THE ROLE OF URBAN AND ENVIRONMENTAL PARAMETERS IN SUSTAINABLE DEVELOPMENT AND FUTURE GROWTH OF SMALL TOWNS:
PARYS – A CASE STUDY

By

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DECLARATION

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I, Lee-Anne Dreyer (2011108103) hereby declare that this mini-dissertation is my own work and that it has not been submitted for any other degree, at the UFS or any other University or any higher education institution, and that all the resources that I have used or quoted are indicated in the text and acknowledged in the list of references.

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ABSTRACT

Small towns in South Africa play a vital role as support and service centres for rural development. Current discussions on sustainable development relate to the dynamicism of small towns. Existing literature on sustainable development accentuates that the majority of sustainability problems and sollutions linked to sustainable development originate at local levels. Local governments of small towns interact very closely with residents, and play an important role in promoting sustainability. Many small towns struggle with environmental management and experience development challenges. The small town of Parys in the Free State was chosen as the focus of this study. Parys is known for its location and characteristics as a tourist destination and important service centre for rural areas and surrounding towns. Parys has several urban environmental management issues which can limit future growth and development. This study will evaluate the growth of Parys, and the town will be evaluated in terms of sustainability. A case study approach was adopted to investigate the current state of sustainability in Parys. The perceptions and concerns of business owners and stakeholders of their immediate urban and natural environment were determined using two semi structured questionnaires. An in-depth literature study was conducted to investigate sustainable development and determine the best suited sustainability indicators to be used in the surveys. Sustainability indicators derived from the Sustainable Cities International, 2012 were used during the sustainability evaluation. Data obtained was statistically analysed using IBM SPSS Software. The results obtained from the surveys and the sustainability evaluation of Parys, were used to identify main problem areas. The results indicated that Parys is currently unsustainable with various urban and environmental issues. Recommendations were then formulated to improve the current situation. An integrated sustainability data base with the necessary parameters for each sustainability indicator is needed and could assist the NLM and other local municipalities in South Africa to determine their state of sustainability. This study will also set the stage for follow up studies and evaluations of other small towns using sustainability indicators.

Keywords: Sustainable development, sustainability indicators, natural environment and businesses, urban environmental management, integrated environmental management, infrastructure and the environment, integrated town planning.

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LIST OF ABBREVIATIONS

DEAT	Department of Environment Affairs and Tourism
FDDM	Fezile Dabi District Municipality
GVA	Gross Added Value
IDP	Integrated Development Plan
LED	Local Economic Development
MDG	Millennium Development Goal
MTSF	Medium Term Strategic Framework
NFSD	National Framework for Sustainable Development
NGO	Non-Government Organisation
NLM	Ngwathe Local Municipality
NSTSI	National Small Town Sustainability Indicators
RSA	Republic of South Africa
SAVE	Save the Vaal Environment
SCI	Sustainable Cities International
SMME	Small Micro and Medium Enterprises
STATS SA	Statistics South Africa
UFS	University of the Free State

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CHAPTER 1: INTRODUCTION

1.1 Introduction

One of the most significant current discussions in sustainable development relates to the dynamicism of small towns. This is supported by the recent (2013) research symposium held at the University of the Free State with the theme; Towards dynamic small towns. Small towns in a South African context help maintain and support rural development. They also act as support systems for rural services. Parys complies with the criteria set by the research symposium held at the University of the Free State with the theme; Towards dynamic small towns (2013) which combines four componets in their definition for small towns. These components are the following; the populalation, the stand alone status of small towns – thus not being part of a metropolitan area, the fact that small towns have a definite rural hinterland and that they act as important service centres to the local and rural areas (Towards dynamic small towns, 2013). When looking at Parys in terms of the entire Free State along with the four components set out by the reasearch symposium, Parys can be classified as a small town. Current literature on sustainable development and sustainability accentuates the fact that the majority of sustainability problems and sollutions linked to sustainable development originate at local level. Local governments of small towns interact closely with their residents, and also play a very important role in terms of the education, mobilization, response and promotion of sustainability amongst the public. Local Municipalities can thus promote sustainability more effectively than District Municipalities. Due to the scale of small towns and their tightly knit communities, sustainable development can be measured, evaluated and promoted much more effectively than in larger cities. Action plans to reach sustainable development objectives are also developed and carried out more effectively on a smaller scale. Due to these attributes related to small towns, small towns in South Africa could be the key components to perfect the road to sustainable development and sustainability.

The impact of development and growth on the urban and natural environment of a city or town can help us understand and discuss the issue of sustainability and the relationships between the different spheres of sustainability. Recently sustainability has become a prominent aspect in development and environmental management. Sustainable development is also a prominant goal set out in Agenda 21 of the United Nations which was adopted at the Earth Summit in 1992.

In a South African context many small towns struggle with environmental management, and according to the South African Local Economic Development (LED) Network 2012, small towns have a number of development challenges. These challenges include among others, infrastructure maintenance neglect and irregular service delivery. These challenges directly affect the natural and urban environment resulting in a need for integrated environmental management consisting of urban environmental management and town planning. Sustainable development contains a number of necessary interrelated disciplines. These disciplines include among others town and regional planning, urban environmental management and environmental management. Town planning is a required discipline because the majority of work done by town planners related to sustainable development occur and affect the urban environment. Furthermore the relationships, impacts and links between urban parameters and the natural environment cannot be denied and therefore urban environmental management and environmental management are also important to sustainable development.

1.2 Background

The small town of Parys (27.438324, -26.91125) was chosen as the focus of this case study. Parys is situated on the periphery of the larger Johannesburg metropolitan area in the Northern Free State. According to the Spatial Development Framework (SDF) of the Ngwathe Local Municipality (NLM) Parys first developed as a service centre for surrounding towns due to its central location on the development axis between Bloemfontein and the Gauteng Metropolitan area (NLM SDF, 2008: 14).

The geographic location of Parys, along the Vaal River as well as the town's close proximity to the Vredefort Dome gives the Parys area and ideal setting for a number of recreational activities which attracts tourists. The tourism information centre in Parys has confirmed an increase in tourists and tourist enquiries since the declaration of the Vredefort Dome as a World heritage site in July 2005 (Kriel, 2013). The increase in tourists caused a revival of the town especially the main street which now thrives with a variety of businesses. The large number of restaurants, shops and overnight facilities make Parys the perfect corridor to the Vredefort Dome and other surrounding areas. These facilities greatly contributed to the popularity of Parys as an overnight and weekend destination (Dreyer, 2009: 15).

Due to the increasing number of tourists visiting the town enormous pressure is placed on the small infrastructure, which in turn causes several urban environmental management

issues and can possibly limit future growth and development by impacting on the success of local economic drivers (businesses). These issues include and are not limited to:

- basic neglect in waste disposal,
- roads,
- storm water drainage,
- degradation of open spaces and parks,
- pedestrian sidewalks,
- solid waste contaminating the Vaal River.

These issues are currently in need of urgent attention.

According to sources such as the Cities Alliance group, (2007: 5) a town is unable to function efficiently in isolation from its immediate environment. In any town, the natural and urban environment forms the foundation on which all business sectors depend. This in turn has a direct impact on the social and economic aspects of Parys. Furthermore investors and tourists tend to be drawn to a place with a healthy environment and well established infrastructure (Cities Alliance group, 2007: 5).

The small town of Parys has two main urban and natural features namely its unique natural environment (the Vaal River and Vredefort Dome) and its urban characteristics (authentic buildings and sense of place). This study will focus on Parys, evaluate the growth of the small town as well as reasons that can explain the growth process. Furthermore the focus will fall on the evaluation of the small town in terms of sustainability parameters on which future growth depends, and investigate the perceptions and concerns of businesses on their surrounding environment. Sustainability indicators could assist the NLM and other local municipalities in South Africa to determine their state of sustainability. This study will also set the stage for follow up studies and evaluations of other small towns using sustainability indicators.

1.3 Research question

This study will be guided by the following research question:

Is Parys sustainable? And which sustainability indicators and urban and environmental parameters affect small towns in South Africa?

1.4 Study objectives

- To investigate and evaluate the small town of Parys in terms of applicable United Nations Sustainability indicators.
- To classify the small town of Parys in terms of its economic drivers and growth factors.
- To evaluate the role and importance of the natural and urban environment on small town economic drivers and important stakeholders.
- To determine the perceptions and concerns of businesses and important stakeholders on their natural and urban environment.
- To identify the main urban and environmental components affecting the survival of Parys and the community of Parys.
- To formulate recommendations to improve the current urban and environmental situation in Parys to ensure healthy future growth and sustainable development.

1.5 Theoretical framework

A holistic approach including urban and environmental aspects was used in this study in order to focus on all three spheres of sustainability. The interpretation of the research question, literature and the subsequent results obtained were influenced by the Town and Regional Planning background of the researcher.

1.6 Limitations of the study

The lack of an updated SDF for the NLM along with detailed maps on land uses and zoning areas can be seen as a limitation to this study. Furthermore the lack of sufficient databases for all sustainability indicators limited the sustainability evaluation of Parys, however this also identified a vital issue related to the majority of small towns in South Africa.

1.7 Methodology

For this research project a case study approach will be adopted. A case study approach acts as an empirical investigation. It will be used to investigate an existing occurrence. This study will focus on and investigate the current state of sustainability as well as the urban and

natural environment of the town Parys. The study will also investigate the perceptions and concerns of businesses owners and stakeholders of their immediate urban and natural environment.

1.7.1 Literature study

An in depth literature study was conducted to highlight the interdependent relationship businesses have with their immediate environment, as well as the interdependent relationship between the social, economic and environmental aspects in any town or city. Various sources have been analysed on the internet as well as the University of the Free Sates library. Keywords such as, sustainable development, sustainability indicators, the natural environment and businesses, urban environmental management, integrated environmental management, infrastructure and the environment and integrated town planning were used.

1.7.2 Empirical investigation

According to Maree, (2007: 75) case study research is used by researchers from various disciplines to answer questions relating to exactly how and why phenomenona occur. Furthermore this approach offers a multi-perspective analysis and thus sets the stage for an empirical investigation where stakeholders and business owners in Parys can contribute and participate in a survey which will determine their perceptions and concerns of the natural and urban environment of Parys as well as the importance of these parameters for the success of businesses and the future growth of the town. Parys will be evaluated by using applicable sustainability indicators and statistical data supplied by Quantec's regional indicators along with data from STATS SA, information from the NLM IDP documents and the Fezile Dabi District Municipalities (FDDM) SDF. Blue drop reports for the NLM will also be utilised to evaluate the water quality in Parys for a sub division of the sustainability indicators. Furthermore statistical data will also be applied to determine and verify the main economic drivers of Parys.

Sustainability indicators derived from the Sustainable Cities International (SCI), 2012 will be used during the sustainability evaluation of Parys, these indicators include three main parameters namely, economic, social and environmental indicators.

Data gathering instruments will include two surveys to determine how business owners and stakeholders experience certain urban and environmental aspects in the town of Parys. The

surveys will assist in testing the perceptions and concerns of business owners and stakeholders in terms of the natural and urban environment of Parys as well as the importance of these parameters for the success of businesses and the future growth of the town. These two surveys will be conducted through two semi–structured questionnaires that will be designed using different aspects of the urban and natural environment. These parameters will be derived from The Local Economic Network for Small Town Development, Sustainability indicators for cities in accordance with Agenda 21 of the United Nations, personal observations and factors pointed out during informal interviews and email correspondence to formulate questions and statements for the questionnaires. The data obtained through the questionnaires will be statistically analysed using IBM SPSS Software. The results obtained from the statistical analysis along with the results obtained through the sustainability evaluation of Parys will then be used to identify the main problem areas of concern in Parys. After the identification of the main problem areas recommendations will be formulated in order to improve the current situation. Table 1 depicts a summary of the methodology used for this study.

Table 1. Research methodology

Research design	Descriptive Case study	
Study population and sampling size	Category A: Business owners Population: 61 Respondents: 49	Category B: Stakeholders Population: Between 6 & 12 8 respondents
Data gathering instruments and techniques	Semi- Structured questionnaires (Category A & B) Observations	
Data analysis	Descriptive statistics – SPSS Software	
Ethical considerations	Voluntary participation Anonymity	

1.8 Outline of research report

The research report consists of the following Sections:

Table 2. Chapter outline

Chapter One: Introduction and Background	This Chapter provides background information about the research theme as well as a short discussion on Parys and location of the town. The Chapter also states the objectives, limitations, methodology and the structure of the study.
Chapter Two: Literature Review	This Chapter investigates the term sustainable development in a general, global and South African context and focuses on the term sustainability in an urban context and expresses the importance of the term on local municipal levels. Sustainability indicators are discussed. Furthermore this Chapter investigates the linkages between natural and urban components and the sustainability of urban areas.
Chapter Three: The Study Area	This Chapter deals with the location and the relative location of Parys, along with the trade area and accessibility of the small town. The Chapter investigates Parys as an important growth point in the NLM and investigates the town's economic profile along with the identification of the main economic sectors. In depth background information regarding the town is given along with the unique characteristics of Parys. The current issues in Parys are highlighted in order to set the stage for the sustainability evaluation as well as urban environmental evaluation of the town.
Chapter Four: Sustainability Evaluation of Parys	This Chapter relays from Chapter 3 and links with Chapter 2, where the issue of sustainable development was discussed in numerous contexts. The Chapter uses the sustainability indicators discussed in Chapter 2 to evaluate Parys in terms of sustainability. A possible set of small town sustainability indicators are also presented. The Chapter also gives an indication of the sustainability indicators in need of attention and concludes the main problem areas in Parys.
Chapter Five: Methodology	This Chapter describes the methodology used for the study. It also revises on the objectives of the study. The Chapter provides information on the research design, approach and method used for the study. The study area and sample sizes are also discussed along with the measuring instrument and ethical considerations of the study
Chapter Six: Research Results	This Chapter presents the results obtained through the evaluation of urban and environmental elements in Parys. It discusses the results obtained through the 2 surveys in the study through generating numerical data that can be statistically analysed to quantify the existing perceptions and concerns of business owners and important stake holders in Parys. The Chapter also depicts the main problem areas in Parys as well as the corresponding perceptions of stakeholders and business owners on these areas. The Chapter deliberates on the current state of each sustainability area and urban environmental element.
Chapter Seven: Conclusions and Recommendations	The Chapter focuses on the main problem areas identified in Chapter 4 and 6, and formulates recommendations to improve the current situation in Parys. Recommendations are formulated using urban environmental management and town planning initiatives in accordance with the goal to initiate sustainability in economic, social and environmental spheres of the town. This chapter also serves as the final Chapter for this study and concludes on the objectives set in Chapter 1.
List of References	A complete list of all references used for the study

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The presence of any town or development is associated with urban and environmental impacts. These impacts range in scale and are often not measurable, nevertheless they are still important and they need to be addressed (United Nations Environment Program, 2002: 245). In the case of Parys, environmental and urban impacts are not only limited to issues caused by urbanisation and population growth but also to impacts due to the town's tourism popularity, business sectors and general growth and development. This literature review will investigate and discuss the term sustainable development in a general context and focuses on the term in an urban context. It will also discuss international sustainability indicators. Furthermore this Chapter will investigate the linkages between natural and urban components and the sustainability of urban areas.

2.2 Sustainability and sustainable development defined

Sustainability as a concept has played a fundamental role in development since the 1980's. The process of understanding and defining sustainability evolved due to the Brundtland Commission, formerly known as the World Commission on Environment and Development, who primarily defined sustainable development in 1987. Through defining sustainable development, the Brundtland Commission tried to find solutions to problems which eradicated due to disparities between development and environmental goals. Sustainable development was defined as follows:

"…Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs…"(Report of the World Commission on Environment and Development 1987: 43).

This definition contains two main concepts. Firstly the concept of needs which refers to the essential needs of the poor, and secondly the concept of limitations created by technological progress and society on the environment's carrying capacity to meet present and future needs (Lee, 2012: 4).

This definition has been adopted by the United Nations, the Organization for Economic Cooperation and Development, as well as the World Bank. The definition lends itself to the broad nature of sustainability. The Brundtlands Commission strived to place the

responsibility of sustainability solely on the agendas of National governments in order to guide their decision making and development goals in a direction that would consider the basic needs of citizens (Lee, 2012: 4).

Another explanation of sustainable development which is similar to the Brundtlands Commissions definition stated above came from Zuindeau, (2006: 461) who described the term as follows:

"*... current development should not harm the interest of future generations…*"

Hens, (1996: 85) defines sustainable development as:

"*…the rearrangement of technological, scientific, environmental, economic and social resources in such a way that the resulting heterogeneous system can be maintained in a state of temporal and spatial equilibrium…*"

Sustainable development thus focusses on current activities or operations as well as the long term implications related to these activities or operations. The term sustainable development and sustainability has evolved in literature and today these two terms consist of three main features that are associated with them. These features according to Koglin, (2009: 9) are:

- Social sustainability,
- Economic sustainability,
- Environmental or ecological sustainability.

The above listed features are the basic fundamental parameters of sustainability and sustainable development and although they are used co-operatively they are approached in different ways when it comes to planning, measuring or evaluating levels of sustainability and sustainable development (Koglin, 2009: 9).

2.3 Sustainability and sustainable development in a global context

Sustainable development and sustainability has become a prominent field of interest on a global as well as National, local and communal scale (Ndeke, 2011: 2). Governments, civil societies, commercial sectors and many communities have responded to the agreed framework of the United Nations Conference on Environment and Development. The framework also known as Agenda 21 was developed at the Earth Summit which was held in 1992 in Rio de Janeiro (Ndeke, 2011: 2). The response to Agenda 21 on a global scale includes among other initiatives, the development of indicators to measure the level of sustainability of numerous cities all over the world. Despite some difficulties regarding the exact meaning of sustainable development, Agenda 21 helps clarify sustainable development and can be used as an action plan to achieve sustainable development. The Rio Declaration is a document which reflects the general and most important principles of Agenda 21 (Hens, 1996: 86). According to Devuyst *et al.*, (2001: 8) the most important selected principles from the Rio Declaration on Environment and Development that have received attention on a global scale are:

- The public trust doctrine - which implies that governments must act to prevent environmental damage should such threats exist. This also implies that governments should act on behalf of citizens should situations of environmental threats exist.
- The precautionary principle - which implies that should a possible threat exist where the damage would be of an irreversible nature, the necessary measures must be taken regardless of a lack of scientific certainty on the matter.
- The polluter pays principle - the polluter should be held responsible for the costs of controlling or preventing pollution.
- The principle of inter-generational equity - this principle comes back to the core of sustainable development and entails that the needs of the present generation must be met in such a way that it does not compromise the needs of future generations.
- The principle of intra-generational equity - this principle is applicable to people within the same country as well as those between different countries. The principle implies that citizens of the present generation have a right to benefit equally from the exploitation of resources and that they have an equal right to a clean and healthy environment.

- The subsidiarity principle - this principle requires that affected communities must participate in decision making as these issues affect them directly.
- The user pays principle - this principle entails that the user will have to carry not only the cost of the resource being consumed but also the environmental costs related to the extraction and production thereof.

Further responses to Agenda 21 include the implementation of the Millennium Declarations, Millennium Development Goals (MDG's). In 2000 all member States of the United Nations attended the Millennium Summit and adopted the Millennium Declaration. In 2001 the United Nations General Secretary proposed a Road Map in order to implement the Millennium Declaration. The Road Map for the implementation of the Millennium Declaration included 8 MDG's to be achieved in global communities by 2015 (R.S.A., Millennium Development Goals Country Report 2010: 13).

