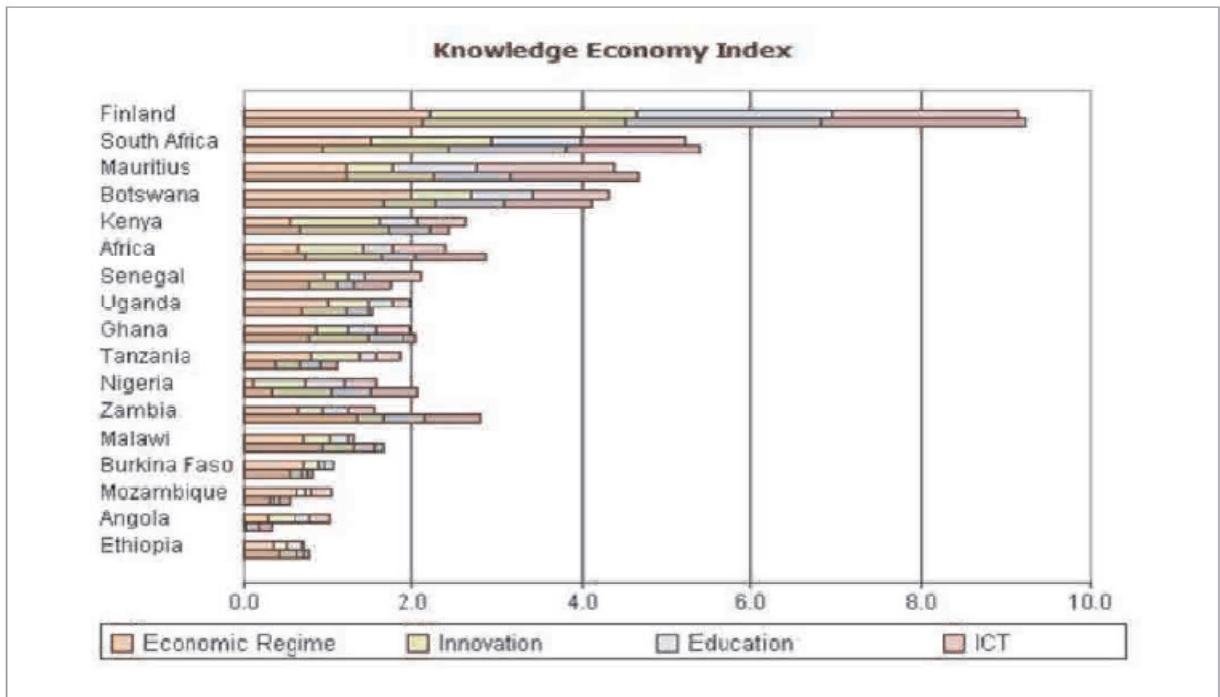


Figure 2: Knowledge Economy Index across Selected Countries^{xxvii}

Figure 2 depicts the changes in the KEI across African countries as compared to Finland.¹ The top bar indicates the most recent data (2004 -2005) while the bottom bar depicts 1995 data. The figure above reveals that relative to Africa, South Africa performs well with regard to knowledge based factors. It is, however, important to note that relative to developed countries such as Finland, South Africa and Africa in general have huge ground to make up.^{xxviii}

¹ Finland was selected as it has one of the highest KEI score.

To make progress with regard to knowledge-led economic growth requires government to actively foster strategies and policies. Within South Africa this discussion framed within the context of a “developmental state.” The notion of a developmental state is built on the assumption that although economic growth is a prerequisite for economic development, there is no guarantee that the benefits of growth will automatically trickle down to all social and economic groups. This, therefore, necessitates that the developmental state need to intervene in the economy to facilitate shared growth. The notion that the state should play an active role in facilitating socio-economic development forms the basis of all provincial government planning in South Africa.^{xxix}

When the notion of a developmental-state approach is applied to the knowledge sector it is to create to “knowledge-based ecological suitable growth that is shared by all the residents, especially the poor.” Based on the assumption that shared knowledge is shared growth and prosperity, the developmental state is tasked with creating a general enabling framework conditions for investment and enterprise development within the knowledge sector. The table below provides examples of the possible policies at the disposal of a developmental state.

Table 3: State Policy Interventions to Create an Enabling Environment for Knowledge-Led Growth^{xxx}

<p>Enhancing human capital by:</p> <ol style="list-style-type: none"> 1. Upgrading the education system in line with the needs of the economy, and 2. Encouraging well-targeted research and development programmes; <p>Encouraging partnerships between:</p> <ul style="list-style-type: none"> • Public and private sectors, • Firms, • Domestic and foreign partners, • Regional initiatives; <p>Providing adequate infrastructure for supporting the creation, diffusion and exchange of knowledge, through:</p> <ul style="list-style-type: none"> • ICT • Finance - banking and venture capital;

Facilitating **networking** through the creation of clusters and technology parks;

Regulations which provide **clear and transparent rules** for conducting business. Examples include:

- Intellectual property protection,
- Internet governance,
- ICT policies,
- Labour policies, etc.;

Special programmes to **support start-ups**, such as business incubators;

Other **government contributions**, such as:

- Large research and development projects,
- Tax rebates or subsidies for research and development activities
- A special government-sponsored technology fund;

To facilitate knowledge-led growth in the Western Cape, the Provincial Government of the Western Cape (PGWC) has in its developmental framework, IKapa Growth Development Strategy (2008), identified the higher-education sector as a key stakeholder in regional-policy development and a full partner and major driver in the realisation of shared growth and development.

The opportunities that have been identified by the PGWC for the higher-education sector are the following:

1. Providing leadership, R&D and tertiary qualifications that addresses the skills requirements and human-capital development;
2. Playing a key role in knowledge transfer and innovation for private-sector development and the establishment of the competitive advantage; and
3. Playing a key role in the development of public policies in partnership with government, the private sector and non-governmental sectors.^{xxxii}

This higher education sector is therefore a key sector in obtaining the desired outcome of developing the **“Western Cape a premier learning region in South Africa.”**^{xxxii} The policy challenge, according to the

United Nations, is therefore to create an enabling environment that will facilitate the creation, use and dissemination of knowledge and ideas to foster economic growth and development.^{xxxiii}

One example where this policy challenge is being met head on is within the City of Barcelona. During the 1980s, the City of Barcelona was experiencing social decay, low economic growth and high unemployment rates. In light of this economic and social crisis, the Barcelona City authorities decided to rethink their growth and development strategies. What evolved from this crisis was an innovative tool to drive local development of the city - Barcelona Activa.^{xxxiv} The case study provides concrete evidence of the economic and social benefits of knowledge-led growth.

Case Study Barcelona Activa^{xxxv}

Barcelona Activa is the local development agency founded in 1986. This municipal company of the City of Barcelona is tasked with promoting entrepreneurship, job creation and quality employment as means to obtain social inclusion and economic growth.

The logic of the developmental agency is simple. By fostering entrepreneurship, Barcelona Activa supports the creation of new businesses and therefore also the generation of new employment and business opportunities. This in turn boosts the local economy and the community as a whole. SMMEs are the backbone of this strategy as it is estimated that within the OECD area, SMMEs are the main source of new jobs and are responsible for an estimated two-thirds of employment. Within these SMMEs, Barcelona Activa aims to inoculate a culture of risk-taking and innovation. In doing so the developmental agency is actively shifting the city towards a knowledge and innovation economy and building an industrial structure that is international competitive and responsive to the needs of the global economy.

In collaboration with private institutions, Barcelona Activa has identified that the needs of the broader community can be met by offering the following four big services:

- Business creation and entrepreneurship culture
- Innovative business consolidation and growth
- Human capital development and new employment opportunities
- Access and improvement of employment

1. Business creation and entrepreneurship culture

This objective seeks to create an entrepreneurial culture within the City. To that end, entrepreneur centres such as Glòries Entrepreneurship Centre were created in 2004. The centre is an open space that is free for the public. The space provides entrepreneurs with a group of professional advisors and a complete set of services to assist and support their development.

2. Innovative business consolidation and growth

Traditionally business incubators are seen as spaces to help newborn and weak companies. But Barcelona Activa houses incubators (such as Glòries Entrepreneurship Centre mentioned above) that seek instead to create 'cutting-edge spaces for innovation and growth.' Within Barcelona Activa there are three business incubators (Glòries, Nou Baris and Sant Andreu). Companies of up to 12 months old that have been identified as being innovative, have the potential for growth and the capacity to create jobs can establish within these hubs and stay for a maximum of three years. The benefits are numerous and include low rental, networking opportunities, training opportunities, financial training and advice.^{xxxvi}

3. Human capital development and new employment opportunities

To meet the human capital requirements of the city of Barcelona, Barcelona Activa intends to:

- increase professional opportunities and new occupations of the city
- reduce the mismatch between the supply and demand of skills in the labour market and
- improve the local production processes in order to create higher quality jobs and more internationally competitive labour force

One of the means by which this objective is achieved is through an intranet site known as Porta22. This virtual information hub was created in 2003 and has become the metropolitan reference that facilitates access to information and knowledge with regard to labour market trends and information.

4. Access and improvement of employment

Access, inclusion and improvement of employment in Barcelona Activa is being achieved through centres such as Can Jaumandre. By constantly improving and updating the professional skills of the jobseekers, Can Jaumandre seeks to 'inform, orientate, motivate, train, and promote employment in Barcelona.' Also of importance is that Barcelona Activa actively determines the needs of the private sector and tailors their training to these needs. This is a direct attempt to promote the inclusion of labour to the economy as well as creating the professional skills and capacities required to meet the demands of a knowledge society.

The impact of the Barcelona Activa

In terms of impact, Barcelona Activa has emerged as a local, regional, national and international reference point for policies on how to introduce the 'seed of entrepreneurship' into a society that was initially not inclined towards entrepreneurship, risk and innovation. The agency also boasts strong public support and good will across the city. The political will of Barcelona City to implement the positive economic and social changes has been rewarded as the agency is perceived as a professional and trust worthy instrument of the City Council. The results of Barcelona Activa for 2007 are listed in the table below.

Table 4: Barcelona Activa main results (2007)

	N° of participants: (companies or persons)	Number of jobs created	Main results
Business creation	15,994**	1,500 jobs	1,189 business projects coached and 700 companies created
Innovative business consolidation and growth	3,760	848* jobs	84% survival rate fourth year
Human capital development and new employment opportunities	36,222	N/A	Improving human capital of 3,000 active people
Access to and improvement of employment	20,651	2,500 jobs	72% of labour insertion
Digital professionalisation and training	53,510	N/A	8,263 participants in business technology training
Total	140,044**		

* Total jobs of all companies in the Glories Business Incubator and in the Barcelona Nord Technology Park

** This figure shows the total number of participants in physical persons and not in number of companies

Source: Barcelona Activa

The outcomes above reflect the significant positive impact of Barcelona Activa's actions on the economy of Barcelona City. Unemployment rates have dropped, the number of businesses has increased, and there has been a growth in inward investment and an improvement in the human capital.

