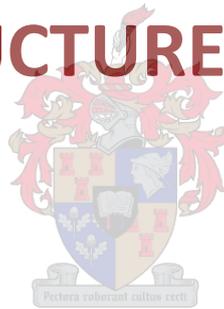




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CREATING A SUSTAINABLE ENVIRONMENT FOR INFRASTRUCTURE DELIVERY



*Thesis presented in fulfilment of the requirements for the degree of
Masters of Science in Civil Engineering Stellenbosch University*

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March 2013

Declaration

By signing, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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March 2013

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Abstract

Since 1994 the government of South Africa has spent substantial amounts of money on the development and expansion of infrastructure to include the previously disadvantaged. Each year the amount spent on infrastructure increased, and still the poor is marginalised. The title proposes that there should rather be a focus on creating a sustainable environment to deliver infrastructure. The economy, unemployment, people living in poverty and level of human resources determine the environment in which infrastructure is delivered.

South Africa is on a growth path towards 2030 that aims to reduce unemployment by approximately 10% and increase the economic growth rate 5% per annum. Key challenges that inhibit economic growth were identified by the National Planning Commission (NPC). These key challenges such as poverty, poor education, unsatisfactory public transport and a divided society represent the environment that South Africa is currently operating in. If these key challenges could be addressed and nullified a sustainable environment could be reached.

The purpose of this thesis is to investigate a sustainable environment to deliver infrastructure. Existing models will be analysed and the key principles will then be incorporated in the development of the proposed Infra-Connect Model. Strategic Planning and decision-making tools will also assist in the process towards developing the Infra-Connect Model.

The theoretical results that are obtained are positive. It conforms to the goals that are set out based on the key challenges presented by the NPC. The financial resources are found to be distributed more effectively and the poor is empowered to take part in the economic activities and hence a sustainable environment to deliver infrastructure is created.

Opsomming

Sedert 1994 is daar aansienlike bedrae bestee op die opgradering en uitbreiding van infrastruktuur. Steeds is die huidige infrastruktuur nie voldoende nie en onontwikkeld. Die behoeftiges is steeds uitgesluit uit die ekonomiese aktiwiteite en gemarginaliseer. Hierdie verhandeling beoog om die fokus te plaas op die skepping van 'n volhoubare omgewing wat die ontwikkeling van infrastruktuur tot gevolg het. Die omgewing verwys na die ekonomie, die behoeftiges, vlak van werkloosheid, en die kwaliteit van onderrig en mense ontwikkeling.

Suid Afrika is in die proses om 'n groeiplan saam te stel vir 2030. Onbevredigende dienslewering, 'n verdeelde samelewing, en onvoldoende onderrig is onder andere faktore wat die groei van Suid Afrika verhinder om 'n positiewe, kompeterende land teen 2030 te wees, soos geïdentifiseer deur die *National Planning Commission*. Hierdie faktore verhoed dat Suid Afrika positiewe ekonomiese groei ervaar.

Die doel van die verhandeling is om die skepping van 'n volhoubare omgewing wat infrastruktuur lewering tot gevolg sal hê, te ondersoek. Bestaande modelle word geanaliseer en gebruik om 'n model vir munisipaliteite saam te stel wat sal help om fondse reg aan te wend en die druk rondom infrastruktuur lewering te verlig.

Die teoretiese uitkomstes is positief en daar is gevind dat die model die bepalende faktore aanspreek. Die behoeftiges is na afloop van die model beter af waar hul bemagtig is en 'n werksgeleentheid gebied word. Die gevolg is dan 'n verlaging in die werkloosheidskoers en 'n verwagting dat Suid Afrika se ekonomie positief sal groei. Voldoende lewering van infrastruktuur en dienste word dan ook verwag. Sodoende word 'n volhoubare omgewing geskep vir effektiewe ontwikkeling en lewering van infrastruktuur en basiese dienste.

Acknowledgements

I would like to thank Millard Fuller, who unfortunately passed away in 2009, for his exceptional work by establishing Habitat for Humanity that effectively empower the poor through housing provision. I would like to give him credit for thinking out of the box and showing that it can be done.

I would also like to thank Andre Roux for simplifying a complex topic such as the economy, making it understandable for non-economists and drawing the bigger picture.

My appreciation to the University of Stellenbosch, who made it possible for me to attend the Construction Management Program (CMP) 2011. The program gave me a new point of view concerning our country.

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List of Acronyms and Abbreviations

AsgiSA	Accelerated and Shared Growth Initiative for South Africa
BoP	Bottom of the Pyramid population
CMP	Construction Management Programme
DBSA	Development Bank of South Africa
DPLG	Department of Provincial and Local Government
GEAR	Growth, Employment and Redistribution
GDP	Gross Domestic Product
HDI	Human Development Index
HFH	Habitat for humanity
ICM	Infra-Connect Model
JIPSA	Joint Initiative on Priority Skills and Acquisition
MDG	Millennium Development Goals
NPC	National Planning Commission
PIR	Poverty and Inequality Report
PPP	Purchasing Power Parity
Pr Eng	Professional Engineering certificate
SACMEQ	Southern African Consortium for monitoring Education Quality
SADC	Southern African Development Community
SAHF	Southern African Housing Foundation
SWOT	Strength Weaknesses, Opportunities and Threats
RDP	Reconstruction and Development Programme
USA	United States of America
WCED	Western Cape Education Department

1

INTRODUCTION

The thesis is introduced in this Chapter, giving background information and identifying the research opportunity, research approach, research questions and hypothesis.

1 Introduction

Infrastructure and service delivery is closely correlated with the level of poverty and economic growth. Currently government is providing grants for infrastructure delivery and for the alleviation of poverty (in the form of cash and in-kind transfers), in order to promote economic growth. It is true that infrastructure delivery and poverty alleviation results in economic growth which further encourage infrastructure delivery. The question is whether this approach is sustainable.

The Construction Management Programme (CMP) is an annual course presented by the University of Stellenbosch attended by consultants, contractors and clients of infrastructure development projects. This course addresses the issues faced by South Africa in terms of construction. The theme of CMP 2011 was *Creating an environment to deliver sustainable infrastructure*. At the end of the course Brian Bruce¹ (former CEO of Murray & Roberts) concluded the CMP and presented the concept of *Creating a sustainable environment to deliver infrastructure*. It was emphasised that it is important to invest in human resources and thereby create a sustainable environment throughout the duration of the course and therefore he proposed a change of theme. The proposed change of focus serves as starting point for this thesis.

Over the past decade substantial amounts of money have been provided for the development of infrastructure. The aim is therefore on delivering sustainable infrastructure and not on creating a sustainable environment within which infrastructure could be delivered. The authorities focus on distributing resources (finances, energy, expertise and workforce) in such a way to deliver sufficient infrastructure, especially to those living in poverty and the previously disadvantaged. Funds in the form of subsidies are distributed to the low-income communities for water and electricity, housing, health care and education. There seems to have been a shift from delivering infrastructure to improve the economy and include the less privileged towards serving and satisfying the less privileged. Nonetheless poverty and inequalities persist.

The living conditions of the poorer part of the community are being improved to some extent, but the standard of living remains the same. They don't feel confident to take part in the economic activities of South Africa or take up their responsibility to provide for themselves.

Subsidies are beneficial in giving the low income population temporary support, but it becomes strenuous when it results in an 'entitlement culture'. They stay in their current state of poverty, and government feel obliged to continue to provide for them. The poor people remain in a poverty mindset hence, poverty and inequalities persist. Could there be an alternative in providing for the disadvantaged, but also prepare them for providing for themselves?

There is such an immense focus on providing for the previously disadvantaged and delivering infrastructure for them that there seems to be insufficient funds for the upgrade of current infrastructure or the development of infrastructure for fostering positive economic growth. The poor communities should take part in the economic activities and assist in positive economic growth, even indirectly in quality infrastructure and service delivery, but currently they put a strain on economic development due to their 'entitlement culture'.

A sustainable environment can otherwise be defined as a way to ensure the continuation of development. The empowerment of the low income population could assist in the creation of a sustainable environment to deliver infrastructure. It is expected that the low income population will then be self reliant, self-sufficient and that they would take part in economic activities.

In this thesis a concept model is proposed, called the Infra-Connect Model, aiming to assist government (and municipalities) in effectively and efficiently delivering infrastructure and service. The concept is to empower the poorer part of the community so that they can take part in the development and maintenance of infrastructure. In the long term, it is expected that the result of the model would be an empowered low-income population, a growing economy and sustainable infrastructure delivery. The proposed model would assist in creating a sustainable environment, aiming to integrate the poor communities into the society. In this thesis the investigation is done exclusively for South Africa. In this thesis the focus is on delivering infrastructure. In this introductory chapter the background information is provided and the research approach is defined.

1.1 South African Infrastructure

President Zuma appointed a National Planning Commission (NPC) in 2010 consisting of 25 part time commissioners that were chosen on the basis of their expertise, experience and ability.² Trevor Manuel acts as the minister and chairperson of the commission. The NPC were required to take a broad, cross-cutting, independent, critical view on issues affecting long-term development, such as infrastructure investment, water resources and inequality. Recommendations for the cabinet in the form of a vision statement for 2030, a development plan on how the vision would be achieved, and progress reports were required. The aim of the vision statement for 2030 is to reduce unemployment to 14% and foster economic growth of 5% per annum by 2030.

South Africa's growth thus far has been insufficiently inclusive and left a portion of the population poor and marginalised. The National Planning Commission (NPC) issued a diagnostics report in June 2011³. They identified the infrastructure progress experienced since 1994, the status quo and the main challenges confronting the country and examined their underlying causes.

1.1.1 Infrastructure Progress

Progress of economic infrastructure can be listed as follows⁴:

- Rail: coverage of 21 000 km; connects eight primary sea ports to the inland
- Road: Proclaimed as national, provincial or municipal amounts to 154 000 km of paved road and 454000 km of gravel road. Total road network (proclaimed and unproclaimed) amounts to approximately 750 000 km
- Electricity: Coverage of more than 300 000 km of power lines. Transformer capacity increase almost doubled from 2007 to 2011 (118630 MVA to 130000 MVA). Nine million customers, 31 000 employed people.
- Water: 4718 water reservoirs; 800 water treatment plants, 2000 wastewater treatment plants
- Optic Fibre: Increased from approximately 400 000km to 600 000km coverage in 2008 to 2010

Before the 1994 democratic election, South Africa was economically isolated from the rest of the world due to the trade barriers erected in retaliation for South Africa's apartheid legislation. Infrastructure progress related to socio-economic development post 1994 is among others:

The NPC diagnostics report cites the following improvements since the 1994 election, among others^a:

- 96% of black and coloured children below the age of 15 are in school
- Over 700 health clinics, accessible to the low/no-income population, have been built
- 2.6 million subsidised houses have been built which provide shelter for more than 10 million people
- Household access to electricity increased from 32% (pre 1994) to 80% (post 1994)

In terms of the economic infrastructure, 90% of the rail infrastructure was completed by 1925! The lack of maintenance on road infrastructure results in expensive upgrades. Electricity capacity challenges surfaced in 2007 and still linger on the surface. South Africa would always have a lack of water resources to the fact that South Africa is listed as one of the most water scarce countries in the world. Measurements should be put in place for future generations.

Though significant infrastructure progress has been observed post 1994, still there has been increasing unemployment and growing inequality. The social development since 1994 hasn't made significant progress.

1.1.2 Status Quo

South Africa is a developing country, a developmental state. Infrastructure is an enabler of development, and therefore the decisions on infrastructure investment are critical. The expenditure on infrastructure should be aligned with targets such as growth, employment, the reduction of poverty and addressing the inequality gap. The history of South African infrastructure reveals that it was designed for a resource-based growth (rail, road and port infrastructure were mainly build to exploit the resources such as diamonds, iron ore etc). This growth path excluded the low income communities. It has not been labour-absorbing, the marginalised lacks access to wage income, and income differentials increase between the different ethnic groups. Currently infrastructure lack sufficient governance framework for infrastructure development towards an all-inclusive growth path (including labour and resources). Government intervention to enhance public goods and positive externalities is in the form of direct production, subsidization, and taxation. Little attention is given with regard to an all inclusive economy.

FUNDING

Across the six major economic infrastructures (Rail, Road, Port, Water, Electricity and Telecommunications) the dedicated funds for operation and maintenance are limited. Also funds are lacking for future investments. It is speculated that the cost of upgrading road infrastructure is seven times higher than it would have been if adequate maintenance had been done. It is

^a The information in sections 1.1.1 to 1.1.3 was obtained from the NPC diagnostics report 2011 and DBSA report: State of South Africa's economic infrastructure (2012), unless stated otherwise.

recommended by the Development Bank of South Africa (DBSA) to create resource streams for infrastructure rehabilitation and maintenance, especially at municipal level.

CAPACITY CONSTRAINTS

The shortage of skills in South Africa is problematic, especially in the technical field. The technical capacity at municipal level with regard to water, electricity and roll out of fibre optic cables is seen as a critical constriction. It is necessary that capacity be build in South Africa, but it is a long term goal involving education and training.

HUMAN RESOURCE DEVELOPMENT

Human resource development relates to the level of education and training received by individuals. The Human Development Index (HDI) gives an indication of the level of human development. The index was established by the United Nations in 1990. It can be also be related to social development, unemployment and inequality of a country. The HDI gives an indication of life expectancy, literacy, education and standards of living. ⁵

GDP is defined as the sum of gross value plus product taxes minus subsidies. GDP per capita is defined as the Gross Domestic Product divided by the midyear population⁶. In other words GDP per capita can serve as an indicator of a country's standard of living.

South Africa's national income per person (or GDP per capita) classifies the country as an upper middle income country. In South Africa⁷ the human resource development (rating of 0.61) is below the average of a middle income country. A possible reason for the low HDI is the level of poverty and inequality evident in South Africa. In 2006/2007 the richest 10% of the population accounted for 51% of the household income⁸ hence the high GDP per capita and low HDI.

Infrastructure investment is hindered the most by lack of funding and shortages.

1.1.3 Way Forward

Infrastructure management and service delivery need to be revised (the focus of the first literature chapter). In addition to poor service delivery, political and economic uprisings are part of the modern day South African society. The reasons cited for these uprisings are the high poverty levels and inequalities in South Africa. The poor social services provided by the various government institutions and the ineffective policies regarding social problems result in a feeling of powerlessness within previously disadvantaged communities. The poor education provided to these communities also limits social mobility.

The NPC proposes a plan to assist in reducing the high unemployment rate to 14% and by growing the economy to approximately 5% per annum. The plan aims to eliminate poverty, reduce inequality and eliminate illiteracy. Nine challenges were identified, presented as objectives that would assist in reducing the unemployment rate and positive affect the economy: ⁹

- Increase the percentage of employed South Africans.
- Improve the quality of school education for most low income communities.
- Focus on delivering adequate infrastructure that assist in social inclusion.

- Shorten the transit length of the low income population between their work place and residential areas.
- Incorporate a labour-absorbing growth path.
- Improve public health system.
- Establish reliable public services.
- Reduce the level of corruption.
- Integrate the South African society.

These objectives should determine how the resources are allocated across and within infrastructure sectors for infrastructure is an enabler of development. The reason for including these objectives will be briefly discussed (the main issue is emphasised).

- The percentage of employed South Africans:
The rates of **unemployment** and underemployment are high in South Africa (only 41% of the working age population is working) which undermines South Africa's potential for economic expansion.
- Lack of inadequate infrastructure:
Increased **investment in new and existing infrastructure** is lacking to meet South Africa's economic and social requirements. The lack of people and the systems involved to plan, design, build, maintain and operate complicated and expensive systems over a long period of time add to the lack of inadequate infrastructure.
- Vast distances between the work place and residential areas of low income population group:
Spatial (geographical) apartheid and unreliable public transport **exclude the poor** from economic activities.
- South Africa's growth path is highly resource-intensive: South Africa's economy is highly resource driven, relying on the exploitation of natural resources. The effect of exclusively relying on natural resources, and not **focus on a more knowledge base, labour absorbing economy** can be seen in the unemployment and low educational/skill levels.
- Unreliable public services: Reliable and affordable public transport is a necessity for the low income population to make a living. Concerns have been raised about the **quality of services** and the level of variation in service delivery.
- Corruption undermines government legislation and service delivery:
Corruption can be defined as the misuse of official position for personal gain. It undermines **good relations** between citizens and authorities, as well as the confidence in the democratic system. South Africa has experienced high levels of corruption in the last decade and as a result accountability has deteriorated. Corruption inhibits the ability of government to deliver quality services, reduce poverty and overcome inequalities.
- The South African society is divided:
Even though South Africa enjoys the infrastructure progress made since 1994 (section 1.2.1), the country continues to be divided. The division caused by apartheid produced deep issues with trust which adds to the society being divided. Trust is important in **nation and community building**. Therefore, it is necessary to build and maintain trust among social partners.

1.2 Sustainability

Nine objectives were identified by the NPC to focus on growth, poverty alleviation and inequality elimination in terms of infrastructure investment and expansion. The current issues associated with these objectives as presented in the previous section demonstrate the environment that South Africa is currently operating in.

Sustainability is concerned with the effects of human actions towards preserving the environment¹⁰. The interconnectivity of the different aspects of sustainability is illustrated in Figure 1.1.

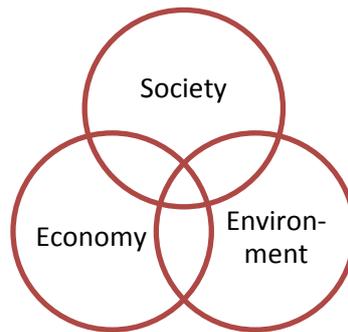


Figure 1.1. Aspects of sustainability

To achieve sustainability the interconnectivity and relations between the economy, society and the environment should be addressed and strived towards. The sustainable environment associated with the delivery of infrastructure is interlinked with the economy of the country and the society (communities).

As illustrated in the list below, the nine objectives either affect the society, the economy or the environment. Therefore focussing in these objectives would assist in creating a sustainable environment.

- The percentage of employed South Africans is too low. **[ECONOMY]**
- The quality of school education for most low income communities is sub-standard. **[SOCIETY]**
- Lack of and inadequate infrastructure limits social inclusion. **[ENVIRONMENT]**
- Vast distances between the work place and residential areas of low income population groups marginalise the poor. **[ENVIRONMENT]**
- South Africa's growth path is highly resource-intensive and hence unsustainable. **[ECONOMY]**
- A failing public health system with a large disease burden. **[ENVIRONMENT]**
- Public services are unreliable. **[ENVIRONMENT]**
- Corruption undermines government legislation and service delivery. **[SOCIETY]**
[ENVIRONMENT]
- The South African society continues to be divided. **[SOCIETY]**

The factors that influence the society the most is poverty, education and to some extent the economy. The society in turn plays a role in the environment and the delivery of infrastructure. Therefore, in this thesis infrastructure management, poverty, economy and education will be

investigated. Of the nine objectives identified by the NPC diagnostics report, the public health system and corruption falls outside the scope of this thesis.

1.3 Research Approach

This section presents the key research questions that form the basis of the thesis along with the hypothesis and method. The research approach is illustrated in Figure 1.2.

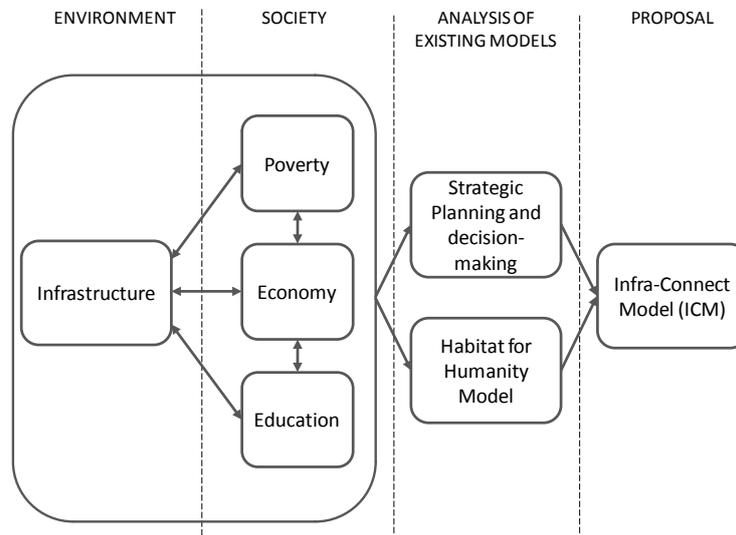


Figure 1.2 Research approach

The block around infrastructure, poverty, economy and education in Figure 1.2 indicates the literature study performed in this thesis. The research done on the society is mainly focussed on how the poor communities can be empowered and what the effect of their empowerment would be. Existing models will be analysed and applied in the context of this thesis in order to develop a concept model that would assist in creating a sustainable environment to deliver infrastructure. The proposed model is referred to as the Infra-Connect Model.

The Infra Connect model is based on the principles of Habitat for Humanity, a successful non-profit organisation that empowers the poor through housing provision. An addition of an employment creation model was inspired by the Zibambele initiative in Kwazulu Natal. The Infra Connect model is validated against the habitat for humanity case study and an expert analysis. The case study is based on the success of the general habitat for humanity model. A small sample of industry practitioners were asked to provide their opinion with regard to the development of the Infra-Connect model. The validation was done on an interview basis. It was decided that a much wider audience will be consulted before and during implementation.

1.3.1 Research Questions

The research questions are based on the background information provided in section 1.1:

- 1) What obstructs the development and maintenance of infrastructure and what role does the management of infrastructure play?
- 2) What role does government play in the delivery and maintenance of infrastructure?
- 3) What role do poverty and unemployment play in the effective delivery of infrastructure?

- 4) What is the relationship between the economy and infrastructure delivery?
- 5) What role does education and human resource development play in the level of poverty and the economic growth?
- 6) Can the analysis and application of existing models assist in creating a sustainable environment to deliver infrastructure?

Chapter 2 will investigate numbers 1 and 2, and the rest of the chapters coincide with the question number.

1.3.2 Hypothesis

The following hypothesis is derived from the research questions and background information provided in section 1.1:

High unemployment rate and increasing inequalities inhibit the creation of a sustainable environment for the delivery of infrastructure. Participation in economic activities and empowerment by the low-income population would have the opposite effect.

This hypothesis will be tested and discussed in order to validate this thesis. It will further be used to identify means for creating a sustainable approach to deliver infrastructure and determine the validity of the proposed concept for a model.

1.3.3 Research method

The research method that was implemented can briefly be defined in seven subsequent steps. These seven steps are described below:

- 1) Identification of the general purpose and justification of the research :
The need for the study was identified during the attendance of the Construction Management Programme (CMP) in 2011 presented at Stellenbosch University. The theme of the four week long course was “Creating an environment for sustainable infrastructure”. In his address at the final day of the course Brian Bruce (former CEO of Murray & Roberts) suggested that the theme should rather have been the need for creating a “sustainable environment” for infrastructure delivery. Subsequently, having considered the contents of the National Planning Commission’s (NPC) Diagnostic Report it became clear that a study was needed to investigate this topic.
- 2) Identifying room for improvement and opportunities for infrastructure delivery :
Room for improvement in infrastructure delivery was then identified upon understanding the South African context in the global economy (made possible by Andre Roux, *Everyone’s guide to the South African economy*), and through problem areas identified in literature. The identification of *room for improvement* and opportunities for infrastructure delivery are thus presented in Chapters 1 and 2. Three major issues were identified for further investigation, being the role of poverty, the economy, and education.
- 3) Presentation of the background and literature study :
The three major issues that had been identified were then each investigated to obtain a better understanding of their implication on infrastructure needs and delivery. These investigations also served to identify relevant issues that could be used as input to a decision

making process which followed. This presentation of the background and literature study is done in Chapters 1 to 5

4) Synthesis of literature :

The synthesis of the literature as investigated in Chapters 1 to 5 was subsequently carried out. It identified the need to perform an analysis which can lead to a structured approach to solve the problem. A summary of the synthesis is provided in Chapter 6. The literature was then further analysed using the Strategic Planning and Decision-Making process as proposed by Illbury and Sunter (Chapter 6).

5) Development of a model to assist in creating a sustainable environment to deliver infrastructure using the information from literature:

The strategic planning and decision-making tool (step 4 above) assisted in understanding the current environment that South Africa operates in. The environment that would be sustainable in the long term is characterised by high level of government support and high level of citizen participation. The creation of such a sustainable environment is then integrated into the design of the proposed concept model (Infra-Connect Model) on the basis of the background, the literature study and the results of the decision-making exercise. The model aims to address the challenges identified by the NPC diagnostics report and thereby to create a sustainable environment for infrastructure delivery.