The 8 MDG's are:

1. Eradicate extreme poverty and hunger,

2. Achieve universal primary education,

3. Promote gender equality and empower women,

4. Reduce child mortality,

5. Improve maternal health,

6. Combat HIV/AIDS, malaria and other diseases,

7. Ensure environmental sustainability,

8. Develop a global partnership for development (R.S.A., Millennium Development Goals Country Report 2010: 13).

2.3.1 Agenda 21 on a local level

When considering the implementation of Agenda 21 on a local level, the motto for sustainable development can be seen as an important link. The motto reads: "...*Think globally, Act locally…*" (Devuyst *et al.*, 2001: 18). Chapter 28 of Agenda 21 stresses the importance of introducing and implementing sustainable development at local levels. The basis for action is summarised in Chapter 28 of Agenda 21 and reads:

"*…Because so many of the problems and solutions being addressed by Agenda 21 have their roots in local activities, the participation and cooperation of local authorities will be a*

determining factor in fulfilling its objectives. Local authorities construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing National and subnational environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development…"(United Nations Conference on Environment and Development, 1992: 285).

Despite the difficulty of the implementation of Agenda 21 on a National and international scale, at local levels many success stories have been recorded. There have also been indications that local municipalities have been some of the most advanced municipalities to develop a Local Agenda 21. Sustainable development can be translated into a more understandable, action orientated and smaller scale initiative at local levels. Due to the fact that sustainable development and the indicators used to measure sustainability are still in need of further development, local municipalities can be used as a tool. Local municipalities are said to be the best and the most effective starting point to initiate the assessment of sustainable development through indicators (Devuyst *et al.*, 2001: 19). Thus it can be concluded that small towns could be the key to perfecting the road to sustainable development.

2.3.2 Sustainability indicators

As discussed in the previous Section the responses to Agenda 21, a framework produced by the United Nations include among others the development of sustainability indicators. These indicators are used by cities all over the world to measure their levels of sustainability. The development of sustainability indicators evolved as part of a new concept known as sustainable city planning (Lee, 2012: 2). On a global scale many cities decided to establish an additional department for sustainability while others modified their approach to development by integrating a strategic sustainable development plan (Devuyst *et al.*, 2001: 18). The current challenge remains the actual implementation of these plans and the formulation of indicators that will reflect their progress towards sustainability (Lee, 2012: 2). These indicators are used to measure progress in certain areas by using quantitative and qualitative data. The indicators are used to provide other data sets and figures that can be used to identify problem areas and guide policy making. The indicators also set the stage for comparisons between different municipalities or regions.

The SCI, (2012) developed a tool kit consisting of the core sustainability indicators for cities. The indicators that have been developed are based on general available scientific data, and are easy to understand. The SCI, (2012) also recognized that the monitoring and evaluation needs in terms of sustainability differ from one municipality to the next. However the toolkit was designed with the idea that cities that choose to use it will have a shared vision on the following: that they have a responsibility to ensure that they meet the basic needs of all citizens and that they are committed to embracing the three fundamental parameters of sustainability.

The indicators vary in type and include parameters of each sphere of sustainability, economic, environmental and social aspects. The SCI, (2012) used analyses and information obtained from various case studies in order to develop this core toolkit for cities. The toolkit is summarised in Table 3.

Table 3. Sustainability indicators

Indicators for Sustainability
ECONOMY
Unemployment rates/Jobs
Underemployment/employment/unemployment rates
Percentage of green jobs in the local economy
Average professional education years of labour force
Economic Growth
Annual GDP growth rate
Annual GNP growth rate
Net Export Growth rates (% increase of country's total exports minus the value of its total imports per annum)
Foreign Direct Investments (Capital/Earnings accrued from listed FDI's per annum)
ENVIRONMENT
Green Spaces
Percentage of preserved areas/ reservoirs/ waterways/parks in relation to total land area
Percentage of trees in the city in relation to city area and/or population size
Reduce Greenhouse gases / Energy Efficiency
Total amount of GHG emissions per city and per capita
Percentage of total energy consumed in the city that comes from renewable sources
Mobility
Transportation mode split. (Percentage of each mode of transportation, i.e. private, public, bicycles, pedestrians)
Average commute time and cost
Water Quality/ Availability
Total amount of water availability
Water quality index/score
Proportion of population with access to adequate and safe drinking water
Air Quality
Levels of Particulate Matter (PM10 - mg/m3)
Waste/ Reuse/ Recycle
Recycling rate (Percentage diverted from waste stream)
Volume of solid waste generated
SOCIAL
Complete neighbourhood / Compact city
Access to local/ neighbourhood services within a short distance
Crime rates
Measures of income distribution and inequality
Housing
Percentage of social / affordable / priority housing
Breakdown of housing sector by property type (owner occupied / rental, single occupant/couples/family/multifamily etc.)
Quality Public Space
Percentage of roadways in good conditions
Percentage of green space (public parks) coverage in relation to city area and/or population size
Education
Number of schools with environmental education programs
Adult literacy rate
Sanitation
Percentage of population with access to water-born or alternative (and effective) sanitary sewage infrastructure
Health
Mortality rate/ Life expectancy
Percentage of population with access to health care services

(Source: Adopted from SCI, 2012)

2.4 Sustainability and sustainable development in a South African context

For the purposes of this study, the focus in terms of sustainable development will fall on Goals, Plans and frameworks applicable in Local Municipalities and their Integrated Development Plans (IDP's). South Africa did not officially participate at the United Nations Conference of Environment and Development in 1992. South Africa did however compile a report on the State of the Environment in South Africa – also known as "Building the foundation for sustainable development in South Africa". This report consisted of various identified challenges regarding sustainability and also set the foundation from which a list of actions could be compiled (United Nations Department for Policy Coordination and Sustainable Development, 1997: 2).

According to Meyer and Kola, (2009: 50) South Africa experiences difficulties when it comes to responding to global concerns on climate change. This is due to the fact that most South African citizens are currently living in poverty with the desire to eventually better their living standards, should they succeed they will condemn any commitments to battle climate change. By escalating their living standards more energy, water, among others will be utilised. Furthermore an increase in waste and air pollution among others will occur creating a setback for progresses made towards battling climate change.

Although South Africa currently has a number of strategies and programmes which focus on sustainable development, the country unfortunately lacks a logical nation-wide strategy for sustainable development at this stage. However the Department of Environmental Affairs and Tourism (DEAT) has compiled a broad National Framework for Sustainable Development (NFSD) and this framework can act as a basis for the development of a National strategy plan (Department of Environmental Affairs and Tourism, 2008: 6).

The purpose of the National Framework for Sustainable Development in South Africa is summarised as follows:

"…The purpose of this Framework is to enunciate South Africa's National vision for sustainable development and indicate strategic interventions to re-orientate South Africa's development path in a more sustainable direction. It does not present detailed strategies or actions, but rather proposes a National vision, principles, trends, strategic priority areas and a set of implementation measures that will enable and guide the development of the

National strategy and action plan…"(Department of Environmental Affairs and Tourism, 2008: 7).

Furthermore South Africa has also adopted the Millennium Declaration along with the 8 MDG's. In 2005 South Africa produced its first National report on progress regarding the achievement of the MDG's. Since 2005 three more reports followed namely; the South African Millennium Development Goals Mid-Term Country Report 2007 which was updated in 2008 and the Millennium Development Goals Country Report 2010. South Africa has made considerable progress towards achieving targets set for the MDG's (R.S.A., Millennium Development Goals Country Report 2010: 13). The Medium Term Strategic Framework (MTSF), 2009 – 2014 is a framework which outlines the South African governments intent, and also identifies the development challenges of the country. Furthermore this framework supplies an outline of the strategy in use to guide planning and resource allocation to improve the living conditions in South Africa across all government spheres (R.S.A., Millennium Development Goals Country Report 2010: 16). The strategic parameters of the MSTF and their linkages to MDG's are summarised in Table 4 .

Table 4. Linkages between MTSF and MDG's

Linkages between MTSF (South Africas' National Development Planning and MDG's)		
Strategic Priority	**MTSF Strategic Element**	**Relevant MDG's**
1	Speeding up growth and transforming the economy to create decent work opportunities and sustainable livelihoods	MDG 1, MDG 2, MDG 3 and MDG 8
2	Massive programme to build economic and social infrastructure	MDG 1, MDG 3, MDG 8
3	Comprehensive rural development strategy linked to land and agrarian reform and food	MDG 1, MDG 2, MDG 7
4	Strengthen the skills and human resource base	MDG 2
5	Improve the health profile of all South Africans	MDG 4, MDG 5, MDG 6
6	Intensify the fight against crime and corruption	MDG 2, MDG 3
7	Build cohesive, caring and sustainable communities	MDG 2, MDG 3, MDG 7
8	Pursuing African advancement and enhanced international cooperation	MDG 8
9	Sustainable resource management and use	MDG 2, MDG 3, MDG 7
10	Building a developmental state, including improvement of public services and strengthening democratic institutions	MDG 1, MDG 2, MDG 3, MDG 8

(*Source: Adopted from the R.S.A. Millennium Development Goals Country Report, 2010: 17)*

It is thus clear that South Africa has made the MDG's their own by integrating it with strategic frameworks, at local municipal levels MDG's are also included in IDP's thus guiding some of the key performance areas.

2.5 Sustainability and sustainable development in an urban context

The urban context is an important one when it comes to sustainability and sustainable development due to the fact that a large number or the vast majority of the earth's population resides in urban areas may it be small towns, large cities or metropolitans (United Nations Human Settlements Programme, 2009: 3). The importance of sustainability and sustainable development in an urban context is further stressed by the predictions made by the United Nations Human Settlements Programme, (2009: 3) that the earth's urban population will continue to grow. Urban population growth is also said to affect developing countries more than developed countries in the future (United Nations Human Settlements Programme, 2009: 3).

Researchers all over the world have investigated the concept of sustainable development for many years now (Ndeke, 2011: 1). The main objective linked to these investigations is to find solutions for the following problems:

- To achieve a certain level of development that will enhance the quality of life of all citizens while sustaining their current needs as well as the needs of future generations, and
- To reduce the quantity of natural resources extracted for consumption and to reduce waste generation (Ndeke, 2011: 1).

Sustainability and sustainable development in an urban context is also important due to the fact that the majority of work by urban planners related to sustainability and sustainable development occur in urban areas (Koglin, 2009: 7). All cities hold potential for sustainable development given the fact that they concentrate populations in order to reduce land pressure, provide economies of scale and infrastructure services (United Nations Environment Programme, 2002: 245). Cities are also classified as complex systems made up of economic, social and environmental systems which are interrelated (Ndeke, 2011: 2).

According to the United Nations Human Settlements Programme, (2009: 3) urban areas worldwide are currently affected by altered forces, due to these forces governments are now

required to rethink their management approaches when it comes to managing urban areas and the future of these areas. Urban areas in developing as well as developed countries are experiencing the effects of amongst others; climate change and the depletion of valuable natural resources. These issues could impact on the future of towns and cities. The issues affecting towns and cities need to be addressed in an efficient manner if these urban areas are to be sustainable.

Sustainability in the urban context refers to a town or city that is environmentally sustainable, economically fruitful and socially inclusive. The abovementioned again refers to the three fundamental parameters discussed in Section 2.2.

The United Nations Human Settlements Programme, (2009: 3) states that urban planning can be perceived as a vital tool when it comes to accomplishing sustainability in the urban area. The management of an urban area by governments alone will not lead to success, but governments and important urban stakeholders need to work together to develop objectives to make urban areas sustainable.

2.5.1 Sustainability and the three fundamental parameters

The United Nations Human Settlements Programme, (2002) sets certain goals to achieve sustainability in all three fundamental parameters in urban areas. In order to achieve environmental sustainability in urban areas the following must happen:

- The reduction of greenhouse gas emissions and the implementation of climate change mitigation and adaption plans.
- Urban sprawl must be minimized and urban areas must be served by public transport.
- Non-renewable resources must be used in a sensible manner and preserved where possible.
- Renewable resources must be used in such a way that they are not depleted.
- Waste production must be minimized and the amount of energy used must be reduced.
- Recycling systems must be put into place and used efficiently.
- Waste generated must be recycled or disposed of in such a manner that it does not harm the environment.

- A general reduction in the ecological footprint of the city or town must take place (United Nations Human Settlements Programme, 2002: 24).

For economic sustainability in urban areas the focus must fall on LED, this can be achieved by developing favourable conditions for the efficient operation of economic enterprises of all sizes (United Nations Human Settlements Programme, 2002: 18). The priorities of governments and urban stakeholders must shift to provide for the following:

- A reliable infrastructure and adequate service delivery (water supply, waste management, transport and energy supply).
- Access to premises with proper locations for enterprises.
- Financial institutions and well established markets that can mobilize investments.
- A healthy and well educated workforce.
- Frameworks that promote healthy work environments and efficient waste disposal (United Nations Human Settlements Programme, 2002: 18).

The social aspects that need to be addressed to achieve social inclusiveness according to the United Nations Human Settlements Programme, (2002: 23) are:

- The equal access to services as well as fair service provision.
- Social integration through the provision of well-established public spaces which offer opportunities for public interaction.
- The provision for people with disabilities as well as certain genders in public spaces.

2.5.2 Urban planning and sustainability

The concept or idea of sustainability might be an unrealistic, unachievable one however many cities around the world have contradicted this image. These cities act as examples to show the world that it is in fact possible to move toward sustainability within societies. These movements are often the result of alternative approaches to urban planning. Three examples of this phenomenon can be named:

- In the United States of America, less than 1 % of all urban trips make use of bicycles, the idea of increasing this to 30 % sounds impossible. However if we look at Dutch cities it is done on a daily basis (Devuyst *et al.*, 2001: 27).
- Stockholm's city council supports the establishment of residential areas in close proximity to offices and shopping facilities – these are called transit villages or transit

orientated development. Transit villages are districts within a city suburb which are characterised by mixed land uses and frequent available public transport. These villages are usually situated around suburban railway stations and are designed to encourage the use of public transport systems and pedestrian activities instead of personal motor vehicle use. This small initiative has reduced the number of trips conducted by motor vehicles in Stockholm by 229 kilometres per person between 1980 and 1990, thus relating to a reduction of 22.9 kilometres per motor vehicle trips per person annually (Devuyst *et al.*, 2001: 27).

- By planning for an efficient public transport system Curitiba in Brazil has managed to reduce traffic by 30 % since 1974, despite the doubling of the population (Devuyst *et al.*, 2001: 27).

Urban planning is one of the major responsibilities of local municipalities, the activities and way of life of citizens in a city or a town is mainly determined by the urban planning and design of the area (Devuyst *et al.*, 2001: 27). This way of life can be explained with an example, people living in areas where mono functional urban planning with limited public transport is dominant will be more likely to use private vehicles than public transport than people living in a compact, mixed land use city with well-established public transport facilities.

2.5.3 Business and the environment

Over the past few years the state of the environment has become an increasing concern to all businesses. These concerns are not limited to businesses associated with high pollution levels or those who extract large amounts of natural resources (Bansal and Howard, 1997: 2). As the impacts of the human activities on the environment along with environmental problems increase, so does the public and business awareness of environmental concerns. This phenomenon is also said to be linked to an increase in scientific knowledge on environmental impacts.

The condition of the natural environment of a place or geographic area is said to have an influence on the business activities of the area (Gopal, 2009: 251). People living in a specific area or place have similar tastes, preferences and requirements when it comes to goods and services. These similarities fuel the type of business enterprises present in a specific area. Furthermore the natural environment also plays an important role in the type of business enterprise as well as the methods by which business activities are conducted (Gopal, 2009:

252). It can thus be concluded that the environment and business enterprises have an inter-dependant relationship and that these two components directly and indirectly impact on each other.

Gopal, (2009: 257) states that the preservation and protection of the environment to ensure efficient business activities in a specific area is increasing on a global scale, and has been identified as an issue in need of urgent attention. The environment surrounding a business refers to all external forces which can impact on the functionality of a business. These mentioned external forces can pose a direct threat to a business or offer opportunities to grow (Prasad, 2010: 3). According to Bansal and Howard, (1997: 3) environmental issues are not geographically limited and increases with population growth, more advanced technology and development. These are all factors which add to the complexity and intensity of environmental issues. It can thus be concluded that the protection of the environment is necessary to ensure the success of local businesses in Parys. This is in agreement with the statement of Bansal and Howard, (1997: 4) who stipulates that there is an increasing demand for businesses to accept greater environmental responsibility and that formal environmental management has become relative to businesses.

2.5.4 Infrastructure and the environment

Infrastructure is one of the most important components which affect economic and social development. The infrastructure of a town or city plays a double role, firstly infrastructure acts as a vital tool which can be used to resolve several challenges in the urban area. Examples are that infrastructure stimulates economic growth, improves transport services, provide sanitation, communication, educational and health services. The second role is a less desirable one as infrastructure can also contribute to environmental pressure, through the provision of the services mentioned above infrastructure also impacts negatively on the environment (Shilling, 2007: 1). One can conclude that infrastructure can enhance the quality of life in a town or city while simultaneously degrading it. This can lead to tension when it comes to further infrastructural development and achieving sustainability.

When infrastructure is well planned and maintained it can contribute to environmental sustainability, however the link between an infrastructure sector and the immediate environment is complex. For every infrastructure sector – water, power, sewage, waste or transport the interaction with the natural environment varies (Ranade, 2009: 3). The United Nations Human Settlements Programme, (2002: 5) defines infrastructure as one of the main challenges relating to sustainability in urban areas because the infrastructure in many towns

and cities are inefficient. Due to the inefficient nature of these systems they frequently affect the urban and natural environment as well as social aspects of the city such as health related issues.

The development of infrastructure also changes certain parameters of the natural environment. A few examples of changes in parameters and their impacts can be discussed. For example roadways and transportation is important for social and economic aspects however the presence of roadways include many environmental impacts. These impacts include and are not limited to, the degradation of air quality, noise pollution, habitat fragmentation and the loss of biodiversity. Other impacts are related to the presence of an impervious surface which limits rainwater infiltration, increases rainwater runoff and can lead to the increased silting of rivers and streams as well as erosion (Ranade, 2009: 4).

Waste management systems in cities or towns can also impact on the urban and natural environment. Solid municipal waste is usually disposed through the use of landfill sites which are not managed correctly. These sites can impact on the aesthetic quality of the natural and urban environment. Another impact is leachate that is produced in these landfill sites, leachate does not only have a bad smell but can also contaminate rivers, streams and groundwater resources. Storm water drainage can also impact on the natural and urban environment, poor maintenance of these systems can lead to flooding in urban areas and environmental degradation through the contamination of streams and rivers through urban storm water runoff (Ranade, 2009: 4).

Infrastructure is one necessity no urban area can go without. Without infrastructure no economic growth is possible, and without growth poverty will increase. During the development of many infrastructure services the environmental impacts are considered, in other cases the environment and possible impacts are not part of the planning process. This means that during infrastructure development environmental threats occur either knowingly or unknowingly. These threats need to be addressed in order to avoid limitations on growth. Another problem related to infrastructure is the fact that these systems are designed to last approximately 50 years at the least. Due to the fact that these systems affect and determine the direction of future development it is crucial to take all possible impacts into account (Shilling, 2007: 5).

2.6 Sustainability and urban environmental management

Urban environmental management can be defined as a practical term which indicates environmental activities along with management (Barrow, 1999: 6). These activities are usually limited to a particular geographical area. A number of issues can be addressed in urban environmental management, these issues include; land use and land use planning, economic interests, social and cultural values, health, educational facilities and social service provision, technical service provision (water, sanitation, electricity, waste management) only to name a few. Urban environmental management thus deals with a number of interrelated issues which include social, economic and environmental parameters. International literature on urban environmental management is infinite and a number of definitions and various opinions exist for this discipline, however the general focus in academic literature and in general practise consider urban environmental management to be interrelated and multidisciplinary (Jeppesen *et al.*, 2006: 2). According to Williams, (2000: 12) the nature and severity of environmental issues in a town depend on a variety of factors which include; population size and growth rate, the level of income and economic development, the spatial dimensions of problems and the role of local actors.