In terms of the four services the following achievements are worth noting:

- **Business creation and entrepreneurship culture:** Barcelona has established itself on the forefront of entrepreneurship as in total it is home to more than 100,000 businesses. For the year 2007, the new business creation rate was 60 per cent with an estimated 1 500 new jobs being created for the year.
- **Innovative business consolidation and growth:** In total, 84 per cent of all businesses within Barcelona Activa survive after the fourth year. On average, these firms employ 9.8 employees per firm and have an annual turnover of EUR 980,000. Of these companies 50 per cent of have businesses in the international market and 75 per cent of companies within the business incubators collaborate with each other.
- **Human capital development and new employment opportunities:** In 2007, Porta22 reached a wide audience with more than 35 000 users.
- **Access and improvement of employment:** Through Can Jaumandre, over 20 000 participants have access to improved labour market and employment statistics in 2007.

4. KNOWLEDGE INDUSTRIES IN THE WESTERN CAPE – POLICY, LEGISLATIVE AND INSTITUTIONAL CONTEXTS

Traditionally, the Western Cape has relied on agricultural sectors with a strong dominance in manufacturing production. World food markets, however, are notoriously unpredictable and unstable and trade liberalisation reforms implemented as part South Africa's World Trade Organisation (WTO) commitments have produced negative effects in some economic sectors such as the clothing and apparel sector of the Western Cape. In a quest to maintain its competitiveness, the Western Cape has begun to transform its economy towards a service-driven economy. In addition, the Western Cape has sought to take advantage of its coastal location to increase its share of global knowledge-intensive activities.

Against this backdrop, the study will provide an environmental analysis of the Western Cape in an attempt to explore the Western Cape's prospects as a premier knowledge hub.

4.1 Socioeconomic Profile

In 2006, the Western Cape Education Department (WCED) estimated that the Western Cape is home to about 4.5 million people which represent 10 per cent of South Africa's total population. The population growth is estimated at 2.9 per cent per annum with an additional influx of 48,000 that migrate to the province, from other provinces each year.^{xxxvii}

Only 10 per cent of the Western Cape can be classified as rural.^{xxxviii} The area that dominates the social and economic life of the province in the Western Cape is known as the Cape Town Functional Region (CTFR) and it stretches from the City of Cape Town to Cape Winelands and Overberg.^{xxxix} Of the total population, approximately 80 per cent live within the CTFR.^{xl} The major urban node of the Western Cape is the Cape Town metropolis. Of the total population, 68 per cent live in the Cape Town.^{2xli}

Globalisation has placed the Western Cape region in a strategic position that centers on the competitiveness and attractiveness of the major metropolitan localities such as the CTFR and Cape Town.^{xlii}

² See Figure 5 in Appendix for a map of the Western Cape.

The strengths that the Western Cape possesses to become a stronger global knowledge player are:

- A relatively well endowed and high performing schooling and higher education system;
- A high concentration of existing base of knowledge industries and high skills base;
- The existence of key areas of competitive advantage;
- The emergence of a collaborative institutional framework;
- A diversified economic structure and enabling environment;
- A relatively developed infrastructure
- High levels of connectivity; and
- A high quality of life.

Each factor will now be explored in more detail.

4.2 Educational landscape

The higher educational landscape of the Western Cape is one of the greatest strengths of the province. The Western Cape has the highest education and literacy levels in South Africa. In 2003, only 6.7 per cent of the Western Cape adult population had no schooling, 15 per cent had some primary schooling, 39 per cent had some secondary education and 19 per cent had matriculated (Grade 12).^{xliii}

The province hosts three of South Africa's internationally acclaimed universities (University of Cape Town, University of Stellenbosch, and University of the Western Cape) as well as a number of reputable technikon and technical colleges such as the Cape Peninsula University of Technology (CPUT). The Western Cape region is therefore comparatively very well endowed with regard to higher education provision.^{xliiv}

In 2003, there were just over 82 000 headcount enrolments, representing 11 per cent of national enrolments. Of these, approximately 56 000 were in the three universities and a further 26 000 in the former technikons now merged to form the CPUT. Of the total enrolments, 40 per cent were White, 31 per cent were African students, 25 per cent were Coloured and 4 per cent were Indians. Women represented 52 per cent of total enrolments.^{xliv}

In terms of undergraduate enrollment, for 2003, enrolments in humanities and social sciences totaled 39 per cent of total graduation (25 per cent in the broad humanities, 8 per cent in education, 4 per cent in law

and 2 per cent in the visual and performing arts), 38 per cent of total graduation was in science, engineering and technology (SET) and 23 per cent of total graduation was in business enrollments. Post-graduate enrollments reflect the academic strengths of the Western Cape – 12 per cent of all postgraduate enrollments, 20 per cent of national masters and 22 per cent of all doctoral enrolments were in this province.^{xlvi}

Both universities and the former technikons reported graduation rates above the national average of 15 per cent, 23 per cent and 20 per cent respectively. These figures are, however, skewed by race. The graduation rate amongst white students in the Western Cape for 2003 was 26 per cent whereas Africans, Coloured and Indian students had a graduation rate of 19 per cent in each case. Women formed 54 per cent of Western Cape's graduate output in 2003 with humanities graduates at 39 per cent making up the largest proportion of the 2003 Western Cape graduates.^{xlvii}

Regarding geographic origin, 63 per cent of the total of 82 000 Western Cape enrolments in 2003 were from the Western Cape itself, with about 25 per cent from other South African provinces and 12 per cent either had unknown home addresses or were from outside the country. Non-Western Cape enrolments in 2003 originated predominantly from three provinces: the Eastern Cape (10 per cent), Gauteng (6 per cent) and KwaZulu-Natal (4 per cent). Foreign students are mainly from the South African Development Community (SADC) regions. In 2001, 5 650 non-South African were enrolled in Western Cape higher education institutions, making up 8 per cent of the total Western Cape enrolments.^{xlviii}

These higher education institutions are also underpinned by a strong research ethos. In 2009, UCT was rated as having the highest number of A-rated scientists on the African continent with a total of 85 National Research Foundation (NRF) A-rated scientists. Second is US with a total of 53, UWC with 12 and CPU with 2 NRF A-rated scientists. This represents a significant asset to the Western Cape.^{xlix}

As the figures suggest the Western Cape universities are a major "industry" in themselves. The university sector is both a user of high level person power and a supplier thereof. In 2003, the total sector employed approximately 10 000 people and provided education and training for some 80 000 students. The sector brings with it valuable foreign currency and cultural diversity. In 2008, it was estimated that UCT, UWC, US, CPU, University of South Africa (UNISA), had expenditure totalling R5 billion and brought in R1 billion

to the province in the form of central government subsidies.ⁱ In addition, the Western Cape's credentials as South Africa's potential premier knowledge hub are bolstered by the fact the province already hosts a strong base of knowledge intensive industries within the CTRF.

4.3 Institutional framework

The building of knowledge-ledge according to the PGWC can only be achieved only through the “building of collaboration and partnerships with key stakeholders in the business sector, labour, civil society and higher education.” Leadership is critical for sustaining the social dialogue between stakeholders.ⁱⁱ Wherever knowledge-based, innovation-driven growth has taken place in the global economy, it has been characterised by the private sector, government and universities working together in well-structured and funded research and capacity-building projects.ⁱⁱⁱ

Role of Government

Over the past decade, successive Western Cape governments have sought to position the province as a knowledge and innovation hub. The following section therefore provides a policy analysis and leadership offered by the PGWC and the City of Cape Town for the emergence of a knowledge and innovation hub in the Western Cape.

- **Ikapa Growth and Development Strategy (2008)**

The purpose of this policy document is to provide the PGWC with a “clear strategic framework for accelerated and shared economic growth.ⁱⁱⁱ It also deepens the PGWC commitment to crafting the province into ‘A Home for All’ its citizens.^{iv}

The *Ikapa Growth and Development Strategy*, the provincial governments' economic strategy, aims to shift the developmental path of the Western Cape towards a “future of shared growth and integrated development” in which knowledge industries play a pivotal role. Based on the assumption that shared knowledge is shared growth and prosperity, the developmental state recognizes that the higher-education sector has been identified as a key stakeholder in regional-policy development and a full partner and major driver in the realisation of shared growth and development.^{iv}

- **Human Capital Development Strategy for the Western Cape, A Focus on Youth (2006)**

This is the lead strategy of the Provincial Government of the Western Cape that contextualizes the human capital development within the context of “A Home for All.” It therefore provides the WCED with a blueprint for ensuring access to quality education for all.^{lvi} This policy document believes that knowledge and education has the potential of turning the Western Cape into an international economic powerhouse.^{lvii}

The approach adopted is long-term with the focus on building human capital from the ground up. The emphasis will be on the development of certain knowledge and skills that are required by the modern economy with a particular focus on the youth, and especially those in the poorest communities.^{lviii} Higher education therefore plays a critical role in creating the skills and knowledge base providing the competitive edge amongst talent in the Western Cape to respond to this developmental challenge.^{lix}

- **Micro Economic Development Strategy (MEDS)(2005)**

The Micro-economic Development Strategy (MEDS) is one of the complementary, interactive strategies of iKapa Elihlumayo. The strategy was led by the Department of Economic Development and Tourism in the Western Cape and acts as a planning tool to stimulate economic development and transformation in the Western Cape.^{lx}

This first phase of the MEDS was to examine a large number of sectors and themes. Based on an analysis of the strengths and weaknesses of the Western Cape economy, this strategy recommends a range of public sector interventions to stimulate specific high-potential sectors. Sectors were identified as high priority if they had a high impact on employment, revenue and empowerment accompanied with a lost cost or investment requirements. The five areas that were identified were:

- Call Centres/BPO;
- Oil and Gas,
- Tourism,
- ICT, and
- SMMEs.^{lxi}

The MEDS also found that in terms of knowledge intensive infrastructure, the Province that the Western Cape almost certainly does better than the national average. This strengthens the argument that the Western Cape is the premier definition in South Africa for knowledge intensive activity.^{lxii}

- **City of Cape Town's Vision of a Knowledge City**

The City of Cape Town has recognised that to create wealth from knowledge and innovation there needs to be, “innovation-led entrepreneurship support with a strong focus towards ICT which will enable the creation of new enterprises that will stimulate and grow of the economy and create more jobs.”^{lxiii} To that end, The City of Cape Town in its Integrated Development Plan 2007/8 – 2011/12 has identified knowledge creation as a directive objective to foster shared growth and development. One of the key objectives of the Integrated Development Plan is to: **“Develop the city’s creativity and knowledge and innovation-based industry.”**^{lxiv}

This strategic vision has additional power as it carries with it political weight and consensus. This vision has been agreed to at the highest level between the city politicians and council that is shared with council and all stakeholders within the City of Cape Town.^{lxv}

The opportunity of creating wealth from knowledge has been actively undertaken by the City of Cape Town as a relationship between the City of Cape Town and the City of Barcelona began in 2008. In June 2009, the City of Cape Town’s Council sent a delegation to Barcelona to actively learn from polices implemented within Barcelona Activa. Two key lessons were drawn from the exchange:

- There is recognition that global investors are hungry for African innovation and Cape Town can easily provide this platform. Cape Town can be positioned globally as the leading enabler of entrepreneurship on the African continent.^{lxvi}
- Knowledge transfer was accelerated as the City of Barcelona agreed to share its Barcelona Activa experiences and lessons with its Cape Town counterpart.