6) Validation of the model, including views from industry players :

The proposed concept model (ICM) is validated in Chapter 8. The ideal validation is to test the proposed concept model, document the findings and make amendments to the model. Unfortunately the preparation, implementation and duration of the model fall outside the timeframe of this thesis. The outcomes and the results of the Infra-Connect Model (ICM) can therefore not be measured in order to determine its feasibility. Due to the nature of the research, the practical testing and continuous assessment is therefore not feasible or practical. For these reasons this proposed model was then validated against a case study and a practitioner analyses. The analysis takes the form of an interview-based assessment. A limited number of practitioners were asked for their opinion in order to test the concept. It was decided to make use of the opinions of knowledgeable industry practitioners, as the concept could be explained to them on a one-on-one basis.

7) Research conclusions :

The thesis is then concluded, taking into account the knowledge gained from the literature study, the outcome of the strategic planning and decision-making exercise, as well as the validation process. The application of the literature study and synthesis is validated against the research questions and hypothesis and a conclusion is drawn.

1.3.4 Scope of this report

The implementation and success of the proposed Infra-Connect Model would require a number of years and a combined effort of management teams to achieve and analyse the desired outcomes. The final testing of the proposed Infra-Connect model therefore falls outside the scope of this thesis. There is also additional work that needs to be done before implementation. The additional work requires a much more extensive study and falls outside the scope of this thesis. As mentioned, the public health system (disease burden) and corruption evident in South Africa also falls outside the scope of this thesis.

The concept will however be validated against existing models, former successes of the existing models and a practitioner analysis.

1.4 Summary

In this chapter the thesis is introduced, background information is given and the research approach is presented. The NPC diagnostics report identified key challenges that South Africa face illustrating the current environment that South Africa operates in. The key drivers in achieving the NPC's goals are the economy which in turn is influenced to a great extent by the quality and effectiveness of infrastructure, which again are influenced by poverty and education. The challenges identified by the NPC diagnostics report are presented as objectives of this thesis: In summary they:

- Increase the percentage of employed South Africans.
- Improve the quality of school education for most low income communities.
- Focus on delivering adequate infrastructure that assist in social inclusion.
- Shorten the transit length of the low income population between their work place and residential areas.
- Incorporate a labour-absorbing growth path.
- Improve public health system.
- Establish reliable public services.
- Reduce the level of corruption.
- Integrate the South African society.

The aim is to develop a model that would assist in creating a sustainable environment in South Africa. Existing models will assist in the development of the proposed Infra-Connect Model (ICM). The proposed model aims to address the key challenges as set out by the NPC diagnostics report, but exclude the quality of the public health system and corruption.

2

INFRASTRUCTURE

Infrastructure is an enabler of development. In the light of a developing country, infrastructure management in South Africa is discussed in this chapter.

2 Infrastructure

Infrastructure creates the environment that the country operates in, but poverty, the economy and education contributes to the environment, as will be seen in the following chapters. The context of this chapter is depicted in Figure 2.1.

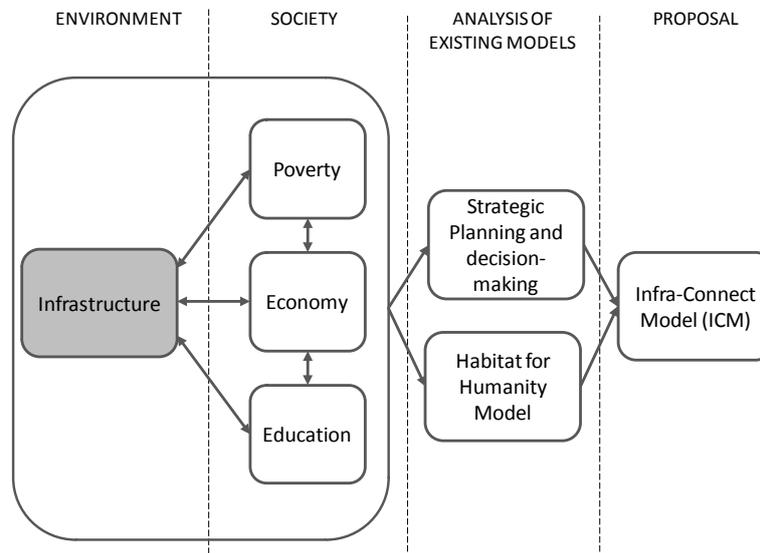


Figure 2.1 Chapter 2 in context

In Southern Africa to date, it is estimated that Southern Africa Development Communities (SADC) need US\$100 billion¹¹ by 2015 for its infrastructure development program. This figure includes the funding needed for national as well as cross-border projects. South Africa is included in this prediction and therefore South African also faces this need to invest in infrastructure. As mentioned in the previous chapter if maintenance had been done on the road infrastructure the cost of upgrading road infrastructure would have been 7 times less.

This chapter focus primarily on the management of infrastructure with regard to maintenance and development that is mainly the responsibility of municipalities. The chapter is laid out as follows: Infrastructure management; Consumer ownership; Payment for services; and Social aspects

2.1 Infrastructure Management

In 2007, the fourth edition of the *State of the Nation* was compiled. It was compiled after the First International Forum on Social Science–Policy Nexus held under the aegis of Unesco’s Management of Social Transformations Programme. The project was undertaken with a strong critique of government policies and state institutions. Their interpretations are based on historical understanding and empirical research.

Atkinson¹² (State of the Nation 2007) reveals aspects influencing the performance of municipalities and thereby the management of infrastructure^b. It will be addressed as follows:

1. Municipal ineffectiveness in service delivery and unresponsiveness
2. The failure of intergovernmental support provided to local governments

Avellanera¹³, also presents similar reasons for poor performance of municipalities in a field study done in Columbia.

2.1.1 Municipal Inefficiency in Service Delivery and Unresponsiveness

The number of municipalities was reduced from approximately 800 to 284 after 1994. In 2005, out of these 284 municipalities, 136 were identified as needing urgent assistance in providing basic infrastructure to its residents. Ninety percent of these 136 municipalities, amounting to approximately a third of the total municipalities, experienced protests from its citizens. Furthermore, the Minister of Safety and Security reported 5085 legal and 881 illegal protests during the 2004/5 financial year¹⁴. This is an indication of the severity of the grievances among the citizens with regard to the operations and service delivery of their municipalities.

These protests can be ascribed to the unavailability of infrastructure, poor maintenance of infrastructure, the high price of services (referring mainly to water and electricity), the inconsistent provision of infrastructure, unjust treatment by front-end municipal staff, patronage networks, and resentment at the sight of financial privileges enjoyed by councillors and senior staff of municipalities.

The Department of Provincial and Local Government (DPLG) figures, as indicated by the National Treasury of 2005, showed that out of the 284 municipalities, 203 could not provide sanitation to 60% of their residents, 182 were not able to provide sewage removal to 60% of their residents, 155 could not provide water for 60% of the properties, 122 could not provide electricity to 60% of their residents and 42 were unable to execute 50% of their functions¹⁵.

A paradox exists in the sense of reported success and popular grievances. Municipalities, such as Mantsopa (Ladybrand, Free State), eThekweni Metro (Durban) and Nelson Mandela Metro (Port Elizabeth) among others received VUNA rewards sponsored by DBSA, DPLG and National Productivity Institute for their integration of best practice, but these same municipalities experienced protests from their citizens.

The political process, operations and accessibility of officers and councillors are also among the reasons for protest from the public. Communication with mayors and councillors are blocked. In a true democracy, the citizens must have the opportunity to hold the state officials accountable to their responsibilities.

^b The information in this section is obtained from the *State of the Nation* unless otherwise stated. Some of the information was verified by other sources and where the other sources differ from Atkinson it will be briefly discussed.

2.1.2 Intergovernmental Support

A change in the financial aspect of municipalities occurred in the amount of governmental grants made available after the implementation of the full democracy of South Africa in 1994. Figure 2.2 gives an indication of the rapid provision of funding and rapid roll-out of infrastructure. In light of Figure 2.2, the discontent of citizens with regards to infrastructure provision is difficult to grasp. ^c

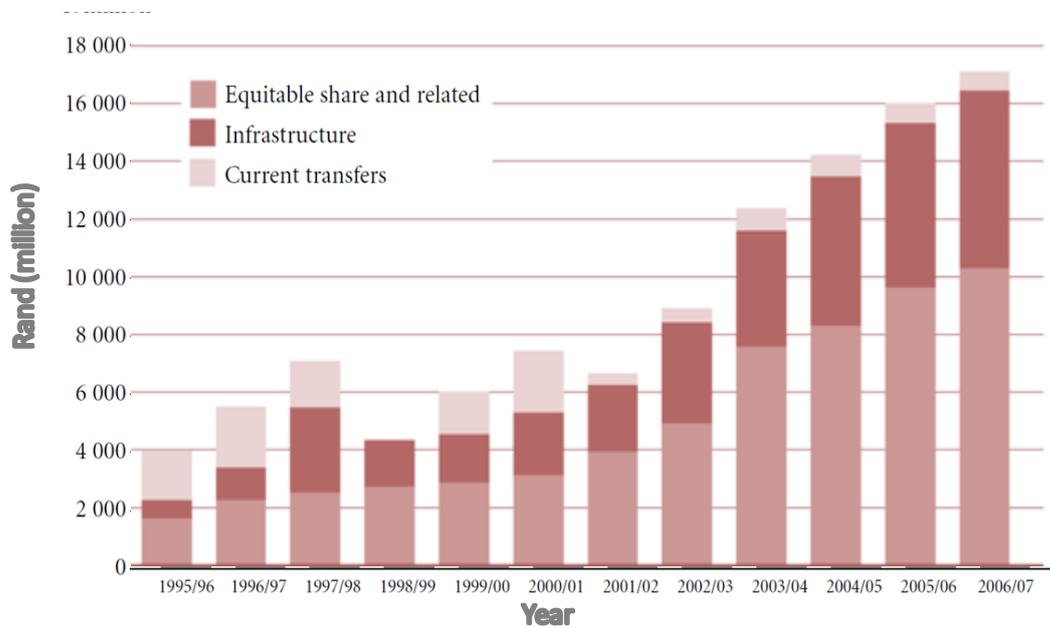


Figure 2.2 National transfers to government¹⁶

Atkinson proposed three reasons for the discontentment of citizens:

- **Provision:** The figures show that municipalities do provide, but it does not show the distribution and coverage of the neighbourhoods, whether informal neighbourhoods or remote areas are also included in the provision
- **Technical:** Statistics do not reflect the maintenance and performance of infrastructure
- **Human:** Statistics also do not indicate the human aspects of service delivery such as complaints, waiting lists and dealing with bills.

Although an increase in municipal allocation and governmental grants can be seen in Figure 2.2, it is not certain if the finance available is utilised effectively, giving heed to the above reasons. Statistics show that a percentage of municipalities provide basic free services, but do not show the exact distribution of the services to specific neighbourhoods. The technical aspects of infrastructure maintenance is not provided, neither are the human aspect. ¹⁷

It is possible that local protests do not only indicate the incompetence of municipalities, but also reflect the result of decentralisation (the delegation of government responsibilities to municipalities) and lack of government support. The decisions that were made with regards to municipalities (reduced from 843 to 284 municipalities) complicated the decentralisation. Alongside the reduction

^c The information in this section is obtained from the *State of the Nation* unless otherwise stated. Some of the information was verified by other sources and where the other sources differ from Atkinson it will be briefly discussed.

in 'manpower' (section 2.1.1) municipalities also endured rapid change in jurisdiction, administration and developmental mandate. Developmental policies and programmes had to be implemented across, at least, 15 sectors, namely: housing, health, HIV/AIDS, poverty alleviation, land reform, community-based public works, environmental management, local economic development, water sanitation, transport, road maintenance, sport and recreation, arts and culture, agriculture and infrastructure provision.

Government did not assist municipalities in developing viable systems of management, operation or maintenance of infrastructure. Also no assistance was given in improving their front-end standards of client service in terms of additional office staff, meter readers, technical staff, maintenance staff or complaints office staff. In some areas government has provided support (notably the introduction of integrated development planning and the new government system), but municipalities had to decide upon their own policies, create their own infrastructure maintenance programmes, and design their own information systems.

The municipal Housing Sector, being the focus of many public grievances, has experienced significant difficulties. Housing is not an initial function of municipalities, but with the decentralisation it was left to municipalities to implement policies with regards to housing.

In 2005 the Department of Housing acknowledged that it was the apparent lack of service delivery that is the reason for protest, but also stated that the department has no jurisdiction over local government. In this statement the department denied their leadership responsibility and disrupted the line of authority.

The confusion experienced by municipalities with regards to their function and the ineffectiveness in operations can be understood. The department of housing belatedly recognised that municipalities need assistance and in 2007 focussed on the "accreditation" of municipalities so that they have the skills and resources to perform the housing function adequately.

2.1.3 Final Remarks on Infrastructure Management

Even though governmental grants have increased (Figure 2.2), unintended infrastructure problems such as leaking water pipes, blocked water-borne sewage mains, leakage of sewage into public spaces and natural watercourses are experienced. The funding made available for infrastructure increased each year but the problems that South Africa faces also seem to increase. It could be that the increase in funds is as a result of poor quality and lack of maintenance. Does the answer lie in increasing the funding every year, or could a more effective management of the funding bring better results?

Apart from the poor municipal performance and the lack of assistance from government, the attitude of the recipients also plays a role in the effective delivery of infrastructure.

2.2 Consumer Ownership of Municipal Infrastructure

This section investigates the possible reasons for the non-payment of rates and taxes by citizens. The degree to which infrastructure has succeeded in achieving its intended goals can be derived from the following:¹⁸:

- The willingness of local consumers to pay for the infrastructure.
- The manner in which local consumers make use of the infrastructure is consistent with the intention of the investor.

These indicators point towards consumer ownership. It affects the degree of local participation in infrastructure development and maintenance.

The initial intention is that infrastructure should be sustainable (the cost of investment and maintenance must be recoverable). The development and maintenance of infrastructure is intended for the comfort and convenience of the consumer, and therefore it should be that the consumer pays for it. Local participation can assist in achieving the infrastructure investment goals, but considerable effort, skill and understanding must be conveyed to citizens in order to achieve success. Possible reasons were identified for lack of community support with regard to participation¹⁹:

- weak community leadership
- a lack of communication between the committee and the community
- a lack of project management expertise
- impatient and ill-advised engineering consultants
- projects proceeding without contribution from all community members
- a lack of means to force the community members to pay
- lack of trust within the community
- political influences from external institutions.

The participation of citizens will be discussed, followed by the importance of understanding the community and government's role in promoting participation.

2.2.1 Participation of Citizens

It is important to take note that participation fails when unrealistic results are expected to soon. Participation strategies often mean the simplification of operation and technologies and therefore slower delivery. High standards, service delivery and instant improvement stand opposite participation. It must be realised that participation could be the only solution in building South Africa together. The start-up will take time and patience, but in the end the country will be thriving. As Friedman states, "Participation strategies in South Africa requires significant investment and patience. It would require a radical rethink of the current eagerness for rapid delivery and payment recovery."^d

Some municipalities achieved success by involving local residents in budgeting, planning and labour-intensive service delivery. International literature also provides evidence of effective participation but in order to manage the participation of citizens; or impose new ideologies; or provide alternative means to improve service delivery; or impose a sense of ownership it is first necessary to understand the community.²⁰

^d For this section the paper by Steven Friedman, *Municipal infrastructure investment and community participation*, holds reference unless otherwise stated.

2.2.2 Understanding the Community

There is a tendency to plan for people rather than encourage and empowering people to plan for themselves. Professionals must work at passing on roles to the people and allow them to facilitate and take hold of the process, hence encourage participation of citizens. The approach should be to first have an interest in the communities and recognise the divergent interests of multiple actors. Undoubtedly this takes time, work and effort. Besides the effort, it should be recognised that the relationship between decision and policy makers and those they are representing are very important. Government should aim to understand communities and design accordingly.

In South Africa there is a gap between official administration, development and the social life of citizens and consumers. Official developments sometimes destroy/weaken 'social capital' (referring to the behaviour patterns and values by which citizens sustain themselves socially and economically). The demolition of this 'social capital' leaves people without a foundation and discourages creative initiative. Halfani²¹, sees the solution to the problem as granting citizens that operate 'unofficially' the role of deciding on development priorities and outcomes. The approach of reaching these communities is very important.

2.2.3 Government's Role

In general citizens view government as an 'institution for delivery' (especially among the low income citizens) where citizens express their grievances in the absence of infrastructure and service delivery and expect that there it be addressed. Unfortunately this view has also been adopted by the authorities. In the government's Urban Development Strategy, municipalities are viewed as organizations responsible for delivery²². This, however, is contrary to the purpose of a government. The purpose of a government is to perform a representative function and not a service provision function.^e

The Department of Human Settlements stated that they aim to provide housing for all. Currently they are at a backlog of 2.1 million houses still to be built. The Department promised that the backlog would be addressed over an eight-year period (an annual construction rate of 250 000 public houses) and would amount to over R170-billion altogether as reported in the September edition of the Engineering news.²³ Government is performing a service function instead of a representative function.

2.2.4 Final Remarks on Consumer Ownership

Among the reasons for poor participation of the citizens are weak community leadership and lack of project management expertise. It is recommended that there should be a focus on developing leaders that can motivate and encourage citizens to participate.

To encourage ownership and community participation means slower delivery, it is therefore not an instant solution to the infrastructure problems faced by South Africa. The end result, however will be that citizens and government work together as a team in building South Africa.

^e For this section the paper by Steven Friedman, *Municipal infrastructure investment and community participation*, holds reference unless otherwise stated.

Participation by citizens is a key component in the delivery and maintenance of infrastructure and in preserving and paying for it. Low-income citizens, expect municipalities to perform a service instead of a representative function. If municipalities perform a service provision function, it is not required of citizens to participate in or take ownership of infrastructure. If government continue to provide as in the provision of the 2.1 million houses to be built in eight years, where will it end? Government would just continue to perform a service function.

2.3 The Issue of Payment

The issue of non-payment today is popular in current policy debates on poverty alleviation, service delivery and local governance. Local authorities (municipalities) are dependent on user utility fees (for water and electricity) to finance their operations. The result of non-payment issues are year-end deficits, a reduction in local government services to balance the budget and higher fees and taxes for those who do pay. A result of these procedures is unsatisfied loyal customers and possibly an increase in non-payment of rates and taxes. Sometimes it is as simple as the inability to pay. In such cases subsidies have been provided.

During the apartheid era people living in townships and rural areas have adapted illegal practices in terms of service delivery and were effectively ungovernable. At the end of apartheid such boycotts were expected to cease but it could not easily be discarded. The illegal usage of public services has become the 'norm'. Some studies reveal the 'entitlement culture' and the 'culture of non-payment' that spilled over from the 1980's. An understanding of the relationship between payment and the provision of services is a fundamental factor for compliance, but Odd-Helga narrows it down to the issue of trust:²⁴

- trust in the local government to use revenues to provide expected services
- trust in the authorities to establish fair procedures for revenue enforcement and distribution of services ; and
- trust in other citizens to pay their share of service fees.

Local government tried to involve citizens in the operations of the country by the Masakhane campaign ("Let us build together" campaign) and also made them aware of the issues associated with finances and service provision. The campaign was a major opportunity for government to achieve cooperation as well as trust from the citizens. Unfortunately, the campaign failed in building trust and in achieving collaborate action towards building South Africa, because the campaign had a narrow focused program to 'get people to pay for services'. The importance of delivery of services did not receive attention.^f

Trust is the basis for social cooperation and voluntary compliance with laws and regulations that is for the benefit of everyone, as pointed out by Scholtz²⁵. Citizens are likely to trust government if they know that it is for their benefit. If government act in the citizens' interest and if their procedures are fair and reasonable, then citizens are more likely to trust their conduct.

The severity of the sanctions and the way in which the law is enforced often undermine the trustworthiness of local government and fuel resistance. It is not the present formal local

^f The article written by Odd-helga, *What's trust got to do with it* holds reference for this section.

government *per se*, but rather the perceived history of these institutions that results in distrustful behaviour.

Social influences definitely affect compliance. A general trust among citizens with regards to meeting payments is important as well. The perceived probability of others meeting payments, limits the perceived proportion of non-payers and thereby increases the chance to be detected.

2.4 The Social Context of Local Government: Unemployment, Poverty and Marginalisation

Apart from the blame for poor service delivery, municipalities also face poor rates bases, low levels of payment for services, poor cash flow, poor maintenance, public disaffection and further deteriorating payment levels. They have to function in the context of prevalent unemployment where poverty-stricken (indigent) households are entitled to free basic services.⁸

The 'equitable share grants' received from National Government are not enough to cover all the hidden administrative costs of the development policy as mentioned in section 2.1.2. The time associated with lists, checking overstepping of water and electricity quotas, and law enforcement also requires financial support.

The frustration of the youth and the excessive time they have on their hands due to unemployment result in protests. The young have strong material needs and virtually no opportunity to meet them. The children of low-income families have great difficulty in establishing a bright future and securing proper employment in the current South African economy. This will in turn spill over into resentment and frustration and again influence the next generation.

Unfortunately municipalities are blamed for policy failures and ineffective programmes in areas that are not part of their core functions. Together with their own internal dysfunctional management, it is impossible for municipalities to promote effective development and to improve service delivery as well.

2.5 Summary

The increase of governmental grants (Figure 2.2) seems to indicate that the need for infrastructure increase each year by approximately 12% (2003/2004 - 2006/2007). In some cases as a result of poor quality or insufficient maintenance the houses must be rebuilt (more detail in section 4.3.1), which translates to ineffective and unnecessary spending.

It is not effective that government continues to provide and perform the perceived service function. If municipalities perform a service function, citizens would not see the necessity of participation. The increase in governmental grants strengthens the perceived service function that the municipalities should perform, and not the representative function which is the main purpose of local authorities.

Unemployment, poverty and marginalisation however play a role in the level of participation, payment and level of trust in low-income communities (more detail in the next chapter).

⁸ For this section the paper by Steven Friedman, *Municipal infrastructure investment and community participation*, holds reference unless otherwise stated.

This chapter concludes that the provision of houses and lifeline tariffs results in an 'entitlement culture'. An 'entitlement culture' would result in an increase of governmental grants. The purpose of the grants, which is to alleviate poverty, would not be achieved. This is one of the aspects that the proposed Infra-Connect Model aims to address.

In the next chapter poverty and the effects thereof will be presented.

3

POVERTY

Poverty contributes to the infrastructure delivery environment. The level of poverty influences infrastructure investment and economic growth.

3 Poverty

As mentioned in the previous chapter, poverty, unemployment and inequality in many cases results in an 'entitlement culture'. Poverty complicates the management of infrastructure (Figure 3.1). It could be said that the level of poverty and therefore the financial support given to people living in poverty is traded off against infrastructure investment and maintenance.

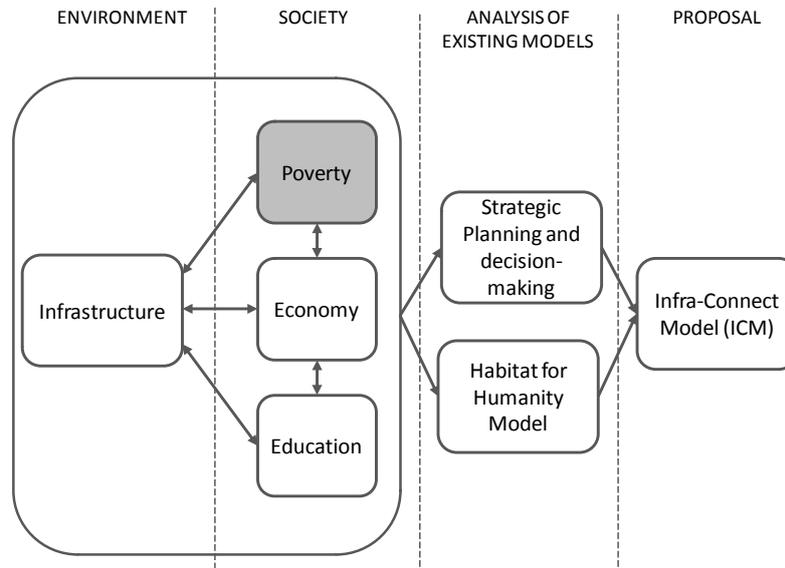


Figure 3.1 Chapter 3 in context

People living in poverty are sometimes referred to as the Bottom of the Pyramid Population. The Bottom of the Pyramid (BoP) population is defined as those individuals that have to survive with less than \$1500 (approximately R12 000) per year²⁶. For the remainder of this chapter the low-income communities in need of support would be referred to as the BoP population.