Urban environmental management can be linked to environmental management due to the broad scope of the discipline. According to Barrow, (1999: 6) environmental management displays a number of characteristics. These characteristics are that environmental management supports sustainable development, deals with a human altered environment and demands a multi-disciplinary approach. Urban environmental management is guided by the need to integrate different viewpoints and disciplines such as science, social science, policy and planning when it comes to development, and strives to meet basic human needs. Furthermore urban environmental management attempts to identify opportunities, threats and problems related to a situation or proposed project and focusses on stewardship of resources instead of exploitation. The final characteristic of urban environmental management is that the discipline involves a time scale which ranges beyond short term planning and takes into account the long term impacts and problems related to a situation or project (Barrow, 1999: 6).

2.7 Conclusion

By evaluating these aspects related to urban environmental management in terms of the small town Parys it is possible to classify the nature and severity of urban and environmental problems in the town. These urban and environmental problems also make out the three spheres of sustainability and sustainable development supported by environmental management. By identifying the possible threats and issues present in Parys, the actual management of the related aspects can commence. The concept of sustainable development is based on two major components namely, equity within and between generations and maintaining integrity between the spheres of the natural, financial and human capital. These major components are used to balance economic and social development with environmental protection in accordance with environmental management. In South Africa we use our natural ecosystems not only for their important services but also their non-material benefits. This includes among others, aesthetic values such as, spiritual value which includes charm and beauty, recreational opportunities and relaxation areas (Department of Environmental Affairs and Tourism, 2007: 5). The National strategy on sustainable development for South Africa aims to integrate environmental issues into all sectorial activities, furthermore it has also been recognized that legislation in South Africa is needed in order to enhance cooperation among various government departments at all levels (Department of Environmental Affairs and Tourism, 2007: 5). In the case of Parys the identification and classification of environmental issues can be accompanied by the use of urban and environmental sustainability indicators to assess all levels of sustainability. This assessment will include social, economic and environmental aspects. Furthermore it will contribute the identification and explanation of various links between the three spheres of sustainability and help identify possible factors that could limit future growth of Parys. These links can be identified with the emphasis on the crucial relationship between the environment and the community. Given the international sustainability indicators from the SCI, (2012) toolkit it could be possible to set up National small town sustainability indicators.

CHAPTER 3: THE STUDY AREA

3.1 Parys, Free State Province

3.1.1 Location

The small town of Parys was chosen as the focus of this case study. The town is situated on the periphery of the larger Johannesburg metropolitan area in the Northern Free State. According to the NLM SDF, (2008: 14) Parys first developed as a service centre for its surrounding towns. The development of Parys can also be ascribed to its central location on the development axis between Bloemfontein and the Gauteng Metropolitan area. The geographic location of Parys, along the Vaal River as well as the town's close proximity to the Vredefort Dome gives the Parys area and ideal location for a number of recreational activities which attracts tourists. The tourism information centre in Parys has confirmed an increase in tourists and tourist enquiries since the declaration of the Vredefort Dome as a World heritage site in July 2005 (Kriel: 2013).

The small town of Parys is situated on the southern bank of the Vaal River on the northern border of the Free State Province with Tumahole as the town's township. The Vaal River separates the Free State and the North West Provinces. Parys falls under the jurisdiction of the FDDM and is situated in the NLM. The location of Parys is one of the key assets of Parys.

Figure 1 indicates the location of Parys on the periphery or "urban fringe" of Gauteng. The distance between the inner and the outer radius is 29 km. Figure 1 also indicates the location of Parys in relation to the rest of the Free State, Gauteng, North West, Limpopo and Mpumalanga Provinces. Given the close proximity of Parys to the Provinces mentioned above it is obvious that the town's location plays an important role relating to the tourism popularity associated with Parys.

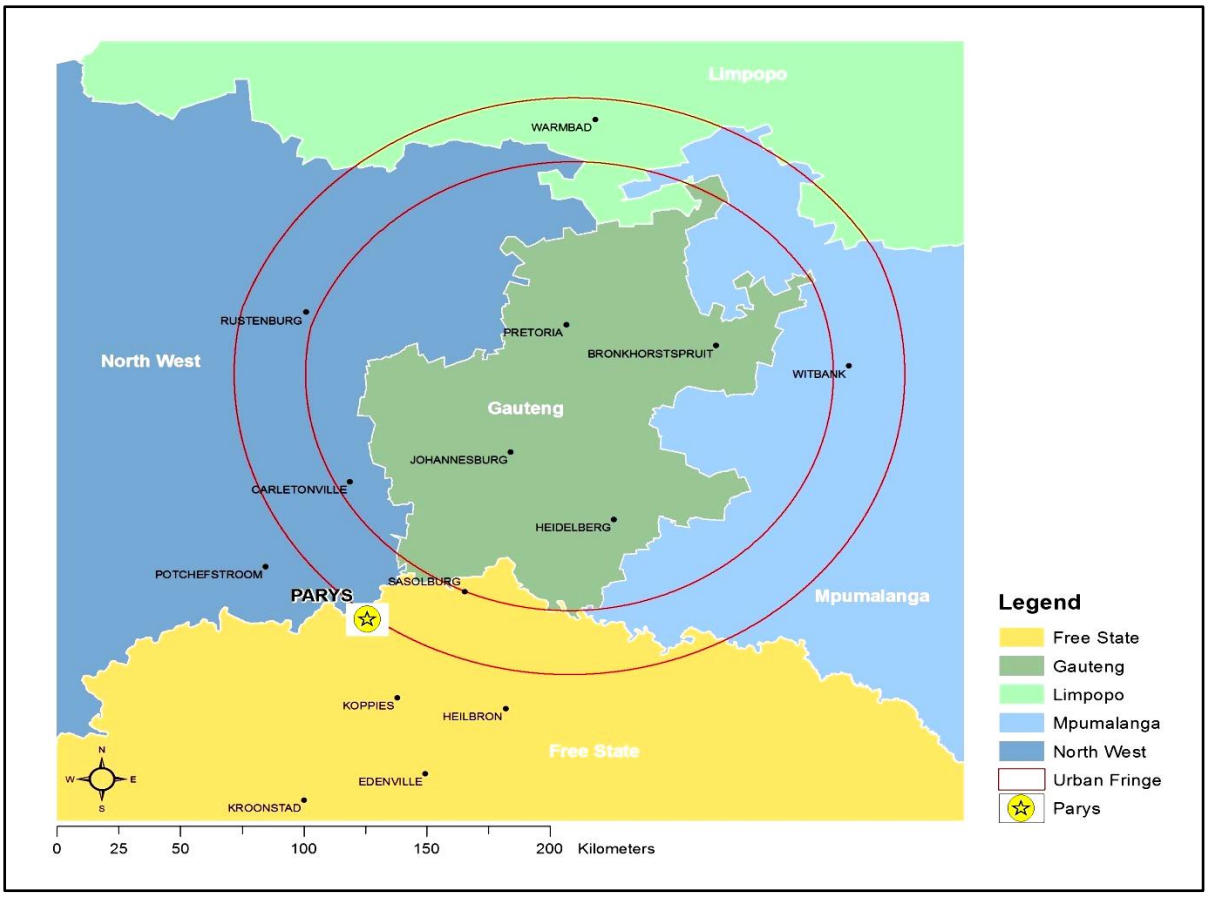

Figure 1: Location of Parys on the urban fringe
Source: (Created by Researcher, 2013)

3.1.2 Accessibility

The Parys urban area can easily be accessed from Johannesburg using the N1 and the R59, Potchefstroom using the R53, Sasolburg using the R59, and Vredefort and Kroonstad through the R59 as depicted in Figure 2. Furthermore the close proximity of Parys from these towns also plays a role given the characteristic of Parys as a service centre.

The R59 from Sasolburg and from Vredefort runs through the Parys via Loop, Water and Breë Street as depicted in Figure 2. The majority of Small Micro and Medium Enterprises (SMME's) are situated in these streets. The central business area is also situated adjacent to the route running through Loop, Water and Breë Street. In Breë Street and the central business area alone there are approximately 186 businesses and this number only includes businesses listed at the Parys information centre and the Parys Business Forum.

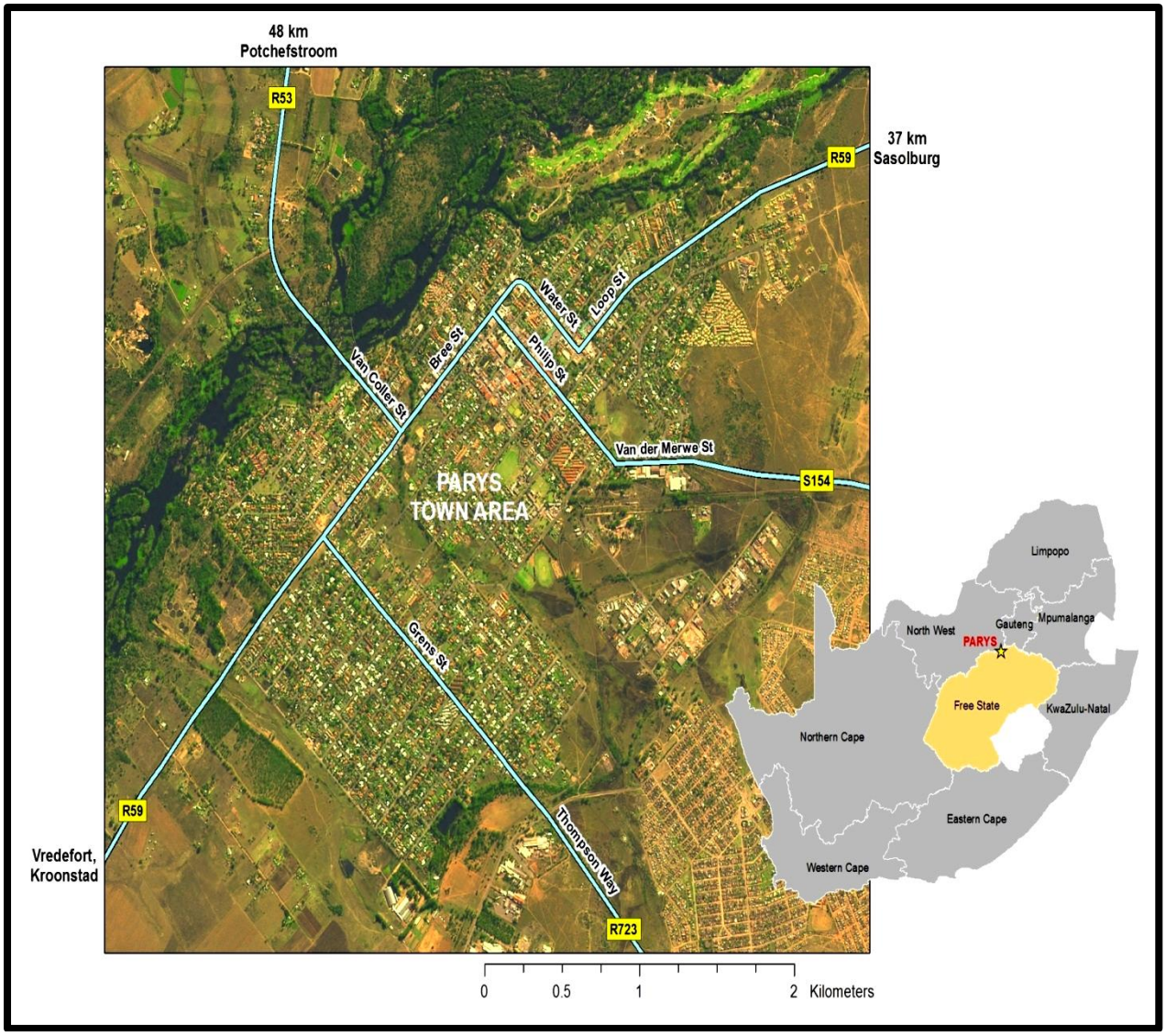

Figure 2: Accessibility of Parys
(Source: Created by the Researcher, 2013)

Parys provides a large number of facilities and shops and land uses. Parys can further be classified as a town offering a diversity of land uses, as well as a dominating mixed land use character. Due to the fact that the majority of businesses are situated along the R59 corridor they ensure and contribute to their accessibility.

3.1.3 Parys as growth point

Parys was officially established in 1882, according to De Bie, (1991: 20) and can be classified as an additional nodal town, and was established due to the need for churches in surrounding towns and farms. Parys was however established unofficially in 1876 due to the presence of church farms.

Parys currently has one of the highest per capita investment numbers in South Africa when compared to other small towns in the country. The small town has also recently experienced a renewal in property investments (Anon, 2013: 1). Due to the unique characteristics and strategic location of Parys, the town presents exceptional tourism potential. Parys also has a high urbanisation rate when compared to other urbanisation averages in the Free State Province. Parys currently consists of an urban population of 90.1 % and a rural population of 9.82 % (NLM IDP, 2011: 44).

Parys has a formal and visible central business area and is surrounded by free standing houses ranging from high income to low income housing. The absence of informal dwellings around Parys further relates to the formal layout of the town (Department of Water Affairs, 2011: 18). The NLM IDP, (2011: 44) concluded that there are more employment opportunities in the town of Parys than employment opportunities in rural areas. This was done by investigating the economic structure of the region.

3.1.4 Economic profile

Parys is characterised as an important town in the NLM and acts as a service centre to its surrounding towns namely, Vredefort, Heilbron, Koppies and Edenville. The NLM IDP, (2010: 46) characterises Parys as an important service centre and economic sector with a strong commercial component for its district and surrounding towns.

The NLM IDP, (2011: 121) identified six main economic areas as the key economic drivers of Parys, these areas are listed below:

- Mining,
- Construction,
- Tourism,
- Agriculture,
- SMME Development,
- Manufacturing.

According to Dewar, (1996: 4) all towns consist of an economic base which is responsible for the town's development and actual existence. Small towns are also known to have developed due to limited or specialised functions. In order for the town to prosper or grow it needs to sustain these functions and should the demand or so called need for these functions disappear the town will fail (Dewar, 1996: 4).

Parys consists of various sectors which contribute to the gross value added (GVA) of the NLM, this is mainly attributed to the urban area of the small town which provides for a wide range of services including health, education and other professional services. The long term economic prospects discussed in the NLM IDP, (2010: 47) includes tourism potential for the small town by recognising the unique environmental assets of the small town and further economic growth potential due to granite mining.

GVA at basic prices are the output at basic prices minus intermediate consumption at purchaser prices. The basic price is the amount receivable by the producer from the purchaser for a unit of a product minus any tax on the product plus any subsidy on the product (Quantec Data, 2013).

Figure 3 depicts the contribution of the 8 main economic sectors and their contribution to the GVA from 1995 to 2011 to the NLM area. The sectors included are the following:

- Agriculture, forestry and fishing,
- Mining and quarrying,
- Manufacturing,
- Construction,
- Wholesale and retail trade, catering and accommodation,
- Finance, insurance, real estate and business services,
- Community, social and personal services,
- General government.

Construction, tourism, agriculture, mining and manufacturing were included due to the fact that they were identified by the NLM IDP as the key economic drivers of Parys.

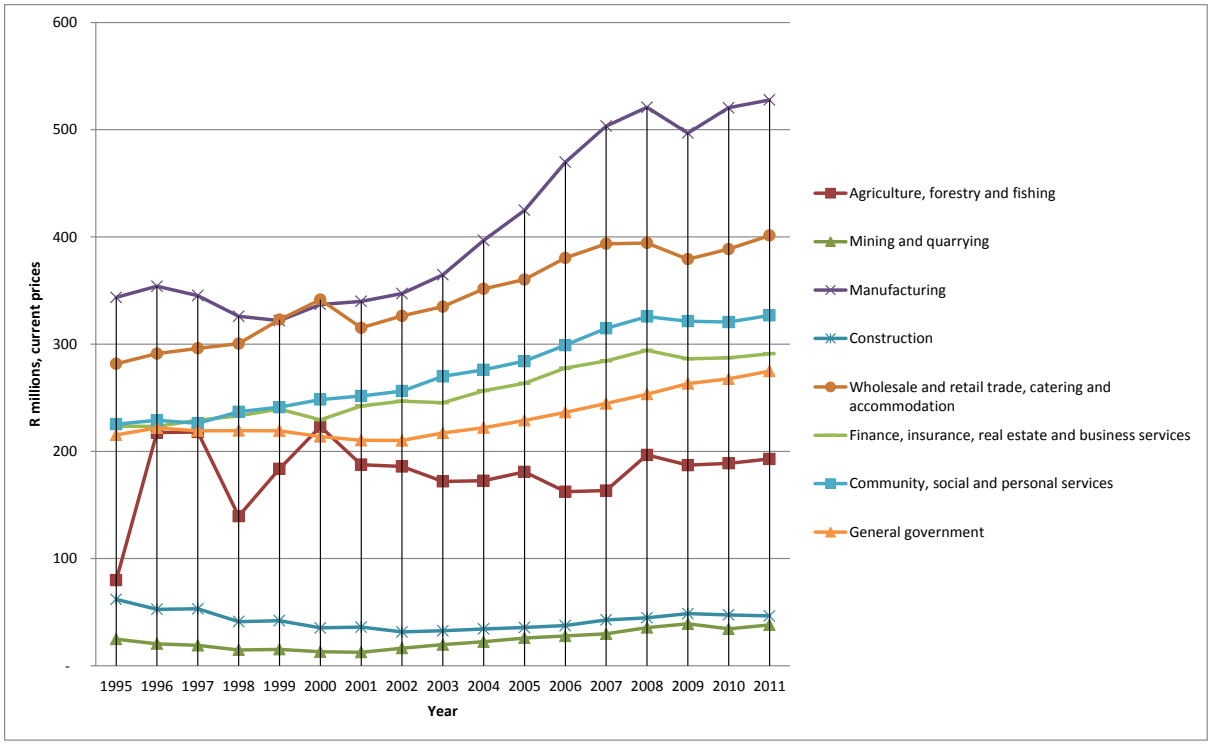

Figure 3: Contributions of economic sectors in the NLM 1995-2011 (Source: Quantec Data, 2013)

From Figure 3 manufacturing remains dominant in the NLM economic profile, followed by wholesale, retail trade, catering and accommodation and thirdly by community, social and personal services.

3.1.5 The relative location of Parys

The relative location of Parys can be best demonstrated by using a formula derived from Reilly's Law of Retail Gravitation. William J. Reilly developed the law in 1931 and this law relates to the distance of a central place or service area in relation to its surrounding towns and the populations of these towns. Reilly's law states that larger cities will attract more customers than smaller towns (Vendamani, 2003: 157). Reilly's law can be stated by using the following formula:

$$BP = \frac{\text{dij}}{1 + (\sqrt{p2/p1}}$$

BP: Being the Break point or Balance

dij: Being the distance between the two places.

P1: The population of town 1 (the larger town)

P2: The population of town 2 (the smaller town) (Vendamani, 2003: 157).

This formula can be used to determine the relative trade area of a town or city. Through calculating the break point of Parys in relation to its surrounding towns it is possible to illustrate the trade area or service area of Parys.

Table 5 summarises the values used in the calculations for each surrounding town and the breaking point value for each small town serviced by Parys.

Table 5. Breaking point values and relevant information

Town	Distance from Parys (Km)	Population	Break Point (Km)
Parys	~	44840	~
Vredefort	14	10649	9.4
Koppies	53	11445	35.21
Edenville	102	25515	77.84
Heilbron	108	6729	58.14

(Source: NLM IDP, 2011: 84)

Figure 4 illustrates the trading area of Parys regarding the surrounding small towns, Vredefort, Koppies, Heilbron and Edenville.