Cape Town is therefore seeking to position itself as a leading enabler of entrepreneurship in Africa by emulating the systems and methodologies used by Barcelona Activa. Given the success rates of Barcelona Activa (see Table 4); there is great potential of knowledge-led economic growth in the Western Cape.^{lxvii}

Role of Business

From the private sector's perspective, the conversation on knowledge-led growth in Cape Town is being led by Accelerate Cape Town, a network of business enterprises in the Western Cape. Accelerate Cape Town is a business-led initiative that began in 2006 made up of business leaders who are concerned over the pace and direction of change in the Cape. To that end Accelerate Cape Town, has unveiled its long-term vision and future strategy, Vision 2030.^{lxviii} The vision seeks to transform the region into *“Africa’s Global City, a city of inspiration and innovation.”*^{lxix}

The establishment of a vibrant network of leaders in business, government, education and other institutions speaks to the objective of transforming Cape Town into a “creative, cultural, academic and business hub of Africa.” One of Accelerate Cape Town’s key roles is to bring together influential stakeholders in the city-region to find solutions for long-term growth and competitiveness. With regard to harnessing knowledge for growth and development, Accelerate Cape Town has been actively creating constructive partnerships^{lxx}

Role of Higher Education

The Cape Higher Education Consortium (CHEC) was established to facilitate institutional collaboration amongst higher education institutions and other organisations in the Western Cape. CHEC is a Section 21 company representing the four tertiary education institutions in the Western Cape of South Africa, namely, UCT, US, UWC and CPUT.^{lxxi}

CHEC has championed the idea of higher education institutions in the Western Cape seeing themselves as regional institutions that cultivate partnerships and work with local and provincial governments to advance the development in the region.^{lxxii} Specifically, CHEC has engaged higher education institutions to align their institutional programmes, qualification mixes as well as size and shape policies with the PGWC regional development framework.^{lxxiii} To that end, CHEC facilitated the signing of a public “compact” in 2002 by the Vice-Chancellors of all four higher education institutions. In terms of this compact they committed their institutions to becoming a collective development resource in the region.

An example of the type of collaboration that exists between the triple helix, government, business and HEI is given in the case study below.

Case Study: Accelerate Cape Town and CHEC's role in Institutional Collaboration^{lxxiv}

A groundbreaking meeting was organised together with the National Business Initiative (NBI) and the CHEC and Accelerate Cape Town in March 2008.

This meeting facilitated the interaction between the vice-chancellors of all four universities (UCT, US, UWC and CPUT) and a group of top business people. The intention of the meeting was for each stakeholder to explore the synergies between business and academia.

The benefit of the meeting was the opportunity to discuss how graduates can be retained by business, while the educational institutions found out more about the type of skills business needs and expects.

Based on the situational analysis, it can be argued that the ingredients of the triple helix have already begun to take shape in the Western Cape. Even though these relationships are embryonic, a culture of working together among the institutions has begun to take root. CHEC and Accelerate Cape Town play a major role in facilitating collaboration among institutions.^{lxxv}

The next section identifies international best practices in establishing a knowledge hub.

4.4 International Knowledge Hub Models – Lessons for the Western Cape

Four innovation and knowledge hubs – the Science Hub in Singapore, the Australian Technology Park, the Dubai Knowledge Village and MediaCityUK in England - have been researched to provide lessons for the development of an internationally competitive hub in Cape Town.

4.4.1 Singapore

Initially, the Singaporean government was not keenly committed to the idea of a technology corridor even after the concept was recommended in the National Technology Plan 1991. With references made to Silicon Valley as a 'well-established' technopole that Singapore could emulate', The National Technology Plan rationalised the concept of a technology corridor to meet the needs of an economy characterised by knowledge-intensive activities.^{lxxvi}

In September 1998, however, things changed. Singapore, like other Asian countries was forced to re-evaluate its growth strategies in the aftermath of the Asian financial crisis. Being a very small country with a population of 4.2 million, and lacking a natural hinterland for cheap labour and land supply, Singapore realised if it wanted to retain its economic competitiveness in the wake of the crisis, it had few alternatives but to shift towards fostering higher value-added, knowledge intensive activities.^{lxxvii} This time the state was anxious for the science hub to work since the crisis was perceived by the ruling government to pose a greater challenge to its political legitimacy and cause socio-political instability as was happening all around the Southeast Asian region during that period.

A stable, farsighted, and uncorrupted government, which adopted proactive growth strategies, has long been credited as one of the main factors behind the success of the Singapore economy. Not only does the government fund the bulk of the investment in innovation infrastructure, it also takes a very strategic approach in deciding which specific industries to promote. “Picking winners” is very much a part of the strategy. Few governments in the world can boast a strong track record in picking winners. By attracting both local and foreign talent as well as providing an environment of technology exchanges, networking, innovation and technopreneurship, the state wanted to ensure that the Science Hub would become a success.^{lxxviii}

In September 2000, Jurong Town Corporation (JTC) was appointed as the master developer of Science Hub by the government. The science hub is being developed on around 200 hectares of land in the south-western part of the country over the next fifteen to twenty years^{lxxix}. The JTC would develop key ‘nodes’, in which government research institutions would be located and the supporting infrastructure (such as roads and utilities) in the science hub. The private sector also took responsibility for developing up to 80 per cent of this zone over the next fifteen to twenty years.^{lxxx}

Launched in December 2001, the One-north³ has quickly become a world class R&D hub for scientists and entrepreneurs working in the biomedical sciences, ICT and media in Singapore. One-north is strategically located in Singapore’s technology corridor, between the Singapore Central Business District (CBD) to the east and the Nanyang Technological University to the west. The location of the hub was carefully selected, mainly considering the infrastructures already available, such as public transportation, roadways and R&D

³ Represents the latitude of Singapore at one degree north of the Equator

institutions – the National University of Singapore (NUS), the National University Hospital (NUH), the Singapore Polytechnic, the Singapore Science Parks and the Singapore Campus of the Insead Business School.^{lxxxix} Located within a 10 minute drive from the CBD, the S\$15 billion (US\$8.5 billion) development is envisaged to become a world class R&D hub for scientists and entrepreneurs working in three industries -- biomedical sciences, information technology (ICT) and media.

Phase I of the project constructed two centers of activities; *Biopolis* which serves as the focal point for biomedical sciences R&D and *Fusionopolis* which houses collections of firms involved in R&D and production works for ICT and media industries.

The *Biopolis* - houses five of Singapore's seven biomedical institutes.⁴ Government grants have also helped attract foreign universities to establish in Singapore to increase the clustering of knowledge and creative infrastructure. Government grants were given to set up joint research centres between the local and reputable foreign universities to fund collaborative projects between them. Nine world class universities offering courses in Singapore, ranging from Massachusetts Institute of Technology, Wharton, Johns Hopkins, Shanghai Jiaotong University, and INSEAD, and Chicago Graduate School of Business, have set up their Asia campuses in Singapore.^{lxxxix} More resources are also channelled to specific areas of study seen to be closely linked to the government's blueprint of an innovation-based economy: life sciences, entrepreneurial studies, communications etc.

Fusionopolis – another hub in one-north is a vibrant exciting place and the epicentre for infocomm technology (ICT), media and science industries. This is where talents, expertise and organizations come together to create innovations and breakthroughs.

The project's close proximity to major tertiary institutions makes for easy collaboration with researchers. The tenants of One-North comprise both public and private research institutions and business enterprises including The Genome Institute of Singapore and the Bioinformatics Institute. Private companies such as GlaxoSmithKline, Novartis Institute for Tropical Diseases are already set up. Many of these firms intend to

⁴ The Bioinformatics Institute (BII), the Bioprocessing Technology Institute (BTI), the Genome Institute of Singapore (GIS), the Institute of Bioengineering & Nanotechnology (IBN) and the Institute of Molecular and Cell Biology (IMCB), and has dedicated space for commercial researchers. The Singapore Tissue Network, a central tissue banking facility is also located at Biopolis along with the newly created Singapore stem cell bank. The global stem cell company ES Cell International and the multinational pharmaceutical company Novartis have their laboratories and offices at the complex. (MTI 2006).

undertake a wide range of activities in Singapore, from basic research and development to product and process development, clinical research, manufacturing, business headquarters and healthcare delivery operations.^{lxxxiii}

To ensure highly qualified human resources, education is highly subsidized and constitutes the second largest item of government expenditure in Singapore. The Singapore Workforce Development Agency was established in 2003 with the specific purpose of enhancing workforce skills through 'developing a comprehensive, market-driven and performance-based adult continuing education and training framework'.^{lxxxiv}

To overcome the shortage of scientists in Singapore, the government has been actively recruiting from abroad. Already, some acclaimed researchers have moved into the *Biopolis* including Doctor Alan Colman, who cloned Dolly the sheep, has moved from Edinburgh to Singapore to continue his research. Dr Edison Liu, director of the National Cancer Institute of the US, is now in Singapore heading the country's Genome Institute. Professor Yoshiaki Ito, one of the chief authorities on stomach cancer research in Japan, together with his team of 10 researchers, has uprooted and moved to Singapore to continue the research.^{lxxxv} Many foreigners have also been appointed to leadership positions in the three universities to help map the research directions for the institutions.⁵

Apart from physical infrastructure development, the government also implemented policies to develop an information communications sector.⁶ The Singapore ONE project, launched by the government in 1998, provides broadband infrastructure of high capacity networks and switches, with the goal of making broadband access available to 99 per cent of the population.⁷ First class digital infrastructure was also developed to allow seamless connectivity between industries. One-north has a 24/7 seamless

⁵ It has been reported that a mere 8.2 per cent or 160 of the 1,930 researchers in government research institutes are Singaporeans. While there are no official statistics for the foreign component of the workforce, the population data reveals that 19 per cent of the 4.17 million people in Singapore are foreigners. (Kim-Song and Phang. 2005)

⁶ The state owned monopoly, Singapore Telecoms, was partially privatized through listing on the stock exchange in 1993 to help realize greater efficiency. Market liberalization and a pro-competition framework were established, with regulatory functions performed by the InfoComm Development Authority (IDA). Competition resulted in lowering of prices and spurring demand in the telecoms sector.