In this chapter the prevalence of poverty and inequality in South Africa and government's approach to alleviate poverty are investigated. After which the vulnerability and assets of the BoP population are discussed.

3.1 Poverty and Inequality in South Africa

The poverty and inequality gap seems to persist, despite the increase of governmental grants and the provision of houses to the BoP population. The South African Government has been constrained in the past decade in light of the actions that they need to take that promote economic growth as well as the distribution of wealth. It was expected that the benefits of growth would reach the low income population through a filtering down effect.²⁷ Unfortunately the low income population, in many instances, have not benefited because of ineffective targeting.^h

A Poverty and Inequality report has been undertaken by the cabinet of South Africa in 1995 (referred to as the PIR). This report is a compilation of research undertaken in the preceding 15 years. It is an

^h The report written by Julian May, *Poverty and inequality in South Africa*, holds reference for this section, unless otherwise stated.

analysis of the current policy framework of the new government for the reduction of poverty and inequality.

Fifty programmes, pilot projects and grants were identified by the PIR in an attempt to reduce poverty and inequality. These programmes were designed to address issues related to the welfare of children, water provision, municipal services, adult education, the capacity of different spheres of government and employment creation, where most of the preparatory work has been completed and in the process of implementation. Currently (17 years later) the same issues are still evident.

Some of these programmes encountered problems in their implementation phase. The reasons for failure, among others are insufficient resource allocations, poor planning and targeting. Generally the capacity to implement a developmental agenda and the possible corruption associated with the agenda contribute to the programmes being unsuccessful. Julian May recommends an on-going strategy whereby government expenditure is maintained: "Education and information programmes should be focussed on methods to improve the capability of the beneficiaries to search out and take up new opportunities".

People living in poverty can contribute towards poverty alleviation if the right attitude is taken towards what they have. In the previous chapter it was shown that citizens feel that they cannot take part in the decision-making and improvement of infrastructure and therefore participation is suppressed. The general feeling of not meeting their payments leads to depression, never-mindedness, and a poverty mentality. People living in poverty and those that experience inequality might view themselves as inferior to the middle and high income population. They therefore see no need in taking part in the economic activities. The BoP population do have assets to offer but often due to their vulnerability of moving in and out of poverty inhibits them of effectively applying their resources.

3.2 Social Welfare

The then Department of Welfare released a white paper²⁸ⁱ in 1997 presenting principles, guidelines, recommendations, proposed policies and programmes for developmental social welfare in South Africa. This document has since served as a baseline document for policy initiatives²⁹.

The paper published in the *International Journal of Social welfare* written by Dorethee Hölsher (University of Kwazulu-Natal)³⁰ took a critical view on the proposals made in the white paper published in 1997 and it concluded that 'government does not have the political will to bear the costs of the substantive change that the move towards developmental social work requires, choosing instead limited increased social security spending'.^j

Statistics showed that between 1980 and 1991, 350 000 employment opportunities were created during which the labour force grew by 4.5 million. Therefore it can be understood that about a third of the South African population (35,2%) live in poverty, and over half of the children (54%) live in poverty (1997). These have to rely on remittances (approximately a tenth of household income) and social grants (approximately a quarter of household income) for day-to-day living. The 1995/1996

ⁱ An informational document issued by companies trying to promote or highlight the significance of a planned product or service (<http://www.investopedia.com/terms/w/whitepaper.asp>)

^j The white pare written by the department of welfare and the paper written by Dorethee Hölsher holds reference for this section unless otherwise stated.

national budget for social security and welfare assistance amounted to 13.4 billion consisting of 8.7% consolidated national income (2.7% GDP). The finances distributed to social welfare in South Africa originally are allocated to social security (grants, transfers) and assistance and services, and capital (Table 3.1).

Table 3.1 Social Welfare Financial Distribution

SOCIAL WELFARE DISTRIBUTION	
88% social security	<ul style="list-style-type: none"> • 60% elderly • 24% disabled • 14% maintenance grants
8% assistance and services	<ul style="list-style-type: none"> • 87% residential services and facilities • 13% subsidised ports for social workers and capital expenditure
4% capital expenditure.	

The money spent on residential facilities includes old age homes, children's homes, treatment centres (for alcohol and drugs), homes and workshops for the disabled. The facilities are not built for multi-purposes and often centres are inappropriate for the needs of people in informal settlements.

The social security component is said to be the 'largest direct programme aimed at alleviating poverty', reaching approximately 12 million people. Social security mainly refer to the cash and in-kind transfers made to people living in poverty that are unable to provide for oneself, due to disability, old age as well as in order to maintain children. The white paper states that the domains of social security are to prevent poverty.

The argument in this thesis is that it cannot be prevented only by providing financial support, there needs to be some sort of development of the individual. Professor Mel Gray³¹ argues that 'diverting money to social grants means diverting it away from sustainable development through education, health and job creation'. Benefits of development is not a new concept, but nothing has been done in order to develop the individual, as Dorethee Hölsner argues in a paper published in 2007, *The Emperor's new clothes*. The department changed its name to the Department of Social development in 2002, but the focus continued to be in income grants.

The formal sector of the economy became less labour-intensive, because of the lack of employment opportunities and therefore a portion of the labour force has to rely on welfare systems. Interestingly the portion of the population that are most affected by the lack of employment do not qualify for a cash or in-kind transfer. Only children up to the age of 14 and the elderly above 60 and disabled persons qualify for a cash transfer and able bodied, working age adults do not qualify.

There is a trade-off in investment in economic growth and human resources against investment in the welfare system (or referred to as a social safety net). On the other hand it is also true that welfare expenditure can only expand as higher economic growth rates are achieved.

Dorethee (2007) points out the economic and social prospects listed in the white paper are out of sync. The economic policy of neoliberalism (favouring capital accumulation strategies) tends to nullify

social welfare goals of development. The white paper subtly prioritises economic growth over expansion of social welfare. The author argues on the basis of the research done on this thesis that social welfare, or more specifically development d =social welfare is necessary for economic growth.

In 1997 a Poverty Relief Fund were created where funds were specifically allocated for the eradication of poverty (channelling 640 million through the department of social welfare in the 1997-2004 period). Apart from the poverty relief fund, National Treasury did not make additional funding available.

Another issue is that other government departments, for example, health, housing, labour, education, justice, and SAPS provide services and finance to some welfare programmes but there is no coordination between these departments. This results in fragmented delivery of services and inefficiency in resource utilisations.

The provision of housing subsidies is provided by the Department of Housing, but is not done in coordination with the department of social development. It cannot be said that these individuals receiving houses are empowered and on the way to self-reliance.

3.3 A Subsidy

There is a distinction between two types of subsidies, a *Supply Side subsidy (or sometimes referred to as Cross subsidisation)*, provided to the operator and a *Demand side subsidy*, provided to the user. Research has shown that a supply side subsidy is seen as neutral or regressive, but even though supply side subsidies are regressive in some instances it is recommended to provide supply side subsidies.³²

In developing countries, extensive evaluations have not been done on the effect of subsidies on income distribution. Considering transport subsidies, the social aspect supports the reasoning of the importance of making transport available, accessible and affordable for the well-being of people. Transport is essential to obtain social benefits such as education, health services and employment opportunities. This however is not reason enough to justify subsidies to the transport sector, for the people that the subsidy is intended for not always enjoys the benefit thereof. People that are poor may prefer or is obliged to walk.^{33 k}

The same argument can be made for other essentials such as water, electricity and food. How should it be determined where funds should be allocated in order to include the low income population? Could it possibly be more effective to increase the income level and leave the decision to the beneficiaries to distribute the funds? In other words provide a demand-side subsidy. The demand-side subsidy would indeed help to empower the poor people, but the correct steps should be taken.

In the case of potable water it could be better to have a supply side subsidy for if a monetary transfer would be made (demand-side subsidy), the money could be used to purchase other goods or services instead of potable water. Thus a subsidy that is towards a consumption of a good, it would be better to have supply side subsidy. It would allow the resources to be available to specific

^k For this subsection the article *Affordability and Subsidies in Public Transport by Serebriskit, T et al* holds reference

members of the household (woman, children etc) which would not have been available if a monetary transfer had been made to the head of the household.

Demand side subsidies would assist in creating the environment for the BoP population to make decisions and learn from their mistakes. It creates an environment to give them confidence in their abilities and give them control over their fate. For the implementation of a demand side subsidy, it is imperative that the country has a well-functioning welfare system. If not, it could generate distortions worse than those created by supply side subsidies. If the mechanisms are not in place it could be very costly and cost-inefficient to make monetary transfers on a regular basis.

In South Africa subsidies are provided in the form of cash and in-kind transfers (demand-side subsidy) and cross-subsidisation (supply-side subsidy). They are provided in an attempt to give those in need temporary support. Financial assistance is given, but assistance in personal development, in order for the individual to be self-reliant, is lacking. It is assumed that due to the lack of personal development, the 'entitlement culture' persists.

3.4 Assets and Vulnerability of the BoP Population

Poverty results in alienation from the community, food insecurity, crowded households, disintegration of the family as well as lack of employment that is adequately paid for and or secure³⁴. People moving in and out of poverty are vulnerable due to the uncertainty thereof.¹ The aim should be to strengthen the people's own inventive solutions in order to obtain a sustainable local level poverty reduction strategy.

Household responses to deteriorating macroeconomic circumstances and labour market conditions are summarised under the following (as identified by World Bank (1995)):

- Difference between poverty and vulnerability;
- Relating vulnerability to asset ownership; and
- Categorising coping and asset management strategies

These responses will briefly be discussed next.

3.4.1 Difference between Poverty and Vulnerability

In order to change and address the socio-economic well-being in the BoP population, the difference between poverty and vulnerability should be understood. Poverty measures are fixed in time. During a specific timeframe the income of your household could not equal the demands. Vulnerability on the other hand refers to the process of moving in and out of poverty. Vulnerability could be ascribed to "livelihood insecurity". Vulnerability is related to elements such as disaster management, food security, and exposure to risks, hazards, shocks and stress. Therefore at any point in time the vulnerability level is much greater than the poverty level. Together with changes often come increasing risk, uncertainty and a decline in self-respect. A more descriptive definition of vulnerability follows.

Vulnerability

¹ For this section The Asset Vulnerability Framework written by Mosser holds reference, unless otherwise stated.

“Insecurity and sensitivity in the well-being of individuals, households and communities in the face of a changing environment, and implicit in this, their responsiveness and resilience to risks that they face during such negative changes.”

Vulnerability is therefore the greater issue. If people are vulnerable, it means that they are insecure and lack a sense of self-confidence. People that are vulnerable and dependent on the changes in the economy and other factors suffer in terms of dependency, self-esteem and confidence in individuals and authorities.

3.4.2 Relating Vulnerability to Asset Ownership

The relationship between vulnerability and asset ownership plays a crucial role in the participation of the BoP population. Vulnerability is not limited to the threat but also the response of a changing environment. It is evident in the attitude towards exploiting resources and opportunities. Individuals, households and communities can mobilise and manage their assets and entitlements in the face of hardship. Their attitude in this regard indicates their resilience or capacity to recover. However, if no assets are available to manage, the more vulnerable they feel, or the greater the erosion of their assets, the greater their insecurity. Therefore vulnerability is closely linked to asset ownership.

Vulnerability and security is a function of assets. Investments could be made to reduce the vulnerability and insecurity such as education, health and physical investments in housing, equipment and land. Storage of food, money or valuables; and claims on others for assistance such as friendship, kinship, networks and patrons in community, government and international community can further assist in reducing vulnerability and insecurity.

In the urban environment there are three generalised characteristics that are distinctive features of the vulnerability derived from particular assets:

- Commoditization
- Environmental hazard
- Social fragmentation

If these characteristics could be addressed and thereby reduce the vulnerability, the value of human capital for South Africa would increase, social capital (referring to community relations), would persist and an economic growth would be enjoyed. Each one of these characteristics will be briefly discussed.

Commoditization

Labour is the urban poor's most valuable asset, generating income through formal employment or the production of goods and services that are sold through the informal sector and self-employment activities. The BoP population often resides far from the employment opportunities. They are constrained by the vast distances, uneven bus and train schedules. They are dependent on external factors and therefore their vulnerability increases.

Environmental hazards

Even though the urban poor receive service provision from the public sector, they experience poor quality housing as well as inadequate water supplies, sanitation and solid waste disposal. These factors impact the value of human capital, health, and the well-being of the poor. Also pollution as a result of poor sanitation and waste disposal may be worsened by industrial, vehicular, air and water pollution.

Social fragmentation

Social and economic heterogeneity is a result of inequalities in terms of income, opportunities, access to infrastructure, services and political influence in urban areas. It weakens inter-household mechanisms such as trust and collaboration, making communities vulnerable to social fragmentation. Social capital is important for the building and maintaining of trust necessary for social cohesion and change. The lack thereof also increases their vulnerability.

These three characteristics influence the vulnerability of the poor to a great extent. If for example, the human and social capital can be developed, the poor have resources to survive the effects of vulnerability. In the next chapter the importance of human and social capital is addressed. The development of human and social capital would also assist in the management of assets.

3.4.3 Final Remarks on Poverty, Vulnerability and Assets

People moving in and out of poverty, are vulnerable to external factors (for example the economy). Insecurity results from vulnerability. These people, who move in and out of poverty, are dependent, have little or no self esteem and do not have confidence in individuals and/or authorities.

The level of vulnerability could be reduced by teaching the BoP population how to manage their assets. They would then gain confidence in themselves and their abilities and it is expected to have a regenerating effect on their perceived social status.

Labour is the urban poor's most valuable asset and if they could be employed their level of vulnerability would decrease. The following would also assist in the reduction of vulnerability:

- Investments in education and health,
- storage of food, money or valuables,
- claims on others for friendship and kinship,
- networks and patrons in the community, government and international communities,
- and development of social capital

Research has shown that poor people are managers of complex asset portfolios. Therefore room for their innovativeness should be created instead of substituting, blocking or undermining it.³⁵

The proposed Infra-Connect Model presented in Chapter 7 is structured in such a way that the BoP can learn to trust the authorities and people in their community. The model gives the opportunity for education and the development of friendship, kinship and networks, as well as an opportunity for employment security.

3.5 Summary

People that live in poverty, or experience inequality, do not contribute to the economic activities. They feel that they have nothing to offer, and as a result of this mindset, poverty persists. They are dependent, have little or no self esteem and do not have confidence in individuals and/or authorities. Some of the BoP population manages to step out and make a contribution to the economy, but unfortunately very few obtain a secure income and therefore move in and out of poverty. They are vulnerable to external factors.

The level of vulnerability could be reduced by teaching the BoP population how to manage their assets. They would then gain confidence in themselves and their abilities and it is expected to have a regenerating effect on their perceived inferiority. The following, among others, would assist in the reduction of vulnerability:

- Investments in education.
- Claims on others for friendship and kinship.
- Networks and patrons in the community, government and international communities.

As mentioned, labour is the urban poor's most valuable asset, but the commodisation to and from the work opportunities are difficult. The BoP population often resides far from the employment opportunities. They are constrained by the vast distances, uneven bus and train schedules. They are dependent on external factors and therefore their vulnerability increases.

The proposed Infra-Connect Model presented in Chapter 7 is structured in such a way that the BoP can learn to manage their assets, and to trust the authorities and people in their community.

In the next chapter, the economy, the results of a growing economy and the effects on poverty and infrastructure delivery are discussed.

4

ECONOMY

The economy plays an important part in a country's development, especially in infrastructure delivery and poverty alleviation.

4 Economic Affairs

The economy of South Africa is mainly resource-based, relying on the natural resources for economic growth. The growing population and the urbanisation that took place require a more labour-absorbing knowledge economy. South Africa has adapted a neoliberalism economic ideology, defined as an ideology that blends liberal political views with an emphasis on economic growth (originated in 1960)³⁶. Figure 4.1 depicts the context of this chapter.

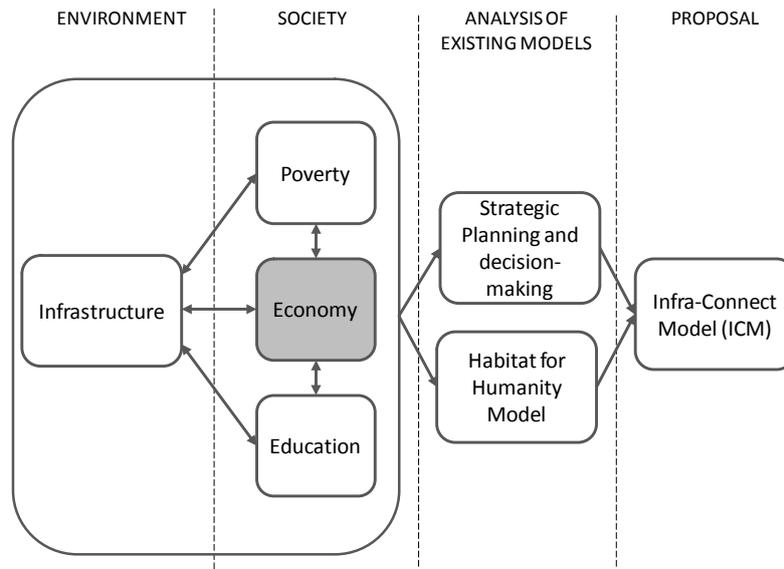


Figure 4.1 Chapter 4 in context

In this chapter the basics of economics, the persistence of unemployment, government's attempts to alleviate poverty and the development of human and social capital are discussed. The influence of human development (human and social capital) on the economic growth is introduced.

4.1 South African Economy: The Basics

The South African economy has changed dramatically over the past 20 years. After the democratic election in 1994, the normalisation of society and the relieving of world boycotts took place, as well as the reintegration of South Africa into the world economy. There are still however many concerns and policy challenges in South Africa such as high unemployment and a high poverty rate while income inequalities persist³⁷. These concerns do not positively contribute to the economy or assist in the delivery of infrastructure.

Economics is the inter-relationship and balance between demand and supply. Needs and desires of individuals or entities are known as demand, and resources are known as supply. A nation's demand often outweighs its supply. Government can for example decide to double its spending on infrastructure, schools and housing, but then have to raise its demand on the taxpayer or have to decide to spend less on maintenance and welfare.^{38 m}

^m The information in this section is obtained from a presentation given by Andre Roux and his book *Everyone's guide to the South African Economy unless otherwise stated*.

The economy of a country greatly depends on how government utilise its resources and decide to distribute funds. Since 1994 the following progress has been observed in the economic realm³⁹:

- Full democracy; non-racial, non-sexist states
- Constitution; Bill of rights
- Virtually inclusive access to primary and secondary education
- Formal housing for additional 10 million people
- Expansion of primary health care
- Significant expansion of access to electricity and water
- Free and fair elections
- Entrenchment of autonomy of democratic institutions
- Significant macro-economic progress

Any country has four basic production factors to their disposal. In South Africa, more specifically, the resources can be classified as follows.

- **Natural Resources:** Mineral deposits, such as platinum, gold, and diamonds; Agricultural and marine harvests; and extensive forests
- **Labour:** Physical energy and mental effort
- **Capital:** Investments and savings made
- **Entrepreneurship:** Someone recognising economic needs and is willing to harness the other three resources to meet these needs.

These four production factors enable a country to meet the demand for required goods and services. Therefore, it can be derived that if the supply of these factors increase, so will the goods and services. It could be stated that the fundamental requirement for growth is the increase of these production factors.

4.1.1 South African Land and Resources.

South Africa covers an area of approximately 120 000 km², and this area produces much of the world's agricultural products and minerals. South Africa is considered as the 'mineral treasure house of the world', as being one of the top three producers of a wide variety of minerals such as gold, manganese, platinum, chromium, vanadium and diamonds. These minerals cover more than half of the total export earnings.

4.1.2 Labour and Entrepreneurship

Mid 2009 the total population of South Africa was estimated at 49.3 million⁴⁰. A rapid urbanisation took place in the last few decades, where 42% of the population established themselves in urban areas⁴¹. The population still continues to grow, which translates to more accommodation to be provided in the urban areas, and a rising pressure on basic resources such as food and clothing. A country's growth should be accompanied by an increase in production and services in order to provide employment, otherwise the burden on the high and middle income populations of providing for the unemployed increase.

A population growth is positive in the sense that there are more people that can be economically active, the labour forces will continue to expand. A question though posed by André Roux is: "Does

South African labour force have adequate skills and sufficient training to produce enough goods and services to meet growing demands of the increasing population?" An undeniable fact is that the performance of education and the development of skills in South Africa are lacking.

Although entrepreneurship plays a major role, it cannot be encouraged in light of the high and persistent poverty levels, income inequalities, and lack of government support in terms of entrepreneurship.⁴²

4.1.3 Capital

The capital of a country rises when government and business invest in goods such as machinery which would in turn equip a country to produce and in turn foster economic growth. Therefore investment is considered to be the "engine of growth".

Growth can certainly lead to an improved standard of living and could possibly eliminate poverty to some extent, but often the cost involved in the economic growth could leave the poor worse off. The only way to benefit from the growth is to participate actively in the economy. Investment in South Africa's capital is lacking.

4.1.4 Final Remarks on the South African economy

Among the progress observed since 1994 are:

- Virtually inclusive access to primary and secondary education
- Formal housing for additional 10 million people
- Significant expansion of access to electricity and water.

Even though primary and secondary education are accessible, there are few who pass matric (as will be discussed in Chapter 5). It is revealed that the construction of some of the additional houses was unsafe (section 4.3.1) and the access to electricity and water does not imply quality service delivery (Chapter 2). It can be expected that the economy of South Africa would not grow significantly in the next few years. Furthermore, if the majority of the society is poorly educated it cannot be expected that they would be properly skilled or knowledgeable.

The four basic production factors were introduced of which labour and capital are relevant to this thesis. As mentioned in the previous chapter, labour is the urban poor's most valuable asset, and therefore if the opportunity could be created, the labour force of South Africa could increase and positive economic growth could be experienced.

Urbanisation took place the last few decades where 42% (total population 49,3 million) of the population established themselves in urban areas. If the unemployment rate of 25,3% (section 4.2) would be applied to the urban population approximately 5,2 million people are unemployed in the urban areas and it is assumed that they are poor. If 5,2 million people could be employed the economy of South Africa would flourish. If a country has a growing economy the opportunities for employment and participation increase. Unemployment has a negative effect on the economic growth of a country, the delivery of infrastructure and services.

In terms of capital it can be concluded from the preceding chapters that the current financial operations in terms of governmental grants, subsidies, continuous financial support towards education and health of the previously disadvantaged prevent government from investing in capital.

4.2 Persisting Unemployment

South Africa has an unemployment rate of 25.3 %⁴³. This means that the people actively seeking work is 25% of the total labour force. This number of people seeking work is defined as someone that has been employed and is seeking work in the week that the census was taken. In this figure, scholars and home-workers are excluded. Many South Africans adequate to work however have given up trying to find employment because of previously failed attempts and are therefore excluded from the labour force. According to the definition of unemployment the unemployment rate does not account for the people who have given up trying to find work. Therefore in the South African context the unemployment issue could be more severe than indicated by the unemployment rate.ⁿ

Two of South Africa's major economic development drawbacks are:

- The inability to provide sufficient employment for the growing labour force
- The unevenness of the skills distributed within the labour force.

There is a focus on creating employment opportunities and in effect grow the economy. Government allocated R88.3 billion in the next three years to the Expanded Public Works Programme. All of the progress however, together with the substantial amounts invested in similar projects has not yet been successful.

4.3 Government's Attempts to Alleviate Poverty

In 2006/2007 the richest 10% of the population accounted for 51% of the household income (GDP per capita) and the poorest 50% of South Africa's population accounted for 10% of the household income⁴⁴. This gives an indication of the vast income inequality in South Africa.⁴⁵^o

Against this backdrop the South African government formulated and released three important social-economic plans since 1994:

- RDP (Reconstruction and Development Programme)
- GEAR (Growth, Employment and Redistribution)
- AsgiSA (Accelerated and Shared Growth Initiative for South Africa)

These programmes will be briefly looked at in the following sections.

4.3.1 Reconstruction and Development Programme (RDP)

The RDP's focus was to invest in people, emphasising the fact that long-term development together with the reduction of poverty can only be achieved by empowering the people. Unfortunately

ⁿ The information in this section is mainly obtained from a presentation given by Andre Roux and his book *Everyone's guide to the South African Economy unless otherwise stated*.