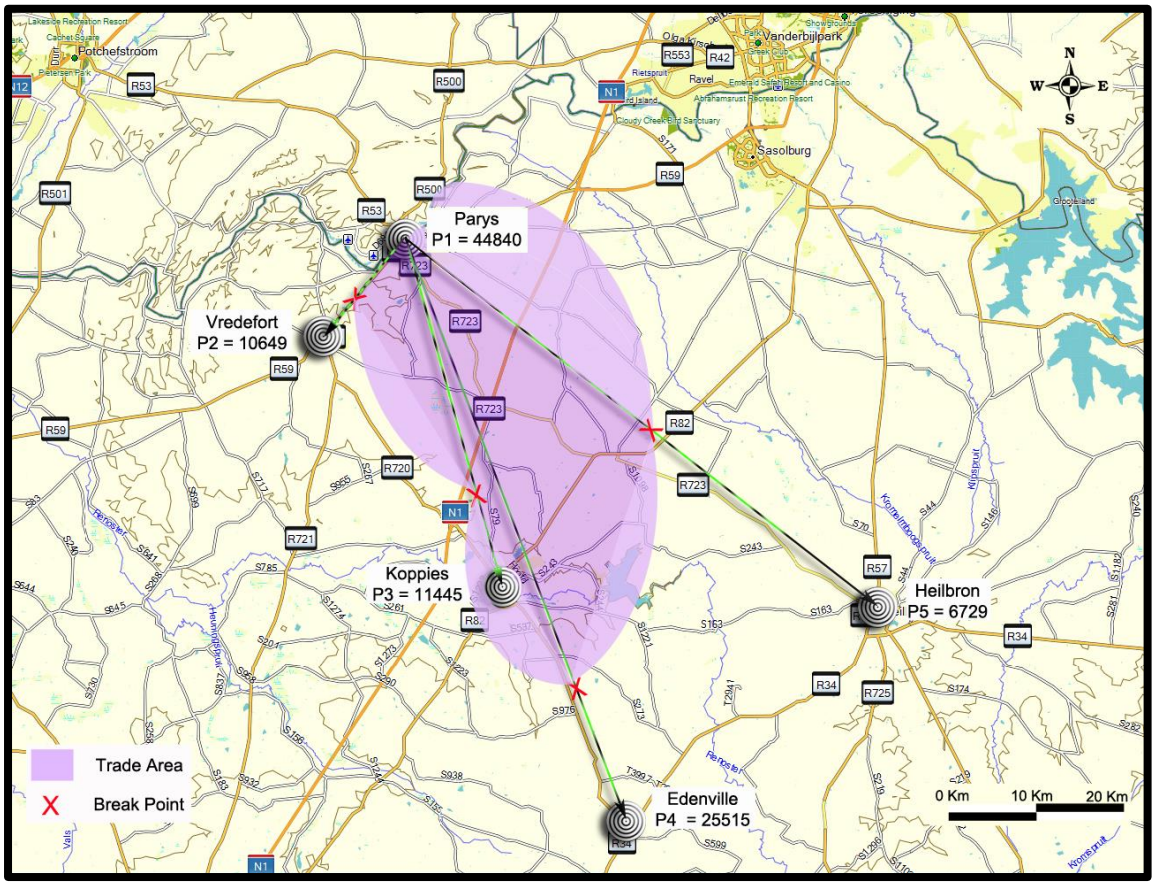

Figure 4: Trade area of Parys regarding surrounding towns
Source: (Created by Researcher, 2013)

3.1.6 Unique characteristics

The small town of Parys has two main urban and natural features namely its unique natural environment (the Vaal River and Vredefort Dome) and its urban characteristics (authentic buildings and sense of place). The increase in tourists caused a revival of the town especially the main street which now thrives with a variety of businesses. The large number of restaurants, shops and overnight facilities make Parys the perfect corridor to the Vredefort Dome and other surrounding areas. These facilities also contributed to the popularity of Parys as an overnight, weekend and holiday destination (Dreyer, 2009: 15).

3.1.7 *Current issues in Parys*

Due to the increasing number of tourists visiting the town, enormous pressure is placed on the inadequate infrastructure, which in turn causes several urban environmental management issues and can possibly limit future growth and development by impacting on the success of local economic drivers (businesses). These issues include; basic neglect in waste disposal, roads, storm water drainage, degradation of open spaces, parks, pedestrian sidewalks and solid waste contaminating the Vaal River. These issues can be observed by simply visiting the town (as depicted in the current state descriptions in Chapter 6). Furthermore these issues were also identified during informal interviews and e-mail correspondence with the Parys information centre, and are in need of urgent attention.

3.1.8 *Conclusion*

According to sources such as the Cities Alliance group, (2007: 5) a town is unable to function efficiently in isolation from its immediate environment. In any town, the natural and urban environment forms the foundation on which all business sectors depend. This in turn has a direct impact on the social and economic aspects of Parys. Furthermore investors and tourists tend to be drawn to a place with a healthy environment and well established infrastructure (Cities Alliance group, 2007: 5). It can also be concluded that Parys plays an important role in the NLM firstly as a service centre and secondly as a centre of economic growth and employment opportunities. There is a need to address the issues present in Parys in order to ensure the future growth of the town.

CHAPTER 4: SUSTAINABILITY EVALUATION OF PARYS

4.1 Introduction

Sustainability indicators are discussed in Chapter 2 with the SCI, (2012) tool kit consisting of the core sustainability indicators for cities. The indicators developed are based on general available scientific data, and are easy to understand. The SCI, (2012) recognized that the monitoring and evaluation needs in terms of sustainability differ from one municipality to the next. The question remains why is there a need to evaluate Parys in terms of various sustainability levels? Chapter 3 outlines the current situation in Parys as well as the importance of the town in relation to the entire FDDM as well as the NLM and its surrounding towns. The NLM IDP's stipulate that the municipality has adopted certain principles of sustainable development in their policies. In order to get an indication if the objectives set by the municipality are being met, an evaluation thereof is needed. This evaluation will also give an indication of problem areas and the road forward. This Chapter will supply a set of possible National small town sustainability indicators for South Africa. As mentioned in Chapter 2, Chapter 28 of Agenda 21 stresses the importance of implementing sustainable development on local levels due to the fact that local municipalities are the closest to communities and areas of interest when it comes to sustainability issues. Furthermore the NLM recognizes MDG's as discussed in Chapter 2, and clearly indicates and gives expression to some of these goals in their annual reports and IDP's. However the targets set and progress shown in these documents are only for the entire FDDM and not the NLM as an entity.

Through the use of statistic data obtained from Quantec Data, STATS SA and data from various reports and IDP's of the NLM it is possible to evaluate the overall progress towards certain MDG targets and sustainable development for the Municipality alone. Due to the lack of data for the Parys town area alone, the entire NLM will be evaluated for indicators which lack sufficient data for Parys alone. However certain features of the Parys town area will be pointed out. Furthermore only indicators with sufficient data will be evaluated, thus not all indicators mentioned in Chapter 2 will be discussed.

4.2 Ngwathe Local Municipality and sustainable development

In order to understand the importance of sustainability and sustainable development within the NLM one can start by considering their vision and their mission as a municipality. Their vision and mission reads as follows:

Vision

"…To be a world class municipality that promotes economic development and excellent service delivery…"(NLM IDP, 2009: 2).

Mission

"…To provide quality and sustainable services in an efficient, effective & economic manner to all communities through the promotion of community participation, good governance & improved intergovernmental values…" (NLM IDP, 2009: 2).

The NLM identifies their major challenges in the NLM IDP, 2011:

- Low revenue base,
- Continued disclaimer AG Report,
- Water quality and provision in Parys, Vredefort and Edenville,
- Sanitation problems in most of our towns,
- Un-trafficable streets (aged yellow fleet),
- Lack of refuse handling equipment,
- High rate of poverty and unemployment,
- Housing provision.

The NLM IDP is used as a tool and a framework to provide adequate basic services to the community. The IDP is a strategic five year plan and guides all developments relevant to the municipal area. The IDP is reviewed annually to provide for changes in the area. The IDP has a participatory nature and involves input from the community, stakeholders and sector departments. The municipal IDP forms the cornerstone which guides all development planning within the municipality and is founded on various legislations. The IDP document is realised in terms of Section 5 of the Municipal Systems Act 32 of 2000 and is a legal document (NLM IDP, 2009: 5). The Municipal IDP is founded on and not limited to the following legislations:

- Constitution of the Republic of South Africa,
- Municipal Systems Act 32 of 2000,
- Municipal Structures Act 117 of 1998,
- National Environmental Management Act 107 of 1998,
- Development Facilitation Act 65 of 1995,
- Municipal Finance Management Act 56 of 2003,
- Municipal Demarcation Act 27 of 1998,
- Disaster Management Act 57 of 2002,
- Local Government Property Rates Act 6 of 2004,
- National Spatial Development Perspective,
- United Nations Millennium Development Goals,
- Free State Growth and Development Strategy,
- Operation Hlasela injunctions and programmes,
- All other sector based legislation (NLM IDP, 2009: 5).

As stated above the NLM has a number of challenges with the most prominent challenge being the rising level of unemployment which is directly linked to high levels of poverty and low revenue in the area.

The NLM was represented at the launch of The Durban Adaptation Charter for Local Governments at the 17th United Nations Framework Convention on Climate Change or Conference of the Parties as adopted at the annual (COP17) meeting held in Durban, South Africa. The NLM thus recognises that climate change is a global problem in need of serious attention and is a participant of this charter (NLM IDP, 2011: 81).

The NLM is advocating the following actions in order to slow climate change:

- Reduce emissions of heat-trapping gases,
- Increase energy efficiency, by installing solar geysers, solar street lights and solar high mast lights,
- Provision of energy saving bulbs,
- Use of renewable energy sources like wind, solar and biomass,

- Increase the resilience and resistance of natural systems to the stress of climate change,
- Encourage Greening,
- Discourage and work against veld fires (NLM IDP, 2011: 78).

The NLM IDP at this stage aims to rectify and enhance the quality of life of its citizens by identifying core issues, the challenges related to these issues as well as intervention or mitigation plans. However the prominent occurrence present in NLM IDP's dated from 2010 – 2012 are that no actual targets are being met. Core issues tend to be forwarded from one IDP to the following. In most cases the explanations are related to lack of, or discontinued funding. This could be due to certain duties appointed to local levels of municipality which causes National and District levels to withdraw and leads to a lack of funding.

4.3 Parys sustainability evaluation

In order to evaluate Parys in terms of sustainability and sustainable development and linked MDG's a revision and linkage between goals and current issues identified in the IDP and annual municipal reports must be made. The purpose of this evaluation is to obtain a general overview of the current situation and point out certain problem areas that need attention and which could impact on the future growth of Parys. There will be focused on the current situation of the area and progress made in certain areas. The 8 MDG's as listed in Chapter 2 are:

1. To eradicate extreme poverty and hunger,

2. To achieve universal primary education,

3. To promote gender equality and empower women,

4. To reduce child mortality,

5. To improve maternal health,

6. To combat HIV/AIDS, malaria and other diseases,

7. To ensure environmental sustainability,

8. To develop a global partnership for development (R.S.A., Millennium Development Goals Country Report 2010: 13).

The sustainability indicators as derived from the SCI, (2012) toolkit are summarised below:

Economy

- Unemployment rates
    - Employment and unemployment rates,
    - Education (professional).
- Economic growth
    - Annual GDP growth rate,
    - Annual GNP growth rate,
    - Net Export Growth rates (% increase of total exports minus the value of total imports annually).

Environment

- Green spaces
    - Percentage of preserved areas/ reservoirs/ waterways/parks in relation to total land area,
    - Percentage of trees in the city in relation to city area and/or population size.
- Reduce Greenhouse gases/ energy efficiency
    - Total amount of GHG emissions per city and per capita,
    - Percentage of total energy consumed in the city that comes from renewable sources.
- Mobility
    - Transportation mode split (percentage of each mode of transportation, i.e. private, public, bicycles, pedestrians),

    - Average commute time and cost.
- Water quality and availability
    - Total amount of water availability,
    - Water quality index/score,
    - Proportion of population with access to adequate and safe drinking water.
- Air quality.
    - Levels of Particulate Matter (PM10 - mg/m3),
    - Levels of Particulate Matter (PM2.5 - mg/m3).
- Waste/ Reuse/ Recycle
    - Recycling rate (percentage diverted from waste stream),
    - Volume of solid waste generated.

Social

- Complete neighbourhood / compact city
    - Access to local/ neighbourhood services within a short distance,
    - Crime rates,
    - Measures of income distribution and inequality.
- Housing
    - Percentage of social / affordable / priority housing,
    - Breakdown of housing sector by property type (owner occupied / rental, single occupant/couples/family/multifamily etc.).
- Quality public space
    - Percentage of roadways in good conditions,
    - Percentage of green space (public parks) coverage in relation to city area and/or population.
- Education
    - Number of schools,

- Adult literacy rate.

- Sanitation
  - Percentage of population with access to water-born or alternative (and effective) sanitary sewage infrastructure.

- Health
  - Mortality rate/ life expectancy,
  - Percentage of population with access to health care services.

By considering all the parameters identified in the MDG's, sustainability indicators and the problems identified by the NLM it is clear that they all overlap with the sustainability indicators. The sustainability indicators with sufficient data will thus be used to evaluate the current situation in Parys as well as the NLM, indicators without data will not be used.

4.3.1 Economic sustainability

Economic sustainability includes unemployment rates and general economic growth indicators and will be discussed below.

4.3.1.1 Employment and unemployment

The employment and unemployment of the NLM for 1995-2011 is summarised in Table 6. Data is based on the 1996 and 2001 population censuses, the 2006 local municipal boundaries, the 2007 community survey and the 2011 mid-year population estimates.

Table 6. Employment and unemployment figures NLM

Employment and Unemployment of the NLM 2002-2011										
Concept	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Unemployment rate (%)	33	35	35	34	32	30	29	29	30	30
Labour force participation rate (%)	59	59	58	58	57	56	55	54	54	54
Population - Total (Number)	117 256	116 733	115 313	113 336	110 787	107 736	104 464	101 350	98 784	97 062
Population - Working age (Number)	71 393	71 448	71 017	70 300	69 297	67 953	66 435	65 001	63 898	63 297
Economically active (Number)	42 215	41 887	41 113	40 768	39 533	38 117	36 538	35 090	34 368	34 312
Unemployed (Number)	13 848	14 728	14 457	14 042	12 798	11 440	10 441	10 131	10 200	10 442

(Source: Quantec Data, 2013)

Table 6 indicates a slight increase in the unemployment rate (Unemployed number ÷ Economically active number × 100) for the past four years and a slight increase in the labour force participation rate since 2010. The unemployment number has increased since 2009 with a decrease in the working age population as well as the total population of the NLM. This indicates a negative population growth that could be explained by the unemployment rate in the NLM, at this stage there is evidence of a lack of work opportunities. The Free State Growth and Development Strategy in accordance with the MDG's sets a local municipal goal to reduce their unemployment rate to 20 % by 2014 (NLM IDP, 2010: 72). From Figure 5 it is evident that the current trend in the unemployment rate is increasing instead of decreasing. The chances of the NLM reaching the 20 % unemployment rate target by 2014 are highly unlikely. It can thus be concluded that Parys and the NLM is not sustainable in terms of reducing poverty and unemployment furthermore also contradicting their economic growth.

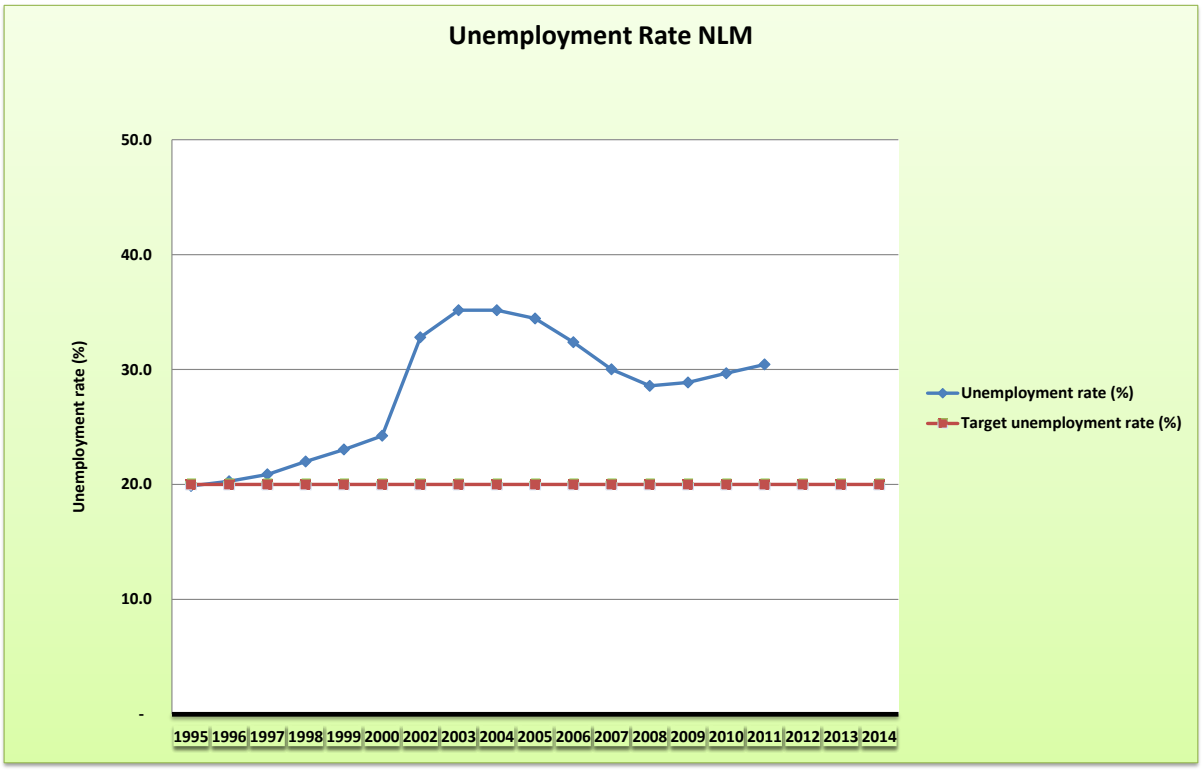

Figure 5: The NLM unemployment rate and target unemployment rate
(Source: Compiled by Researcher)

4.3.1.2 Professional education

Table 7. Professional education figures NLM

NLM level of professional education 2002-2011										
Level of education	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Certificate with Grade 12	802	800	789	772	749	730	703	676	651	639
Diploma with Grade 12	1 778	1 748	1 702	1 647	1 582	1 509	1 435	1 360	1 290	1 267
Bachelor's Degree and Diploma	257	270	281	291	303	312	322	334	345	339
Honours degree	171	181	196	213	232	257	284	321	366	360
Higher Degree (Master's, Doctorate)	229	235	243	247	248	249	248	248	248	243

(Source: Quantec Data, 2013)

Table 7 indicates a slight decrease in all professional levels of education, this can be problematic due to the fact that people with professional levels of education seem to be leaving the municipality. This could be due to limited job opportunities, and could impact negatively on the future of the NLM and Parys as this part of the population is needed to perform specialist functions in water, waste and other management areas.

4.3.2 *Environmental sustainability*

The NLM IDP, (2011: 75) consists of a State of the Environment Report which includes a general overview of the following:

- Natural water resources and water quality,
- Vredefort Dome World Heritage Site,
- Land fill sites,
- Conservation,
- Mineral resources,
- Air quality,
- Land,
- Endangered species,
- Effluents control systems,
- Climate.

4.3.2.1 Green spaces

According to the SCI, (2012) toolkit the following indicators can give an indication of urban and environmental health.

- Percentage of preserved areas/ reservoirs/ waterways/ parks in relation to total land area.
- Percentage of trees in the city in relation to city area and/or population size.

Data for Parys and the NLM on the above mentioned aspects are however limited. The NLM IDP, 2011 does however consider urban greening as an important aspect to combat climate change and ensure liveable, healthy and sustainable urban areas.