⁷ Between 2000 and 2002, the household and corporate broadband penetration rates grew from 8 per cent to 24 per cent and 15 per cent to 41 per cent, respectively. By June 2003, the household broadband penetration rate had increased to 31 per cent, in step with the IDA's target of 50 per cent by 2006. The Singapore government is also one of the earliest in the world to implement the e-government system

communication network like the state-of-the-art People Mover System (PMS) and the latest communications technology that include broadband internet access, wireless broadband and smart card activated networks.^{lxxxvi} In addition, One-north is equipped with an internal shuttle train system for transport.^{lxxxvii}

The project will focus on the whole range of production activities, including a large portion of basic research while promising a “total living and working environment” with not only research institutes and business offices but also residential properties, shopping, public parks and other facilities. The hub is equipped with state of the arts facilities in computing network, sewage disposal and energy generating systems and an internal shuttle train system.^{lxxxviii}

Key lessons:

- **In order to develop human skills, education must be assigned a high priority to facilitate emerging R&D efforts.** Singapore's education system is highly subsidized and the country has transformed it into one that is industrially targeted, able to provide the higher technical skills as well as the worker training needed for high-technology production.
- **Funding for research is needed to attract foreign researchers.** Since 2000, The Singaporean Government has allocated 2 billion US dollars to Life Sciences research under the aegis of the Biomedical Sciences Initiative (BMSI), with a further 5 billion announced in 2007 to 2010, for Science and Technology R & D (MTI 2006).
- **Information infrastructure that is fast and efficient must be available at affordable cost.** The state owned monopoly, Singapore Telecoms, was partially privatized to help realize greater efficiency.
- **Incentives must be put in place to attract companies.** Singapore's efficient logistics infrastructure and trade agreements facilitate access to growing markets in Asia.
- **Urban productivity is highly dependent on the efficiency of its transport system,** to move labour, consumers and freight between various destinations.

4.4.2 The Australian Technology Park

The Australian Technology Park (ATP) was conceived by a consortium of Sydney universities - University of Sydney, University of Technology, Sydney and the University of New South Wales in 1995. The ATP is wholly-owned by the New South Wales Government's Redfern-Waterloo Authority (RWA)⁸ which is also responsible for the urban renewal of the precinct. Established on almost 14 hectares of campus inspired grounds, and featuring a unique integration of heritage architecture, premium commercial space and state-of-the-art conferencing facilities, the Australian Technology Park is host to leading Australian and global IT, communications and science companies.

Corporate governance within the ATP is managed through the ATP Board of Directors. They are responsible for the corporate governance of ATP including setting the strategic direction, establishing goals for management and monitoring the achievement of these goals. The Board meets monthly to consider the progress of ATP with input from senior management relating to strategic direction and performance, while major reviews are held periodically throughout the year.^{lxxxix}

The Park is now in the midst of its second significant development phase. The first phase which involved the refurbishment of the Locomotive Workshops saw the creation of the Innovation Plaza and Biomedical Building. The second phase commenced in 2006 involved the construction of an ambitious research facility to house National Information & Communications Technology Australia (NICTA) and the Defence, Science & Technology Organisation (DSTO). This new development, which was completed in May 2008, coincided with the construction of new roads and infrastructure within the Park. In response to broader urban renewal objectives, the RWA's Built Environment Plan and the State Environment Planning Policy (SEPP) have provided the opportunity to create 109,000sqm of additional floor space within the Park over the next decade.^{9,xc}

There are currently more than 100 innovators at ATP, ranging from one-person start-ups to multinational organisations along with businesses which harness the support of State and Federal Government

⁸ Created by the NSW Government in January 2005, the RWA was established to manage public infrastructure, land and properties in the Redfern-Waterloo area and foster commercial opportunities for local business.

⁹ The RWA's Built Environment Plan (BEP) and the NSW Government's State Environmental Planning Policy (SEPP) allows for further development of Australian Technology Park with future capital investment currently estimated at \$460 million. The aim is for the Park to be fully developed within 5 – 10 years with an ultimate workforce of more than 9000 permanent employees, making ATP the main driver in Redfern-Waterloo's economic growth over the next decade.

agencies, education and training institutions and ICT mentors. ATP provides a platform for innovation evolution through the nurturing of entrepreneurship and the ongoing investment in a strategically-planned precinct offering highly unique and easily accessible world-class facilities.^{xcii}

In 2007, the first private sector investment within the Park began with early works for a major new media hub. Scheduled for completion in 2010, this site will include offices and production studios for the Seven Network, Pacific Magazines and Global Television. This state-of-the art media facility is foreseen to employ up to 1200 permanent staff and 500 freelancers, and will include a new plaza and an extension of Locomotive Street^{xcii}.

The Park's corporate-campus setting encourages collaboration and information exchange between all community members. They include key tenants/business partners such as ATP Innovations, Elcom Technology, the Roads and Traffic Authority, Johnson & Johnson Research, the Cancer Institute of NSW, ac3, Consult Point and Environmental Biotechnology CRC (EBCRC). The ATP community also includes surrounding residents, businesses, Sydney City Council, local police and the broader community.^{xciii}

The Australian Technology Park allows researchers working on tomorrow's technologies proximity to companies with the capital and expertise to commercialize them today. The common mantra of all tenants both public and private at ATP concerns sharing a common commitment to promoting technological innovation that will benefit all locally, nationally and globally.

The Park has a contemporary business facility with an expanding community of researchers, entrepreneurs, incubator companies, start-ups, multinational organisations and learning institutions. The expertise of this diverse community encompasses the fields of biotechnology, education, energy, environmental management, multimedia, information technology, photonics and telecommunications.

The ATP community also works with all levels of education to develop new interfaces between industry and education. Currently, seven premier Australian universities are represented at ATP and with a team of workers now numbering approximately 1 200.^{xciv} Educational institutions conduct conferences and seminars at ATP on a regular basis as the Park provides an excellent environment for companies to showcase their technologies to other tenants, while key speakers from a broad spectrum of industries are regularly invited to share their experiences and business expertise at special functions throughout the year.

ATP is also home to Australian Technology Park Innovations (ATPi) – a vibrant, world-class technology commercialisation hub established by the University of Sydney, University of New South Wales, University of Technology, Sydney and the Australian National University.^{xcv}

The Park's physical attributes include a central location that is accessible to the airport and the city, leading edge infrastructure and proximity to health and educational facilities. The Park has a Heritage industrial architecture and cutting-edge contemporary design with knowledge sharing and information exchange between organisations within and beyond the perimeters of the Park. ATP has easy connectivity between the CBD, airport and Sydney's rail network and established collaborations and exciting new alliances between and among researchers and industries. All these attributes combine to create a dynamic technopolis where leading ICT, biotechnology, education, science and media groups converge in a hub of innovation research, development and advancement.^{xcvi}

Since its inception, the Park has evolved into one of the nation's pre-eminent technology and business precincts. The Park offers a unique and inspiring environment for collaboration, information exchange and knowledge-sharing, while ongoing site development and an ever-expanding tenant portfolio secure the Park's position at the forefront of Australian technology growth and commercialisation.

Key lessons:

- **Tertiary institutions play a leading role in establishing knowledge and innovation hubs.** The ATP was created by the government of New South Wales and consortium of Sydney universities - University of Sydney, University of Technology, Sydney and the University of New South Wales
- **The development of innovation hubs takes time and extensive planning.** The ATP first phase began in 1995 and the second phase started in 2006 following the RWA's Built Environment Plan and the NSW Government's State Environmental Planning Policy.
- **To be at the forefront of innovation and technology, research and development must be a priority.** Smart Services CRC, which is located at the ATP, aims to create research enabled commercial outcomes for its partners and the benefit of the Australian services industry. This research and development partnership between 12 major industry and government players and several

Australian Universities is funded by the private sector and Governments under the Australian Government's Cooperative Research Centre program.

4.4.3 Dubai Knowledge Village

The United Arab Emirates (UAE) economy has been built on trade and continues to depend upon different forms of trade. There are 12 free trade zones in the country and they have been successful in attracting a large number of companies and foreign direct investment, as well as expanding net non-oil exports.

Launched in 2003, Dubai Knowledge Village (DKV), places the Middle East on the map as first and largest community for human resources management professionals. This thriving knowledge community was founded as part of a long-term economic strategy to develop the region's talent pool and accelerate its move into a knowledge-based economy. DKV also enjoys the distinction of being the world's only educational free trade zone. This campus is situated in the city of Dubai that provides facilities for training and learning institutions to operate.

For the concept to be a success, the UAE government has partnered with investors from diverse countries such as Australia, India, Pakistani, Iran, Russia, Belgium, England and Ireland. The entity that manages and operates the knowledge and innovation hub is TECOM Investments (TECOM). This is a subsidiary of Dubai Holding and owns and operates free trade zones set up to support the development of knowledge-based industries in Dubai.

Since Dubai has limited human capital and skills, the government needed to attract skills from its various partners and ensure hassle-free immigration. Incentive offered to Dubai Knowledge Village partners include 100 per cent foreign ownership enterprises, 100 per cent import and export tax exemptions, 100 per cent repatriation of capital and profits with no corporate taxes on companies for 15 years, and renewable for an additional 15 years. In addition, there is no personal income tax and assistance is provided with labour recruitment and housing.

In terms of regulations, the DKV created a one-stop shop for business partner formalities such as issuance of ID cards, health cards, entry permits, residency permits, visit visas, visa extensions and renewals, entry and residency permits for dependents and maids. It takes seven to fourteen working days to set up a

business at DKV. In addition, the DKV offers fully furnished office space such as a full-fledged furnished office environment, with a private reception area and a small meeting room for six persons.^{xcvii}

Before DKV was launched, university level education was very limited and most expats (and nationals) sent their children to colleges overseas after finishing secondary school. Nowadays at DKV, there are several branches of universities from various countries providing educational facilities for students from all nationalities. Instead of students travelling to Western countries with different cultures, most students from Asia can attend university in a country close to home that most likely shares their same culture. The village also provides expats with many tertiary level study opportunities. There are also a significant number of training institutes and consultants in the field of education and human resources. There are over 400 institutions operating within it, which include universities, training centers, professional centers and HR companies.

The community gathered within the DKV include international academic institutes and programs, academic services and support providers, professional training centres, management development centres, e-learning content/systems/service providers, research and development centres, innovation centres, training and education freelancers. The Village is completely focused on professional grooming and learning support services and has more than three hundred partners. DKV has about twelve prominent partner and member institutions.¹⁰ In total, DKV house 220 human resources development institutions, 70 consultancy companies, more than 20 research and development companies and 100 freelancers as well as several branches of international universities. In addition, DKV also has over 450 business partners which include professional training centres, HR consultancies, linguistic centres, assessment centres. DKV provides the right environment for entrepreneurship – it is equipped with a business centre, providing modern facilities for freelancers and start-up entities in the education, training and learning sectors.^{xcviii}

To facilitate exchange and sharing of knowledge and best practices in diverse areas like education, project management, leadership, investment, IT design, HR and Tourism among others, DKV Events was

¹⁰ American College of the Emirates (ACE), University of Wollongong in Dubai (UOWD), Birla Institute of Technology & Science Pilani (BITS Pilani), European University College Brussels, Heriot Watt University, Dubai; Islamic Azad University; Mahatma Gandhi University; Middlesex University, Dubai Campus; University of New Brunswick in Dubai; Saint-Petersburg State University of Engineering and Economics; The British University in Dubai; The American Academy of Financial Management - AAFM FZ LLC Dubai

launched in early 2007 with the main objective of supporting the knowledge-based economy of Dubai and offering a platform for knowledge and best practices sharing. Part of DKV Events core functionality is to bring state-of-the-art seminars and events to the current workforce and executives within the UAE as well as nurture the future by tapping into the development of students and teachers.