^o The information in this section is obtained from a presentation given by Andre Rous and His book *Everyone's guide to the South African Economy unless otherwise stated*.

results did not compliment the objectives, and it seemed as if the objectives were too ambitious. Although progress has been made to reduce hardships, the question is whether the investment in people with regard to empowerment was accomplished in these improvements. Progress that has been made is listed below:

- 73.5% of households were living in formal dwellings by 2008, compared to the 64% in 1996
- The households with access to water infrastructure rose from 64,4% in 1993/1994 to 96,5% in 2008/2009
- Households with access to sanitation rose from 49,9% in 1993/1994 to 77,1% in 2008/2009
- Approximately 4.7 million households obtained electrical connections between 1994/1995 and 2007/2008
- The amount of social assistance grants increased from 2.41 million (1996/1997) to 13 million (2008/2009).

However, at the start of 2011 studies revealed that the poor building design of the RDP houses negatively affect the health of the respondents. Health factors were not taken into account in the policy and design. TB and diarrhoea resulted from the poor design and maintenance. The houses also lack proper insulation and ventilation. It was found that 99% of the respondents could not afford repairs such as leaking roofs. It can therefore be concluded that the RDP programme did not comprehensively assist in alleviating poverty, but added to the issues of poverty. ⁴⁶

4.3.2 Growth, Employment and Redistribution (GEAR)

The GEAR strategy was designed to improve economic growth and development for all South Africans and to reduce unemployment. Unfortunately some of the targets set by GEAR turned out to be too ambitious. The biggest problem/concern was that government did not have the ability to implement the GEAR strategy.

4.3.3 Accelerated and Shared Growth Initiative for South Africa (AsgiSA)

The AsgiSa programme was initiated by government to encourage economic growth and reduce poverty and unemployment.

The Joint Initiative on Priority Skills and Acquisition (JIPSA) was also introduced by government as part of AsgiSA, identifying skill shortages. The skills that are set as a priority for economic growth are *inter alia*: acquisition of intermediate artisan and technical skills (for infrastructure); the development of information and communication technology (ICT) skills; the recruitment, re-training and employment of unemployed graduates; high-level, world class engineering and planning skills for the transport, communication and energy industries; city urban and regional planning and engineering skills; artisan and technical skills, especially in infrastructure development, housing and energy; management capacity in education and health; and mathematics, science, ICT and language competence in public schooling⁴⁷.

The social-economic plans since 1994 mostly lack the development of human and social capital.

4.4 Human and Social Capital

Government principally aimed at alleviating poverty through financial support in the provision of subsidies (section 3.3). Although it alleviates poverty to an extent, people living in poverty will continue to depend on government.

The focus should be on the development of human and social capital. The development of human and social capital would encourage the development of the community. It would assist in the development of the individual and thereby be more sustainable than the provision of financial support. Human development will assist in the participation of economic activities and the delivery of infrastructure and services.

4.4.1 Definitions and facts

In section 2.2.4, the aspect of social capital was introduced. In this section the role that social and human capital plays in the economy will be further discussed. Human capital and infrastructure are interlinked in the explanation of regional productivity dynamics. Both have a positive effect on productivity. Through a study done in Italy it was found that a 1% increase in human capital, public infrastructure and productivity raises approximately by 0.38% and 0.11 % respectively. A causality direction from human and public capital to productivity is verified, but not vice versa⁴⁸.

Anthropologists acknowledged the importance of social capital as a critical factor in the building and maintaining of trust that are necessary for social cohesion and change. Recently economists have also come to understand the importance of social capital as part of the feasibility and productivity of economic activities⁴⁹. Human and social capital can be defined as follows⁵⁰:

Human capital

Knowledge which economic actors have acquired that can assist them in being employed for productive purposes and generate income.

Social Capital

The material and immaterial resources that belong to a group/individual in a durable network of relationships.

Social capital may have long-term effects on the community's ability to take care of themselves when public services deteriorates. The social cohesion found in households and intra-household relationships together with the level of trust and collaboration in a community fosters the capacity to respond to the external environment. Social capital refers to connections among individuals with regard to social networks and the mutual benefit derived from it. Trustworthiness then arises from these networks. The connections make life more rewarding and provide support in times of personal crisis. The management of social capital creates trust in relationships and encourages people to engage in issues affecting the whole community and it thereby strengthens the community. The positive and effective formation of social capital can be distinguished from the absence of social capital by considering the goals that mobilization of social capital might accomplish. These four goals as laid out by Putnam are:⁵¹

1. **Resources that would not be otherwise mobilised are mobilised to address community problems.** The main drivers of these resources are the market and the state. They are focused on the reinvestment in activities that provide maximum financial return. Non-profit organisations on the other hand are able to allocate private resources away from the individual consumption towards activities that address community needs. A lack of coercive mechanisms that will raise large amounts of revenue, cause these institutions to be supplements to state activity rather than substitutes.
2. **Raising consciousness of problems in the community among people.** Individuals should be involved in the problems of the community. Involvement cause and encourage people to have an outward focus and an awareness of others' needs. It is expected that social capital networks would encourage an outwork focus and recognition of a wide range of human needs.
3. **Linkages between unrelated social groups are created that would not otherwise have existed.** Divisions in class, gender and ethnic lines cause people in the urban community to operate in different social worlds even as they reside in the same geographic area. In bridging these social chasms, individuals will act in ways to benefit the community and not only in a particular group.
4. **The empowerment of social groups that normally would not have had any influence.** Education, occupational prestige and resources cause individuals to have better opportunities in order to form social networks as well as influence the decision-making of the community. Healthy networks provide confidence when entering into relationship within the larger community. It may result in strong disagreements and conflict, but balanced expressions of disagreements are part of a democratic process⁵².

One organisation that strives to meet these goals stipulated above is Habitat for Humanity International. Their model will be discussed in section 5.3.2.

It is better to invest in and support the development of human and social capital rather than increase governmental grants. The development of human and social capital is also more sustainable.

4.5 Summary

Economic growth does not guarantee development but development is a function of economic growth. Economic growth is not the answer to the current situation, but it does create the necessary resources that can finance health care, education, and infrastructure development. These in turn contribute towards employment creation, poverty alleviation and human development.

The inability to provide sufficient employment in South Africa for the growing labour force and the unevenness of skills distributed within the labour force inhibit positive economic growth. Education is probably the most fundamental determining factor, but even though primary and secondary education is accessible, there are few who pass matric with sufficient grades to allow access to tertiary education.

Labour is the urban poor's most valuable asset, and therefore if the opportunity could be created the labour force of South Africa can increase, the unemployment rate would decrease and as a result

positively influence the economic growth. If a country has a growing economy the opportunities for employment and participation increase and *vice versa*.

In terms of capital it can be concluded from the preceding chapters that the current financial operations such as governmental grants, subsidies, continuous financial support towards education and health of the previously disadvantaged prevent government from investing in capital.

Governments past attempts to alleviate poverty (RDP, GEAR, AsgiSA) were unsuccessful, too ambitious, and lacked the necessary quality (RDP houses, section 4.3.1).

The development of human and social capital assists in the empowerment of the poor. Human and social capital encourage the development of the community as well as the individual. It is part of creating a sustainable environment to deliver infrastructure. Social capital is a critical factor in the building and maintaining of trust that are necessary for cohesion and change (section 2.3). If social capital could be developed the following would be achieved:

- Resources that would not be otherwise mobilised are mobilised to address community problems.
- Raising consciousness of problems in the community among people.
- Linkages between unrelated social groups are created that would not otherwise have existed.
- The empowerment of social groups that normally would not have had any influence.

The development of human and social capital will result in community building and participation in the economic activities and thereby result in economic growth. The proposed Infra- Connect Model (ICM) aims to develop human and social capital through education, training, working together in teams, mentoring, community service and employment (Chapter 7).

5

EDUCATION AND EMPOWERMENT

Development through education and training is fundamental, especially for the unemployed. By being empowered individuals can positively contribute to the economy and infrastructure delivery.

5 Education and Empowerment

The white paper on social welfare stated that ‘All South Africans should be afforded the opportunity to play an active role in promoting their own well-being and in contributing to their society’s growth and development’⁵³. This statement is relevant to poverty alleviation and positive economic growth, but is not possible without education, or some sort of empowerment. The context of education in relation to this thesis is depicted in Figure 5.1.

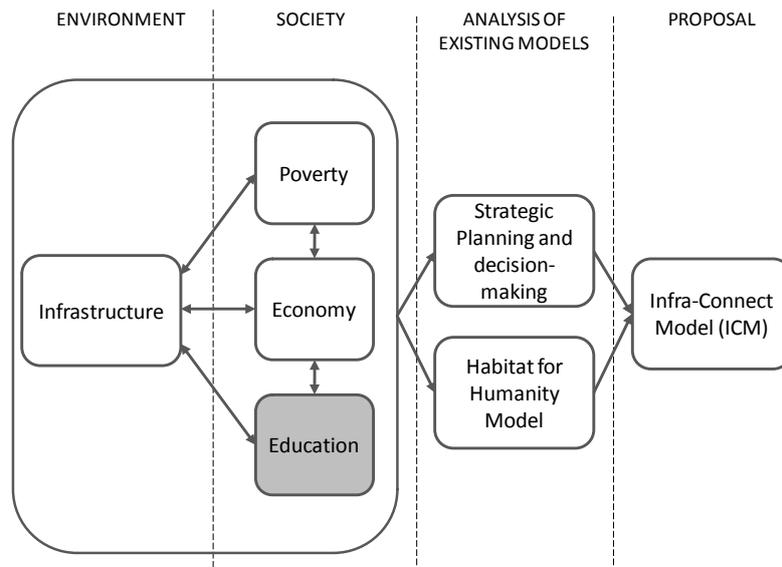


Figure 5.1 Chapter 5 in context

The importance of education is highlighted by the white paper on social welfare (refer to extract below).

The lack of education of the head of a household is closely correlated with poverty in households. Of the 7,1 million people between the ages of 16 and 24 years, approximately 2,1 million have not matriculated and do not attend school. For more than a third, this lack of education is due either to a lack of money or to family responsibilities. The lack of education, employment opportunities and access to services has deprived many people of their dignity and the ability to look after themselves. These factors necessitate the need for additional support mechanisms to allow people to live in some degree of comfort and security. To reap the benefits, South Africa must invest in people; that is, develop the human capital which is essential for increasing productivity and moving people out of poverty. Internationally, the strategy that has proved most effective in improving economic and social well-being consists of three elements: labour-absorbing growth, equitable investments in education, health care and social support for poor and vulnerable groups.

The reason behind governments’ attempts to alleviate poverty with regard to the provision of houses, water, electricity, and sanitation services is to take care of the people and equip them with resources. The perceived goal is to empower the people so that they in turn can contribute to the economy. The literature provided in this thesis indicates that the approach taken thus far falls short of reaching its goal.

5.1 South African Context of Education

The South African educational system originated from the western educational system brought into Africa in 1652. The system focussed on:

1. Serving the capitalist interest of producing skilled labourers to serve the industry.
2. Theoretical/academic education which produced graduates who did not and could not challenge the political status quo and white domination.

Education in the mother tongue and in coloniser language served as a division of the elite from the peasantry.

The Dutch embarked on South Africa and provided an European type of education for the indigenous people. It was *'intended to produce semi-literate and semi-educated Africans that would best serve the interest of the European settlers'* as stated by Hendrik Verwoerd, the prime minister at the time. In this educational system the history, medicine and religion were imposed on the people, providing Europe as the point of reference and not Africa. It resulted in de-culturation, alienation and under-development.⁵⁴

From the above information and the next section it can be assumed that South Africa's low income population experience the butterfly effect of the earlier education system. The parents of the previous generation taught improper education to their children. They also cannot assist their child in their homework because they are semi-literate hence the butterfly effect. In the next section, the role that the parents play in the education of their child is pointed out.

5.1.1 Performance of Education in South Africa

The amount of money that the government spent on education is currently the highest budget line item, accounting for approximately 6 percent GDP⁵⁵. There is a great effort from government to invest in education. Figure 5.2 indicates that the outcomes are far from satisfying.

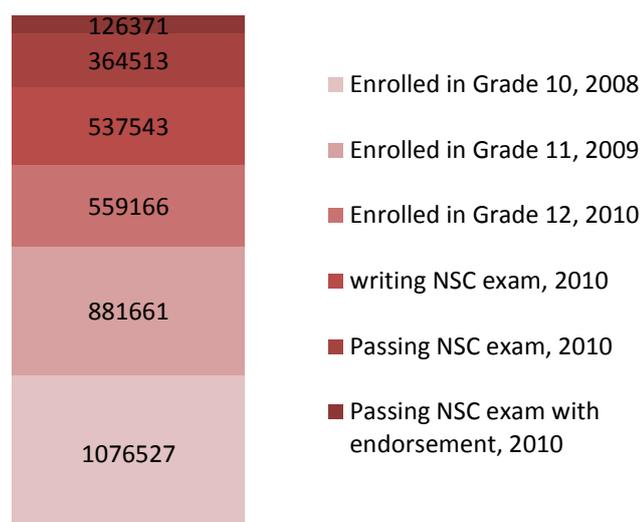


Figure 5.2. Proportion of Pupils enrolling for Grade 10, 11 and 12 and proportion passing NSC exam⁵⁶.

The enrolled numbers decreased from 1076527 in grade 10 to 559166 in grade 12 of which only 364513 passed the NCS exam. Only 34% of learners enrolled in Grade 10 passed the NSC exam of which only 12% fulfilled basic requirements for entry into tertiary studies.

In South Africa the standard of living has a strong correlation with the individual's level of education, based on the fact that unemployment rates strongly relates to educational levels⁵⁷. Those with tertiary qualifications can potentially contribute and command a substantial premium in the labour market⁵⁸ and therefore an improved standard of living. Burns⁵⁹, Lam⁶⁰ and Louw, et al⁶¹ indicated that family background does influence a student's performance. They identified two channels affecting the student's performance with regard to family background namely: parent's education and private household resources.

The resources available at the student's household may determine how well the individual performs in the school. For example in the twentieth century, households having internet access the student is more likely to advance. Access to more resources implies greater household support. Looking at the basic resources, such as school fees, transport to school, school uniforms, investment in infant healthcare and nutrition, education materials and supplementary private teaching, it can be seen that the greater the resources, the greater the household support.⁶²

In black households it is shown by Case and Deaton⁶³ that the income influences the educational attainment. The parents and their social status also influence the education and future career paths of the child. Affluent parents are part of affluent social networks, which can possibly provide their children with superior labour market prospects.

Parents that received education may value education for their child more, and set it as a priority. They understand the importance of knowledge. It is assumed that they will thus be willing to devote money, time and other necessary resources to the schooling of their child. It can also be expected that they would complement the teaching that their child receive by, for example, helping with homework⁶⁴. Well-educated parents may directly affect the quality of the school system by being informed, and by participating in the management of the school. In South Africa, the above has been confirmed by Case and Deaton in both black and white households.

A minor growing up in a household where the head had secondary education is likely to achieve one third of a grade per year above the individual's peers growing up in a household where the head only completed primary schooling. In South Africa the relationship between the learning abilities of a minor and his parent's educational attainment is likely to be non-linear, increasing with the level of the parent's education. Figure 5.3 indicate the percentage of youth matriculated in the Western Cape and South Africa with regard to the education of their parents.

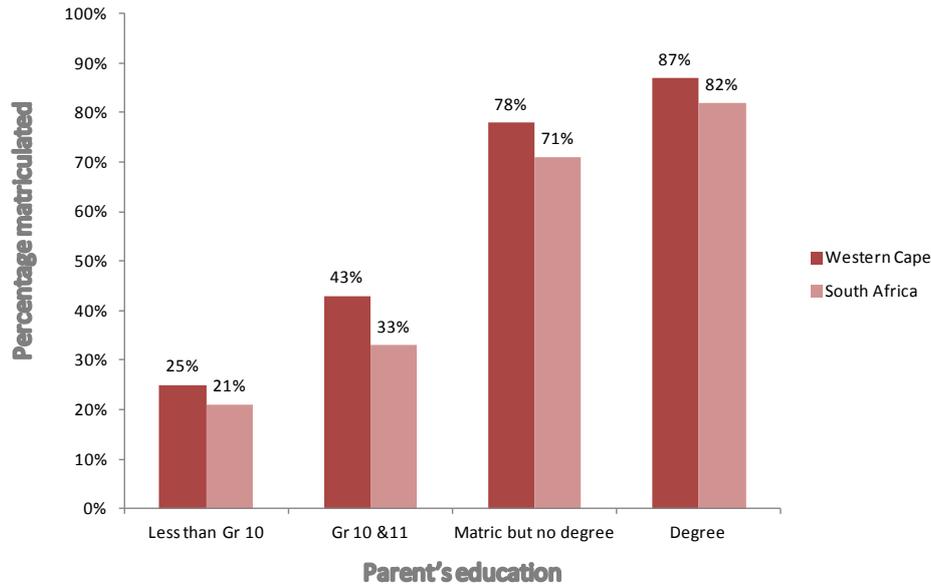


Figure 5.3. Percentage of 20-24 age-group matriculated by parent education⁶⁵

The horizontal axis indicates the level of education of the parent and the vertical axis indicates the percentage of pupils that matriculated in the category of their parent's education.

The parents need to see the essence of education and in order for the parents to appreciate the value of education; they need to have experienced the value thereof. Before the commencement of the apartheid era, the apartheid principles were already applied by the settlers in the development of the educational system for the indigenous people. Research has shown that the parents play a major role in the education of their children. In the next section, the relationship between education, poverty and the economy is elaborated on.

5.2 Poverty, Education and Empowerment

Education is regarded as the best, but not the only, 'social vaccine'. It is predicted that education increases life-expectancy, decrease child mortality, and improve social cohesion.^p

5.2.1 Poverty and Education

It is realised that a lack of education maybe the most powerful determinant of poverty. Unequal access to education is strongly related to poverty. It is a cyclical prelateship. 77 million⁶⁶ poor children in the world do not have access to education, but also they have a lack of access because they are poor, hence the cyclical prelateship.

Then there are children who do have access to education, but disregard the importance thereof and never complete their schooling career. There are approximately 144 million adults in Sub-Saharan Africa that lack the basic literacy skills. Thus any effective strategy to eliminate poverty, reduce inequalities and create life opportunities should also focus on providing education.

^p In Section 5.2 the document compiled by the Human and Science Research Council, *Education and Poverty Reducation strategies* holds reference, especially the two Chapters by Maille and Sayed

Education is not the solution. It is a possible means to an end. Education will bring changes in knowledge, values and behavioural patterns. It should also provide learners with skills, perspectives, values and knowledge that lead to enrichment.⁶⁷

5.2.2 Empowerment through Education

Research has shown that education leads to accelerated human development, poverty reduction and sustained economic growth. In 2000 leaders of developed and developing countries agreed upon a set of Millennium Development Goals (MDGs)⁶⁸. The MDGs provides a vehicle for broad-based, community participation in development. Education has been listed as a primary MDG. The perception is that education indirectly results in reproductive health and improved welfare through better nutrition. Illiteracy, which is seen as one of the strongest predictors of poverty, will be reduced with education and again reduce inequality and empower the poor.⁶⁹

The Constitution of the Republic of South Africa (Act No. 108 of 1996) provides guidelines with regard to the role that government play in transforming South Africa i.e “Improve the quality of life of all citizens and free the potential of each person” as well as “Build a united and democratic South Africa able to take its rightful place as a sovereign state in the family of nations”.

It is anticipated that if the government programmes line up with the MDGs, acceleration is expected in human development and integration of the poor in the global economy. For South Africa to meet the MDGs it is necessary to focus on the following⁷⁰:

- Prioritise economic development as well as mobilise capital and civil society around development by ensuring broad-based benefits from growth.
- Focus on diversification and the protection of the domestic market as the basis for new industries
- Direct resources to new industries.

In other words, in a developmental state, such as South Africa, mass support is needed to improve the living standards of the poor.

5.2.3 Empowerment through Training

Power Group, founded by Graham Power, focuses on civil engineering, construction and developments. They not only deliver excellent work, but also empower their employees and individuals. They made it their conduct to make use of local labour, in many cases, unschooled and unemployed individuals. They then train them in a certain trait and at the end of a project the tools that were necessary to accomplish the work remain the individual’s property. In many cases, Power assisted these individuals to start their own company, with a 51:49 share distribution in favour of the individual.⁷¹

Power also give employees that have served the company a number of years the opportunity to own shares in the company, irrespective of their job description. The employees are then empowered by gaining knowledge of the financial side of the company, and are involved in decision-making.

5.2.4 Empowerment through Employment

The *Zibambele* initiative in Kwazulu Natal (initiated in 1999) gives the opportunity for less privileged households to be employed. They award a contract to a household, in effect employ, them to maintain a section of road in the rural areas. *Zibambele* targets the neediest, identified and selected by the communities. Households are required to maintain the road drainage system, ensure that there is good roadside visibility, maintain the road surface and clear the road verges of litter and noxious weeds. They are provided with the necessary equipment including safety vests and plastic cones. Dr. KB Mbanjwa, former Head of Department of transport, Kwazulu Natal, stated the following: ⁷²

"ZIBAMBELE stands out because it creates meaningful work and enhances human dignity which is associated with being gainfully employed. ZIBAMBELE creates a sense of community ownership and partnership with government in the maintenance of public assets. ZIBAMBELE is a wonderful example of how a programme designed to alleviate poverty can indeed be gender affirmative, employ the neediest and still be successful."

The Kwazulu Natal department of transport provide the training necessary to maintain a road. The training included technical skills on how to maintain a road. Training is also provided on aspects such as social development and life skills. Support services are provided where *Zibambele* households are assisted to obtain an identity document, open a bank account and invest in savings.

Currently *Zibambele* annually maintain approximately 11 000 kilometres of rural road. *"Zibambele* creates meaningful work and enhances human dignity which is associated with being gainfully employed".

5.2.5 Final Remarks on Relationship between Education, Poverty and the Economy

It is predicted that education increases life expectancy, decrease child mortality and improve social cohesion. Research showed that education leads to accelerated human development. Any effective strategy to eliminate poverty and reduce inequalities should therefore focus on providing education.

The previous section concluded that the education and development of the parents plays a major role in their child's education. Therefore it is proposed to focus on the development of the parents in order to improve the educational outcomes of the child.

Power and the Department of Transport, Kwazulu Natal showed that empowerment is possible through training and employment.

5.3 Human Resource Development

Ken Dovey⁷³ addressed the importance of human resource development, the resources attained from human development and the strategic management thereof. He recommends that it should be set as a key leadership task. The effective management of a country, company or organisation should set human resource development as a top priority. Education greatly assists in human development, but there are alternative means. This section mainly focuses on the development of the Bottom of the Pyramid (BoP) population. Firstly Maslow's hierarchy of needs is considered in light of poverty and government's attempt to alleviate poverty. Secondly, the influence and success

of Habitat for Humanity, a non-profit organization that focuses on alleviating poverty and the empowerment of the poor through human resource development, are laid out.

5.3.1 Maslow's Hierarchy of Needs

Abraham Maslow (1954) constructed a hierarchy of needs⁷⁴. He argues that every human being has basic needs which would in turn result in intrinsic motivation (self motivation). The basic needs are referred to as physical and growth needs such as physiological, security and social needs, ego and self actualisation needs. Maslow constructed a triangle indicating the level of needs. The triangle is constructed in such a way as to illustrate the order of priority starting from the bottom as depicted in Figure 5.4.



Figure 5.4: Illustration of Maslow's hierarchy of needs

The higher needs only become a priority when the lower needs are satisfied. In other words the physical needs must be met before the growth needs can be desired. Ideally everyone reaching adulthood must have a desire for growth needs. This will then generate self confidence and self reliance. A Description of the five basic needs as described by Maslow is stipulated in Table 5.1⁷⁵.

Table 5.1 Description of Maslow's hierarchy of needs⁸¹

Physiological needs	Required to sustain life. In this category Maslow places chemical needs of the body such as sexual desire, hunger, and sleep. Activity needs and desired sensory satisfaction
Safety needs	Once the physiological needs are satisfied, one's needs are directed towards attaining a feeling of safety and security. It concerns the need for freedom of threat, that is, the security from threatening events or surroundings. People are motivated to avoid wild animals, extremes of temperature, assault, disease and so forth. This category includes the needs for living in a safe environment, medical insurance, job security and financial reserves.

Love needs	Very comprehensive, as it includes the needs for affiliation and belongingness. It involves the need for friends, spouses, parents and group membership. Typical love needs are friendship, belonging to a group, giving and receiving love
Esteem needs	This category falls into two broad groups. The first are internal esteem needs. It includes desires for power, achievement, confidence, freedom and independence. The second group refers to external esteem needs and is derived from reputation, prestige, recognition, attention and importance. Both groups of needs lead to higher self-confidence.
Self-actualisation needs	The summit of the hierarchy. Self-actualisation needs refer to the desire to realize or actualize one's full potential. This category includes needs such as truth, justice, wisdom, meaning etc.