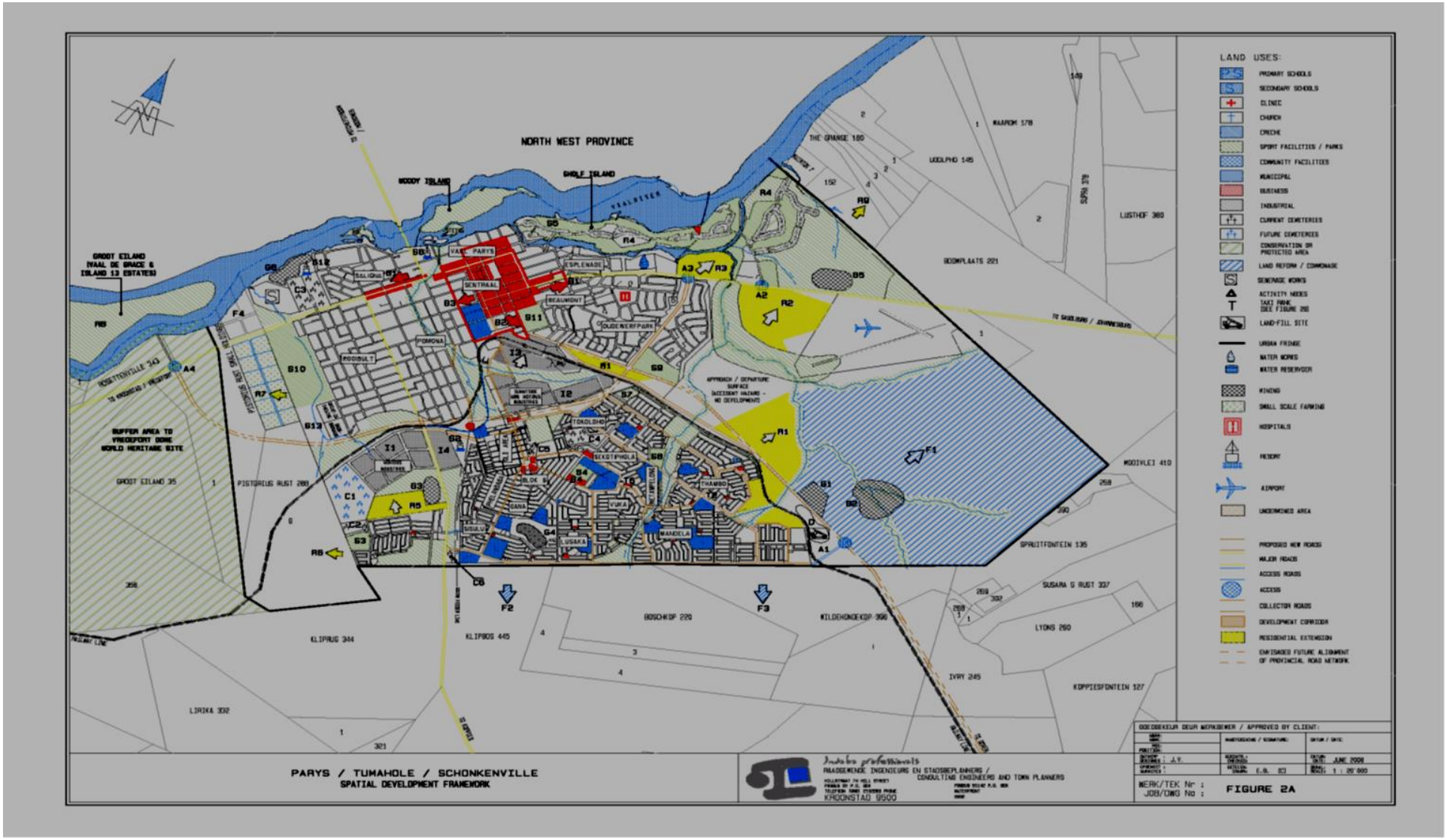

Figure 6: The Parys SDF
(Source: NLM SDF, 2008)

Figure 6 gives a visual indication of the relation between green areas, parks and protected areas and the urban area of Parys. When consulting Figure 6 it is clear that Parys has a good relation in terms of parks, green areas and protected areas and the urban area of the town. Parys does however lack green areas within the urban area as the majority of green areas and parks are situated on the outskirts of the urban area. Furthermore the NLM IDP, (2010: 94) sets a number of environmental management objectives and strategies to inform and guide future planning procedures. Among these objectives the development of green areas through tree planting programmes are listed with a strategy to develop green areas in Parys that will contribute to environmental sustainability. None of the protected areas in the Free State fall within the Parys town area. There is thus a need for the NLM to start monitoring and implementing their tree planting programmes and incorporate the issue along with other evaluations. A more detailed database regarding green areas, parks and protected areas are needed in order to set certain objectives relating to this indicator.

4.3.2.2 Reduce Greenhouse gases and increase energy efficiency

This indicator is measured using the following:

- Total amount of Green House Gas emissions per city and per capita.

No data for total amounts of Green House Gas emissions are available for Parys or the NLM. The NLM IDP, (2011: 78) does however indicate that the municipality is in the process of advocating the reduction of Green House Gas emissions in order to slow climate change by the encouraging greening and discouraging veld fires.

- Percentage of total energy consumed in the city that comes from renewable sources.

According to the NLM IDP, (2011: 56) the municipality lacks an Energy Master Plan. At this stage the municipality follows the National Target related to electricity, this target is to improve access to basic electricity from 81% to 92% given the fact that South Africa is still a developing country energy from renewable sources is not at the top of the agenda. Parys and Tumahole consist of 15500 households of which 14989 are electrified. A total of 200 households have conventional meters while 14589 have pre-paid meters, 511 households are currently not electrified (NLM IDP, 2011: 56). The focus of objectives and strategies for the NLM falls on the eradication of backlogs on electricity to households. The municipality does however aim to implement alternative energy sources through a strategy which includes the promotion of solar water heating and street lighting in order to save energy and

use renewable energy sources (NLM IDP, 2011: 159). Unfortunately no additional data is available for this Section.

4.3.2.3 Mobility

This indicator is measured using the following:

- The transportation mode split (percentage of each mode of transportation, i.e. private, public, bicycles, and pedestrians).

The NLM does not have a transport plan due to limited funding and technical capacities (NLM IDP, 2011: 154). The NLM does however aim to improve public transport. When considering Parys, the town does have potential to accommodate residential pedestrian and bicycle transport given that residential areas are in close proximity to work places and the central business district.

4.3.2.4 Water quality and availability

This indicator is measured using the following:

- The total amount of water available.

The Parys town area receives its water supply from Vaal River. According to the Department of Water Affairs, (2011: 22) the surface water resources for the Parys town area will be sufficient enough to ensure a sustainable supply of water to the area until 2030.

- Water quality index score.

According to the 2012 Blue Drop report card for the NLM the Blue Drop score for the Municipality was 20.59% while the Blue Drop score for Parys was 14.33% with absolutely no improvement on the 2010 situation. Water quality indicates that the drinking water in Parys did not comply with standard targets in terms of micro and chemical compounds. Although the drinking water quality in Parys is not merely as poor as its surrounding towns there is still reason for concern. When looking at Figure 7 it is evident that the Blue Drop Score for Parys improved in 2011 however the situation worsened in 2012. It is evident that efficient action to improve the water quality is noticeably needed.

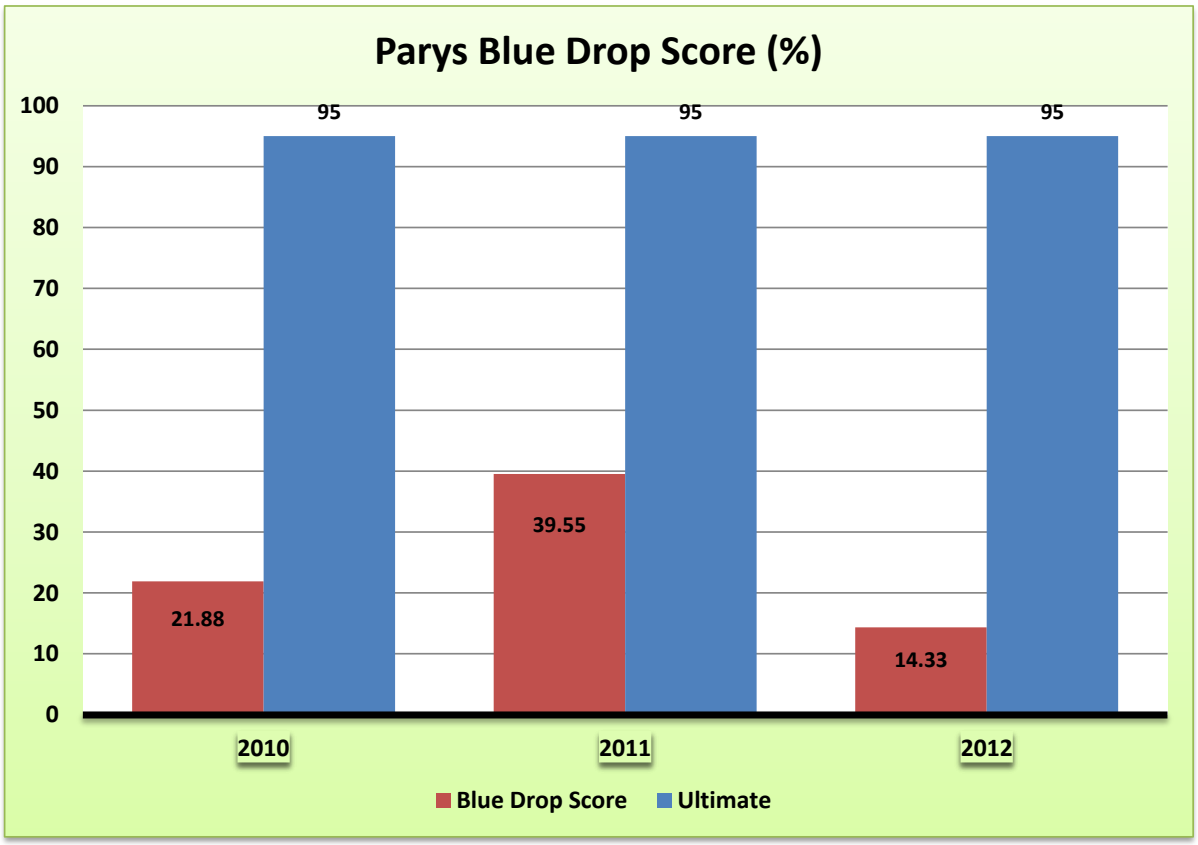

Figure 7: Parys Blue Drop Score 2010-2012
(Source: Compiled by Researcher)

- Proportion of population with access to adequate and safe drinking water.

Table 8. NLM household access to tap water

NLM household access to tap water			
Type	**1996**	**2001**	**2011**
Piped (tap) water inside dwelling/yard	21615	27545	32505
Piped (tap) water on a communal stand	5850	3863	4236
No Access	2000	700	361

(Source: STATS SA 2011 Census Data)

From Table 8 it is clear that there has been an increase in the number of households who have access to tap water inside their dwelling or yard which indicates a high access to safe drinking water, furthermore the number of households without access has decreased substantially.

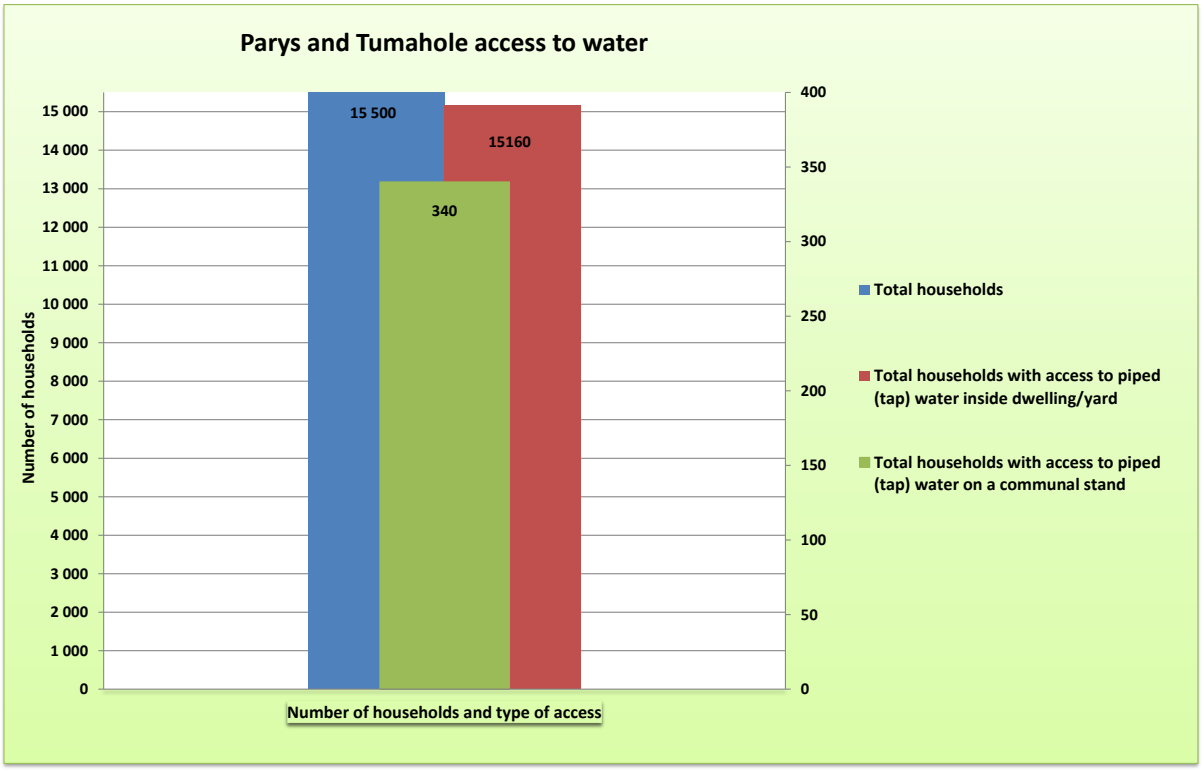

Figure 8: Parys and Tumahole access to water
(Source: Compiled by Researcher using data from NLM IDP, 2011: 46)

Parys and Tumahole are within the National target of a 92 % access improvement to 100 % access by 2014. From Figure 8 it is evident that the Parys and Tumahole area has a total of 97 % of households with access to piped tap water inside their dwelling, and a total of 2.19 % of households with access to piped tap water on a communal stand. It is important to note that all households have access to water, however there are only 28 communal pipe stands serving 340 households which means that each pipe stand is serving approximately 12 households. Should the NLM as stated in their NLM IDP, (2011: 43) improve the number of communal pipe stands and households with access to piped tap water inside their dwelling they will be able to reach the target of a 100 % access by 2014.

4.3.2.5 Air quality

The NLM relies mainly on the FDDM policy on air pollution issues. The NLM only has a few air polluting parameters in comparison with highly industrialized areas NLM IDP, (2011: 76). However Parys neighbours the highly industrialized Sasolburg. Sasolburg is known as a 90% air polluter and this makes Parys susceptible to poor air quality. The lack of air quality data for the Parys area is alarming given the situation above and the fact that air pollution is Trans boundary. There is clearly a need for an inclusive air quality monitoring plan for Parys (NLM IDP, 2010: 42).

4.3.2.6 Waste management

Waste management is measured by the recycling rate and the volume of waste generated in a town or city.

- Recycling rate (percentage diverted from waste stream).

There is currently no waste recycling services in the Parys town area and no waste recycling projects. The issue of waste recycling programmes in communities are however recognised in the NLM IDP as a key focus area in terms of service delivery with the implementation strategy to promote recycling within communities (NLM IDP, 2011: 156).

- Volume of solid waste generated.

There is currently no data available for Parys or the NLM on the volume of solid waste generated, this can be explained by the fact that Parys has one landfill site, the site is permitted but currently not compliant with relevant legislation or regulations. The current situation in Parys and Tumahole is as follows; there are 15500 households of which 13982 are serviced on a weekly basis. A total of 1518 households do not have rubbish bins and are not serviced (NLM IDP, 2011: 59). This could have serious health and environmental consequences. An integrated waste management plan is needed as well as a data base to monitor the amount of waste generated and recycled.

4.3.3 *Social*

Social indicators for the sustainability evaluation include the following.

4.3.3.1 City parameters

- Access to local or neighbourhood services within a short distance.

Parys has a relatively small town area with various public service centres in close proximity to residential areas. Access to local and neighbourhood services are not a problem. This can also be seen in Figure 6 in Section 4.3.2.1.

- Crime rates.

The current situation in Parys regarding the nature of crimes includes the following; motor vehicle theft, livestock theft, burglaries and assault (NLM IDP, 2011: 110). According to the Crime Research and Statistics (CRS: 2012) - South African Police Service (online) the crime situation in Parys for March 2008 up to March 2012 can be summarised in Table 9.

Table 9. Crime in Parys

Parys crime 2008 - 2012					
Crime Category	**2008**	**2009**	**2010**	**2011**	**2012**
Contact crimes (against a person)	250	238	197	171	151
Contact related crimes	95	71	68	45	36
Property related crimes	379	308	285	313	246
Total:	724	617	550	529	433
Total % reduction:	0	-14.78%	-10.86%	-3.82%	-18.15%

(Source: CRS: 2012)

From Table 9 it is clear that crime incidents in the most serious areas have declined from 2008 up to 2012. According to the NLM IDP, (2010: 47) the target set for local municipalities in terms of crime rates by the Free State Growth and Development Strategy is a reduction of at least 7 % annually. Table 9 also indicates that the average annual crime rate in Parys has decreased with more than 7 % annually except for 2011. This indicates a downward trend for the small town in terms of crime rates.

- Measures of income distribution and inequality.

Table 10. NLM average household income

NLM average household income (Rand)	
2001	**2011**
R 22179	R 56316

(Source: STATS SA 2011 Census Data)

Unfortunately no applicable statistic data for income distribution and inequality are available for Parys or the NLM, Table 10 does however indicate that the average household income for the NLM has increased from 2001 up to 2011 indicating positive economic growth.

4.3.3.2 Housing

- Percentage of social / affordable / priority housing.

The NLM does not have a social housing demand data base however the lack of data has been identified as a major challenge (NLM IDP, 2011: 83).

- Breakdown of housing sector by property type (owner occupied or rented).

Table 11. NLM dwelling and tenure type

NLM Dwelling type and households by tenure status			
Dwelling type and tenure status	**1996**	**2001**	**2011**
Formal Dwellings	16952	22505	30175
Traditional Dwellings	1670	970	160
Informal Dwellings	10558	8485	6511
Owned and fully paid off	~	17928	22300
Owned - not yet fully paid off	~	3968	2299
Rented	~	5495	6519
Occupied rent free	~	4717	4759

(Source: STATS SA 2011 Census Data)

From Table 11 it is clear that the number of formal dwellings have increased along with a decrease in traditional and informal dwellings. The increase in formal dwellings along with an increase in ownership as well as rent free occupation of dwellings indicates favourable economic conditions.

4.3.3.3 Quality public space

- Percentage of roadways in good conditions.

The Parys town area has a total of 417 streets and internal roads of which only 51 are tarred and 366 are gravel roads (NLM IDP, 2011: 66).

4.3.3.4 Education

- Number of schools.

Parys has an adequate number of schools. The Parys town area currently consists of the following schools;

- 11 Primary schools,
- 1 Comprehensive school,
- 2 Intermediate schools,
- 4 Secondary schools and,
- 1 Agricultural school (NLM IDP, 2011: 84).

4.3.3.5 Sanitation

- Percentage of population with access to water-born or alternative (and effective) sanitary sewage infrastructure.

Table 12. NLM household sanitation status

NLM household sanitation			
Type	**1996**	**2001**	**2011**
Flush/chemical toilet	13327	16968	28619
Pit latrines	6393	5302	3608
Bucket system	7945	7512	3963
No toilet	1831	2326	609

(Source: STATS SA 2011 Census Data)

The increase in households with flush toilets and the decrease in bucket and pit systems in Table 12 indicate adequate service delivery and environmental protection. The overall trend indicates positive progress towards eradicating the bucket and pit systems in the following years. The National target set for sanitation by 2014 is a 100 % access to flush toilets and the total eradication of the bucket system (NLM IDP, 2011: 51). Furthermore data on Parys and Tumahole indicate that 87 % of the households have access to flush toilets while 6.2 % use the bucket system and 7 % use a septic tank system. Unfortunately no data for Parys and Tumahole is available in order to establish the overall trend towards reaching this target.