Partner Development Management (PDM) was launched in 2007 and aims to support business partners through fostering their interaction with the TECOM community as well as with other industries, maximizing their exposure and visibility, and helping them reach their target market via building appropriate marketing channels. Within 30 months, PDM had successfully conducted 158 workshops and seminars that have been attended by approximately 15 000 professionals.^{xciix}

A breakfast club – the Dubai Knowledge Village Breakfast Club, a regular networking event was formed to bring together officials of leading companies in the UAE and human development professionals based in Dubai Knowledge Village to network, exchange ideas and share knowledge.

Dubai Knowledge Village offers the most advanced technology ensuring seamless internet connectivity and telephony to support modern businesses in this rapidly developing age of technology. Business Partners benefit from the most competitive operating costs in the region due to reduced IT and Telecom tariffs.^c DKV also offers first-rate infrastructure and facilities for the use of its HR business partners and their clients including serene landscapes, a food court, retail facilities and other services.

The kilometre long picturesque community provides a ready environment for a variety of knowledge-based entities.

Key lessons

- **To enable the sharing of information and nurture creativity, create an environment/platform to share ideas.** DKV Events was created in 2007 to bring state-of-the-art seminars and events to the current workforce and executives within the UAE as well as nurture the future by tapping into the development of students and teachers.

- **Offer incentives to attract investors and researchers.** DKV partners benefit from various tax exemptions and can repatriate 100per cent of their profits
- **It is important to have one entity managing and operating the innovation and knowledge hub** such as TECOM Investments in Dubai.

4.2.4 MediaCityUK

The city that will house the media hub, Salford Docks, was a lynchpin of the region's industrial might and once one of the country's busiest dock systems. However, towards the end of the 20th Century, Salford Docks suffered from the decline of heavy industry and the containerisation of shipping. It was finally closed in 1982, leaving the disused piers and waterways at risk of becoming a wasteland. But in 1985 the Salford Quays Development Plan was unveiled, signalling the start of one of UK's first and biggest urban regeneration projects. Almost 20 years later, the UK's biggest media house – British Broadcasting Corporation (BBC) – announced its plans to relocate five London-based departments.¹¹ In July 2006, Salford Quays was selected as the preferred site for MediaCityUK which would house the five BBC departments. The concept for the digital media hub was inspired by media clusters in cities like Dubai and Singapore.^{ci}

Located on a 200-acre site at the Quays on Manchester's waterfront, MediaCityUK is a long-term development for the creative and digital industries which will enable creative and digital businesses to thrive in a unique, collaborative environment. The £500m project will be a place for people to work, live and play. In addition to the state-of-the-art studios and an unparalleled communications structure, MediaCityUK will include a five-acre public piazza twice the size of Trafalgar Square.^{cii}

Public/private interaction has been facilitated through the use of partnering frameworks and shared commitment. For instance, for the construction of the media hub, a team of public sector bodies – the Northwest Regional Development Agency (NRDA), Salford Central Urban Regeneration Company (SCURC) and Salford City Council (SCC) – worked with site owners, Peel Holdings and developers (private companies) to create a long-term proposal for a brand new media district supporting a whole host of like-

¹¹ BBC Sport, Radio 5 Live, Future Media and Technology, Children's channels (including CBBC and CBeebies).

mindful businesses. Construction of Phase 1 of the project started in summer 2007 and is scheduled for completion in 2011. MediaCityUK is also supported by Trafford Metropolitan Borough Council.

Issues of community involvement in regeneration planning have been overcome through the implementation of a city wide standard. Consultations and surveys have been conducted through community committees to ensure that the residents of Salford have an input on the transformation of their city.^{ciii}

MediaCityUK will house the largest High Definition facility ever built in the UK, containing seven High Definition television studios, two audio studios, and a technical block including fully equipped sound and vision control rooms, core post facilities, CTA, dressing rooms, make-up, workshops, set storage and green rooms. In doing so, MediaCityUK will give businesses access to a range of specialist on-site services, available on a flexible, utility basis. All parts of the creative process will be supported; from content creation within the MediaCityUK studios through to data capture and storage. Designed to meet the needs and trends of a rapidly-changing marketplace – for example High Definition, web and mobile distribution. Companies operating out of MediaCityUK will not have to invest in technology but can leapfrog the competition by leveraging the technology infrastructure readily available to them. The media hub provides scale economies, opportunities for business to transform, buyers and sellers of services on the same site and a new environment with innovation and technology at its heart. Businesses can focus their energies and resources on outputs and audiences rather than wires and boxes ^{civ}

The BBC will move around 2 500 staff to MediaCityUK from 2011 onwards. This will involve relocating five London-based departments, along with all local and network broadcasting currently operating out of Manchester city centre.^{cv} In addition, the University of Salford has also committed to a new higher education centre at MediaCityUK by creating a new higher education centre at the heart of MediaCityUK. More than 800 students and staff from the University of Salford are expected to use the campus, which will open in time for the autumn intake of 2011. The media hub will be home to around 5 000 workers, students, residents and visitors when Phase 1 opens in 2011. Research has suggested that MediaCityUK could ultimately accommodate up to 15 500 jobs.^{cvi}

Salford and Manchester universities which are in close proximity provide one of the largest student populations in Europe, generating an annual crop of high quality graduates. Students at the 18 universities

within an hour's drive of Manchester can choose from nearly 300 media-related courses, while the same geographic area offers nearly 15 000 students studying computer science subjects. Salford University offers courses in radio and TV performance, animation, media technology, computer and video games which will benefit from employment opportunities at the media hub.

For ease of movement by people, a tram terminus has been constructed within the MediaCityUK which will link it to Manchester as well as 300 cycle bays provided for cyclists. The developers also constructed a foot bridge across the Manchester Ship Canal, linking Salford Quays with Trafford Wharf.

The media hub aims to be an internationally significant hub for the digital industries, delivering a convergent media centre that will bring key global players from broadcast, media and technology together with a range of entrepreneurial players.^{cvii} Through a combination of advanced communications networks, purpose-built studio facilities, state-of-the-art editing and post-production suites, leading edge sound and vision control rooms, MediaCityUK will be the best environment in which to create, manipulate and distribute content.^{cviii}

Key lessons

- **Public, private partnerships and planning are vital for the development of innovation hubs.** A team of public sector bodies worked with site owners and developers to create a long-term proposal for a brand new media district.
- **Public perception surveys** were conducted through community committees to ensure that the residents of Salford have an input on the transformation of their city.
- **Substantial resources are needed to build a knowledge and innovation hub.** The first phase of MediaCityUK has a budget of £500 million.
- **Redevelopment of old city sites creates employment and opportunities for the local population.** When complete, MediaCityUK is expected to add £1.5 billion to the regional economy as well as employment opportunities for 15 500 people.
- **Proximity to knowledge and creative industries such as universities and colleges provide a ready pool of talent.** Salford and Manchester universities which are in close proximity to MediaCityUK provide one of the largest student populations in Europe.

5. EMERGING CONSENSUS ON THE CRITICAL SUCCESS FACTORS

Based on the preceding knowledge hub case studies and other international literature, it can be argued that there are at least seven critical factors that are crucial to building successful knowledge industries. These critical success factors provide a framework for this research report. They are: institutional framework – the power of the triple helix; the presence of strong, quality, research-driven internally reputable higher education institutions; enabling environment; social cohesion; infrastructure, connectivity and social networks; economic specialisation; and quality of life.

1. Institutional Framework – The Power of the Triple Helix

Previous experience highlights the need for strong support and commitment to the knowledge sectors across what is commonly known as the “triple helix” – government, business and higher education institutions. Moreover, a knowledge hub should ideally be led by a single organisational vehicle or mechanism that manages and operates the hub. Ideally this entity is responsible and accountable for implementing a long term vision, policy and objectives that have consensus. Leadership should transcend political imperatives with key politicians and policymakers in championing and driving strategies and policies, and the importance of cultivating allies at regional and national levels.

2. The Presence of Strong, Quality, Research Driven Internally Reputable Higher Education Institutions

Education should be viewed systemically as a whole. What is required is a pool of education excellence in general but specifically within higher education. In particular, tertiary education institutions have a central role to play in contributing towards the attainment of such success and effectiveness. This is because universities have the capacity to create, acquire and transmit knowledge for use by enterprises, organisations, individuals and communities.^{cix} Proximity to knowledge infrastructure such as universities have been found to be critical in the establishment of a knowledge hub as it creates a ready pool of highly skilled talent that companies can draw from. If a ready pool of highly skilled is lacking there needs to be a long term plan and strategy to direct the education system toward this goal.^{cx} In addition, universities should also have the ability to not only attract but also retain top students and staff.^{cxii}

3. Enabling Environment – Incentives and Marketing

A growing economy is the first fundamental prerequisite. Associated with that growth is policy and regulatory environment direct and coordinate behaviour. To the support of the constituents within the triple helix, a comprehensive package of incentives is required to entice and retain talent, attract capitalist and investment as well as obtain buy in from the public sector. Private sector incentives include funding, tax incentives, subsidies and venture capital financing.^{cxii} Examples of higher education institutions incentives are the ability to attract the very best talent (students, lecturers and researchers), subsidies and an international profile.^{cxiii} Government on the other hand, is motivated by issues such the economic spinoffs that lead to job creation,^{cxiv} “prestige incentive” such as elevating the prestige of a region, and the transfer of expertise to government related issues and policy development.^{cxv} Also important is the support given to small medium micro enterprises (SMME)^{cxvi} and the linkages between the formal and the informal economy.^{cxvii} Once the comprehensive incentive packages is agreed, this then needs to be marketed through a *‘coherent, well connected and coordinated promotion and marketing campaign.’*^{cxviii} This sends out a signal to prospective investors as to where to invest and prospective students as to where to study.^{cxix}

4. Social Cohesion

Persistently high levels of racially defined inequality – reflected in social and economic indicators such as poverty, social alienation, unemployment, public health, housing and income distribution – pose a serious threat to social stability of any society. The degree of tolerance of foreigners is also critical as a strong presence of foreign talents has been found important. Successful knowledge hubs are diverse, multicultural and vibrant creative spaces.

5. Infrastructure , Connectivity and Social Networks

Excellent infrastructure and connectivity is a prerequisite in any knowledge hub. Connectivity speaks to physical connectivity, virtual connectivity as well as the social networks, linkages and clusters that exist between knowledge infrastructure and institutions.^{cxx} Knowledge hubs speak to the creation, acquisition, and transmission of knowledge to enterprises, organisations and individuals.^{cxxi} A knowledge hub requires a culture of collaboration among institutions and social networks based on trust and reciprocity. After all, ideas can only translate into new investments if people are willing to communicate and collaborate. There

needs to be synergies and links between institutions (across the triple helix) as critical mass in any area of expertise requires research and development teams.^{cxix} Moreover, successful knowledge hubs possess the physical and electronic infrastructure to move information, goods, and services and people quickly and efficiently. ICT is a major driver and enabler in this process.

6. Economic Specialisation

The emergence of a knowledge hub requires enormous resources and funding. To prevent spreading resources and funding too thinly, the suggestion is to focus on a few specific innovative industries where a competitive advantage has already been or can be established. A strategic approach needs to be employed in the investment of funding as critical pockets of excellence needs to be identified and invested in.^{cxix} An additional strength is the existence of a culture of creativity and innovation.