By applying Maslow's theory it can be deduced that it would be beneficial if the majority of people reach self-actualisation stage. At this level the importance of sustainability could be understood and people would also act upon achieving sustainability and improving their living standards. Unfortunately many low income individuals, have not progressed from the Bottom of the Pyramid (physiological needs), hence, the Bottom of the Pyramid (BoP) population. It can be argued that adults in the BoP find it difficult to see to their own needs, because they have moved from 'being cared for' to 'taking care of'. These adults do not have the resources to satisfy their own basic needs, and expect the authorities (government) to provide for them (resulting in a dependency attitude). The limited resources result in needs not being met and the BoP population experience hopelessness as discussed in section 3.1.

It was argued (section 3.3.3) that by providing shelter (houses) it will assist in satisfying the basic needs, and hopefully encourage, in the end, self-actualisation. This approach does not encourage the development of the individual. In the case of being provided for, the individuals could expect that their other needs should also be provided for. This would mean more external support and again a dependency attitude. In this regard the approach from government to provide houses to the BoP would not have the desired outcome, as mentioned in Chapter 3 and section 5.2, and cannot be sustainable. It is not beneficial for the BoP or South Africa. Habitat for Humanity⁷⁶ took a different approach and focussed on the formation of social capital and human development.

In the next section the Habitat for Humanity approach is discussed. Habitat for humanity develops human resources through participation, and encourages low-income individuals to contribute in satisfying their own needs.

5.4 Habitat for Humanity

Habitat for Humanity (HFH)⁷⁶ was established by Millard Fuller in 1976. It started in the United States of America (USA) and in 2002 the total number of houses completed in the USA, as well as in developing countries amounted to 100 000. The organisation commits itself to the elimination of

substandard housing worldwide and the development and empowerment of the poor. HFH refers to the recipients of houses as partners and the coordinators as affiliates.

HFH commits to building modest homes on a no-profit, no-interest basis. Homeowners are expected to invest their own labour into the building of their house as well as houses of other families in their community (so called Sweat Equity). In this way the cost of the house is reduced, the pride of ownership is obtained and the development of positive relationships is fostered. The recipients are also required to pay for their house, by taking out and managing a loan. The building styles and the building costs are reduced in such a way that the bulk amount of building the house is reduced significantly. The rent for the loan is very low (as a result of sponsorships) and therefore the recipients of the houses are not overwhelmed by debt. Funding is received from churches, businesses, individual donations, fundraisings, foundations, and support from local, state or federal governments. The strategy is to attract the sponsoring of a specific house by a church or business where the sponsor takes responsibility of raising funds and the recruitment of volunteers. In that way the coordinators can focus on the management of the project.

Habitat for Humanity homeownership will now be introduced, after which Habitat for Humanity South Africa will be discussed and the results of surveys that had been undertaken and documented.

5.4.1 Habitat for Humanity Homeownership

A survey was done in 1998 by Applied Real Estate Analysis (AREA) to determine the result of Habitat for Humanity International (HFHI).Inc in terms of homeownership⁷⁷. The different components of the HFH Model are laid out in Table 5.2.⁹

Table 5.2 Different components of HFH

Components	Description
Program requirements and skills learned	200-500 hours of Sweat equity are required, either on the construction of the recipient's own home, that of other habitat homeowners, working in affiliate offices or on specific habitat activities.
The construction process	Efficient procedures such as prefabrication of panels off-site enable affiliates to control quality and establish construction schedule. It also limits theft and vandalism.
Loan servicing policy	Payments are due on the first day of the month. After the 10 th of each month, payments are considered late and a 5% late fee is charged on the amount owed. After the 15 th of each month, payment should be delivered in person and budget should be drawn up together with the affiliate.
Training	In some cases affiliates require trainings as prerequisite to moving in. In other cases training is part of Sweat Equity hours.

⁹ For this section the Survey done by Applied Real Estate Analysis (AREA), Making homeownership a reality holds reference, unless otherwise stated

As presented in Table 5.2, Habitat for Humanity has integrated aspects that recipients should adhere to in order to participate in the building process. In Table 5.3 sample of 414 recipients provided the percentage of construction activities performed by recipients.

Table 5.3 Construction activities most commonly performed by habitat homeowners (N=414)

	Number	Percentage
Interior Painting/Drywalling	82	20%
Exterior Painting/Siding Installation	66	16%
Yard work/Landscaping	64	16%
Installing Flooring	49	12%
Applying Roofing	45	11%
Laying Foundation	44	11%
Clean up/Debris Removal	22	4%
Other	42	10%

In terms of training, 85% of the recipients participated in the training being provided. Table 5.4 indicates the percentage of recipients that attended different topics (in a sample of 136).

Table 5.4 Training topics most commonly offered by Habitat (N=136)

	Number	Percentage
Home Maintenance	36	26%
Budgeting	25	18%
Homeowner training (escrow, property taxes, mortgage)	17	13%
Miscellaneous social events	16	12%
Landscaping/Gardening	13	10%
Legal issues (income taxes. Wills)	12	9%
Other	17	13%

Other training topics that are covered as well include: stress management, parenting, energy conservation, insurance, teen activity programs and importance of good credit health issues. Homeowners responded positively with regard to the training that they received. Some elaborated on the amount of money that they saved through skills obtained. Apart from the training received as indicated in Table 5.4, they also received training in home-repairing, such as:

- how to fix a running toilet
- patching of a drywall
- re-track sliding closet doors
- repair of other housing components

The success of Habitat for Humanity is in the empowerment of the poor and human resource development. In the next section, HFH in South Africa is discussed.

5.4.2 Habitat for Humanity South Africa

The HFH area office for Africa and the Middle East are located in Pretoria. The area office only provides training, technical expertise and support in fundraising. The actual work is being done at community level, as required by Habitat for Humanity. HFH South Africa (HFHSA) commenced in 1996 and is currently only operating in Cape Town, Johannesburg and Durban. Since 1996 to September 2009, 2792 habitat houses have been built in South Africa. ⁷⁸

In South Africa, most funding for HFH is obtained from donors. Homeowners are then required to contribute to the so-called Sweat Equity and hand over their subsidy to HFHSA in light of the normal habitat practice of providing interest free loans.

In order to qualify for participation in the Habitat for Humanity initiative in South Africa, the following is required:

- A family must fall in the monthly income range of R0-R3500.
- The family must currently live in a sub-standard house.
- The land on which the house will be built should be owned by the family. They must be in possession of the title deed or Permission to Occupy certificate.
- The family must perform Sweat Equity (physical work on other homeowners' homes before qualifying for their own house).
- The family must qualify for a South African government subsidy.

HFHSA partners with community groups, and they work on a project model basis, where the model is tailored to meet the needs of specific homeowner groups including the environmental and social conditions associated with each individual.

5.4.3 Success Stories

Homeowners of HFH houses are employed in a fairly wide variety of industries, of which the health and educational services, encompasses the largest share (37%) of homeowners' jobs. Interviewees represent all occupational categories, but are primarily concentrated in five areas:

- service (21%)
- executive, administrative and managerial (13%)
- handlers, equipment cleaners, helpers and labourers (13%)
- administrative support (11%)
- and, professional specialty (10%)

The following successes (Table 5.5) were obtained from Habitat for Humanity San Antonio⁷⁹ with regard to the benefits of homeownership:

Table 5.5 Benefits of homeownership

Children	Community	Families
<ul style="list-style-type: none"> • 25% more likely to graduate from high school • 116% more likely to graduate from college • 20% less likely to become teenage mothers • 9% higher math scores • 7% higher reading scores • 3% fewer behavior problems • 59% more likely to own a home within 10 years of moving from parent's household 	<ul style="list-style-type: none"> • 28% more likely to repair or improve their homes • 12% more likely to maintain a garden outside their homes • 10% more likely to report they have worked to solve local problems • Live 4 times longer in a community • 11% more likely to know who represents them in Congress • 9% more likely to know who their school-board representative is • 15% more likely to vote 	<ul style="list-style-type: none"> • 10% more likely to attend church • 16% more likely to belong to parent-teacher organizations, block clubs, etc. • Read newspapers 1.3 times more often • less likely to have alcohol and substance-abuse problems

The HFH operation differentiates the recipients of habitat houses from other low-income residents that have not participated in the building of their own house. By requiring beneficiaries to earn their house by contributing to the construction process and take responsibility for the payment thereof, cultivates confidence and self worth among the beneficiaries. Other low income residents lack the degree of stability and financial responsibility. HFH volunteers were asked to rate BoP families and the Habitat partner families against traditional middle class values. A sample of 98 families was investigated (Table 5.6).

Table 5.6 HFH volunteers' ratings of Low income families and HFH partner families⁸⁰

Characteristic¹	Mean Rating of Habitat Partners²	Mean Rating of BoP in General
Responsible handling of finances	4.11	2.78
Personal honesty and integrity	4.77	3.64
Work ethic	4.54	3.39
Degree of need for housing	5.62	4.42
Family stability	3.99	2.95

1. N = 98

2. Rating on 0-7 scale, with 0 = a total lack of the quality and 7 = a great deal of the quality

The results indicate that HFH partners perform better in all categories. They can better handle their finances, show honesty and integrity, work ethic and family stability. It also indicates that their need for housing is more than that of the average low income people, which strengthens the fact that by providing houses to all the BoP may not meet a desired need. This supports the argument in section 5.3.1. The HFH partners share middle class aspirations and are willing to commit their time and money to obtain a house of their own and with that shelter and security, progressing to the next level of Maslow's Safety needs. The concept of partnership of the HFH volunteers who contribute their time and money empower those being served, fostering the social capital that is desired.

5.4.4 Final Remarks on Habitat for Humanity

In contrast to the RDP houses that was built (section 4.3.1) HFHSA partners with community groups and work on a project model basis. The model is tailored to meet the specific needs of a homeowner group including the environmental and social conditions associated with that group.

Maslow proposes that there is an order of needs to be satisfied by each individual. Satisfying a need for an individual can result in an expectancy to satisfy the other needs as well. The Habitat for Humanity model indicates that by involving the recipients of houses in the building process promotes human development and encourages individuals to reach self-actualisation.

Habitat homeowners are employed in a fairly wide industry. They have learned to be responsible and therefore are trustworthy. They have gained confidence and self worth in the process. They are empowered.

5.5 Summary

The illiteracy of the BoP population may have resulted from the education imposed by the European settlers that aimed only to produce semi-literate and semi-educated Africans. From generation to generation the insufficient education was carried over. Parents are not able to assist their children in their schoolwork and in many cases also do not encourage them. Children then drop out of school, because they struggle to progress and do not see the necessity of education.

One solution to the poor outcome of the educational system is to empower the parents. If the parents understand the value of knowledge, they then would encourage their children to be educated. It would result in positive economic growth and improved living conditions for the low-income population.

Habitat for humanity developed human resources through training and teaching of responsibility. The Habitat for Humanity model indicates that by involving the recipients of houses in the building process promote human development. Recipients of a habitat home are required to assist in the building process or work an amount of hours referred to as Sweat Equity. They must take responsibility of paying for the house that is reduced to a minimum by sponsorships, efficient building styles and Sweat Equity. In the process the recipients receive training and education.

The proposed Infra-Connect model (ICM) addresses the need for educating the parents of the poorer part of the community through applying the principles of habitat for humanity. Instead of providing houses, as in the case of Habitat for Humanity, the ICM maintain and develop infrastructure and provides employment.

6

ANALYSIS

A synthesis of the previous Chapters is presented as well as the analysis of the current environment that South Africa operates in.

6 Synthesis and analysis of environment

In this chapter a summary and synthesis are provided of the preceding chapters. The approach towards developing the proposed Infra-Connect Model is to analyse and utilise existing methods. The first method, Strategic Planning and decision-making, would be applied to the current environment delivering infrastructure. The strategic management would guide municipalities and government to understand the status quo and effectively utilise its resources to achieve the desired sustainable environment to deliver infrastructure. Secondly, the Habitat for Humanity model (section 5.4) would be presented to assist in creating a sustainable environment to deliver infrastructure.

6.1 Synthesis

A summary and synthesis are given of the preceding chapters as indicated by the dashed block in Figure 6.1.

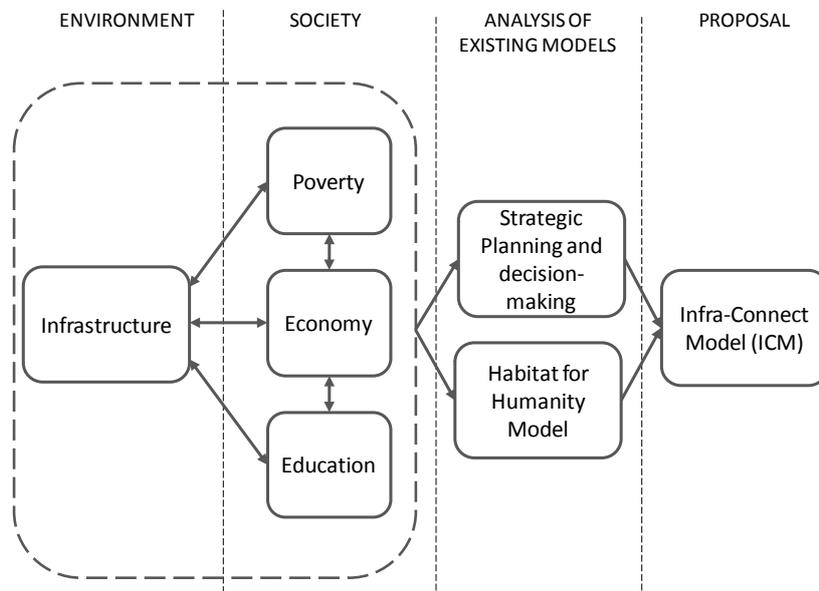


Figure 6.1 Section 6.1 in context

See Table 6.1 for a summary of the preceding chapters, followed by the synthesis.

Table 6.1 Summary of Chapters 1-5

CHAPTER	SUMMARY
Introduction (Chapter 1)	<ul style="list-style-type: none"> • The progress observed since 1994 in South Africa is remarkable, but far from sustainable. • The status quo and challenges provides the backdrop for the future of South Africa.
Infrastructure (Chapter 2)	<ul style="list-style-type: none"> • Municipalities lack expertise, manpower, experience and government support for effective management. • Poor management in municipalities is the cause of unsatisfactory service delivery and protests. • A lack of consumer ownership with regards to municipal infrastructure can be ascribed to a lack of participation by citizens and a lack of trust in the local authorities.
Poverty (Chapter 3)	<ul style="list-style-type: none"> • The matters of poverty and inequality result in exclusion from economic activities which in turn lead to a lack of confidence and a feeling of unworthiness. • The low-income population does have assets (labour, being the most important) and can contribute to the economy and infrastructure delivery, if given the opportunity. • South Africa's social welfare system is focused on providing cash and in-kind transfers, mostly to children, elderly and the disabled.
Economy (Chapter 4)	<ul style="list-style-type: none"> • Unemployment restrains GDP growth and therefore restrains government from effectively exploiting natural resources as well as investing in capital. • The development of human and social capital is important for economic growth. • The principal contributor to growth is education.
Education and empowerment (Chapter 5)	<ul style="list-style-type: none"> • Statistics show that children exposed to schooling increased significantly, but the number that matriculated decreased drastically. • The parents play a major role in the education of their child. Attention should be given to the development of the parents, especially in low-income communities where the parents most possibly did not matriculate. • By applying Maslow's hierarchy of needs it was found that it is not beneficial for the people living in poverty to be provided for in the form of subsidies. • The model that Habitat for Humanity uses to build social capital and encourage human resource development through the building of houses was introduced.

From Chapter 2 it is seen that the cost of upgrading infrastructure is much more than it would have been if continuous maintenance were performed on the existing infrastructure. The effective delivery of infrastructure is hindered through an overload of responsibilities on the municipalities' part. The grants made available are not sufficient to cover the hidden costs. The level of poverty and a so-called 'entitlement culture' further complicates the matter.

Chapter 3 shows that poverty, inequality and unemployment are a reality in South Africa and it constrains economic growth and development. The social welfare system focuses only children, elderly and the disabled. The labour force that is unemployed and therefore poor receives little help or assistance.

The most effective way to invest in people is through education and/or training (Chapter 5). They in turn can then invest in the country and their communities. Individuals between 14 and 35 years of age that are poor due to unemployment should be educated or trained and aid should be provided in seeking employment opportunities. The habitat for humanity model accomplished effective empowerment of the less privileged. They provided education, training and assisted in private financial management. Individuals that have taken part in the Habitat model are equipped for employment in that they are confident and responsible.

6.2 Strategic Planning and Decision-making

It can be seen from Chapter 1 through to Chapter 5, as well as from the synthesis, that government is taking an approach towards quality infrastructure delivery, poverty alleviation and providing education for all. It is also evident that the attempts fell short of reaching the desired outcomes. In this section a strategic approach is taken to view the current environment for infrastructure delivery and the desired environment (Figure 6.2).

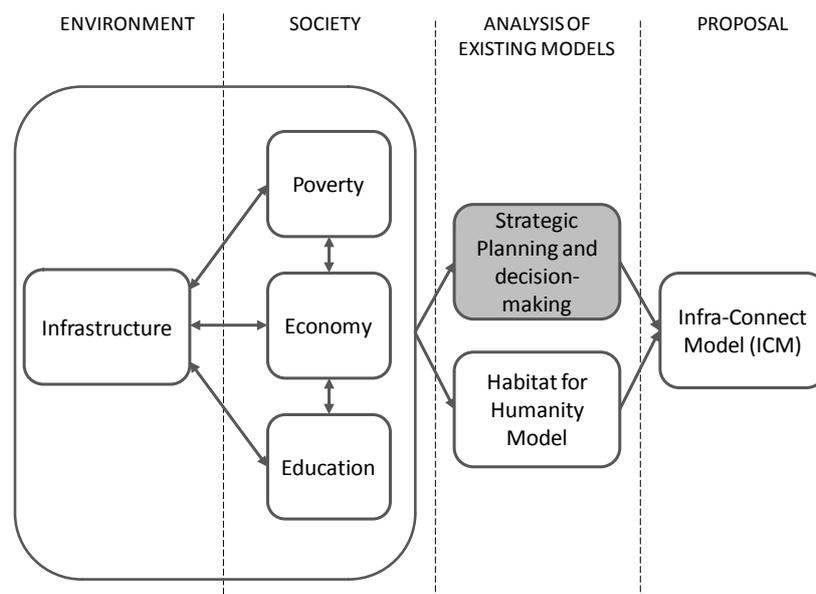


Figure 6.2 Strategic planning and decision-making in context

Strategic planning and decision-making are proposed by Illbury and Sunter in their book *the Socrates and the fox*⁸¹. Various companies ranging from governmental to private organisations have benefitted from this decision making method (or model). They reported on the usefulness of taking an objective view and addressing the uncertainties in order to be a competitive organisation. This method will be used to formalize a proposed solution towards to the current environment that South Africa operates in.

Illbury and Sunter propose ten questions to perform the strategic planning and decision-making exercise. The ten questions and the thesis chapter(s) from which the answer would be derived, are set out below. A discussion on each question will follow.

1. What is the context? (Chapter 2)
2. What is the scope? (Chapter 2)
3. Who or what are the role players that can most advance or retard the alternative approach? (Chapters 2 and 3)
4. What factors would govern the improvement? (Chapters 3,4 and 5)
5. What are the key uncertainties that would have a positive or negative influence? (Chapters 2,3 and 4)
6. What are the possible scenarios and where would the current affairs be positioned? (Derived from Questions 1-6)
7. SWOT (Strength; Weaknesses; Opportunities and Threats) Analysis (Chapters 1-5)
8. What are the options that could improve the current performance and longer-term prospects? (Chapter 5)
9. What options can be turned into decisions right now? (Chapter 5)
10. What is the set of measurable outcomes that could be assessed that would give an indication of whether it is improving? (Chapter 1)

6.2.1 The Context

Amongst the infrastructure progress observed since 1994 are the following:

- Virtually inclusive access to primary and secondary education
- Formal housing for additional 10 million people
- Significant expansion of access to electricity and water.

Even though primary and secondary education are accessible, there are only a few who pass matric with access to tertiary education (Chapter 5). In the light of the formal housing provided it is revealed that the construction of some of the additional houses was unsafe (section 4.3.1). The access to electricity and water does not imply quality service delivery (Chapter 2). Therefore, it can be expected that the economy of South Africa would not grow significantly in the years to come and it can be expected that infrastructure delivery and public service would not improve. Unemployment would also persist (Chapter 4).

Municipalities also experienced major changes (Chapter 2). The changes, uncertainties, and poor management and the performance of municipalities deteriorated. The maintenance and upgrading of infrastructure take longer than necessary. Public service delivery in low-income communities is unsatisfactory. There is a backlog of 2.5 million houses to be built. The current billing and accounting system are not effective.

6.2.2 The Scope

Urbanisation took place during the last few decades where 42% (total population 49.3 million) of the population established themselves in urban areas. The urban population continues to grow in an environment of limited employment opportunities and insufficient infrastructure and service delivery. If the unemployment rate of 25.3% (section 4.3) would be applied to the urban population,

approximately 5.2 million people are unemployed in the urban areas and it is assumed that they are poor. If 5,2 million people could be employed, or just a portion of the unemployed urban population, the economy of South Africa would flourish (section 4.1).

Originally the function of municipalities was the roll-out of infrastructure, the maintenance thereof and public service delivery. Government distributed their responsibilities, known as the shift towards decentralization (section 2.1.2) in order to improve government's efficiency and effectiveness. The major responsibilities includes provision of houses, health and education facilities for the low-income population, while poverty and income inequalities persist. The scope therefore broadened with regard to the municipal responsibilities. Corruption also increased with the broadened scope (section 3.1).

6.2.3 The Role Players

The role players that would determine the success or failure of creating a sustainable environment are the government, the bottom of the pyramid (BoP) population especially those receiving subsidies (Chapter 7) and the management with regard to the proposed model. The specific management and individuals responsible for the implementation plays a key role in the success thereof.

6.2.4 What Factors would Govern the Improvement?

The determining factors that would govern the improvement are interlinked with the role players. These factors are: the effective training of personnel; the outcome of training and educational classes for the BoP population; level of human resource development together with the formation of human and social capital.

The training of personnel that would implement the different approach is essential. Effective training would result in effective operation. Furthermore the desired result expected from the partakers of the alternative approach depends greatly on the training and education of the recipients.

6.2.5 What are the Key Uncertainties?

By taking a different approach a level of uncertainty exist. A form of risk assessment is being done by predicting the uncertainties. The possible uncertainties are laid out, and the different scenarios as a result of the uncertainties are set out and discussed in the next section.

In light of the local authorities and the empowerment of the people the key uncertainties are obtained from Chapter 2:

- Degree of government support
- Level of participation

The level of human resource development is a key indicator in creating a sustainable environment and the uncertainties associated with the development of human resources are the level of government support and the participation of the recipients.

6.2.6 The Possible Scenarios

The possible scenarios are developed from the key uncertainties. The different combinations of the uncertainties create different scenarios. The possible scenarios assist in understanding and anticipating changes that might occur due to the uncertainties. It also assists in understanding the context and status quo. It illustrates the least and most beneficial scenario in the context and scope.

The key uncertainties associated with the success of municipal performance are the degree of government support and the level of citizen participation.