4.3.3.6 Health

- Percentage of population with access to health care services.

Parys has one clinic and one hospital. It can thus be assumed that the majority of the population has access to health care services although no adequate data is available.

4.4 National small town sustainability indicators

By using international sustainability indicators along with the SCI, (2012) toolkit, problem areas identified by The Local Economic Network for Small Town Development

and personal observations it is possible to compile a list of National small town sustainability indicators for South Africa. The National small town sustainability indicators include the urban and environmental parameters used in the questionnaires for this study. A possible National small town sustainability indicator list is summarised in Table 13.

Table 13. National small town sustainability indicators

Indicator number	National Small Town Sustainability Indicators (NSTSI)
1	**Economic Indicators**
1.1	Unemployment rates
1.1a	Employment and unemployment rates
1.1b	Level of population with professional education (Certificate with Grade 12 and above)
1.2	Economic growth
1.2a	Annual GDP growth rate
1.2b	Annual GNP growth rate
1.2c	Net Export Growth rates (% increase of total exports minus the value of total imports annually)
2	**Environmental Indicators**
2.1	Green Spaces
2.1a	The quality of open spaces and parks (public safety & litter)
2.1b	Percentage of preserved areas/ reservoirs/ waterways/parks in relation to total land area
2.1c	Percentage of trees in the city in relation to city area and/or population size
2.1d	Percentage of green space (public parks) coverage in relation to city area and/or population size
2.2	Appearance of the town
2.2a	The overall clean appearance of the town
2.2b	The overall clean appearance of public spaces
2.3	Transportation mode split. (Percentage of each mode of transportation, i.e. private, public, bicycles, pedestrians).
2.4	Surface water quality
2.4a	Water quality of all surface water resources, rivers, streams and canals
2.5	Air quality
2.5a	General air quality of town (measured quarterly)
2.6	Public spaces & Urban elements
2.6a	General conditions of roads (% of roads in good and bad condition)
2.6b	General conditions of buildings
2.6c	Traffic congestion (time and duration of heavy traffic)
2.6d	Storm water drainage systems (conditions and maintenance)
3	**Social Indicators**
3.1	Pedestrian friendliness of town
3.1a	Condition of side walks
3.1b	Sufficient pedestrian crossings
3.2	Complete neighbourhood / Compact town
3.2a	Access to local or neighbourhood services within a short distance
3.3	Crime rates
3.3a	Crime rates for town (% increase or decrease)
3.4	Measures of income distribution and inequality
3.5	Housing
3.5a	Percentage of social / affordable / priority housing
3.5b	Breakdown of housing sector by property type (owner occupied / rental, single occupant/couples/family/multifamily etc.)
3.6	Education
3.6a	Number of schools with environmental education programs
3.6b	Adult literacy rate
3.7	Sanitation
3.7a	Percentage of population with access to water-born or alternative (and effective) sanitary sewage infrastructure
3.8	Health
3.8a	Mortality rate/ Life expectancy
3.8b	Percentage of population with access to health care services
3.9	Service delivery
3.9a	Refuse collection
3.9b	Availability of public waste bins
3.9c	Volume of waste generated
3.9d	Provision and availability of recycling facilities
3.9e	Volume of waste diverted from waste stream via recycling
3.9f	Quality of tap water
3.9g	Availability of tap water
3.9h	Electricity provision
3.9i	Energy efficiency
3.9j	Alternative energy resources used
3.9k	General municipal rates and taxes
3.9l	General municipal services
3.9m	Quality Public Space
3.9n	Percentage of roadways in good conditions

4.5 Conclusion

It is clear that the NLM is currently not sustainable in all three spheres of sustainability; economic, social and environmental. The main challenges identified by the NLM reflect in the evaluated sustainability indicators used. Although the current situation is alarming with regards to the future growth and survival of Parys it is important to take into account that the majority of indicators are developed for developed countries and that South Africa is still in the primary phases of sustainable development. Furthermore in a South African context the focus falls on basic service delivery to all. It is however important to note that by focussing on basic service delivery to all citizens it is possible to lose sight of sustainable development visions. Parys and the NLM have a number of challenges when it comes to sustainability, however most of these challenges are noted and in the process of being strategically implemented in the NLM IDP. The major challenge will be to implement monitoring and mitigation programmes along with sufficient data collection. With this evaluation and results obtained during the urban and environmental survey of Parys it will be possible to identify the key issues and develop recommendations in order to rectify these problems. The NLM has already begun the process, the components lacking are the actual implementation of strategies related to objectives and challenges and adequate data collection.

CHAPTER 5: METHODOLOGY

5.1 Quantitative (qual) mixed methods research

After the sustainability evaluation of Parys and the overall NLM in Chapter 4, some parameters for the Parys town area were lacking. In order to achieve the objectives set out in Chapter 1, a further in depth investigation was needed. The objectives are:

- To investigate and evaluate the small town of Parys in terms of applicable United Nations Sustainability indicators.
- To classify the small town of Parys in terms of its economic drivers and growth factors.

These two primary objectives have been reached in Chapter 3 through the investigation of Parys as a growth point, the economic profile of the town and the relative location of Parys as a service centre. Chapter 4 focussed on the evaluation of Parys and the NLM in terms of sustainability indicators identified in Chapter 2.

The remaining objectives are listed below:

- To evaluate the role and importance of the natural and urban environment on small town economic drivers and important stakeholders.
- To determine the perceptions and concerns of businesses and important stakeholders on their natural and urban environment.
- To identify the main urban and environmental components affecting the survival of Parys and the community of Parys.
- To formulate recommendations to improve the current urban and environmental situation in Parys to ensure healthy future growth and sustainable development.

The methodology relating to the achievement of the objectives listed above will be discussed in the following text.

5.1.1 Research design

After formulating the research question and research objectives, they were used as guidelines and a case study approach was adopted. A case study approach acts as an empirical investigation. It will be used to investigate an existing occurrence. According to

Maree, (2007: 75) case study research is used by researchers from various disciplines to answer questions relating to exactly how and why phenomena occur. Furthermore this approach offers a multi-perspective analysis and thus sets the stage for an empirical investigation. During the empirical investigation stakeholders and business owners in Parys can contribute and participate in a survey. The survey will determine their perceptions and concerns in terms of the natural and urban environment as well as the importance of these parameters for the success of businesses and the future growth of the town. This study will focus on and investigate the current state of sustainability as well as the urban and natural environment of Parys.

The case study approach was selected along with a quantitative research approach. The quantitative research method was selected to generate numerical data that can be statistically analysed to quantify the existing perceptions and concerns of business owners and important stakeholders in Parys. By quantifying these perceptions and concerns it will be possible to determine the satisfaction, importance and ratings of certain urban and environmental parameters to the economic drivers and important stakeholders of Parys. The main problem areas can be identified and along with the findings of the sustainability evaluation (Chapter 4) recommendations can be formulated. These recommendations could assist in improving the current situation and secure a healthy and sustainable future for Parys.

5.1.2 Research approach

The research approach consists of two surveys conducted through questionnaires developed to test the perceptions of business owners and important stakeholders on certain urban and environmental parameters in Parys. Questionnaires were chosen in order to reach the maximum number of respondents within a short period of time. Questionnaires are also more cost effective than personal interviews. The surveys were conducted through questionnaires that were given to the identified respondents by the researcher. They were given adequate time to answer the questions. The perceptions of business owners and stakeholders were tested on selected urban and environmental parameters and included three areas. Firstly how satisfied they were with the parameters, secondly how important they felt the parameters were for the success of their businesses and the future growth of Parys and finally they had to rate the parameters. Parameters were named elements in questionnaires in order to make the subjects more user friendly for respondents. Each area was tested using a modified likert scale as depicted in Table 14. Furthermore personal

observations were made by the researcher in order to visually aid in the evaluation of urban and environmental parameters through photos taken during the surveys.

Table 14. Likert scale used in questionnaires

Perceptions					
Satisfaction Scale 1-5	**1** Very dissatisfied	**2** Somewhat dissatisfied	**3** Didn't notice	**4** Somewhat satisfied	**5** Very satisfied
Importance Scale 1-5	**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
Rating Scale 1-5	**1** Poor	**2** Fair	**3** Unsure	**4** Good	**5** Excellent

5.1.3 Method of investigation

The methods used for the empirical investigation includes two surveys conducted over a one week period from the 2nd to the 6th of September 2013:

- Survey 1: a questionnaire to determine the perceptions of important stakeholders on certain urban and environmental parameters in Parys. The questionnaire included questions on the importance, satisfaction and general rating of urban and environmental parameters in Parys. The general rating for each parameter is used to determine the main problem areas in Parys.
- Survey 2: a questionnaire to determine the perceptions of business owners on certain urban and environmental parameters. The questionnaire included questions on the importance, satisfaction and general rating of urban and environmental parameters in Parys. The general rating for each parameter is used to determine the main problem areas in Parys. The business questionnaire consisted of an additional Section, (Section A) which consisted of semi-structured questions on general aspects of the business.

5.1.4 Study area demarcation

The study area was demarcated and includes, the Parys central business area, businesses situated between Breë Street and the Vaal River and the entire main street, Breë Street. The study area was chosen in order to narrow the study to areas with high density business

activities within close proximity to the prominent features (the Vaal River and urban characteristics) of Parys. The boundaries of the study area is summarised below:

- The Parys central business area (Loop Street with Paulensen Street as a border, water Street up to Shilbach Street and St. Jan Street up to Breë Street),
- Businesses situated between Breë Street and the Vaal River with Allenby and Fick Street as borders,
- The main street, Breë Street with Water and Allenby Street as borders.

Figure 9 depicts the study area within the Parys urban area and the Vaal River.

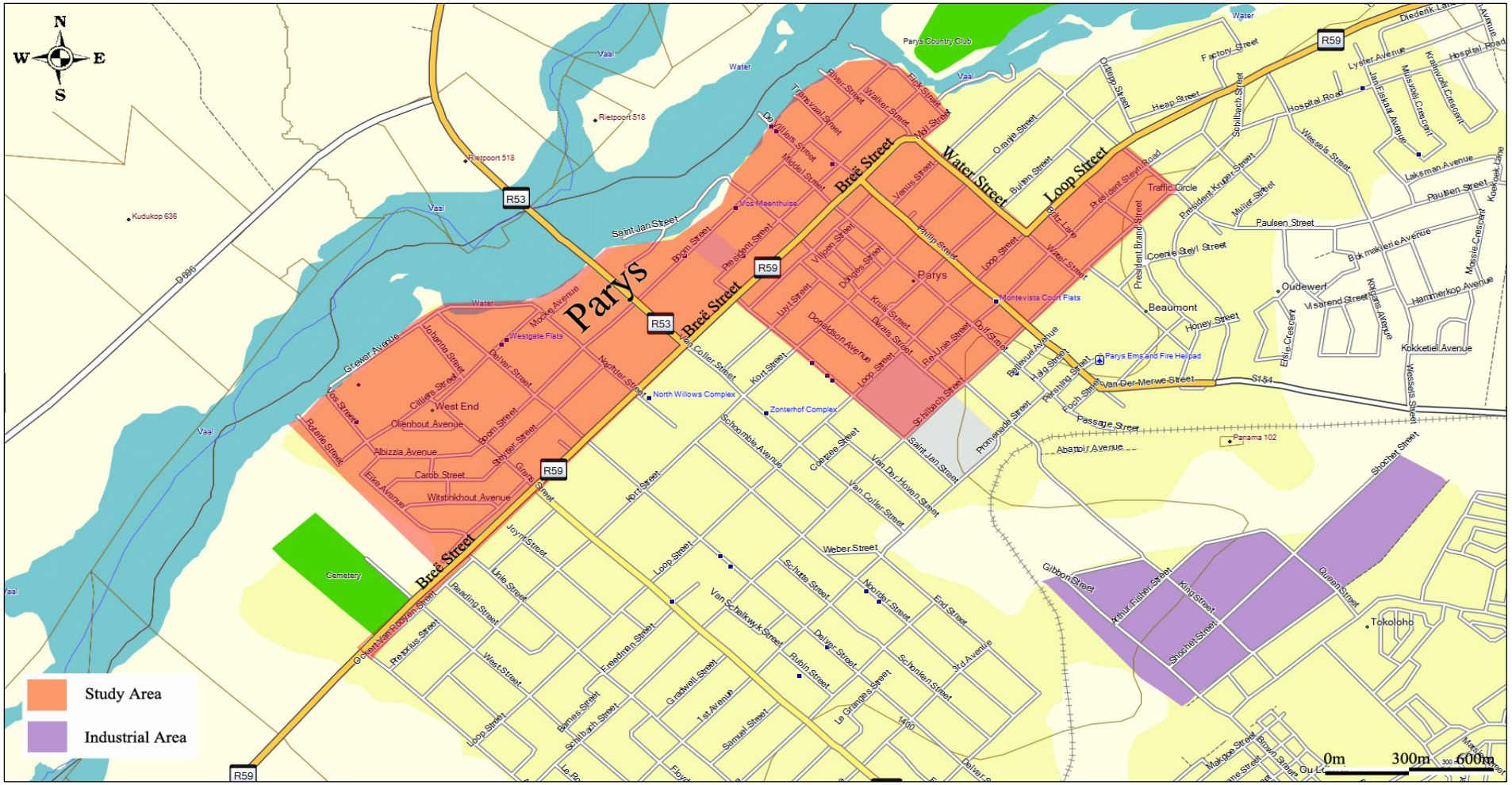

Figure 9: The study area
(Created by the Researcher, 2013)

5.1.5 Population groups

The population group consists of key stakeholders in Parys ranging from political councillors, Business Forum chair persons and important pillars in the community as well as 186 business owners in the demarcated study area namely, the Parys central business area, businesses situated between Breë Street and the Vaal River and the main street, Breë Street.

The Oxford English dictionary, 1989 defines stakeholders as: *"…People or organizations that are concerned about, affected by, have a vested interest in, or are involved in some way with the issue at hand…*"

In order to identify stakeholders in Parys the NGO group SAVE Parys and the NLM was approached to ensure that the main key stakeholders were approached to participate in the study. Business owners for the study area listed above were chosen to represent Parys as a community and for the purposes of this study it can be expected that most business owners will also reside in Parys, however a question on their residential status has been included in the questionnaire.

The population sample size for the study area was determined by using business listings from the Parys Business Forum as well as businesses listed at the Parys information centre. The number of businesses (population N) in Parys for the study area was established as N = 186, and the sample size (n) for the study area was established using a formula designed by Stoker, 1981: 13. According to Stoker, (1981: 13) the sample size (n) can be determined using the following formula:

$$n = \sqrt{N}/20 * 20$$

Thus (n) = 60.991802

The total sample size for business owners can thus be rounded off to 61.

According to Welman *et al.*, (2005: 202) the focus group varies between 6 and 12. The stakeholder sampling size (n) = ≥6 ≤ 12.

A stratified proportional random sample for the business sector of Parys was structured using the existing SMME categories as derived from the National Small Business Act 102 of, 1996. The sample frame was also compiled using these categories as sub-zones.

Table 15 illustrates the sub-zones with the number of businesses in each category of the population, as well as the sample size and percentages calculated for each sub-zone. For the total population (N=186) identified in the study area there are three sub-zones.

Table 15. Sample frame business owners in Parys

Sub -Zone: Category of SMME	Businesses	Sample size	% Sample
1. Micro enterprises	61	20	33
2. Very small enterprise	73	24	39
3. Small enterprise	52	17	28
Total:	N = 186	n = 61	100

In order to determine the sample size for each sub-zone the following calculations were made:

Sample size for sub-zone 1 = the number of businesses in the category divided by the population (N=186) multiplied by the sample size (n = 61)

Sample size: Sub –zone 1 = (61/186) x 61

= 20

Sample size: Sub-zone 2 = (73/186) x 61

= 23.9 thus 24

Sample size: Sub-zone3 = (52/186) x 61

= 17

After which the percentage sample for each sub-zone sample size was calculated.

5.1.6 Measuring instrument

The survey was made available to respondents through a week-long visit to the study area from the 2nd to the 6th of September 2013. Various business owners were visited by the researcher, informed on the purpose of the survey and also given background on the study. Furthermore they were then asked if they would be willing to complete a questionnaire in order to assist with the urban and environmental evaluation of Parys. Stakeholders were contacted and a short meeting was scheduled in order to introduce the researcher and supply them with the needed information.

5.1.7 Business owner survey and questionnaire

The survey was conducted by the researcher over a period of one week by consulting business owners individually, as a stratified proportional random sample for the business sector of Parys was structured using the existing SMME categories as derived from the National Small Business Act 102, (1996) as a guideline. The sample frame was also compiled using these categories as sub-zones to ensure all sub-zones were sampled. Other sectors were added after observing the types of businesses present in the study area. A random availability survey was conducted for this study, thus from the 61 businesses identified in the study area 20 Micro enterprises, 24 very small enterprises and 17 small enterprises were each asked to complete a voluntary and anonymous questionnaire.

The business questionnaire consisted of two Sections (See Annexure B). Section A consisted of semi-structured questions on general aspects of the businesses. These include:

- The main source of income, local, visitors or mixed.
- The residential status, residing in Parys or not.
- The number of employees currently working for the business.
- The sector under which they are classified.

The first two points were included to determine the residential and tenure status of the business owner's sample.

The latter two points mentioned, are derived from the National Small Business Act 102, (1996) (See Table 16 and Table 17) and supply the researcher with information regarding the dominating enterprise size in the study area - small, micro or medium enterprises and to determine which sector dominates the study area.

Table 16. Summary of SMME category and number of employees

Category of SMME	Number of Employees
Micro enterprises	Between one to five employees.
Very small enterprise	Less than 10 paid employees.
Small enterprise	Less than 100 employees.

(Source: National Small Business Act, 102 of 1996)

Table 17. Summary of different sector classifications for SMME's

Sectors
Agriculture
Mining and Quarrying
Manufacturing
Electricity, Gas and water
Construction
Retail and motor Trade and repair services
Wholesale trade, commercial agents and allied services
Catering, accommodation and other trade
Transport, storage and communications
Finance and business services
Community, social and personal services
Retail
Other

(Source: National Small Business Act, 102 of 1996)

Section B consists of closed questions that were designed using different aspects of the urban and natural environment. These aspects were derived from The Local Economic Network for Small Town Development, Sustainability indicators for cities in accordance with Agenda 21 of the United Nations, personal observations and factors pointed out during informal interviews and email correspondence.

5.1.8 Stakeholder survey and questionnaire

The stakeholder questionnaire was designed in accordance with Section B of the business owner questionnaire, and has identical urban and environmental parameters. However this stakeholder questionnaire only has one Section consisting of closed questions on various parameters derived from The Local Economic Network for Small town development, Sustainability indicators for cities in accordance with Agenda 21 of the United Nations, personal observations and factors pointed out during informal interviews and email correspondence (See Annexure A for questionnaire).

5.1.9 Ethical considerations

The ethical considerations related to the survey include anonymity and voluntary participation. Furthermore a cover letter was attached to all questionnaires supplying respondents with the needed information regarding the survey and the study as well as contact details should they experience any problems or vagueness regarding questions or

instructions. Contact information was also helpful in the event of informing the researcher that questionnaires could be collected. In the following Chapter the response rates and results will be depicted and discussed in detail.

CHAPTER 6: RESEARCH RESULTS AND DISCUSSION

6.1 Introduction

This Chapter focuses on the results obtained through the evaluation of identified urban and environmental parameters. The numerical data obtained during the survey was statistically analysed to quantify the existing perceptions and concerns of business owners and important stake holders in Parys. The Chapter will depict and discuss the results obtained through the two surveys discussed in Chapter 5. Furthermore the main problem areas in terms of urban and environmental parameters will be discussed. This Chapter will also discuss the current state of each sustainability area and urban and environmental parameter.