7. Quality of life

The quality of life has increasingly become an important consideration in attracting and retaining skilled workers. Soft location factors such as a good environment, distinctive architecture, quality housing, cultural facilities and access to natural amenities have become important in making decisions about where to live and work. Lifestyle factors should draw talent to the region but also importantly retain this talent within the region.

6. CREATING A SUCCESSFUL KNOWLEDGE HUB IN THE WESTERN CAPE: PROSPECTS AND CONSTRAINTS

In terms of the critical success factors for a knowledge hub, the Western Cape Town generally compares favourably. The strengths of the economy speak to a highly diversified economy with a relatively well endowed education, higher education and the existence of a knowledge intensive sector and attractive lifestyle options.

6.1 Economic Diversity

The province can be commended for a diversified and expanding economy driven by small and medium-sized firms, a strong industrial base; sophisticated financial and communications systems; an attractive business environment; and the lowest unemployment rate in the country.^{cxxiv} Moreover, even though total inward investment into South Africa over the past decade has not lived up to projections, it is notable that the Western Cape has absorbed 16 per cent of the investment generated by the country. The Western Cape's economic attractiveness has been buoyed by the positive international disposition towards the South African economy. As the second biggest contributor (11.1 per cent of national GDP), to South Africa's national economic output, the Western Cape has been one of the key drivers of South Africa's integration into the global economy. In recent years, the Western Cape along with Gauteng, has recorded the highest growth rate per region with a growth rate of 5,7per cent growth, eclipsing the national average.^{cxxv} In 2006, the formal economy in the Western Cape absorbed 1, 3 million workers with the informal sector absorbing roughly 144,065 workers.^{cxxvi}

The bulk of growth is recorded in sectors such as transport, communications, tourism, retail and wholesale, as well as financial and business services.^{cxxvii} Within the service sector, financial and business services are particularly important, accounting for 29.5 per cent of the provincial economy in 2005.^{cxxviii} Moreover, the service sector is also a dominant generator of employment. In 2005, an estimated 67 per cent of all workers were employed in the tertiary sector.^{cxxix}

The open economy of the Western Cape benefits from improved access to world markets through preferential trade agreements between South Africa and other major markets throughout Europe and the

United States. The Western Cape also has preferential access to market in Africa through the Southern African Development Community (SADC) free trade agreement and through the New Partnership for Africa's Development (NEPAD) initiative.^{cxxx}

6.2 Social, Operational Infrastructure and Connectivity

Historically, the apartheid government has underinvested in basic infrastructure such as roads, transportation, energy, water, sanitation and waste.^{cxxx} The Western Cape, however, is relative to the other provinces well developed and endowed. The province has a sophisticated network of rail and road that link the Cape to the world and the rest of the country, excellent transport facilities by sea via the harbour of Cape Town and Saldanha and by air via Cape Town International Airport as well as George.^{cxxxii}

In terms of social infrastructure, on average, of all the households in the Western Cape:

- 98.9 per cent have access to water (piped water in a dwelling, piped water on site or access to a public tap);
- 95.8 per cent have access to electricity; and
- 94.8 per cent have access to sanitation (a flush or chemical toilet or a pit latrine).^{cxxxiii}

With regard to virtual connectivity, communications systems in South Africa are largely influenced by Telkom's monopoly with ICT costs in South Africa far above international norms. Cape Town has a sophisticated telecommunications system. In terms of IT infrastructure, Cape Town is serviced by a fibre optic-based Metropolitan Area Network (MAN). In addition, submarine cable and satellite networks connect Cape Town to the global arena.^{cxxxiv} The Western Cape is more wired than the rest of South Africa with a 60 per cent higher internet usage than in Gauteng.^{cxxxv}

The social networks demonstrate evidence that a culture of collaboration is emerging with linkages and clusters that exist between knowledge infrastructure and institutions. In the Western Cape there are 18 cluster initiatives with a total annual budget of \$US 8million. These are the Cape Clothing Cluster, Visual Arts Network, Cape Craft and Design Institute, South Africa Aqua-culture Institute, Cape Film Commission, Western Cape Tooling Initiative, Cape Town Boatbuilding and Technology Initiative, South African Wine and Brandy Trust, Cape Initiative in Materials & Manufacturing (CIMM), Cape Town Fashion Council,

Clotex - Cut Making and Trim, Cape Information Technology Initiative, Cape Bio-tech Trust, Professional Business and Services, South African Oil and Gas Initiative, Performing Arts Network, Cape Ship Repair, Calling the Cape and Cape Music Initiative.^{cxxxvi} In addition there is also a Technology Park situated outside Stellenbosch.^{cxxxvii}

6.3 Enabling Environment - Marketing and Incentives

One of the greatest strength of the Western Cape is the official Trade and Investment Promotion Agency for the Western Cape Province, WESGRO. WESGRO is the first point of contact for foreign importers, local exporters and investors wishing to take advantage of the unlimited opportunities in the Western Cape. It creates an enabling environment by facilitating a more policy friendly regulatory environment in the Western Cape. WESGRO can facilitate dealings with immigration, work permits, incentives, site locations, business match-making and network access.^{cxxxviii}

The incentives available to firms with the innovation sector are both public and private. Public funds can be structured as grants, loans, rebates, tax incentives, co-investments, or venture capital, while private funding includes seed/incubation funding, angel investments, venture capital, private equity, and private donations, trusts or foundations.

Some of the public funds available for commercialization are:

- Biotechnology Regional Innovation Centres (BRICs) - Funds available from the BRICs are directed at the development of biotechnology in South Africa.
- Innovation Fund, administered by the National Research Foundation (NRF). The Innovation Fund supports projects in various focus areas that are aimed at commercialization.
- Patent Fund, administered by the NRF. The fund is used to cover 50per cent of the patenting costs of public research institutions.
- Department of Trade and Industry (DTI) incentive schemes, such as the Technology and Human Resources for Industry Programme (THRIP), the Support Programme for Industrial Innovation (SPII), the Skills Support Programme (SSP), the Competitiveness Fund (CF).^{cxxxix}

Because the majority of firms in the Western Cape are SMME, the knowledge hub has to facilitate their growth and ensure that opportunities are available to SMMEs. If the knowledge and innovation hub is to be associated with job creation and poverty alleviation it should also encourage SMME development.^{cxl} To that end, there is a Small and Medium Enterprise Development Programme (SMEDP). This fund is administered by the Department of Trade and Industry (DTI) and takes the form of cash grants for manufacturing, tourism and selected other sector investments.^{cxli}

The greatest strength in terms of marketing is the Cape Town brand. Locating a business or studies inside of Cape Town means that you have everything that Cape Town has to offer.^{cxlii} These benefits relate mainly to the lifestyle factors which are addressed in the section below.

6.4 Quality of life

The Western Cape is home to unrivalled natural beauty, blessed with environmental resources that make this region truly unique.^{cxliii} Most of the biodiversity in the Western Cape is found nowhere else on earth - 9 600 species of fynbos plants and 11 000 species of marine animals.^{cxliii} The Western Cape is surrounded by two oceans and is home to mountain ranges such as Table Mountain. The combination of the beauty of the physical environment as well as its cosmopolitan nature gives Cape Town a life style advantage and makes Cape Town a very attractive area to live and study.^{cxliii}

When one compares Cape Town with the critical success factors listed above the Western Cape compares quite favourably. The research therefore agrees with the analysis of the PGWC that the Western Cape's strategic advantage is its:

- Strong higher-education sector;
- Relatively well-developed knowledge capital,;
- Attractive living environment,;
- Cross-sectoral knowledge network;
- Integrated and diverse city-regional economy;
- Rapidly growing services sector; and
- Relatively high-quality communications infrastructure.^{cxliii}

However, this general positive picture masks a range of challenges that need to be addressed if an internationally competitive hub is to emerge within this province. “Beneath the veneer of success lurk vulnerabilities that threaten the city’s quest to meet the challenges of globalisation.” In several ways, the vulnerabilities of the Western Cape mirror the national experience. The constraints to the emergence of an internationally competitive knowledge and innovation hub are: inadequate growth, poor international competitiveness, exchange rate volatility, skills shortage, low productivity, low domestic savings, insufficient investment in research and development, small domestic market, endemic crime, high social and economic inequality, a deficient public transport system and a poor entrepreneurial culture.^{cxlvii}

The next section looks at the above vulnerabilities in more detail.

6.5 Institutional framework

The history of the past has created a situation where institutions have never really worked together. The greatest weakness is that the constituents of the triple helix have no institutional memory and practices to rely on. The model of collaboration and networking for international competitiveness is relatively new to all constituents. One can therefore anticipate trial and errors as we determine from experience what is good or bad practice.^{cxlviii}

From the public sector’s perspective, government must be convinced that the knowledge hub will have the ability to create jobs. Because the knowledge intensive industries tends to demand a higher level of skills, and are not directly labour intensive, the danger is that the knowledge hub will exacerbate levels of income inequality and on an aggregate level, benefit the wealthier section of society.^{cxlix} This will be politically unacceptable for a government. If government doesn’t believe that a knowledge hub within the Western Cape will create employment and alleviate poverty they will not support the idea.^{cl}

The PGWC holds the perception that in the Western Cape there are a range of well-organised business, professional and development promotion associations but that these business leadership networks are, however, relatively weak.^{cli} According to the PGWC, the private sector has little incentive to invest in redistributive development^{clii} and therefore these business associations and networks have not yet committed themselves to large-scale investments.^{cliii} The challenge that government poses to business

leaders is to break out of the capital-intensive high-skills investment pattern as it is not translating into large-scale job creation for unskilled and semi-skilled workers.^{cliv}

Lastly the role and presence of CHEC has been identified as hugely important but the organisation lacks political teeth and a funding source of its own as CHEC receives funds from the universities itself. If CHEC, for example was given funds of their own they could use this to provide a greater range of innovation and R&D incentives.^{clv}

6.6 The higher education landscape

Despite the fact that the Western Cape celebrates the highest education and literacy levels in South Africa, quality general schooling is, however, is skewedly distributed with historically disadvantaged communities still finding it difficult to access quality education.^{clvi} In addition the Western Cape also has the dubious title to having the highest dropout rate in South Africa. Of the total number of learners that enroll in Grade 1, only 45 per cent to 52 per cent of learners reach Grade 12. Of the 30 000 eligible to enter higher education (HE) only 16 per cent (or 10 000) Grade 12 learners typically do so.