The different combinations or scenarios therefore are:

- High degree of government support, high level of participation
- Low degree of government support, high level of participation
- Low degree of government support, low level of participation
- High degree of government support, low level of participation

The characteristics associated with the different scenarios are set out in Table 6.2:

Table 6.2. Characteristics of scenarios associated with municipal performance

NR	SCENARIO	CHARACTERISTICS
1	High degree of government support together with high level of participation	<ul style="list-style-type: none"> • Empowered low income population • Developed human resources • Increasing work force • Decreasing unemployment rate • Nation and community building • Positive economic growth • Effective infrastructure and public services delivery
2	Low degree of government support together with high level of participation	<ul style="list-style-type: none"> • Frustration experienced by citizens • Ineffectiveness of municipalities • Increasing complaints • Low motivation of citizens to participate • Unutilized human resources
3	Low degree of government support together with low level of participation	<ul style="list-style-type: none"> • Poor quality of service • Low motivation to participate • Low morale • Low income population not empowered • Underdeveloped human resources • Responsibilities of municipalities unbearable
4	High degree of government support together with low level of participation	<ul style="list-style-type: none"> • Waste of money and resources • Unsustainable • Unutilized human resources • Low workforce • Entitlement culture/Dependency

In scenario 1 it could be expected that a sustainable environment to deliver infrastructure would be **achieved**. Government's aim to empower people to effectively contribute to the economy (Chapter 4) would be reached. In Scenario 2 the citizens have a desire to contribute and participate but they **struggle** to engage due to a low level of government support. Low level of participation as well as low level of government support in Scenario 3 can be identified with **unsuccessful** in terms of economic growth. Scenario 4 denotes a **delusion** in that government perceives that their support would result in sustainable growth, but the absence of citizens' participation results in an unsustainable scenario. The possible scenarios developed in the aforementioned discussion are illustrated in Figure 6.3 :

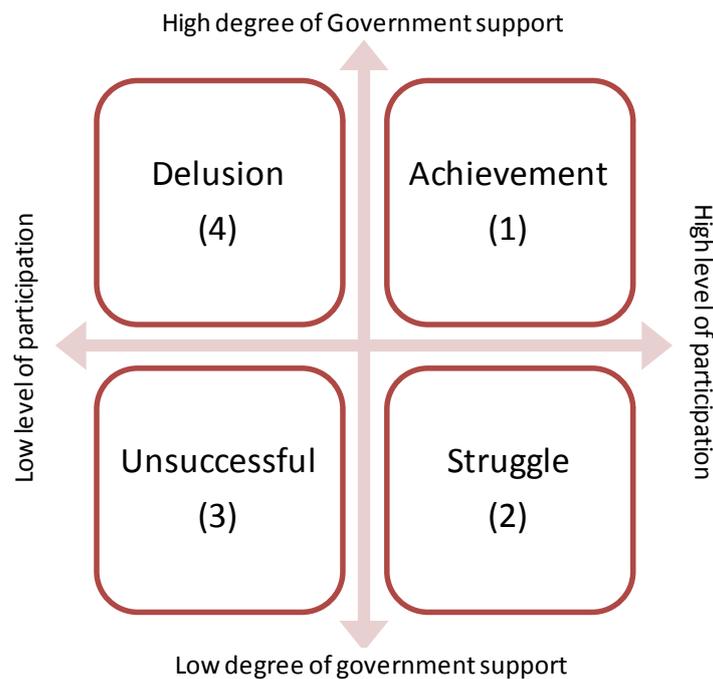


Figure 6.3 Possible scenarios associated with municipal performance

The current environment to deliver infrastructure alternates between 'delusion' and 'unsuccessful'. The support from government is mainly in the form of governmental grants. The empowerment and development of people are lacking (Chapters 2, 3 and 4) and therefore participation is lacking. The aim of government should be to reach the 'achievement' scenario.

In section 6.2.8 possible options are identified in order to move from 'delusion' and 'unsuccessful' to 'achievement'. As part of the strategic planning and decision-making exercise a SWOT analysis will be performed in the next section. A SWOT analysis⁸² refers to the identification of Strengths, Weaknesses, Opportunities and Threats that affect the environment. From the SWOT analysis the strengths should be utilized; the weaknesses should be addressed; opportunities should be seized and threats should be prepared for.

6.2.7 SWOT (Strengths, Weaknesses, Opportunities, Threats) Analysis

A SWOT analysis is performed in order to:

- Apply the strengths

- Acknowledge the weaknesses
- Identify the opportunities and threats

By doing a SWOT analysis, the position of an entity is determined and a more comprehensive decision can be made in terms of the way forward. Table 6.3 identifies the strength, weaknesses, opportunities and threats of South African municipalities in general as obtained from literature.

Table 6.3 SWOT Analysis

STRENGTHS (Sections 2.1 and 4.1)	WEAKNESSES (Sections 2.3,3.1, and 4.2)	OPPORTUNITIES (Sections 2.1, 5.2.2, and 5.3)	THREATS (Sections 3.1, 4.1 and 4.2)
<ul style="list-style-type: none"> • A degree of government support in finances, but not in empowerment. • Virtually inclusive access to primary and secondary education. • Significant expansion of access to water and electricity. 	<ul style="list-style-type: none"> • High unemployment rate. • Persisting poverty and inequalities. • 'Entitlement culture' • Perceived inferior low income population not taking part in economic activities. 	<ul style="list-style-type: none"> • Empowerment through education and/or training. • Human resource development. • Employment creation in municipalities (admin staff). 	<ul style="list-style-type: none"> • Perceived corruption. • Shortage of skills. • Increasing urban population and possibly increasing unemployment.

The strengths listed in the table are mainly as a result of government intervention. The weaknesses, however, is as a result of not empowering the needy to be self-reliant and participating in economic activities. Opportunities arise in that the poorer part of the community can be empowered (section 5.4). Threats result from the realization of possible corruption and the shortage of skills.

6.2.8 Options and decisions

The options stem from the opportunities. Therefore the options are: to empower the poorer part of the community to be self-reliant and to take part in economic activities; to focus on human resource development; to assist in employment creation; and to teach the low income population responsibility and ownership.

As mentioned in the previous section the poorer part of the community can be empowered (section 5.4). The decision is to adopt the principles of habitat for humanity. It is then expected that the poorer part of the community will be empowered and that they will partake in the economic activities, which will result in a sustainable environment to deliver infrastructure. In the next section the desired outcomes of the decision are presented.

6.2.9 Desired Outcomes

The desired outcomes of creating a sustainable environment for infrastructure delivery are also the outcomes of the proposed Infra-Connect Model (Chapter 7):

- Increased percentage of employed South Africans.

- Adequate infrastructure that results in social inclusion.
- Shorter distances between the work place and residential areas of low income population
- South Africa’s growth path be more labour-intensive.
- Reliable public services.
- Integrated South African society

These outcomes are in line with the challenges South Africa face, as presented by the NPC diagnostics report (section 1.2.3).

6.3 Habitat Model

The principles of Habitat for Humanity (section 5.4) can assist in achieving the desired outcomes. Figure 6.4 illustrates the context of this section.

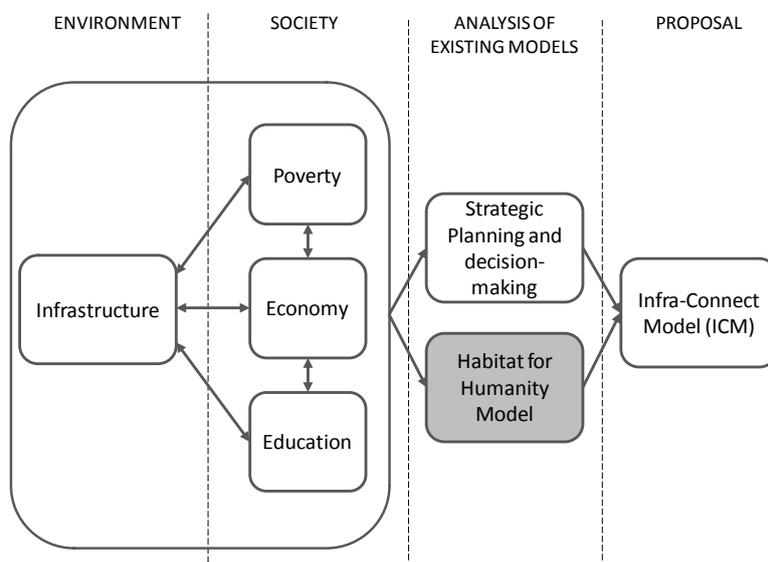


Figure 6.4 Subsection 6.3 in context

The habitat model can be presented as follows: (Figure 6.5).

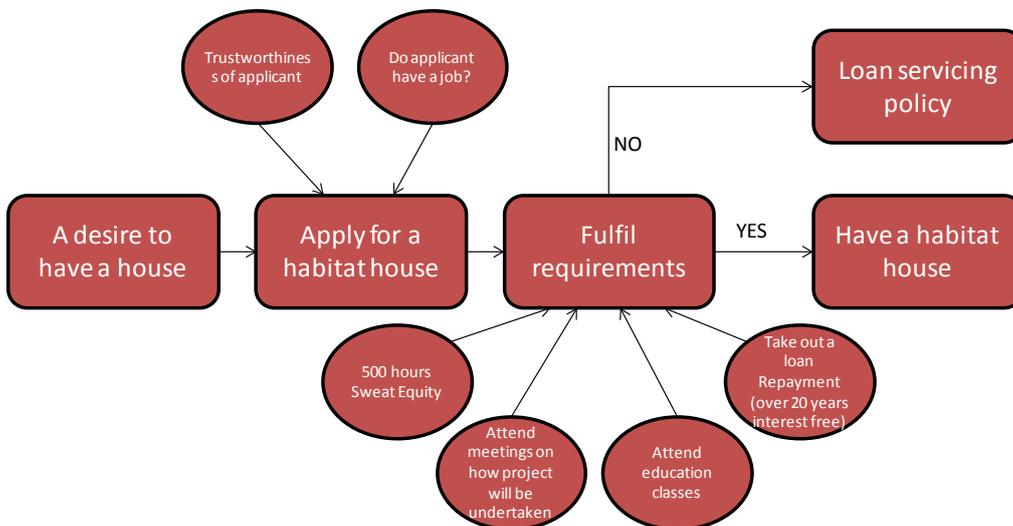


Figure 6.5 Habitat Model

The basic principles of the Habitat model, commonly used for housing delivery, will be applied to develop the Infra-Connect Model that aims to address the desired outcomes of the strategic planning exercise and to create a sustainable environment for infrastructure delivery.

6.4 Summary

A synthesis of the literature study was given and the integrated way in which the chapters relate to each other was presented. The strategic planning and decision-making tool assisted in understanding the current environment that South Africa operates in. The environment that would be sustainable in the long term is characterised by high level of government support and high level of citizen participation. The Strengths, Weaknesses, Opportunities and Threats (SWOT analysis) is performed and following the SWOT analysis, the options and desired outcomes were identified. The desired outcomes are mainly focussed on involving the poor in the economic activities which will be accomplished by the employment creation model within the proposed Infra-Connect Model. The employment creation model can only be implemented after the empowerment of the poor. This can be achieved by the application of the habitat model principles of infrastructure development, as presented in Figure 6.5. A summary of the strategic planning and decision-making exercise is provided below:

- The context: Municipalities experience major changes and lack sufficient resources and capacity to perform required duties. Education is accessible, but the desired outcomes are not yet met.
- The scope: Urbanisation took place and the urban population continues to grow in an environment of limited employment opportunities and insufficient infrastructure and service delivery.
- The role players: Government, bottom of the pyramid population, and municipal management.
- What factors would govern the improvement?: Training of personnel, level of human resource development and level of corruption.
- The key uncertainties: Government support and level of citizen participation.
- Scenarios: 'Achievement' is the desired scenario. This is characterised by a high degree of government support and high levels of citizen participation. Currently South Africa is alternating between 'delusion' (high degree of government support together with low level of participation) and 'unsuccessful' (low degree of government support and low level of participation). (Figure 6.3)
- SWOT analysis: There is a degree of government support evident in the provision of finances and the creation of opportunities (strengths), but the empowerment and involvement of the poor is lacking (weakness). The identified opportunity is to empower the poor by developing human resources through skills and education. The possible threat associated with the opportunity is an insufficient project management team and perceived corruption.
- Options and decisions: The options stemmed from the opportunity and the decision is to adopt the principles of the habitat model to empower the poor through human resource development.

- Desired outcomes: Increased percentage of employed South Africans; Adequate infrastructure that results in social inclusion; Shorter distances between the work place and residential areas of low income population; South Africa's growth to path be more labour-intensive; Reliable Public services; and an integrated South African society.

7

THE CONCEPT

This chapter presents the development of the proposed Infra-Connect Model (ICM) concept. The ICM is designed in such a way as to empower the needy, promote economic growth and encourage infrastructure and service delivery.

7 Infra-Connect Model (ICM)

A concept for a model referred to as the Infra-Connect Model (ICM) is developed using the principles of Habitat for Humanity (Figure 6.5). The name, Infra-Connect Model, is derived from infrastructure and connectivity striving towards an integrated society. Figure 7.1 depicts the context for this chapter.

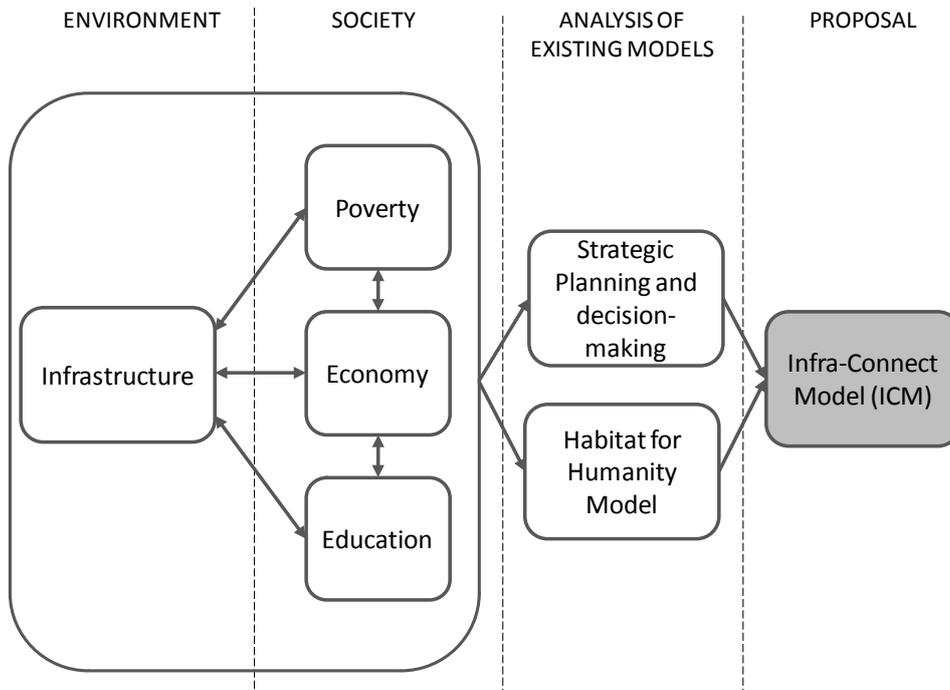


Figure 7.1 Chapter 7 in context

A short literature review is given of the problem areas identified in the literature study and the role that it played in the development of the concept model. The different problem areas identified in literature will then be connected and integrated into the design of the ICM. The framework for the model and the goals will be presented followed by a discussion of the ICM framework components. The concept model will then be validated against the set goals, followed by additional work to be undertaken before implementation, and possible financial implications. The chapter is laid out as follows (Figure 7.2).

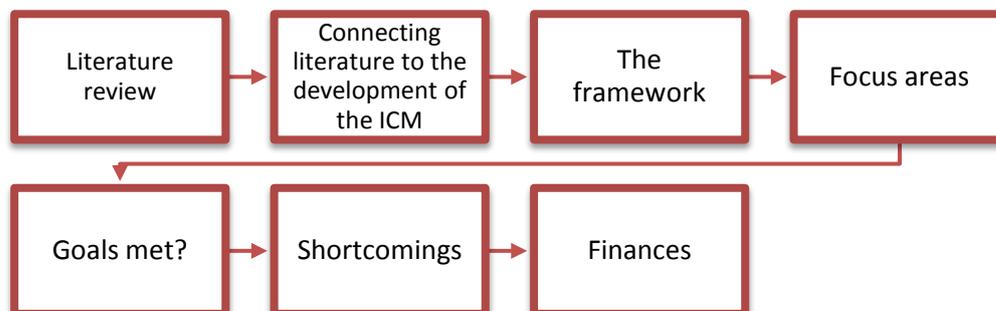


Figure 7.2 Chapter layout

The purpose of the model is to develop a way to empower the poorer part of the community in order to improve infrastructure and service delivery whilst positively contributing to the economy.

7.1 Literature review

The ICM is assembled by using the Habitat for humanity principles in order to address the problem areas identified in literature. The problem areas identified in literature are summarised in Figure 7.3.

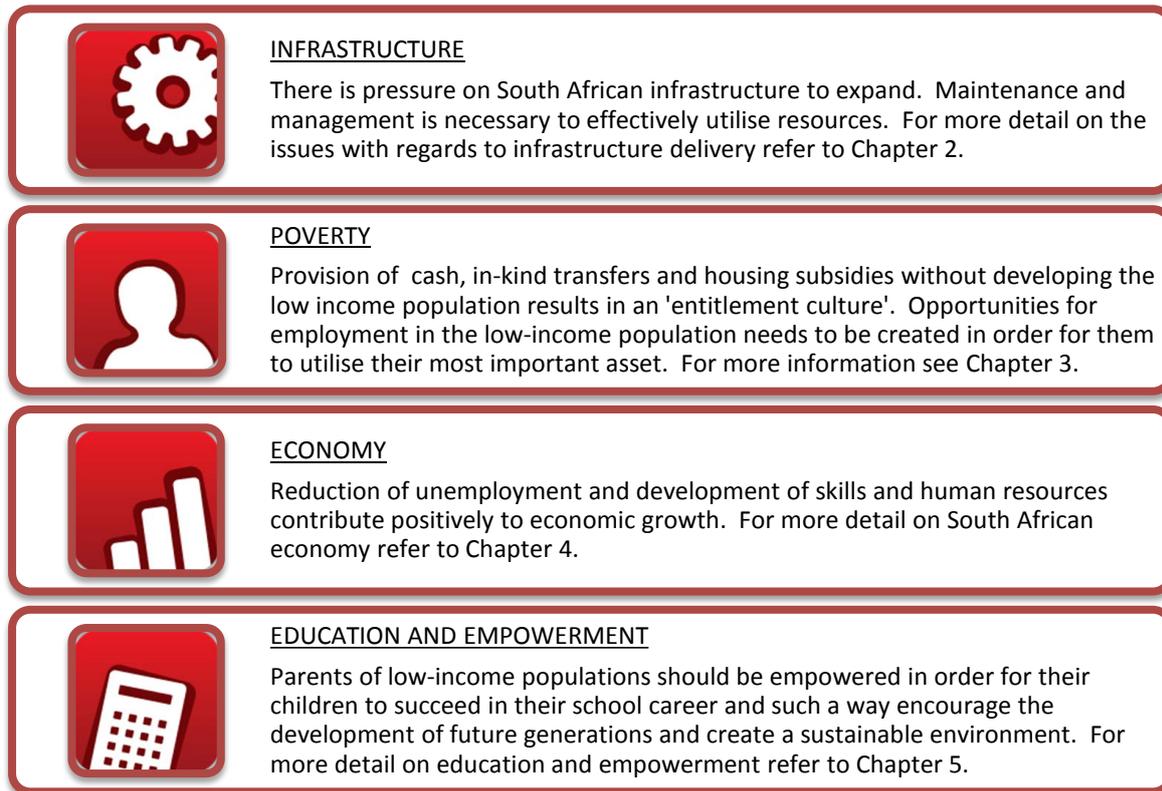


Figure 7.3 Literature review

Infrastructure of a country greatly affects the poverty levels and economic growth and vice versa. Education/empowerment assists in the reduction of poverty and positively contributes to the economy.

A conceptual model is developed around the problems that surfaced during the literature study.

7.2 Development of Conceptual Model.

Habitat for humanity successfully empowered their partners, therefore the basic principles will be used to develop a concept model that would result in infrastructure delivery, but also to create a sustainable environment through empowerment of the poor.

The problems identified in Chapter 2 are that the management of infrastructure is not satisfactory. Administration and billing of accounts are inefficient. Furthermore, complaints in different

municipal areas were recorded of undelivered services, mainly referring to poor delivery of water and electricity in disadvantaged areas.

The target group of the model is people that are unemployed due to being uneducated, untrained, or have given up hope of being employed. As part of the proposed model, it is proposed that the persons will be entitled to apply for an opportunity for employment, but first need to do three months of community service (approximately 200 hours) to show their commitment and willingness.

The individual then continues with community service for the remainder of the year and receives education and training as compensation. After a year financial compensation is given to community service being done and the individual has the opportunity to excel and take the role on of the overseer. The role of overseer is accompanied with an increase in compensation. He/she is responsible for overseeing the work done by the entrants. Refer to Figure 7.4 for a concept of the model.

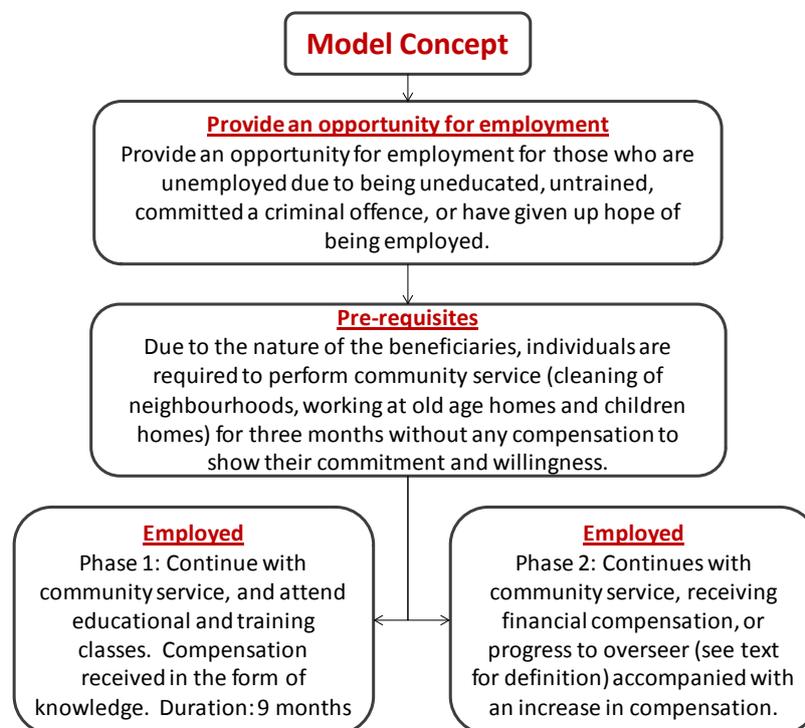


Figure 7.4 Development of model on the basis of problem areas identified in literature

Ideally the individuals must apply for employment, but it is recommended to make the model compulsory for individuals receiving housing subsidies at commencement to test its validity. The three months community service without compensation should be done prior to receiving a house. It is also recommended that the work of the overseer be done by volunteers at start-up.

The model would be further developed and explained in the following sections. The concept model is referred to as the Infra-Connect Model (ICM) from this point onwards.

7.3 Infra-Connect Model: Goals and Framework

The ICM gives a way to include the BoP in infrastructure and service delivery and at the same time improving the economy. The goals and the framework of the ICM are presented next.

7.3.1 Goals

The goals of the ICM are in line with the challenges South Africa face (section 1.2.3) and the desired outcomes of the strategic management exercise (section 6.3) and aim to address the problem areas identified in literature.

The primary goal of the ICM is to create a sustainable environment to deliver infrastructure. Issues that are addressed in accordance with the ICM are those presented in this thesis. From the end-of-chapter-summaries it can be concluded that a sustainable environment for the delivery of infrastructure is not possible in light of persisting poverty and inequalities (Chapter 3), unemployment (Chapter 3 and 4), uneducated low-income population (Chapter 5), and absence of social capital (Chapters 4 and 5). The proposed ICM aims to address these issues. Figure 7.5 illustrates the goals that the ICM wants to accomplish.



Figure 7.5 Goals of the proposed ICM

The goals of the ICM are focussed on assisting in maintenance and development of infrastructure; community development; empowerment of the poor; involving the poorer part of the community in economic activities; and improve the quality of life among South Africans, especially the low income population. Each goal will be briefly discussed and the chapter that it is derived from will be given.

1. Adequate infrastructure that results in social inclusion (Chapter 2).

In chapter 2 protests were recorded due to unsatisfactory service delivery. The low-income population is most effected and as a result they are marginalised. The poor service delivery further fuels inequality. Investment should be made in new and existing infrastructure and services.

2. Integrated South African society (Chapters 2, 3, 4 and 5).

The vast income inequalities, levels of poverty and unemployment, and disparities between different ethnic groups evident in chapters 2-5 result in a divided society. Therefore there should be a focus on nation and community building. Development of human resources through the development of human and social capital is just one of the ways to foster nation and community building.

3. Increased percentage of employed South Africans (Chapter 4).

Employed South Africans contribute to the economy and assist in the investment in infrastructure. An increase in resources and a decrease in dependency are associated with an increase in employed South Africans. Unemployment in South Africa is a major concern. It hinders nation and community building, it affects the quality of life of those affected by unemployment and most of all, it restrains South Africa to excel and grow economically.