6.1.1 Response rates

An overall good response rate was obtained for both surveys. In the following text the response rates for business owners and stakeholders are discussed. Respondents who agreed to take part in the study were asked when the questionnaire could be collected. Answers on the collection date ranged from a minimum of 30 minutes to 2 days. From the data obtained it was clear that the respondents felt certain of their opinions on urban and environmental parameters, since the majority did not choose the "didn't notice" or "unsure" option in the questionnaires. This also indicates high confidence data.

6.1.1.1 Business owners

The survey was conducted by the researcher over a period of one week by consulting business owners individually. The response rate as well as the active response rate for the business owners survey has been calculated and presented in Table 18.

Table 18. Sample frame and response rates

Sub -Zone: Category of SMME	Businesses	Sample size	% Sample	RR	IR+NL	TNR/ number of responses	Response rate (%)	Active Response rate (%)
1. Micro enterprises	61	20	33	1	3	16	94	80
2. Very small enterprise	73	24	39	1	3	20	95	83
3. Small enterprise	52	17	28	2	2	13	87	76
Total:	N = 186	n = 61	100	4	8	49	92	80

Unfortunately not all business owners were interested in completing the questionnaire, a total of 49 out of 61 respondents could be used. From which 16 business owners were micro enterprises, 20 were very small enterprises and 13 were small enterprises. The response rate and active response rates for each sub-zone are also depicted in Table 18.

From a total of 61 questionnaires given out only 49 responded positively. A total of 4 questionnaires came back blank due to business owners who refused to complete them while the other 8 were returned incomplete. Thus a total response rate of 80 % was obtained for the business owner's survey along with an active response rate of 92%.

The active response rate was calculated using a formula derived from Welman *et al.*, (2005: 74). According to Welman *et al.*, (2005: 74) the active response rate can be determined using the following formula, excluding refusal to respond (RR):

$$Active\ response\ rate\ \% = TNR \div n - (IR + NL)100$$

Where:

TNR :Total number of responses

n :Sample size

IR+NL :Ineligibility + inability to locate respondent

RR :Refusal to respond

6.1.1.2 Stakeholders

As described in Chapter 5, the sample size for stakeholders were greater or equal to 6 and smaller or equal to 12. A maximum of 12 stakeholders were contacted, however only 8 responded. The response rate for the stakeholder survey was 66%.

6.1.1.3 Rejection rates

Of the 61 sample size for business owners 49 responded and of the 6 to 12 stakeholders only 8 responded. The 12 business owner's questionnaire rejections consisted of 8 incomplete questionnaires and 4 questionnaires blank questionnaires. Business owners who returned their questionnaires blank stated that they were not interested in completing the questionnaire while others felt that Section A of the questionnaire required too much personal information. The 4 stakeholders who returned blank questionnaires also stated that they did not have time to complete the questionnaire, while others agreed telephonically that they would be interested in participating in the survey but eventually stated that they

were not interested when contacted again. The overall rejection rate for the 2 surveys is low with 20 % for business owners and 33 % for stakeholders.

6.2 Results and discussions on the general aspects of the business owners survey

Section A of the business questionnaire was processed using Microsoft Excel to enter and calculate the data in order to determine the percentages and total corresponding answers for each question.

6.2.1 Main source of income

From Figure 10 it is evident that the main source of income for businesses in the study area comprises of visitors outside of Parys with 37 % and a mixture of locals and visitors with 53 %. Income generated from locals alone had a low figure of only 10 %. It can be concluded that businesses are largely dependent on visitors from outside of Parys as well as locals from Parys.

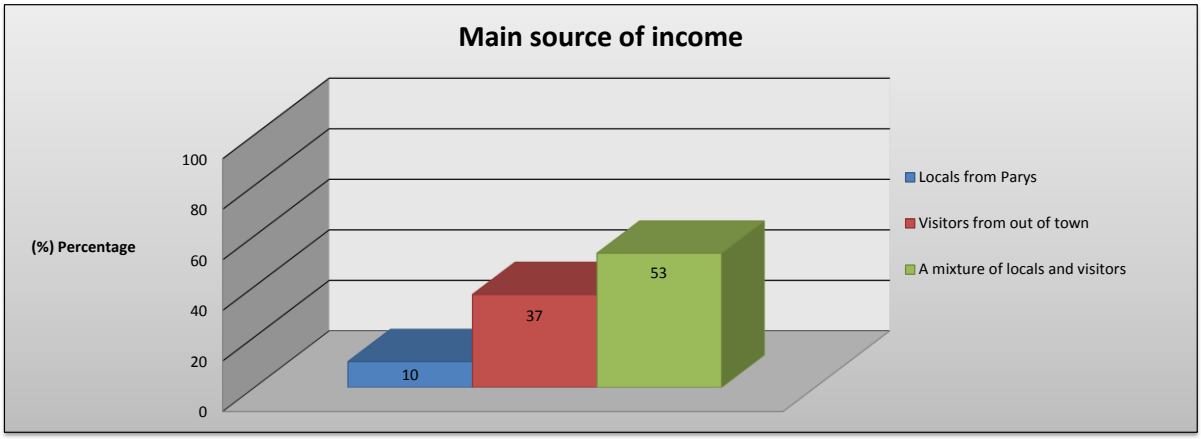

Figure 10: Business owners main source of income

6.2.2 Number of businesses owned

The results from Section A of the questionnaire regarding the number of businesses owned indicated that the majority of respondents only had one business generating income. With a total number of 44 business owners only having one business that generates income it is obvious that they will be vulnerable should certain urban and environmental parameters impact negatively on the success of their business. One can also conclude that should Parys lose its retail gravitational force due to certain urban and environmental parameters it could

severely impact on the economic growth of the town as well as the social aspects relating to unemployment.

6.2.3 Residential status of business owners

From the processed data it is clear that the majority of business owners reside in Parys on a permanent basis. This also indicates that the majority of business owners are in close contact with urban and environmental issues in Parys on a daily basis and have excellent knowledge regarding the problem areas in terms of urban parameters, social aspects, service delivery and environmental parameters. A total of 43 business owners reside in Parys on a permanent basis while only 6 reside outside of Parys.

6.2.4 Business age structure

According to Figure 11 it is evident that the majority of businesses started in 2001 and 2008. Four business owners that were surveyed started before 2000. Five business owners started in 2003 and four in 2007. The youngest businesses date back to 2011 with 2 businesses and 2010 with 3 businesses and 2009 with 2 businesses. From Figure 11 it is evident that the majority of businesses have been up and running for more than 5 years. This indicates that the majority of businesses are surviving in Parys.

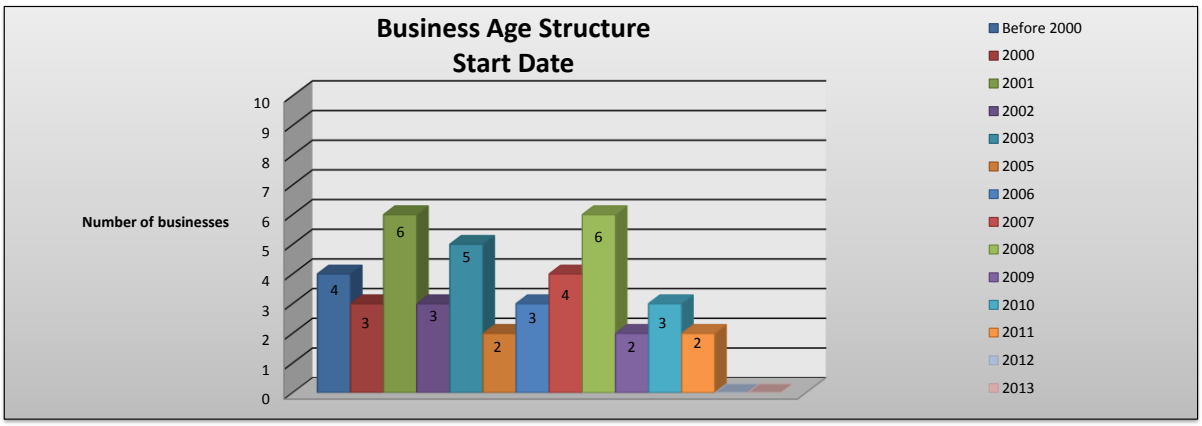

Figure 11: Business age structure

6.2.5 Business premises status

The majority of business owners own their premises with a total of 59 %. The percentage of business owners renting their premises is 41 %. This also indicates that the majority of business owners will suffer should the quality of urban and environmental parameters in Parys deteriorate to such a level that it impacts on the success of their businesses. In the extreme event that businesses in Parys fail due to these parameters business owners will be

forced to close their businesses and also settle for a low sale price for their premises. Business owners who own their premises will also be more aware of urban and environmental parameters due to the fact that these parameters impact on their property value.

6.2.6 Business SMME category

From Figure 12 it can be concluded that the very small enterprise SMME category dominates the study area with a total of 41 %, followed by micro enterprises at 33 % and small enterprises at 27 %.

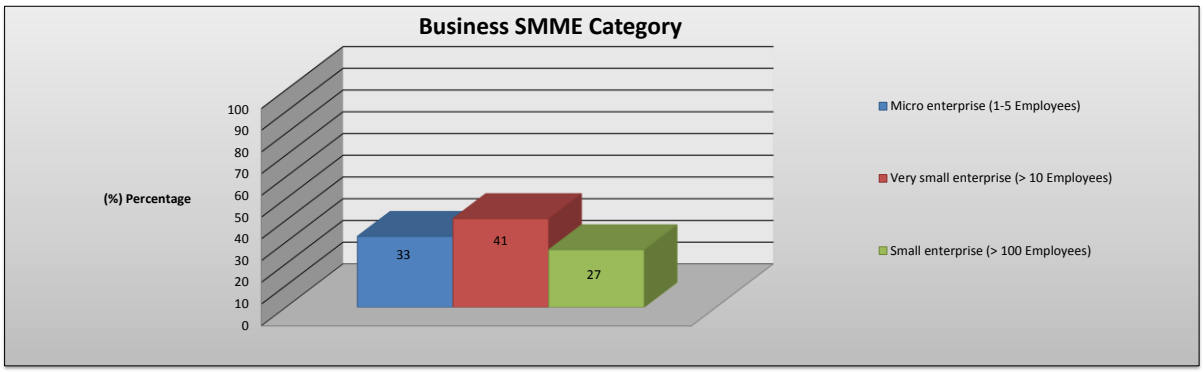

Figure 12: Business SMME Category

6.2.7 Study area business sector compilation

From Figure 13 it is evident that the majority of businesses in the study area consist of arts and crafts, followed by the restaurant and food sector, the motor industry, accommodation, wholesale, and events and recreation sectors. The study area consists of a diverse business area with a variety of sectors.

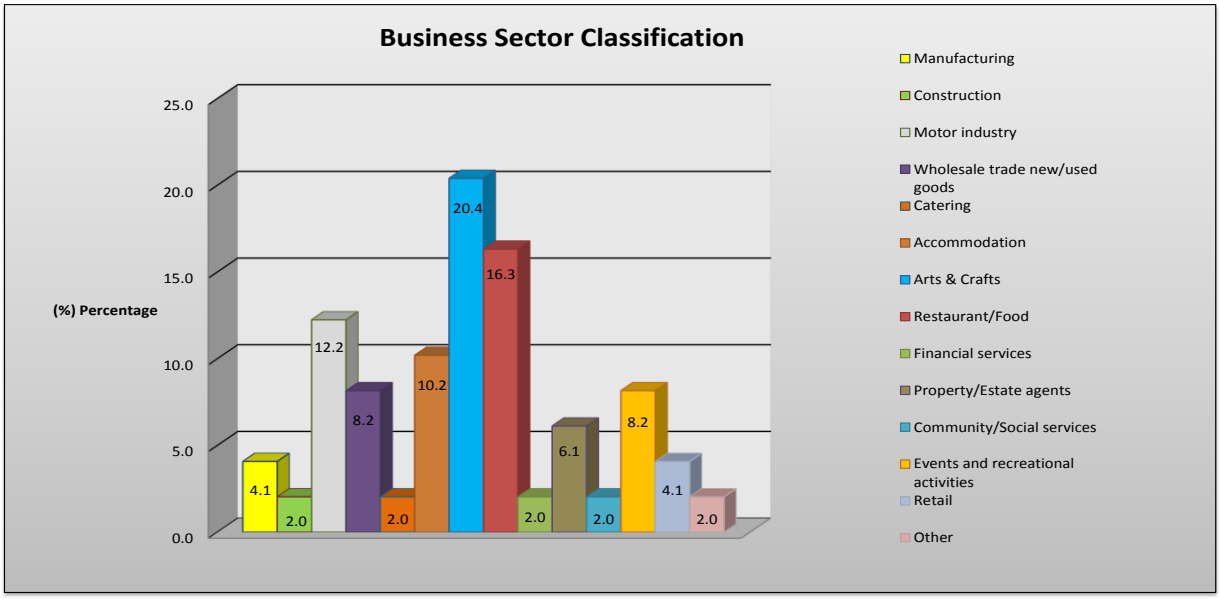

Figure 13: Business sector classification

6.3 Business owner survey results and discussions

Section B of the business owner's questionnaire was used to determine the perceptions of business owners on certain urban and environmental parameters. The questionnaire included questions on the importance of the parameter for the success of their businesses, how satisfied they were and a general rating of urban and environmental parameters in Parys. The satisfactory, importance and rating scale (likert) for each urban and environmental parameter ranged from 1-5 (See Annexure B). After the data obtained through the questionnaires were statistically analysed using the SPSS Software Program, the results of the satisfaction, importance and rating for each urban and environmental parameter question was summarised in table format using the percentages for each question. The key problem areas were identified and summarised in table format to depict the percentages for all three rating scales as observed in the questionnaire. This enables the researcher to determine the main perceptions and general rating of each parameter through the perceptions of business owners in Parys. The results and possible impact of each parameter category is depicted and discussed in the Sections below. The percentage rating for each parameter scoring 45 % and higher have been highlighted in the tables below. All percentages depicted have been rounded off. The legend for each colour is depicted.

6.3.1 Public spaces and urban parameters

From Table 19 the following conclusions can be made for each parameter as discussed in the Sections below.

Table 19. Business owners questionnaire results – public spaces and urban parameters

Public spaces and urban elements	Satisfaction					Importance					Rating				
	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied	1 Of no importance	2 Of little importance	3 Unsure	4 Important	5 Highly important	1 Poor	2 Fair	3 Unsure	4 Good	5 Excellent
The general conditions of roads in Parys	78%	22%	0%	0%	0%	4%	4%	2%	74%	16%	92%	6%	2%	0%	0%
The general condition of the road in Breë Street	57%	37%	2%	4%	0%	2%	4%	2%	65%	27%	67%	29%	4%	0%	0%
The general condition of the side walks in Parys	65%	22%	10%	2%	0%	2%	8%	8%	71%	10%	67%	25%	6%	2%	0%
The walkability of side walks in front of your business	47%	35%	4%	10%	4%	2%	12%	6%	55%	25%	63%	29%	0%	8%	0%
The availability of parking spaces in front of your business	31%	27%	4%	20%	18%	0%	6%	2%	53%	39%	35%	39%	4%	14%	8%
The availability of parking spaces in close proximity to your business	31%	35%	2%	18%	14%	2%	4%	2%	55%	37%	47%	33%	2%	14%	4%
Traffic congestion in Parys	6%	37%	12%	41%	4%	2%	29%	10%	51%	8%	12%	57%	10%	20%	0%
The availability of traffic signs to regulate traffic in Parys	35%	39%	4%	20%	2%	2%	20%	4%	63%	10%	41%	45%	6%	8%	0%
The availability of traffic calming measures (speed humps) to prevent speeding in Parys	49%	35%	6%	6%	4%	2%	18%	12%	55%	12%	55%	31%	6%	6%	2%
The general appearance of buildings in Parys	0%	29%	2%	65%	4%	0%	2%	4%	74%	20%	14%	20%	2%	63%	0%
The general conditions of buildings in Parys	2%	29%	2%	65%	2%	0%	2%	4%	65%	29%	12%	20%	4%	63%	0%
The general maintenance of storm water drains in Parys	53%	37%	4%	4%	2%	2%	18%	10%	53%	16%	76%	20%	4%	0%	0%
The general condition of storm water drains in Parys	57%	33%	2%	6%	2%	2%	18%	8%	59%	12%	69%	27%	2%	2%	0%

	45 % and above dissatisfactory and poor
	45 % and above satisfactory and good
	45 % and above important

6.3.1.1 Roads

The majority of business owners felt very dissatisfied regarding the general conditions of the roads in Parys, and rated it as poor. The general condition of the road in Breë Street was rated as poor and the majority of business owners felt very to somewhat dissatisfied regarding the condition of the road. The conditions of the roads in Parys and the road in Breë Street were rated as important for the success of businesses in Parys.

6.3.1.2 Sidewalks

The general condition of sidewalks in Parys was rated as poor and the majority of business owners felt very dissatisfied regarding the conditions of sidewalks. In terms of the walkability of sidewalks in front of businesses, business owners rated the parameter as poor and felt very dissatisfied with it. Furthermore the majority of business owners felt that the conditions and walkability of sidewalks are important for the success of their business.

6.3.1.3 Parking

The availability of parking spaces in front of businesses was mainly rated as fair, and the majority of business owners felt very dissatisfied regarding the parameter. Regarding the availability of parking spaces in close proximity to businesses, business owners felt somewhat dissatisfied and rated this parameter as poor. Business owners also felt that the availability of parking spaces in front of their businesses as well as in close proximity to businesses is important for the success of their business.

6.3.1.4 Traffic

Traffic congestion in Parys was rated as fair and business owners were somewhat dissatisfied with the parameter. The availability of traffic signs to regulate traffic in Parys was rated fair and business owners felt somewhat dissatisfied. The availability of traffic calming measures to prevent speeding in Parys was rated poor, and business owners in general were very dissatisfied. Business owners felt that all the traffic parameters discussed are important for the success of their businesses.

6.3.1.5 Built environment

The general appearance and conditions of buildings in Parys were rated as good and the majority of business owners were somewhat satisfied with this parameter. The majority of

business owners also felt that these parameters are important for the success of their businesses.

6.3.1.6 Storm water drains

The general condition and maintenance of storm water drains in Parys was experienced as poor and business owners felt very dissatisfied regarding the parameter. The majority of business owners felt that the condition and maintenance of storm water drains are important to the success of their businesses.

6.3.2 Main problem areas for business owners in Parys - public spaces and urban parameters

From the results obtained through the public spaces and urban parameters Section of the questionnaire the following parameters are the main problem areas for business owners in Parys:

- General conditions of roads in Parys.
- General condition of the road in Breë Street.
- General condition of the sidewalks in Parys.
- The walkability of sidewalks in front of businesses.
- The availability of parking spaces in close proximity of businesses.
- The availability of traffic calming measures in Parys.
- The general maintenance and condition of storm water drains in Parys.

6.3.3 Social aspects

From Table 20 the following conclusions can be made for each social parameter as discussed in the Sections below.