Quality higher education is still skewed along racial lines. Of the total 82 000 enrolments in 2003, 40 per cent were White, 31 per cent were African students, 25 per cent were Coloured and 4 per cent were Indians. The dominance of the previously White institutions is also evident in the distribution of post graduate enrolments. The majority (80 per cent) of all 2003 Western Cape doctoral enrolments were located in UCT and US.^{clvii} The graduation rates are also skewed by race. The graduation rate amongst White students in the Western Cape for 2003 was 26 per cent whereas Africans, Coloured and Indian students had a graduation rate of 19 per cent in each case.^{clviii} In addition, although the faculties at the different universities are known and respected internationally in terms of their cutting-edge research, they have not been engaging directly with the regional requirements for development^{clix}

Growth driven by tertiary sectors, such as financial and business services, wholesale and retail trade, tourism, transport and communication places a substantial challenge on providing suitably skilled labour to match the demand in these growing industries.^{clx} Currently the Western Cape lacks the appropriate skills to support the knowledge economy as there is a fundamental skills mismatch between the skills of the population and the skills required by the economy. The WCED acknowledge that the current pool of

human capital in the Western Cape is too low, and that the existing human capital does not possess the requisite knowledge and skills that will enable the province to drive its socio-economic development programme(s).^{clxi} The PGWC views these as a “critical binding constraint on accelerated and shared economic growth.”^{clxii}

In addition to the skills shortage constraint, there is an additional drawback as the Province struggles to retain skilled professionals. In terms of measuring the retention of highly skilled labour, the most often used method is that of the International Labour Organisation (ILO). Highly skilled labour is divided into three major categories. Group 1 represents all legislators, senior officials and managers. Group 2 consists of involves professionals such as people with science or engineering training, architects, academics, teachers, lawyers, and religious professionals. Group 3 comprises of technicians and associate professionals. Based on these classifications, the Figure below reveals that between 1996 -2001, Cape Town is registered below average in Groups 1 and 3 and actually lost professionals to other metropolitan areas in the country.^{clxiii}

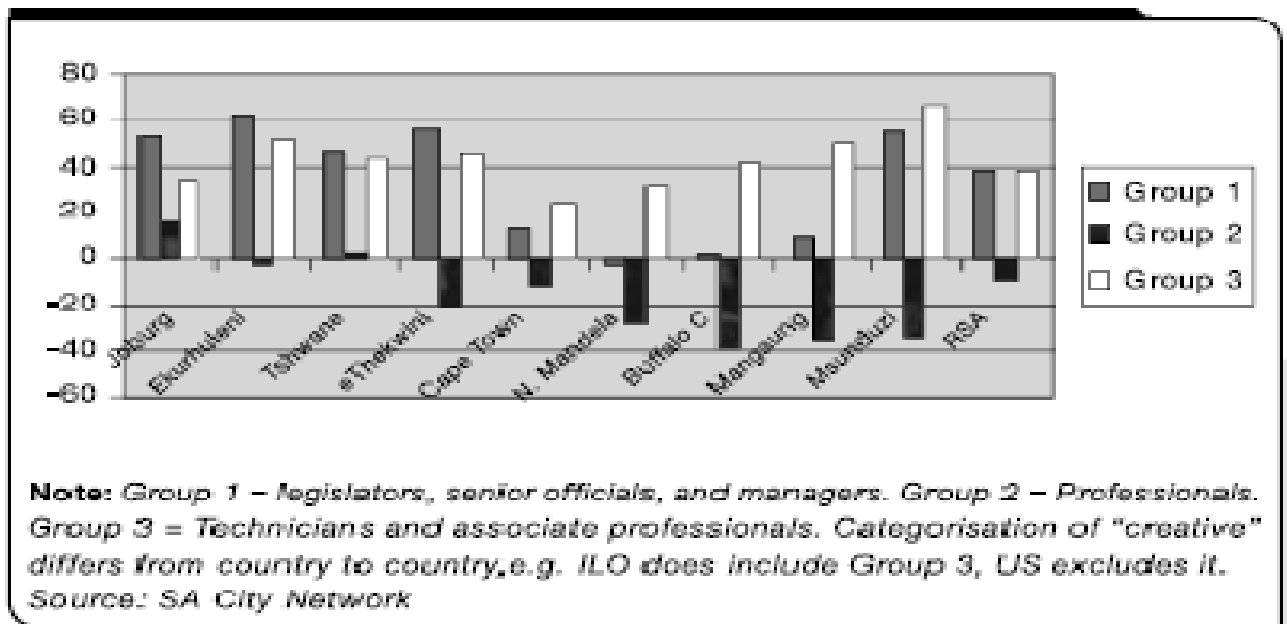


Figure 3: The Retention of Highly Skilled Workers across Major Cities in South Africa (1996 -2001)^{clxiv}

Due to comparatively lower salaries when compared with provinces such as Gauteng, Cape Town does face challenges in retaining quality workers. There is also anecdotal evidence that suggests that foreigners,

especially Black foreigners, do not feel that the City is particularly welcoming. This intolerance of foreigners is another hindrance to retention in the Western Cape.^{clxv}

6.7 Social cohesion

Between 2000 and 2005, employment grew marginally at an average annual growth of 1.5 per cent per year.^{clxvi} The current net rates of employment creation therefore fall far below what is required to halve unemployment by 2014 and have not had a significant impact on unemployment and poverty alleviation.^{clxvii}

The social climate of the Western Cape is one of inequality, poverty, crime, unemployment and racism. The Western Cape has the most unequal distribution of wealth than any of the other provinces in the country. In 2000, the national Gini coefficient was 5.7 whereas the provincial Gini coefficient was 0.62.^{clxviii} The average annual growth rate of unemployment per year for the period 2000 to 2005 was 6.8 per cent with unemployment being concentrated amongst Black youth.^{clxix} In July 2007, 805 868 people received social grants.^{clxx} If one measures poverty by household subsistence level, then poverty in the Western Cape increased by 11 per cent from 1996 to 2005 to 36 per cent. Poverty also has a distinct spatial character, with significant concentrations in the CTFR.^{clxxi}

6.8 Infrastructure, connectivity and social networks

Persistent inequalities and poverty in the Western Cape are reinforced by:

- Poor spatial integration of settlements increasing disconnectedness;
- Inadequate social and operational infrastructure and inadequate connectivity; and
- Poor social networks^{clxxii}

- **Poor spatial integration of settlements increasing disconnectedness**

Under apartheid, social and economic development in the Western Cape was deliberately inequitable and unjust. The end result is that the poor of the Western Cape remain spatially marginalised as they are not located in close proximity to economic opportunity.^{clxxiii} This has resulted in a waste of disposable income, reductions in employment and local demand. These trends have continued due to the “inability of government to contain the structure of the land market” which is “reinforced by market forces.” The spatial

dynamics of the province therefore continue to spatially segregate communities, with low density urban sprawl along class, mall-based commercial organisation and a limited evidence of social integration.^{clxxiv}

It is only recently that the PGWC has begun to conceptualise the spatial development frameworks that aim to reverse the historical inequitable spatial patterns of development and poverty. The approach adopted by the province aims to bring the poor back into inner-urban areas.^{clxxv}

- **Inadequate social and operational infrastructure and poor connectivity**

The key constraint in this province is the housing backlog, estimated at 410 000. Of the total backlog, 300 100 are located in Cape Town. This supports the claim that the housing problem is overwhelmingly an urban problem, concentrated primarily in the Cape Town metropolitan area. The factors fueling this housing backlog is migration as well as declining household size. The number of informal shelters in the City of Cape Town grew at an average rate of 20.5 per cent per year for the period 1993 – 2005. In 2005 it was estimated that there were 98 000 informal shelters in Cape Town alone.^{clxxvi}

In terms of operational infrastructure, the maintenance and upkeep of these infrastructures have not met with the demand. Failing infrastructure in roads, airports, ports, transport systems and communication systems both increases the cost of doing business and undermines the inclusiveness of the economy.^{clxxvii}

Daily commuting to and from Cape Town consists of 1.13 million public passenger trips, the majority of which (53 per cent) is by rail. During the morning peak period of 06:00 to 09:00, 48 per cent of all trips are by public transport and 52 per cent by private car.^{clxxviii} This creates problems such as high levels of congestion with long distance placing additional pressure on disposable income. The PGWC has clearly stated that “aggressive investment in public transport systems is needed in Cape Town.”^{clxxix} In doing so, it acknowledges that shared economic growth can only be achievable when there is safe and reliable public transport system.^{clxxx}

The key infrastructural constraints to shared knowledge-led growth are the housing backlog and the need for integrated public-transport system.^{clxxxi} There is a therefore a need to invest in infrastructure – including connectivity infrastructure (such as mobility and ICT) and operational infrastructure (such as energy, water, sanitation, waste and roads) as well as social (housing, etc.).

The communication systems of the kind that will support a knowledge hub are lacking. In 2005, for example, 460 000 households in the province did not have a private telephone or cell phone.^{clxxxii} Another example is within the creative industries in the Western Cape, the main constraint hindering the development of an excellent animation hub was bandwidth. Because the knowledge industries are extremely data-intensive a large amount of bandwidth is needed as a basic platform.^{clxxxiii} Broadband connectivity was comparatively expensive and slow. If factors such as our ICT infrastructure is not competitive with the best in the world and this could be a deterrent to top professionals.^{clxxxiv}

- **Poor social networks**

Despite a long tradition of well-organised community associations across all communities in the Western Cape, the people of this province are still divided by income and race, with communities living apart in their segregated pockets. In the opinion of the PGWC, the nature of the social fabric is not conducive to knowledge based and innovation led growth.^{clxxxv} In an environment characterised by high inequality and indifference a vital commodity such as trust, reciprocity and knowledge-sharing is missing.^{clxxxvi}

To be globally competitive requires the formation of critical mass and that in turn requires R&D teams. But as mentioned the forms of networking and other forms of cooperative relationships are relatively new to institutions and the challenge currently is to find ways to encourage cooperation. Not enough incentives are currently in place to facilitate collaboration.^{clxxxvii}

Moreover, the business and policymaking sectors are not integrated with the education system.^{clxxxviii} For knowledge to be relevant, it needs to be practically applied and transmitted from universities and research teams to industry and business. There is a need for greater linkages between the output of university to business requirements and vice versa.^{clxxxix}

6.9 Economic specialisation

There is a need to be more strategic approach in identifying and investing in the pockets of excellence that can create international competitiveness.^{cx} There is a lack of focus regarding specific innovative industries.^{cxci} What is required is for key areas of existing strengths to be determined and within these areas appropriate interventions need to be made.^{cxcii}

Although the Western Cape is relatively better in knowledge an intensive activity than the other provinces, it is not, however, competitive with in the global context. To become competitive, the Western Cape must be able to compete with other international players.