4. South Africa's growth path should be more labour intensive (Chapters 3 and 4).

South Africa's growth path is more resource intensive, which exclude the majority of the population, especially with the increase in technology, where machines can perform the work previously performed by people more efficiently. There should be a focus on a more knowledge base labour absorbing economy. Labour is the urban poor's most valuable asset and it should be used in order to reduce unemployment, eliminate poverty and reduce inequalities.

5. Shorter distances between the workplace and the residence (Chapter 2 and 3)

In chapter 3 it became evident that the vast distances that the low income population has to undertake results in a feeling of being marginalised. They struggle to take part in the economic activities. They are reliant on public transport and often they cannot rely on public transport to get them to work on time. Where the distances between the workplace and the residence cannot be shortened there should be a focus on more reliable public transport.

6. Reliable public services (Chapter 2 and 6).

Reliant public transport is important as mentioned in goal 5. Chapter 2 revealed the unsatisfactory service delivery (mainly water and electricity). There should be a focus on quality public service.

A framework will now be developed that aims to accomplish the goals set out in this section.

7.3.2 Framework

The Infra-Connect Model has two phases. The first phase focuses on the empowerment of the low-income individual. The principles of the habitat model would be applied in this phase. The second phase focuses on involving the individual in South Africa's economic activities. The two phases are:

- Empowerment
- Employment creation

First the low income individual should be empowered, and then an employment opportunity is provided where he/she can take part in the economic activities (section 6.2.9).

7.3.2.1 Empowerment

The unemployed should be empowered to be employed. As stated earlier in this chapter the unemployed could apply for employment and then enter the program of empowerment and employment, but for the commencement of the model, it is recommended that it should be compulsory for individuals receiving housing subsidies. In this way the validity of the model can be tested. A portion of the unemployed/low-income population could be reached and results could be measured. The proposed process of empowerment is as follows:

- A requirement of 200 hours (approximately three months), without compensation, of community service must be fulfilled prior to receiving a subsidised house.
- Subsequent to receiving the house community service must be continued and a small compensation will be received. Educational/training classes and meetings must be attended.

Community service can be done within the following categories (Table 7.1): Water and electricity; Public transport; Sanitation and waste disposal; Road infrastructure and Municipal administration. The specific categories were chosen based on the literature provided in chapter 2. The focus should be on improving the quality of infrastructure in these categories and maintaining the existing infrastructure.

Table 7.1 Community service

Water and electricity	Public Transport	Sanitation and waste disposal	Road infrastructure	Municipal administration
In the case of unsatisfactory provision of water and electricity it is required that the water and electricity provision be upgraded and maintained (training is important in this regard).	Required to take part in scheduling and the implementation of the schedule.	Sanitation and waste disposal services in urban poor communities are unreliable. Required to remove the waste and keep the community area clean.	Required to take part in the construction process of upgrading road infrastructure in low-income communities as well as perform maintenance on existing road networks	Required to compile lists, collect payments check overstepping of water and electricity quotas, bills and arrear accounts

In the educational/training classes and meetings the participants must learn to work together in a group, learn work ethic, how to manage private finances and deal with issues with authorities so that trust, human capital and social capital can be developed (sections 2.3, 3.2.2, and 4.4). The importance of knowledge and the involvement in economic activities should also be addressed (Chapter 5). Specific training that is required in order to perform the community service effectively should be provided. Valid skills would be obtained in these sessions.

After the minimum requirement of a year of community service it is proposed that an individual qualifies to apply for being employed as overseer (overseeing individuals performing community service). The level of responsibility and the compensation increase.

7.3.2.2 Employment Opportunity

An individual qualifies for the second phase after he/she has successfully completed the first phase. The second phase focuses on utilising the empowered poor and encouraging them to be involved in South Africa's economic activities.

An individual qualifies for the next level of management (overseer) in the second phase if a certain amount of community service hours have been completed and an acceptable proportion of the weekly classes have been attended. He/she qualifies for the next level, but does not progress automatically yet. Progress to the next level is only possible if approval is given by the individual's peers and overseer.

The individual must be diligent, trustworthy and must contain leadership characteristics, substantiated by a report given by peers and overseer. Also training in leadership and communication skills must precede the promotion and it is advised that the team leader should be mentored and assessed during the first six months.

As the model progresses, it will also be necessary to employ an area manager who is responsible for a number of overseers, and if the model further expands an individual can be employed as zone manager who is responsible for the area managers.

The process is illustrated in Figure 7.6 (illustration of zone management is excluded).

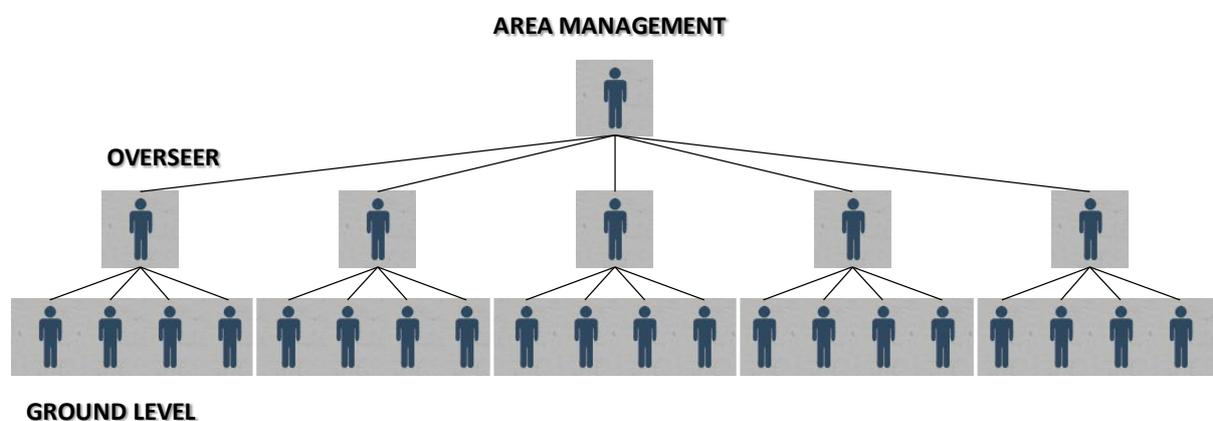


Figure 7.6 Employment creation model

It is recommended that the subsidy receivers commence their community service in their own neighbourhood and if progressing to overseer, that the first option is to oversee subsidy receivers also within their own neighbourhood.

7.3.2.3 Empowered, Employed

In the proposed model, individuals are empowered and employed. They can become confident, they can offer their skills and can also be employed in other industries and learn new skills. Empowerment of the poorer part of the community is accomplished by applying the principles of

habitat for humanity. Figure 7.7 shows how the problem areas identified in literature is addressed in the compilation of the ICM.



Figure 7.7 ICM addressed problem areas identified in literature

Table 7.2 presents a summary of how the goals are addressed.

Table 7.2 Goals addressed by ICM

GOAL	PROBLEMS AND CONSTRAINTS	HOW DID THE PROPOSED ICM ADDRESS THE PROBLEMS AND CONSTRAINTS?
1. Adequate infrastructure that results in social inclusion	Increased investment in new and existing infrastructure is lacking to meet South Africa's economic and social requirements. The lack of people and the systems involved to plan, design, build, maintain and operate complicated and expensive systems over a long period of time add to the lack of inadequate infrastructure.	<ul style="list-style-type: none"> • Community service • Increase in workforce, resulting in decrease in level of poverty resulting in increase in funds available for infrastructure investment.
2. Integrated South African society	Even though South Africa enjoys the infrastructure progress made since 1994 (section 1.2.1), the country continues to be divided. The division caused by apartheid produced deep issues with trust which adds to the society being divided. Trust is important in nation and community building . Therefore, it is necessary to build and maintain trust among social partners.	<ul style="list-style-type: none"> • Elimination of 'entitlement culture' • Elimination of inferiority complex • Development of self confidence
3. Increased percentage of employed South Africans	The rates of unemployment and underemployment are high in South Africa (only 41% of the working age population is working) which undermines South Africa's potential for economic expansion.	<ul style="list-style-type: none"> • Employment creation model • Empowered low income population

<p>4. South Africa's growth path should be more labour intensive</p>	<p>South Africa's economy is highly resource driven, relying on the exploitation of natural resources. The effect of exclusively relying on natural resources, and not focus on a more knowledge base, labour absorbing economy can be seen in the unemployment and low educational/skill levels.</p>	<ul style="list-style-type: none"> • Employment creation model • Empowered low income population
<p>5. Shorter distances between the workplace and the residence</p>	<p>Spatial (geographical) apartheid and unreliable public transport exclude the poor from economic activities.</p>	<ul style="list-style-type: none"> • Employment creation model • Empowered low income population
<p>6. Reliable public services</p>	<p>Reliable and affordable public transport is a necessity for the poor to make a living. Concerns have been raised about the quality of services and the level of variation in service delivery.</p>	

The success of the model and the extent to which problems are addressed will only be evident after implementation. Verification of how the ICM addressed the goals can only be done on the success observed through the habitat principles. The ICM will be validated against the Habitat case study (presented in section 8.1). The ICM can be presented as in Figure 7.8 in comparison with the habitat model (Figure 6.5)

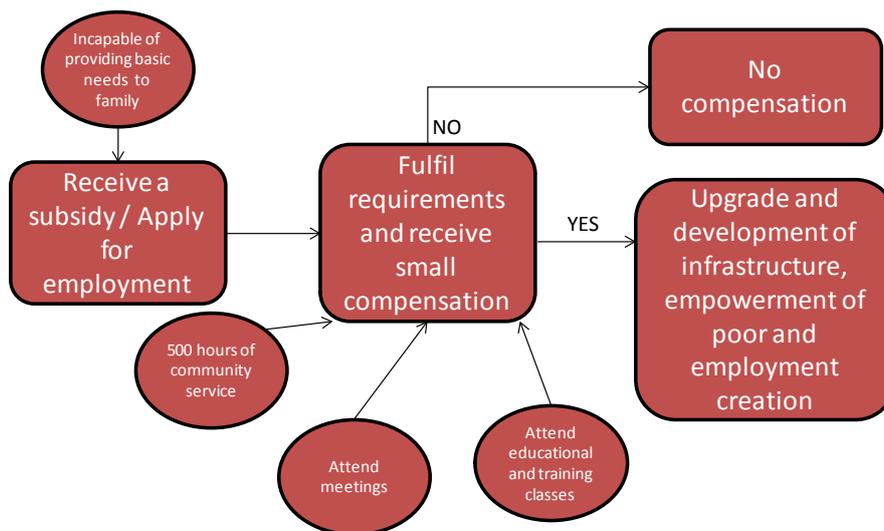


Figure 7.8 ICM illustration

There are still additional investigations that are necessary before full implementation that falls outside the scope of the investigation.

7.4 Additional investigations before and during Implementation

Theoretically the model adheres to the desired outcomes (goals) set out in Chapter 6. The success of practical implementation, however, should be accompanied by additional studies and constant monitoring and alterations to the model where necessary. The additional studies can be categorised in quantitative and qualitative investigations. The following quantitative studies should be done prior to implementation:

- Cost-to-benefit ratio analysis
- Long term financial benefit study (financial feasibility study)
- Operational cost study
- Develop Roll-Out-Plan/ Define tasks

The cost-to-benefit ratio exercise would analyse the cost associated with employing and training people to manage the implementation of the ICM. The cost associated with the employment creation model and the benefit of reduced unemployment rate, empowered low income population and economic growth must also be predicted and compared.

The long term financial benefit study would encompass the possible reduction in governmental grants and the reduction in municipal expenses due to the work that is being done.

The operational cost study would investigate the extra cost associated with the execution of the ICM. The time associated with the implementation as well as the extra personnel required should be specified.

The roll out plan of the ICM is very important. It should be determined what areas should be focussed on first and how the plan should be rolled out from there. Identification of areas and coordination of people and the different implementation stages should be done in collaboration with government and municipal management. After the roll out plan has been set up, the tasks and people responsible for the tasks should be defined.

Qualitative studies are more focussed on the perception of citizens. It would include the following:

- Focus groups/Acceptance by citizens
- Interviews
- Questionnaires

Focus groups, open to the public, should be held prior to and throughout the different implementation stages. The topic should be discussed with the help of a facilitator and the outcomes should be analysed by the project leader and alterations should be made, if necessary.

Interviews should be held with subsidy receivers after completion of the ICM. Interviews should also be held with their employers, municipal staff and the public to determine the attitude of the affected parties.

Questionnaires can be filled out to obtain the general feeling towards the ICM. Questionnaires should be filled out by the ICM partakers and municipal staff.

7.5 Possible Financial Implications

As this is just a concept for a model it cannot be said with certainty what the financial implications will be at this point of the research, it can only be speculated. As mentioned it is necessary to perform a cost-to-benefit ratio analysis and a financial feasibility study.

The aspect of governmental grants and cash and in-kind transfers were addressed in literature and the aim of the ICM, as mentioned is to effectively utilise the resources available and to efficiently manage the maintenance and development of infrastructure. It also aims to include the low-income

population in the economic activities, especially those that are excluded from social security (for more detail refer to sections 2.1.2 and 3.2).

It could also be proposed to make use of the Poverty Relief fund (refer to section 3.2 for more detail). The financial resources available for poverty alleviation will be utilised more effectively.

The assembly of the model was done around the problem areas identified in literature (Figure 7.3). If the governmental grants could be applied efficiently it can be expected that it would decrease, or, stagnate over time. If provision of subsidies could be accompanied by compulsory community service and the creation of an employment opportunity, it can be expected that it would positively affect economic growth. The effective billing system (community service done in municipal administration) would assist in paid services and the development of trust among citizens and the authorities.

It can further be speculated that the effective management of infrastructure development and maintenance would enable the payment of the overseers.

7.6 Summary

The proposed ICM can assist municipalities in the development and maintenance of infrastructure. Municipalities can then focus on their 'serving' role rather than the 'provision' role that they are currently performing. The model can assist government in poverty alleviation and the reducing of inequalities.

The proposed Infra-Connect Model is based on the principles of the successful Habitat Model with the add-on of an employment creation model. The approach is to first empower the poor, starting with those individuals that receive subsidies on the basis of the habitat model principles and then to provide an opportunity for employment.

It is expected that the outcome of the proposed model would result in an increase of the South African labour force and thereby reduce the unemployment rate. Positive economic growth and an increase in infrastructure delivery can be expected.

There is however a substantial amount of investigations still to be done before implementation of the proposed ICM as laid out in section 7.5.

8

VALIDATION

In this Chapter the proposed Infra-Connect Model is validated using a case study and a practitioner analysis.

8 Validation

The feasibility and accuracy of the research application and the proposed concept model is presented in this chapter. The ideal validation is to test the proposed concept model, document the findings and make amendments to the model. Unfortunately the preparation, implementation and duration of the model fall outside the timeframe of this thesis. The outcomes and the results of the Infra-Connect Model (ICM) can therefore not be measured in order to determine its feasibility. Due to the nature of the research, the practical testing and continuous assessment is therefore not feasible or practical.

This thesis will be validated against a case study and a practitioner analyses.

1. Habitat for Humanity(HFH) case study

HFH has successfully empowered the poorer part of the community by their model for housing provision. Its basic principles were applied in order to develop the Infra-Connect Model (ICM).

2. Practitioner analysis

The analysis takes the form of an interview-based assessment. Five practitioners from backgrounds that are applicable to this thesis were asked for their opinion in order to test the concept. After preparation for implementation through qualitative and quantitative studies it is recommended that the model be tested against a much wider audience.

The input from the case study and practitioner analysis added value to this thesis.

8.1 Habitat for Humanity Case Study

Habitat for Humanity (HFH) was introduced in Section 5.3.2. Habitat for humanity partners with community groups and they work on a project model basis, where the model is tailored to meet the specific needs of a homeowner group taking into account the environmental and social conditions associated with that group. Each individual is required to work and pay for his/her house. Approximately 500 hours of Sweat Equity and the repayment of the no-interest, no-profit loan is required.

Habitat homeowners have learned to be responsible and therefore are trustworthy. They have gained confidence and self worth in the process (section 5.4). They are empowered. The model (Figure 6.5) focuses on human development and empowerment of the recipients.

Habitat for humanity is in operation since 1976. Presented below is a list of public recognitions that Millard Fuller (the founder) received for the Habitat for Humanity non-profit organisation⁸³.

- In 2004, Fuller and Habitat for Humanity International received the World Methodist Peace Award from the World Methodist Council.
- In 2003, "The NonProfit Times" named Fuller its Executive of the Year. Fuller also received the T.B. Maston Christian Ethics Award that year.
- In 2002, Fuller and his wife were awarded the Bronze Medallion from the Points of Light Foundation in Washington, D.C., honouring their pioneering work in service.

- Fuller was also awarded the ‘Overcoming Obstacles’ award from the Community for Education Foundation in New York in 2002.
- He was named Georgian of the Year and received the Auburn University Lifetime Achievement Award.
- The Christopher Columbus Fellowship Foundation honoured Fuller with the Frank Annunzio award in 2000 for his lifetime achievement in public service.
- Fuller was also named one of the most influential people in homebuilding in the United States in the 20th century by “Builder” magazine and one of “20 Georgians Who Most Influenced the 20th Century” by the Atlanta Journal-Constitution.
- He was the recipient of a 1999 Jefferson Award from the American Institute of Public Service for Greatest Public Service Benefiting the Disadvantaged.
- “Professional Builder” magazine named Fuller Builder of the Year in 1995 and presented him with its first-ever Lifetime Achievement Award in 2003.
- In 1994 he and his wife were awarded the Harry S. Truman Public Service Award.
- He also received the Martin Luther King Humanitarian Award from both the state of Georgia and the King Centre.
- Fuller received more than 50 honorary doctorate degrees in fields such as law and public service for his leadership toward meeting the goal of eliminating poverty housing worldwide.

It can be concluded from the public recognition that the Habitat for Humanity achieved their goal of empowering the poor, benefitting the disadvantaged, and serving the community. Since its commencement Fuller wrote a number of books of which the first was published in 1997. In his most recent book, *More than Houses (2000)*⁸⁴, it was gathered from testimonies that Habitat for humanity, not only delivered houses to the poor, but accomplished the following:

- Building people
- Building relationships
- Breaking down barriers
- Bringing people together
- Promoting love and understanding
- Building and revitalising neighbourhoods
- Activating faith and planting hope in the hearts of people

The Futurist wrote in their *World Trends and Forecasts* section, *Helping People escape poverty*: “Unlike many recipients of ‘free’ government housing, the people who come to live in a habitat home feel a personal stake in its physical condition and in the well-being of the neighbourhood.”⁸⁵

The City Journal wrote that “habitat is becoming the biggest homebuilder in America and offers a program that draws on conservative ideals” in their summer 1995 edition. They also wrote that the result of the program is “Safe, clean neighbourhoods and low-income homeowners with pride and a stake in an orderly and prosperous community”.⁸⁶

Habitat for humanity transformed families and communities around the world, making a difference in the lives of children and adults. For more success stories of Habitat for humanity refer to section 5.4.3.

The ICM were developed using the principles of the habitat for humanity model.

Table 8.1 presents the differences and similarities between the Infra-connect model and the habitat model.

Table 8.1 Comparison between Habitat and Infra Connect Model

HABITAT	ICM
Open to any family	Compulsory for families receiving subsidies
Provide zero interest loans	Receive a subsidy
Sweat equity	Community Service
Attendance of meetings and educational classes	Attendance of meetings and educational classes
Loan servicing policy	No compensation
Receive a house	Employment opportunity

In South Africa it is desired that the low-income population take pride in their safe and clean neighbourhoods and strive towards an orderly and prosperous community. The habitat model proved to be successful. An empowered low-income population would result in reducing the inequality gap as well as the strain on government to provide for them. Therefore the application of the habitat model principles in the Infra-Connect model assisted in empowering the poor and thereby creates a sustainable South African environment with regards to an undivided society and improved delivery of infrastructure and public services.

The following practitioner analysis was conducted to test the research against the knowledge, experience and logical reasoning of the practitioners.

8.2 Practitioner Analyses

A practitioner survey was performed with the aim of identifying logical flaws and problems. A panel of practitioners were requested to answer questions with regard to the research application and proposed model. They were chosen on the basis of their profession and experience. For the purpose of this research and validation it was decided that in-depth discussions of the concept would assist in refining the idea and cancel out a wrong thought process. A small number of practitioners were chosen to give their insight.

The five practitioners that were interviewed and questioned have a thorough understanding of infrastructure, as well as the implications of development and maintenance in South Africa. Furthermore they also have a good understanding of the South African society, having worked with different ethnic groups. They have a desire to improve the living conditions of the poor and a hope to reduce inequality. Inclusion of a practitioner analyses in the validation process, tests the thought process, model compilation, and recommendations.

Each practitioner was interviewed to establish to what extent they agreed with the proposed model. They had to provide motivations for their answer. Table 8.2 present the practitioners, their background/occupation and reason for inclusion.

Table 8.2 Practitioners summary

Practitioner	Background/Occupation	Reason for inclusion
Hein Stander (HS)	Civil engineer who obtained his Professional Engineering registration. Works for BKS Ltd transport division (32 years). Member of the Transportation research Board.	Has a thorough understanding of municipal operations and performance. He participates in municipal activities and contributes to the maintenance of infrastructure by serving on his neighbourhood ward.
Aubrey Stevens (AS)	Civil engineer who obtained his Professional Engineering registration. Works in the engineering and housing department for Cape Winelands municipality	Serving as civil engineer in a districts municipality, he serves as an expert in the field of municipalities
Gerhaardt van Wyngaardt (GvW)	Consulting Engineer for 13 years. 2008 to present: working for the City of Cape Town in the transport network operations. Also obtained his Professional Engineering registration.	He works for the City of Cape Town and understands the legislation associated with the public sector.
Neo Tladinyane (NT)	Civil engineer. Worked for the Development Bank of South Africa. Director of PH Bagale Consulting for the last 16 years	Understands the effect of the economy and the role that the low income population plays. Grew up in Soweto
Brian Keogh (BK)	Grew up and studied in Ireland. Civil Engineer. Currently Site Agent for Grinaker-Lta (2009 to present)	Worked in Ireland (first world country) and in South Africa (middle income country).

A questionnaire was compiled and the practitioners were asked to what extent they agree with the different aspects of *Creating a sustainable environment to deliver infrastructure*. A personal introduction to the research project was given to Hein Stander, Aubrey Stevens and Gerhaardt van Wyngaardt after which they were interviewed and required to answer the questionnaire. A telephone based introduction was given to Neo Tladinyane and Brian Keogh after which the questionnaire was emailed to them, completed and returned.

8.2.1 Survey Questions

The questionnaire was drawn up to support the research questions as introduced in section 1.3.1. The research questions (RQ), defined in Chapter 1, are:

- 1) What obstructs the willingness of users to pay for infrastructure such as water, sewage and electricity? (RQ1)
- 2) What obstructs the willingness to contribute to the development and maintenance of infrastructure?(RQ2)
- 3) What roles do poverty and the receipt of government subsidies play in a person's willingness to pay for the use of infrastructure? (RQ3)
- 4) What is the relationship between the economy and infrastructure delivery? (RQ4)

- 5) What role does education play in a person's willingness to pay for the use of infrastructure? **(RQ5)**
- 6) Can the application of management tools and existing models assist in the improvement of municipal performance? **(RQ6)**

The survey questions (indicated by "SQ") are described under section 8.2.2 below. Table 8.3 displays the correlation between the research and survey questions.

Table 8.3 Correlation of Research and Survey questions

	RQ1	RQ2	RQ3	RQ4	RQ5	RQ6
SQ1	Directly addresses	Directly addresses				
SQ2			Directly addresses			
SQ3				Directly addresses		
SQ4					Directly addresses	
SQ5	Indirectly addresses	Directly addresses				

SQ = Survey Question; RQ = Research Question

The practitioners were asked to indicate to what extent they agree with the statements provided (1= not at all and 5= to a great extent) and to motivate their answer. In the next section the feedback from the practitioners are given, and their answers are analysed.

8.2.2 Survey Questionnaire and Feedback Analyses

The ratings of the practitioners are analysed with regards to the research questions (Table 8.4). For more detail on the practitioners' commentary refer to Appendix A.