6.10 Enabling environment: incentives and marketing

Innovation is a very risky and costly process with returns only occurring in the long-term. It is, therefore, important for new firms to have a safety net in the initial period. This safety net is lacking in the Western Cape. There are not enough incentives for entrepreneurs and a general lack of active support for innovation.^{cxciii} Government support for innovation in the private sector is very limited. The Support Programme for Industrial Innovation (SPII), for example, is the only direct support that government gives for innovative activities in business. South Africa has the rare situation where there is a net flow of direct financing for R&D from the private to the public sectors. For tax purposes, R&D expenditure is treated as an ordinary business expense. There is evidence to suggest that an incremental tax credit scheme whereby firms would receive a tax credit for any additional R&D spending would greatly increase R&D expenditure.^{cxciv} Another obstacle is that government is excessively bureaucratic with too much legislation and regulations hindering support for innovation.^{cxcv}

For an economy underpinned by the SMME sector, a great deal more can be done to encourage small enterprise developments. It is therefore encouraging to note that the policies and systems of Barcelona Activa are to be emulated by the Western Cape as SMMEs within the Western Cape need to be exposed and supported to take advantage of the opportunities associated with a knowledge hub if it is to have the desired impact of reducing poverty.^{cxcvi}

Another critical ingredient is the marketing. The strategic choice would be to push the business brand of Cape Town and let the world know of the intentions of the City in relation to the knowledge hub.^{cxcvii}

6.11 Quality of life

Despite this rich environmental heritage, agriculture and urban areas are being operated in ways that overexploit these resources and reduce the viability of ecosystems. Approximately 1 400 plant species are endangered or nearing extinction, the marine and coastal resources are collapsing and desertification is reducing the productivity of soils. ^{cxviii} In addition, the Western Cape has the most serious alien-plant problem in South Africa. ^{cxix} The environment is both beautiful and vulnerable.

The lifestyle factors that make the Western Cape so attractive are also under threat as the social fabric of the society is under pressure. There is widespread perception that the Western Cape is a 'white colonist enclave.' This perception is fueled by the province's very slow progress in integrating the previously disadvantaged communities into the mainstream of the provincial economy as well as racially-tinged social and economic inequalities. .

Based on this analysis the next section will look at strategic issues for consideration and make some policy recommendations.

7. LOOKING AHEAD: STRATEGIC ISSUES FOR CONSIDERATION

The developmental state can play a role in utilising knowledge, innovation and creativity towards the ultimate purpose of development and poverty alleviation. An important policy challenge facing the provincial and local governments in the Western Cape is to create an enabling environment that will facilitate the creation, use and dissemination of knowledge and ideas to foster economic growth and development.^{cc} If the Western Cape is to succeed in using knowledge activities to drive economic and social development attention must be given to a number of strategic issues.

7.1 Vision and leadership

International experience shows that even though governments have played crucial roles in establishing knowledge hubs – not least through the creation of enabling regulatory frameworks – the initiatives operate better when they are spearheaded by the private and higher education sectors. Accelerate Cape Town and CHEC are well positioned to play this role. The ingredients for the triple helix are there but these need to translate into a formal economic development strategy.^{cci} In other words, the dialogue has begun but the focus needs to shift to “planning, strategising and investing”.^{ccii}

To this end, the incentives structure and package will be absolutely critical. Also, the government must be convinced that the knowledge hub will have the ability to create jobs and reduce income inequality. There is a need, therefore, to make a credible business case as to exactly how the knowledge hub will achieve the above objectives. This must include a value chain analysis of knowledge-intensive activities and particular attention must also be given to the indirect benefits or economic spillovers of the knowledge hub. Within this arena lies great potential for black economic empowerment and scarce skills development. Another key ingredient from the public sector is political support from political leaders and policymakers. Within all three tiers of government (local, provincial and national) champions for knowledge industries need to be identified and encouraged.^{cciii}

International experience suggests that once a long-term vision, policy and strategy has been elaborated, a single organisational vehicle or mechanism should be mandated from all constituents to lead, direct and implement the knowledge hub. This is true of Australia and Dubai. In the Western Cape context CHEC is

ideally placed play this facilitating role. As Professor Beal, deputy chancellor at UCT, stated in an interview “there is no need to reinvent the wheel.” Critical to the creation of a viable knowledge hub will be the support of universities. This is because universities create the pool of talent, undertake research and in addition have the capacity to transmit knowledge for practical and workable use. In this regard there is room for improvement. For the output to be relevant to business and vice versa there needs to be stronger linkages between the higher education and business sectors.

In particular, there needs to be a conscious shift in respect of the business sector’s orientation. Private enterprises, in concert with the state and civil society, ought to play an active role in dealing with the complicated socio-economic challenges that face the Western Cape. Only through mutual understanding and collaboration between business and government can effective partnerships emerge.^{cciv}

7.2 Incentives structure

As mentioned, the incentives structure and package will be absolutely critical. A great asset in the Western Cape is the facilitation role that WESGRO already plays in creating a hassle free policy regulatory framework. The Western Cape can learn from Dubai in particular. WESGRO could play the role of a one-stop shop for regulatory issues within the knowledge hub.

The key growth area is the range of incentives that can be made available to SMMEs. A lot more can be done to encourage the sector such as the establishment of a new entrepreneur incubator, CapeTownActiva. This hub is set to emulate Barcelona Activa. Making opportunities of the knowledge hub directly available to Black owned (African, Coloured and Asian) entrepreneurs will greatly enhance job creation and skills development and poverty alleviation.

Funding for research has to increase to the level of competitors. In Singapore, for example the government overcame the shortage of scientists by actively recruiting abroad. To draw in talent a total of US \$ 2 billion have been allocated to life science research since 2000. Another US \$5 billion has been allocated to science and technology for 2007 to 2010. The case studies clearly indicate the researchers are attracted by high levels of funding, excellent infrastructure and leadership positions.

In addition, the research funding should encourage collaboration amongst institutions, especially amongst the three universities. Collaboration could also be encouraged through networking. In both Dubai and

Australia the communities across the triple helix is being built through conference and seminars. The Dubai Knowledge Village has a Breakfast Club which is a regular networking event that brings all stakeholders together. This approach has proved to be effective in the transmission and application of research and knowledge.

7.3 Infrastructure development

As already mentioned, researchers are enticed by excellent infrastructure. Despite the fact that relatively Western Cape Town is better than the rest of the country; the real test is in its status relative to the globe. From that perspective, however, the Western Cape is not competitive. There is no escaping the fact that for the knowledge hub to be competitive, huge infrastructure investment needs to be made. All the case studies survey boost of 24/7 connection with seamless and efficient transport systems. It is therefore encouraging to note that the City of Cape Town has embarked on a R292 million capital expenditure programme for 2009/10 period. The investments made within ICT seek to reduce the cost and improve the access of internet provision. Also of importance is the implementation of the envisioned integrated rapid public transport system in South Africa. This system aims to provide safe, reliable and cost-effective transport by connecting and complementing the various modes of transport in the Western Cape. This process has, however, been fraught with problems as enlisting the support of existing mini-bus operators of the proposed public transport system has proved to be challenging.

7.4 Social cohesion through pro-poor development

The persistently high levels of racially defined inequality pose a serious threat to the Western Cape's social stability and make a mockery of its global ambitions. Income distribution remains heavily skewed in favour of white earners in the developed parts of the province, which receive the lion's share of corporate investment, while significant sections of the population continue to experience acute social alienation and are excluded from the benefits of the economy. If left unchecked, these problems could undo hard-earned economic gains.

To overcome these constraints, the World Bank recommends that the following should be implemented to create knowledge-led growth within an African reality:

- Actively tap into the private sector especially the SMME sector.
- Effectively engage in the informal sectors and rural communities to foster innovation.
- Create the most appropriate enabling environment to foster and reward innovation at all levels of society.^{CCV}

Based upon qualitative interviews the following suggestions are relevant to the Western Cape context:

- There is a case to be made for the introduction by the state of targeted bursaries and loans in the identified priority field to learners who are members of the previously discriminated against population. Within a post-apartheid context, learner needs should be taken into consideration with the greatest funding being allocated to the most disadvantaged students.
- Once priority areas have been identified it is important to also develop a sector specific strategy to grow each sector. These sectors should be deliberately and systematically designed to be labour-intensive in order to absorb the high levels of unemployed young people in the Western Cape into the job market. This is already being achieved within the BPO processes.
- The knowledge hub should concentrate on producing socially responsible and relevant research. Research therefore should be centred on having a direct impact on the lives of people and responding to the development challenges facing South Africa, the Southern African Development Community and the Global South in general. In this way the knowledge hub can also contribute towards poverty alleviation efforts. This approach has already been employed in sectors such as health in the development of an HIV/Aids or TB vaccine.
- The Western Cape can take a leaf out of the approach adopted by MediaCityUK in the United Kingdom to strengthen community involvement in the planning of the hub. It is advisable to undertake consultations and surveys within community in the Western Cape to ensure that the citizens of the province are able to influence social transformation.

The social challenges facing the Western Cape cannot be taken lightly as they act as barriers to the creation of a knowledge hub that is situated within the context of poverty alleviation.

8. APPENDIX

- From your perspectives, what are the critical success factors for creating an internationally competitive knowledge hub?
- How can a knowledge hub in the Western Cape contribute to economic growth and poverty alleviation?
- What, in your opinion, are the strengths that the Western Cape can build on to establish an internationally competitive knowledge hub in the Western Cape?
- What, in your opinion, are the key constraints that the Western Cape has to overcome in order to establish an internationally competitive knowledge hub in the Western Cape?
- From your perspectives, what is the nature and extent of collaboration and partnerships between the government, private sector and higher education institutions if the goal of promoting the Western Cape as a globally competitive hub is to be realised?
- What kinds of incentive packages need to be implemented to mobilise private sector participation and support for a knowledge hub?
- What kinds of incentive packages need to be implemented to mobilise higher education sector participation and support for a knowledge hub?
- What kinds of incentive packages need to be implemented to mobilise public sector participation in support for a knowledge hub?
- What kinds of marketing strategy need to be implemented currently to entice foreign students to the knowledge hub?
- Where are the potential areas where a knowledge hub in the Western Cape can establish a competitive advantage?

Figure 4: Questions asked to various Stakeholders as part of the Stakeholder Interviews

Table 5: Stakeholders interviewed for the Study

Stakeholder	Organisation
Higher Education Institutions	
Ms. Nasima Badsha	Chief Executive Officer; Cape Higher Education Consortium.
Ms. Tanja Hichert	Scenario Planner and Facilitator of Strategic Conversations; University of Stellenbosch - Institute for Futures Research.
Professor Jo Beal	Deputy Vice-Chancellor; University of Cape Town.
Dr. Michael Herrington	Director of the Centre for Innovation and Entrepreneurship; University of Cape Town.
Professor Edgar Pieterse	Director of the Centre for Cities in Africa; University of Cape Town.
Government Representatives	
Dr. Hildegard Fast	Deputy Director-General: Strategy, Planning, & Corporate Services; Department of Local Government & Housing, Western Cape.
Professor Dave Kaplan	Chief Economist and Chair of Micro-economic Development Strategy Oversight Committee; Provincial Government of the Western Cape.
Mr. Angelo Manzoni	Chief Executive Officer, Wesgro
Mr. Mansoor Mohamed	Executive Director, Economic, Social Development and Tourism; City of Cape Town.

Business Representatives	
Mr. Albert Schuitmaker	Executive Director, Cape Regional Chamber of Commerce and Industry.
Mr. Guy Lundy	Chief Executive Office; Accelerate Cape Town.
Mr. Rashid Toefy	Chief Executive Officer; Cape Town 'Convention Centre.
Ms. Someshni Naadio	President of the Cape Coast Chamber of Commerce & Industry.
Civil Society Representatives	
Mr. Tony Ehrenreich	Western Cape Provincial Secretary, The Congress of South African Trade Unions (COSATU).



Figure 5: Map of the Western Cape

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