Table 8.4 Survey questions and feedback

	Question 1: Infrastructure	HS	AS	GvW	NT	BK	Ave
1.1	To what extent do the public contribute to the performance of municipalities?	3	4	4	1	3	3
1.2	To what extent should the public take part in the delivery of infrastructure and service delivery?	4	4	3	4	4	4
1.3	To what extent do recipients trust the decisions, law enforcement and leadership of municipalities?	4	2	2	3	2	3
1.4	To what extent do non- payment of rates and taxes influence municipal performance?	2	4	5	5	5	4
1.5	To what extent does municipal performance obstruct the willingness to pay for infrastructure and services?	4	5	2	5	5	4
1.6	To what extent does management influence municipal performance?	4	5	4	5	5	5

Question 2: Poverty		HS	AS	GvW	NT	BK	Ave
2.1	To what extent do poverty and inequalities influence the performance of municipalities?	5	5	5	4	5	5
2.2	To what extent did implementation strategies fail due to expecting that the low-income population would respond in a similar way to that of the middle and high income population?	4	4	4	4	3	4
2.3	To what extent do government subsidies assist in poverty alleviation?	5	5	4	3	3	4
2.4	To what extent is government subsidies sustainable	2	2	2	4	4	3
2.5	To what extent do subsidies influence municipal performance?	3	4	4	3	5	4
2.6	To what extent can people living in poverty contribute to municipal performance?	4	4	5	3	3	4
Question 3: Economy		HS	AS	GvW	NT	BK	Ave
3.1	To what extent can the delivery of infrastructure contribute to economic growth?	5	4	5	5	5	5
3.2	To what extent can the development of human resources contribute to municipal performance?	5	4	5	5	5	5
3.3	To what extent can human and social capital contribute to infrastructure delivery?	4		5	5	5	5
3.4	To what extent can the development of human resources contribute to economic growth?	5	4	5	5	5	5
3.5	To what extent does the economy influence the people living in poverty?	5	4	5	4	4	4
3.6	To what extent do government subsidies contribute to economic growth?	3	3	1	3	4	3
3.7	To what extent can the empowerment of the low-income population contribute to economic growth?	5	4	5	5	4	5
3.8	To what extent does the economy contribute to the delivery of infrastructure?	5		5	4	5	5
Question 4: Education		HS	AS	GvW	NT	BK	Ave
4.1	To what extent does education influence the level of poverty?	5	4	1	4	4	4
4.2	To what extent does education contribute to the non- payment of rates and taxes?	4	3	4	5	4	4
4.3	To what extent does the education of parents contribute to the education of their child?	5		2	5	5	4
4.4	To what extent does education of the uneducated contribute to the management of municipalities?	4	5	5	5	3	4
4.5	To what extent are education and the economy correlated?	5	4	2	5	4	4
4.6	To what extent can the uneducated contribute to municipal performance?	2		5	1	4	3

	Question 5: Application	HS	AS	GvW	NT	BK	Ave
5.1	To what extent do you think can management tools such as strategic planning and decision-making assist in improving municipal performance?	5	4	4	4	5	4
5.2	Habitat for Humanity provides houses, but requires the recipients to assist in the building process and pay for the material by taking out a loan and repay it over 20 years. To what extent can the Habitat for Humanity model assist in the improvement of municipal performance?	4	3	4	3	5	4
5.3	Can the administration of municipalities such as collection of fees, manning of a call centre receiving complaints from citizens and improve the issue of non- payment, serve as employment creation?	4		3	3	5	4
5.4	If the attendance of educational classes is part of a proposed model that aims at empowering the poor, to what extent would this alleviate poverty and reduce dependency on government to provide for basic needs of the low-income population?	4	3	3	1	3	3
5.5	If people would perform community service and infrastructure maintenance, to what extent would the low-income population realize the value of infrastructure?	4		3	4	4	4
5.6	To what extent can unemployment be reduced by the opportunities proposed in the above questions?	4	3	3	2	4	3
5.7	To what extent can economic growth and the delivery of infrastructure be improved by addressing poverty, inequalities, unemployment and education?	5	4	4	4	4	4

The average rating of each question is shown in the last column of Table 8.4. The salient points of the practitioners' commentary on the Survey Questions are provided:

SQs 1: Infrastructure: To what extent does municipal performance relates to poverty and vice versa?

Public participation results in ownership and in taking responsibility. Municipalities tend to be managed on political imperatives rather than looking after the interests of residents. Service delivery suffers because of this. However, municipalities must have effective billing and collection systems. Correct billing is critical with regards to the willingness of users to pay.

One practitioner disagrees with the fact that non-payment of rates and taxes influence municipal performance. He argues that the high income population support, and have an understanding, of the low-income population.

Aubrey Stevens (Cape Winelands Municipality) however said that if a high percentage of users do not pay, or cross subsidisation is not in place for services, the municipalities cannot budget for maintenance or upgrades. Municipalities that have not a policy in place for developers to pay for infrastructure struggle to maintain or budget for upgrades because of the huge costs involved. Not enough income from users.

Conclusion: If the public chooses not to comply with rates and taxes, it inhibits the delivery of infrastructure. The extent to which public can participate depends on management.

SQ 2: Poverty and the effect of subsidies

Poverty and inequalities influence the performance of municipalities, because they cannot operate without money. There are high claims on government. Government provide in the form of grants and transfers (subsidies). Government assist to some degree in the alleviation of poverty. Subsidies is necessary, but should be kept to a minimum, it is not sustainable. Subsidies should always be a short-term intervention, to stimulate self sustainability. However subsidies can be counterproductive in that it can encourage reliance on it and discourage improved performance.

Conclusion: Municipalities need to understand the demographics and income distribution in their municipal area, and design effective systems to balance service delivery and collection of revenue.

SQ3: The relationship between economy, infrastructure and poverty.

Infrastructure fosters economic growth and vice versa. A well performing economy will create funding necessary for infrastructure delivery. People should be trained and employment opportunities should be created. It would result in more economic activity.

High demand for subsidies (as a result of high levels of poverty) inhibits economic growth.

Conclusion: There is evidence (China and India) that the development of human and social capital can contribute to economic growth.

SQ4: The effect of education on poverty and the economy and indirectly on infrastructure delivery

The general motivation is that educated and trained people understand the system and it is expected that they would be self-reliant. Being educated, people will have a better understanding of taxes and the economy.

Education results in that the officials and public can better participate and communicate.

Conclusion: The economy however, plays a bigger role than education, for if educated, the global economy can inhibits one to take part in economic activities.

SQ5: Can the application of management tools and the principles of a successful model assist in addressing the level of poverty and education in order to create a sustainable environment to deliver infrastructure.

The application of management tools help in understanding the situation. Management tools can assist in determining where resources should be allocated in order to make a significant difference. Management tools can assist in improving municipal performance, but the success lies in the implementation.

The proposed model could result in a reduced unemployment rate and the application of the Habitat for Humanity model principles would be appropriate in removing the 'entitlement culture'.

Conclusion: By addressing poverty, inequalities, unemployment and education would contribute to the delivery of infrastructure.

Originally the aim of the model was to exclude the provision of subsidies. After the practitioner analysis it was concluded that the provision of subsidies does alleviate poverty to some extent. The model was then adjusted to incorporate the findings of the practitioner analyses. Furthermore an employment creation model was added. The name of the model then changed to the Infra Connect model from Housing Provision Model and the employment creation model was added.

As mentioned the concept for a model needs to be tested against a wider audience. Focus group meetings should be held, interviews should be carried out and questionnaires should be completed by the affected parties. The next step should then be to present the proposed ICM to the commissioners of the National Planning Commission and after amendments are made on recommendation from the commissioners it should be presented to government to obtain their consent. The qualitative studies and a continuation of the quantitative study can then proceed.

8.3 Summary

The purpose of the thesis was to investigate a potential concept of a model that can be used to empower the poor and thereby create a sustainable environment to deliver infrastructure. A comprehensive validation of the model can only be performed when the concept is introduced in a community therefore this chapter presents the results of a validation of the concept.

The concept validation was done by the Habitat for Humanity case study and a practitioner analysis.

The Habitat for Humanity case study shows that the application of the Habitat for Humanity principles has potential to be successful. The successful outcomes of the Habitat Model are what the proposed Infra-Connect Model strives to accomplish. As a result of applying the HFH principles, it is expected that the poor would be empowered, be self-reliant, improve their living conditions and confidently take part in the economic activities.

Although only a small number of participants were approached, the practitioner analysis indicated on average that the practitioners agreed to a great extent with the research application and goals of the proposed model. Comments on the proposed concept model are amongst others:

- Unemployment rate would be reduced
- The success lies in the implementation
- Principles of Habitat for Humanity are appropriate for the elimination of the 'entitlement' culture

Once all the details of the actual model has been investigated and formulated as pointed out in Chapter 7.4, then the model can be applied on a trial basis in a community for validation.

9

CONCLUSION

In this section the thesis is concluded.

9 Conclusions and Recommendations

The aim of this thesis was to investigate the possibility of creating a sustainable environment for infrastructure delivery. The purpose of this final chapter is to conclude the thesis under the following headings.

- **RESEARCH SUMMARY:**
A summary and how aspects of the research are addressed in the various chapters are provided.
- **THE RESEARCH CONCLUSION WITHIN THE CONTEXT OF THE RESEARCH QUESTIONS:**
The research questions will be analysed against the supporting documentation provided in the thesis in order to determine if the hypothesis proved to be true.
- **CONCLUDING REMARKS AND RECOMMENDATION FOR FUTURE WORK:**
The thesis will be concluded and possible future work will be presented.

9.1 Research Summary

Currently the environment for infrastructure delivery in South Africa is unsustainable. Governmental grants, cash and in-kind transfers and subsidies are being provided, but development of human resources is neglected. In many cases this result in an 'entitlement culture'. As a consequence government must continue to provide financial support. Furthermore, investment in capital is hindered. In this environment it can be expected that economic growth would be restrained.

Municipalities are under constant pressure to deliver infrastructure in the face of prevalent unemployment where poverty-stricken (indigent) households are entitled to free basic services. Municipalities are short in experienced office staff and lack expertise in the management of infrastructure and public service delivery.

Poverty and infrastructure are interlinked. Poverty exists due to a lack of infrastructure and a lack of infrastructure is evident due to the level of poverty evident in a community. The inability to provide sufficient employment in South Africa for the growing labour force and the unevenness of the skills distributed within the labour force inhibits positive economic growth which also restrains investment in new and existing infrastructure.

The empowerment of the low-income population through education and/or training would potentially reduce the poverty levels and degree of unemployment. The empowerment of the low-income population, in collaboration with economic growth, would alleviate burden of executing the responsibilities of municipalities and in turn would result in better municipal management.

Table 9.1 shows how the different chapters that addressed the subjects which formed the basis of the research (section 1.2.3) followed by a description of each aspect of the research approach.

Table 9.1 Research approach as it is addressed in the thesis Chapters

		THESES CHAPTERS								
		1. Introduction	2. Infrastructure	3. Poverty	4. Economy	5. Education and Empowerment	6. The Approach	7. The Proposal	8. Validation	9. Conclusion
RESEARCH APPROACH	1	Identification of the general purpose and justification of the research	✓							
	2	Identifying room for improvement and opportunities for infrastructure delivery	✓	✓						
	3	Presentation of the background and literature study		✓	✓	✓	✓			
	4	Synthesis of literature		✓	✓	✓	✓	✓		
	5	Development of a model to assist in creating a sustainable environment to deliver infrastructure					✓	✓	✓	
	6	Validation of the model							✓	
	7	Research conclusions								✓

- **Identification of the general purpose and justification of the research**

The general purpose and justification was identified during the attendance of the Construction Management Programme (CMP) in 2011 presented at Stellenbosch, and by the National Planning Commission's (NPC) Diagnostic Report. The identification of the general purpose and justification of the research is presented in Chapter 1.

- **Identifying room for improvement and opportunities for infrastructure delivery**

Room for improvement was identified upon understanding the South African context in the global economy (made possible by Andre Roux, *Everyone's guide to the South African economy*) and the problem areas identified in literature. Identifying room for improvement and opportunities for infrastructure delivery are presented in Chapters 1 and 2.

- **Presentation of the background and literature study**

The presentation of the background and literature study is done in Chapters 1 to 5.

- **Synthesis of literature**

The synthesis of the literature is done in collaboration with the presentation of the background and literature study (Chapters 1 to 5) and a summary of the synthesis is provided in Chapter 6. The literature is further analysed using the Strategic Planning and decision-making exercise proposed by Illbury and Sunter (Chapter 6). A literature review is presented in Chapter 7.

- **Development of a model to assist in creating a sustainable environment to deliver infrastructure**

The development of the proposed Infra-Connect model is done on the basis of the background and literature study. The room for improvement identified in the literature study is integrated into the design of the proposed concept model. The model aims to address the challenges identified by the NPC diagnostics report and thereby to create a sustainable environment to deliver infrastructure.

- **Validation of the model**

The proposed concept model is validated in Chapter 8. The success of the Habitat for Humanity model, and a limited survey involving industry practitioners are used to validate this thesis.

- **Research conclusions**

This Chapter (Chapter 9) concludes the research

The purpose of this thesis was to propose a model assisting in infrastructure and service delivery. This is done through the empowerment of the poor, provide an opportunity for employment and positively contribute to economic growth.

9.2 Research Conclusion within the context of the Research Questions

The primary objective of this thesis was to develop a model that would assist in the creation of a sustainable environment for infrastructure delivery by integrating aspects of poverty alleviation, positive economic growth and quality education.

The secondary objective of this thesis is to empower the poor and involve them in the economic activities. From the objectives the hypothesis was drawn.

High unemployment rate and increasing inequalities inhibit the creation of a sustainable environment for the delivery of infrastructure. Participation and empowerment of the low-income population would have the opposite effect.

The objectives and hypothesis led to the author asking questions that would direct the research to the development of a proposed concept model and thus create a sustainable environment. The research questions were presented in section 1.2.1. In order to reach a conclusion as to whether the research questions were sufficiently addressed and whether the hypothesis proved to be true, the conclusion of each research question would be presented.

1. What obstructs the development and maintenance of infrastructure?

Conclusion: Insufficient payment for infrastructure and services as well as the absence of trust in low income communities inhibit the development and maintenance of infrastructure. High unemployment rate and vast inequalities in South Africa also contributes to the lack of infrastructure development and maintenance. (Chapters 1 and 2)

2. What role does government play in the delivery and maintenance of infrastructure?

Conclusion: Government performs a service role in which it provides governmental grants to develop and maintain infrastructure (especially in the low-income communities). Government should play a representation role and should focus on empowering the poor to be self-sufficient. (Chapter 2)

3. What role do poverty, unemployment and the receipt of government subsidies play in the effective delivery of infrastructure?

Conclusion: Poverty, unemployment and the receipt of government subsidies inhibits the effective delivery of infrastructure. The provision of subsidies and governmental grants reduce the amount available to spend on capital and therefore it restrains economic growth which leads to ineffective delivery of infrastructure. The effect of poverty and unemployment can be seen in that only the top 10% of households (in terms of income) are responsible for the delivery of infrastructure (through the payment of taxes). (Chapters 3 and 4)

4. What is the relationship between the economy and infrastructure delivery?

Conclusion: A growing economy ensures effective delivery of infrastructure and effective infrastructure ensures a growing economy. (Chapter 4)

5. What role does education and human resource development play in the level of poverty and the economic growth that would assist in the development of a sustainable environment to deliver infrastructure.

Conclusion: Education, training and human resource development reduces the level of poverty and in the long term promotes positive economic growth. (Chapter 5)

6. Can the analysis of existing models and the development of the proposed Infra-Connect Model assist in creating a sustainable environment to deliver infrastructure?

Conclusion: The analysis of the Habitat for Humanity model, in which the poorer part of the community is empowered through resource development, assisted in the formulation of the proposed Infra-Connect Model. The application of Strategic Planning and Decision-Making tools also assisted in understanding the current environment and the way forward. The proposed Infra-Connect model was then constructed on the basis of the desired outcomes as identified in the Strategic Planning exercise.

Refer to Chapter 8 for more details on how the research questions were validated. The research questions have been answered satisfactorily, and a conclusion can be drawn that the hypothesis can be confirmed as true.

9.3 Concluding Remarks and Recommendation for Future work

Following the literature study, a strategic planning and decision making tool was used to analyse the current environment and to develop a strategy to move from the current unsustainable environment to a sustainable environment for infrastructure delivery. A SWOT analysis was performed and opportunities were identified. From the opportunities an option and desired outcomes were identified. The desired outcomes were formulated to address the challenges presented in the NPC diagnostics report.

The principles of the Habitat model were used for the development of the Infra-Connect model, designed to create a sustainable environment for infrastructure delivery. The Infra-Connect model is designed in such a way that less privileged is empowered through education, skills training, and

participation in infrastructure operations. They then have an opportunity for employment and get involved in the economic activities of South Africa. In this way, a sustainable environment is ultimately created.

The concept for the proposed model was tested using a practitioner survey. The practitioners agreed that the concept model would reduce unemployment and remove the 'entitlement' culture. They emphasised the fact that the success lies in the implementation. The feedback was favourable. It is however recognized that a substantial amount of work still needs to be done in order to formulate the practical implementation of the model. Qualitative (focussing on the financial aspects) and quantitative (focussing on the impact on the community) studies should be conducted and amendments to the model, if necessary, should be made (see section 7.5 for more detail).

Possible future work includes (excluding the additional work still to be done before implementation):

- Expansion of the Infra-Connect Model into rural communities
- Inclusion of entrepreneurship principles in the Infra-Connect Model would further assist in positive economic growth.
- The usage of vouchers instead of compensation in the first phase of the Infra-Connect model, where the vouchers can only be used for necessities.

APPENDIX A



Commentary of Practitioners

The commentary of the practitioners is presented in this Appendix. The commentary of each survey question is provided. The survey questions related to the topics as follows:

- SQ1: Infrastructure
- SQ2: Poverty
- SQ3: Economy
- SQ4: Education
- SQ5: Application

The commentary of the practitioners is in line with the research application. Table A1 provides the commentary from Hein Stander, Table A2, Aubrey Stevens, Table A3, Gerhard van Wyngaardt, Table A4, Neo Tladinyane, and Table A5 Brian Koegh. Aubrey Stevens were assisted by Mr F Rhoda who is a senior official for the department of housing at the Cape Winelands Municipality, Stellenbosch.

Table A1 Commentary of Hein Stander

Survey questions	Commentary
SQ1	There is a direct address between management and the performance of municipalities, and a fine balance between the public and management with regards to the performance of municipalities. He agrees that through participation the public would take responsibility and ownership of infrastructure. Furthermore he disagrees with the effect of non- payment of rates and taxes on municipal performance. The high income population support, and have a understanding, of the low-income population
SQ2	He states that poverty and inequalities influence the performance of municipalities, because they cannot operate without money. High claims on government results in subsidies not being sustainable. The low-income communities can contribute to municipal performance by not vandalising.
SQ3	Infrastructure delivery fosters economic growth, and on the other hand if the economic growth is possible there is again money for the delivery of infrastructure and more opportunities. Subsidies influence economic growth. There will always be subsidies to some extent, but there is a trade off, high demand for subsidies will inhibit economic growth.
SQ4	The general motivation is that educated and trained people understand the system and it is expected that they would better manage. He also agrees in that educated parents value the education of their child to a great extent.
SQ5	The application of management tools help in understanding the situation. He agrees it is better that people take responsibility for their situation. He also agrees that the proposed model could result in a reduced of unemployment rate.

Table A2: Commentary of Aubrey Stevens

Survey questions	Commentary
SQ1	<p>If a high percentage of users do not pay or cross subsidising is not in place for services the municipalities cannot budget for maintenance or upgrades.</p> <p>For the lower income population rates are very high as confirmed by the media with continuous blocking of roads by these communities to try and highlight their plight for houses and basic services and/or quality service delivery.</p> <p>Reality is that those municipalities that have not a policy in place for developers to pay for infrastructure they (the municipalities) struggle to maintain or budget for upgrade because of the huge costs involved. Not enough income from users</p>
SQ2	<p>Income from property tax and water and electricity and other services not enough for expensive upgrades especially towards water and sewerage plants. Lack of proper budgets for maintenance is a serious problem at most municipalities.</p> <p>People living in poverty can assist with maintenance of the infrastructure for example the Employee Welfare West Programme (EWP) for road maintenance where skills (other than road maintenance activities) also form part of the road maintenance tender (life skills, etc)</p>
SQ3	<p>Mobility or movement is critical for economy growth, therefore need to protect such corridors (movement of people and goods) EWP programme deliver and maintain road infrastructure but also provide an opportunity to give the community education in other skills (not only life skills) relating to other business opportunities other than roads.</p> <p>Need a growing economy to create business opportunities or to give an income to these communities.</p>
SQ4	<p>If people do not understand the tax structures and different level of governmental structures responsible for different services it is logic that payment of such services could be problematic - on the other hand, during economic recession periods education will make no difference if people cannot find work.</p> <p>Education needed to: create the skills to budget properly to run a business, to see business opportunities , etc</p>
SQ5	<p>Industrial development plans and Strategic planning of District Municipalities must incorporate the needs of local municipalities to ensure planning on a local level is coordinated on a district level and then to be presented to provincial and then national level</p>

Table A3: Commentary of Gerhard van Wyngaardt

Survey questions	Commentary
SQ1	<p>Management influence the performance of municipalities and results in government making poor decisions due to poor management.</p> <p>If the public chooses to non-comply with rates and taxes, it inhibits the delivery of infrastructure.</p>
SQ2	<p>Subsidies is necessary, but should be kept to a minimum.</p> <p>People living in poverty can contribute to the performance of municipalities in that they take responsibility for their area.</p> <p>Studies have shown that for every R3, R2 is being spent on maintenance and repair.</p>
SQ3	<p>He agrees that the economy plays a major role in the delivery of infrastructure and on the other hand infrastructure enable private sector to deliver that in turn contribute to economic growth.</p> <p>Subsidies are basically a survival mechanism and not a growth mechanism.</p> <p>Meer economic growth , greater rates base (in terms of taxpayers)</p>
SQ4	<p>Education contributes to the non- payment of rates and taxes in that the public understand.</p> <p>Education results in that the officials and public can better participate.</p> <p>The economy however, plays a bigger role than education, for if educated the global economy can inhibits one to take part in economic activities</p>
SQ5	<p>Management tools can assist in determining where resources should be allocated in order to make a significant difference.</p> <p>The Habitat for Humanity model would be appropriate in removing the 'entitlement culture'</p>

Table A4: Commentary of Neo Tladinyane

Survey questions	Commentary
SQ1	<p>He argues that the public do not influence the performance of municipalities in that municipalities tend to be run on political imperatives rather than looking after the interests of residents. Service delivery suffers because of this.</p> <p>Non-payment cripples the municipality and makes service delivery difficult for municipalities. It is important however to note that municipalities must also have effective billing and collection systems</p> <p>Correct billing is critical with regards to the willingness of users to pay</p>
SQ2	<p>Municipalities need to understand the demographics and income distribution in their municipal area, and design effective systems to balance service delivery and collection of revenue. Cross subsidisation policy will be informed by such information.</p> <p>Subsidies should always be a short-term intervention, to stimulate self sustainability. However Subsidies can be counterproductive in that they can encourage reliance on them and discourage improved performance.</p> <p>People living in poverty put a strain on municipalities</p>
SQ3	<p>Good infrastructure encourages investment, and attracts business. This can only be good for the economy.</p> <p>It is simple: provide people with skills = better opportunities = employment = more economic activity.</p> <p>A well performing economy will create funding necessary for infrastructure delivery</p>
SQ4	<p>Uneducated people are generally not employable, and therefore cannot pay for services</p> <p>Skilled personnel = effective service delivery = improved municipal performance</p>
SQ5	<p>Municipalities must have strategic plans for: effective service delivery, improve economy, revenue collection.</p> <p>Habitat for Humanity is a short tem intervention.</p> <p>He argues that there are better interventions. Provide free education, create employment opportunities and then poverty will be reduced.</p>

Table A5: Commentary of Brian Keogh.

Survey questions	Commentary
SQ1	<p>The non- payment of rates and taxes influence the performance of municipalities to a great extent.</p> <p>The extent to which public can participate depends on management.</p> <p>Unfortunately corruption is still evident.</p>
SQ2	<p>The provision of subsidies influences the performance of municipalities to a great extent, but there will always be subsidies to some extent and in that government assist to some degree in the alleviation of poverty.</p>
SQ3	<p>China and India provides evidence that the development of human and social capital can contribute to economic growth.</p> <p>Infrastructure and the economy are closely interlinked.</p>
SQ4	<p>Being educated, people will have a better understanding of taxes and the economy.</p>
SQ5	<p>Management tools can assist in improving municipal performance, but the success lies in the implementation.</p> <p>By addressing poverty, inequalities, unemployment and education would contribute to the delivery of infrastructure.</p>

10

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