Table 20. Business owners questionnaire results – social aspects

Social Aspects	Satisfaction					Importance					Rating				
	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied	1 Of no importance	2 Of little importance	3 Unsure	4 Important	5 Highly important	1 Poor	2 Fair	3 Unsure	4 Good	5 Excellent
Crime rates in Parys	14%	43%	2%	39%	2%	2%	2%	8%	67%	20%	14%	67%	0%	18%	0%
The general safety of Parys at night	16%	67%	2%	12%	2%	6%	8%	0%	67%	18%	20%	61%	4%	6%	8%
The general safety of Parys during the day	2%	14%	2%	63%	18%	2%	2%	0%	67%	29%	0%	25%	2%	57%	16%
The accessibility of Parys from the R59 (from Sasolburg)	4%	10%	6%	57%	22%	0%	2%	4%	45%	49%	0%	6%	6%	71%	16%
The accessibility of Parys from the R53 (from Potchefstroom)	6%	6%	4%	61%	22%	0%	2%	4%	47%	47%	0%	6%	6%	74%	14%
The accessibility of Parys from the R59 (from Vredefort)	6%	29%	6%	47%	12%	0%	2%	6%	43%	49%	8%	29%	8%	47%	8%
The presence of street signage in Parys	22%	55%	8%	14%	0%	0%	14%	4%	53%	29%	31%	41%	12%	14%	2%
The general pedestrian friendliness in Parys	35%	43%	6%	16%	0%	0%	4%	12%	53%	31%	41%	33%	8%	14%	4%
The first impression of Parys	12%	35%	0%	47%	6%	2%	8%	0%	45%	45%	12%	49%	6%	33%	0%
The aesthetic appearance of Parys	4%	47%	0%	45%	4%	2%	4%	0%	51%	43%	6%	55%	4%	33%	2%
The general appearance of Parys	2%	41%	0%	55%	2%	2%	8%	0%	45%	45%	8%	49%	4%	39%	0%
The general appearance of public spaces	12%	49%	0%	35%	4%	2%	6%	0%	49%	43%	25%	49%	4%	20%	2%
The clean appearance of Parys	37%	51%	2%	8%	2%	2%	2%	2%	49%	45%	53%	25%	6%	16%	0%
The clean appearance of public spaces	41%	45%	2%	10%	2%	2%	6%	0%	45%	47%	61%	25%	4%	8%	2%

	45 % and above dissatisfactory and poor
	45 % and above satisfactory and good
	45 % and above important

6.3.3.1 Crime

The majority of business owners felt somewhat dissatisfied with the crime rate in Parys and rated it as fair. The general safety of Parys at night was rated as fair and business owners felt somewhat dissatisfied regarding this parameter. The general safety of Parys during the day was mostly rated good and business owners felt somewhat satisfied. Business owners in general felt that all parameters related to crime are important for the success of their businesses.

6.3.3.2 Accessibility

The accessibility of Parys via the R59 from Sasolburg, the R53 from Potchefstroom and the R59 from Vredefort was rated as good and business owners felt somewhat satisfied. The presence of street signage in Parys was rated as fair and the majority of business owners were somewhat dissatisfied with this parameter. General pedestrian friendliness was considered poor by most business owners, they also felt somewhat dissatisfied with the parameter. All parameters regarding accessibility were rated as important for the success of businesses in Parys.

6.3.3.3 Appearance

The appearance of Parys in terms of the town's first impression was rated as fair and the majority of business owners felt somewhat satisfied about the parameter. The aesthetic appearance of the town was rated as fair and the majority of business owners felt somewhat dissatisfied with this parameter. The general appearance of Parys was rated fair and business owners felt somewhat satisfied, however the general appearance of public spaces left business owners feeling somewhat dissatisfied and they rated it as fair. The clean appearance of public spaces and Parys as a town was rated poor. The majority of business owners also felt somewhat dissatisfied with the parameter. Business owners also indicated that all parameters regarding the appearance of the town are important for the success of their businesses.

6.3.4 Main problem areas for business owners in Parys – social aspects

From the results obtained through the social aspects Section of the questionnaire the following parameters are the main problem areas for business owners in Parys:

- The clean appearance of Parys, and public spaces in Parys.

6.3.5 Service delivery

From Table 21 the following conclusions can be made for each service delivery parameter over the past three months (June, July and August 2013) as discussed in the Sections below.

Table 21. Business owners questionnaire results – service delivery

Service delivery	Satisfaction					Importance					Rating				
	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied	1 Of no importance	2 Of little importance	3 Unsure	4 Important	5 Highly important	1 Poor	2 Fair	3 Unsure	4 Good	5 Excellent
Refuse collection in Parys	45%	47%	0%	8%	0%	0%	4%	0%	55%	41%	61%	33%	0%	4%	2%
The frequency of refuse collection in Parys	67%	25%	2%	2%	4%	0%	4%	0%	53%	43%	78%	16%	0%	4%	2%
The timely collection of refuse in Parys	65%	27%	0%	4%	4%	0%	4%	4%	53%	39%	74%	22%	0%	2%	2%
The availability of waste bins for public use in Parys	55%	39%	2%	4%	0%	0%	22%	2%	33%	43%	63%	31%	4%	0%	2%
The provision of waste recycling facilities in Parys	67%	27%	6%	0%	0%	2%	18%	8%	37%	35%	86%	6%	6%	0%	2%
The availability of waste recycling services in Parys	67%	27%	4%	0%	2%	2%	18%	8%	35%	37%	84%	8%	6%	0%	2%
The quality of tap water in Parys over the past three months	96%	4%	0%	0%	0%	0%	6%	0%	33%	61%	90%	10%	0%	0%	0%
The availability of tap water in Parys over the past three months	80%	16%	0%	4%	0%	2%	6%	0%	35%	57%	74%	22%	0%	4%	0%
Electricity provision in Parys	2%	4%	4%	67%	22%	0%	2%	0%	25%	74%	6%	12%	2%	65%	14%
Regular availability of electricity in Parys	0%	2%	6%	71%	20%	0%	2%	0%	25%	74%	6%	10%	2%	67%	14%
General municipal rates and taxes	10%	29%	6%	55%	0%	2%	14%	12%	47%	25%	14%	59%	6%	20%	0%
General municipal services	61%	33%	0%	6%	0%	0%	6%	2%	29%	63%	82%	14%	4%	0%	0%

	45 % and above dissatisfactory and poor
	45 % and above satisfactory and good
	45 % and above important

6.3.5.1 Waste

The majority of business owners felt very dissatisfied with refuse collection in Parys in general as well as the frequent and timely collection thereof. Furthermore the majority of businesses rated these three parameters as poor. The availability of refuse bins for public use in Parys was rated as poor and the majority of business owners felt very dissatisfied with this parameter. Regarding the availability and provision of waste recycling facilities in Parys, business owners felt very dissatisfied and rated the parameters as poor. Business owners also felt that all parameters regarding waste are important for the success of their businesses.

6.3.5.2 Water

The quality of tap water in Parys was rated as poor and the majority of business owners felt very dissatisfied with the quality of their tap water. The availability of tap water in Parys was rated as poor and most business owners felt very dissatisfied regarding this issue. The results also revealed that the majority of business owners are currently buying bottled water to replace tap water as a drinking water resource. Furthermore the majority of business owners have experienced a shortage and cut off of tap water in the past three months (June, July and August). The results also indicate that the majority of business owners felt that all parameters relating to water are important for the success of businesses in Parys.

6.3.5.3 Electricity

The provision of electricity as well as the regular availability thereof was rated as good and the majority of business owners were somewhat satisfied with it. The majority of business owners do not use solar systems as alternative energy resources. Business owners do however feel that there is a need for alternative energy resources in Parys and that it is important to consider other alternative resources of energy such as wind power or solar systems. They also consider the provision and availability of electricity as an important parameter for the success of their businesses.

6.3.5.4 General

General municipal rates and taxes were rated as fair and business owners were somewhat satisfied with it, they also consider it as important for the success of their businesses. General municipal services were however rated as poor and the majority of business owners

felt very dissatisfied with municipal services in general, they also rated it as very important for the success of their businesses.

6.3.6 Main problem areas for business owners in Parys – service delivery

From the results obtained through the service delivery Section of the questionnaire the following parameters are the main problem areas for business owners in Parys:

- Refuse collection in Parys.
- The frequency and timely collection of refuse in Parys.
- The availability of refuse bins for public use.
- The provision and availability of waste recycling facilities in Parys.
- The quality and availability of tap water in Parys.
- General municipal services.

6.3.7 Environmental Parameters

From Table 22 the following conclusions can be made for each environmental parameter as discussed in the Sections below.

Table 22. Business owners questionnaire results – environmental parameters

Environmental elements	Satisfaction					Importance					Rating				
	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied	1 Of no importance	2 Of little importance	3 Unsure	4 Important	5 Highly important	1 Poor	2 Fair	3 Unsure	4 Good	5 Excellent
The general conditions of open public spaces (empty or open spaces) in Parys	14%	63%	4%	18%	0%	2%	16%	2%	69%	10%	29%	61%	8%	2%	0%
The general conditions of public parks in Parys	20%	61%	4%	14%	0%	2%	16%	2%	69%	10%	43%	47%	10%	0%	0%
The general conditions of open public spaces on the banks of the Vaal River	41%	53%	2%	4%	0%	2%	14%	2%	61%	20%	45%	45%	8%	2%	0%
The general over all condition of the Vaal River	27%	55%	4%	14%	0%	2%	10%	2%	55%	31%	37%	47%	8%	8%	0%
The condition of the Vaal River in terms of illegal sewa	51%	41%	8%	0%	0%	2%	10%	2%	55%	31%	57%	37%	4%	2%	0%
The condition of the Vaal River in terms of illegal sewage dumping	51%	41%	8%	0%	0%	2%	12%	2%	55%	29%	57%	35%	6%	2%	0%
The condition of the Vaal River in terms of illegal refuse dumping	47%	47%	6%	0%	0%	2%	10%	2%	59%	27%	45%	47%	4%	4%	0%
The condition of the Vaal River in terms of odours caused by sewage leaks	49%	43%	6%	2%	0%	2%	10%	2%	53%	33%	57%	33%	6%	4%	0%
The condition of the Vaal River in terms of odours caused by illegal sewage dumping	47%	47%	6%	0%	0%	2%	10%	2%	55%	31%	59%	33%	4%	4%	0%
The condition of the Vaal River in terms of odours caused by illegal refuse dumping	43%	51%	6%	0%	0%	2%	10%	2%	55%	31%	53%	39%	4%	4%	0%
The water quality of the Vaal River for recreational activities (rafting, fishing, picnicking etc.)	45%	49%	2%	4%	0%	2%	10%	0%	51%	37%	49%	45%	2%	4%	0%
The quality of the Vaal River in terms of aesthetic qualities	43%	39%	8%	10%	0%	2%	10%	2%	39%	47%	51%	37%	4%	8%	0%
The quality of the Vaal River in terms of a clean and healthy appearance	39%	51%	4%	6%	0%	2%	10%	2%	39%	47%	49%	41%	2%	8%	0%
The general air quality in Parys	2%	10%	6%	45%	37%	2%	8%	2%	63%	25%	0%	8%	4%	63%	25%

	45 % and above dissatisfactory and poor
	45 % and above satisfactory and good
	45 % and above important

6.3.7.1 Open spaces and parks

The general conditions of open public spaces (open or empty spaces) were rated as fair by the majority of business owners, they also felt somewhat dissatisfied. The general conditions of public parks in Parys were rated as fair and business owners also felt somewhat dissatisfied. The conditions of public spaces on the banks of the Vaal River were rated as poor and business owners felt somewhat dissatisfied with these conditions. Business owners in general all felt that all parameters regarding open spaces and parks in Parys are important for the success of their businesses.

6.3.7.2 The Vaal River

The overall condition of the Vaal River was rated as fair by the majority of business owners, they also felt somewhat dissatisfied. The condition of the Vaal River in terms of sewage leaks, illegal sewage dumping, and refuse dumping was rated as poor and business owners are very to somewhat dissatisfied. The condition of the Vaal River regarding odours caused by illegal refuse and sewage dumping as well as sewage leaks were rated as poor, business owners are very to somewhat dissatisfied with the situation. The water quality of the Vaal River for recreational activities such as fishing, rafting and picnicking was rated as poor and most business owners felt very dissatisfied. Business owners rated the aesthetic qualities and the clean and healthy appearance of the Vaal River as poor and felt very to somewhat dissatisfied with these parameters. All parameters of the Vaal River were rated as important for the success of businesses in Parys.

6.3.7.3 Air quality

The general air quality of Parys was rated as good. The majority of business owners felt somewhat satisfied with the air quality and indicated that it is very important for the success of their businesses.

6.3.8 Main problem areas for business owners in Parys – environmental parameters

From the results obtained through the environmental parameters Section of the questionnaire the following are the main problem areas for business owners in Parys:

- The general conditions of public spaces on the banks of the Vaal River.

- The condition of the Vaal River in terms of illegal sewage leaks.
- The condition of the Vaal River in terms of illegal sewage dumping.
- The conditions of the Vaal River in terms of illegal refuse dumping.
- The condition of the Vaal River in terms of odours caused by sewage leaks.
- The condition of the Vaal River in terms of odours caused by illegal sewage dumping.
- The condition of the Vaal River in terms of odours caused by illegal refuses dumping.
- The water quality of the Vaal River for recreational activities (rafting, fishing, picnicking etc.).
- The quality of the Vaal River in terms of aesthetic qualities.
- The quality of the Vaal River in terms of a clean and healthy appearance.

6.4 Stakeholder survey results and discussions

The stakeholder's questionnaire was used to determine the perceptions of important stakeholders on certain urban and environmental parameters. This questionnaire only had one Section identical to Section B of the business questionnaire. The questionnaire included questions on the importance of the parameter for the success of the town, how satisfied they were and a general rating of urban and environmental parameters in Parys. The satisfactory, importance and rating scale (likert) for each urban and environmental parameter ranged from 1-5 (See Annexure A). After the data obtained through the questionnaires were statistically analysed using the SPSS Software Program, the results of the satisfaction, importance and rating for each urban and environmental parameter question was summarised in table format using the percentages for each question. The key problem areas were identified and summarised in table format to depict the percentages for all three rating scales as observed in the questionnaire. This enables the researcher to determine the main perceptions, possible impacts and general rating of each parameter through the perceptions of important stakeholders in Parys. The results and possible impact of each parameter category is depicted and discussed in the Sections below. The percentage rating for each parameter scoring 45 % and higher have been highlighted in the tables below. All percentages depicted have been rounded off. The legend for each colour is depicted.

6.4.1 Public spaces and urban parameters

From Table 23 the following conclusions can be made for each parameter as discussed in the Sections below.

Table 23. Stakeholders questionnaire results – public spaces and urban parameters

Public spaces and urban elements	Satisfaction					Importance					Rating				
	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied	1 Of no importance	2 Of little importance	3 Unsure	4 Important	5 Highly important	1 Poor	2 Fair	3 Unsure	4 Good	5 Excellent
The general conditions of roads in Parys	75%	25%	0%	0%	0%	38%	0%	0%	63%	0%	88%	13%	0%	0%	0%
The general condition of the road in Breë Street	63%	38%	0%	0%	0%	25%	0%	0%	75%	0%	75%	25%	0%	0%	0%
The general condition of the side walks in Parys	75%	13%	0%	13%	0%	0%	13%	0%	88%	0%	38%	50%	0%	13%	0%
The walkability of side walks in front of businesses	88%	13%	0%	0%	0%	0%	13%	0%	88%	0%	50%	38%	0%	13%	0%
The availability of parking spaces in front of businesses	13%	50%	25%	13%	0%	13%	0%	13%	50%	25%	38%	50%	0%	13%	0%
The availability of parking spaces in close proximity to businesses	0%	38%	0%	63%	0%	13%	0%	0%	63%	25%	25%	50%	0%	25%	0%
Traffic congestion in Parys	38%	13%	0%	50%	0%	13%	0%	0%	88%	0%	13%	50%	0%	38%	0%
The availability of traffic signs to regulate traffic in Parys	25%	50%	0%	25%	0%	13%	13%	0%	75%	0%	63%	13%	0%	25%	0%
The availability of traffic calming measures (speed humps) to prevent speeding in Parys	50%	38%	0%	0%	13%	0%	13%	0%	75%	13%	63%	25%	0%	0%	13%
The general appearance of buildings in Parys	0%	13%	0%	75%	13%	0%	0%	0%	88%	13%	0%	25%	0%	63%	13%
The general conditions of buildings in Parys	0%	13%	0%	75%	13%	0%	0%	0%	88%	13%	0%	0%	0%	88%	13%
The general maintenance of storm water drains in Parys	63%	38%	0%	0%	0%	25%	0%	0%	75%	0%	75%	25%	0%	0%	0%
The general condition of storm water drains in Parys	38%	63%	0%	0%	0%	13%	13%	0%	75%	0%	63%	38%	0%	0%	0%

	45 % and above dissatisfactory and poor
	45 % and above satisfactory and good
	45 % and above important

6.4.1.1 Roads

The majority of stakeholders felt very dissatisfied with the general conditions of the roads in Parys, they also rated it as poor. The condition of the road in Breë Street was also rated as poor and stakeholders felt very dissatisfied with the current condition. Stakeholders felt that the conditions of the roads in Parys as well as the road in Breë Street are important parameters for future growth and success of the town.

6.4.1.2 Sidewalks

The general conditions of sidewalks in Parys were rated as fair and stakeholders felt very dissatisfied with these conditions. The walkability of sidewalks in front of businesses in Parys was rated as poor, and the majority of stakeholders felt very dissatisfied with the parameter. They also rated the conditions and walkability of sidewalks as important parameters for the future growth and success of Parys.

6.4.1.3 Parking

The availability of parking spaces in front of businesses was rated as fair, and the majority of stakeholders felt somewhat dissatisfied. The availability of parking spaces in close proximity of businesses was rated as fair and stakeholders felt somewhat satisfied. Stakeholders also felt that parking parameters are important for the future growth and success of Parys.

6.4.1.4 Traffic

Traffic congestion was rated as fair and stakeholders felt somewhat satisfied on the issue. The availability of traffic signs to regulate traffic in Parys was rated as poor and stakeholders felt somewhat dissatisfied about the parameter. The availability of traffic calming measures to prevent speeding was rated as poor and very dissatisfactory. Furthermore stakeholders also felt that all traffic parameters are important for the success and future growth of Parys.

6.4.1.5 Built environment

The general appearance and conditions of the buildings in Parys was rated as good and the majority of stakeholders were somewhat satisfied regarding these parameters. They also rated the parameters as important for the success and future growth of Parys.

6.4.1.6 Storm water drainage

The majority of stakeholders felt very dissatisfied with the maintenance and general condition of storm water drains in Parys and rated it as poor. They felt that this parameter is important for the success and future growth of Parys.

6.4.2 Main problem areas for stakeholders in Parys - public spaces and urban parameters

From the results obtained through the public spaces and urban parameters Section of the questionnaire the following parameters are the main problem areas for stakeholders in Parys:

- General conditions of roads in Parys.
- General condition of the road in Breë Street.
- The walkability of sidewalks in front of businesses.
- The availability of parking spaces in close proximity of businesses.
- The availability of traffic calming measures in Parys.
- The general maintenance and condition of storm water drains in Parys.

6.4.3 Social aspects

From Table 24 the following conclusions can be made for each social aspect as discussed in the Sections below.

Table 24. Stakeholders questionnaire results – social aspects

Social Aspects	Satisfaction					Importance					Rating				
	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied	1 Of no importance	2 Of little importance	3 Unsure	4 Important	5 Highly important	1 Poor	2 Fair	3 Unsure	4 Good	5 Excellent
Crime rates in Parys	13%	25%	0%	63%	0%	0%	0%	0%	88%	13%	13%	50%	13%	25%	0%
The general safety of Parys at night	0%	50%	0%	50%	0%	0%	0%	0%	88%	13%	0%	63%	0%	38%	0%
The general safety of Parys during the day	0%	0%	0%	100%	0%	0%	0%	0%	75%	25%	0%	13%	0%	75%	13%
The accessibility of Parys from the R59 (from Sasolburg)	0%	25%	0%	63%	13%	13%	0%	0%	50%	38%	0%	0%	0%	100%	0%
The accessibility of Parys from the R53 (from Potchefstroom)	25%	0%	0%	50%	25%	13%	0%	0%	50%	38%	13%	13%	0%	63%	13%
The accessibility of Parys from the R59 (from Vredefort)	38%	13%	0%	38%	13%	13%	0%	0%	50%	38%	38%	13%	0%	50%	0%
The presence of street signage in Parys	13%	25%	25%	25%	13%	0%	0%	0%	75%	25%	38%	38%	0%	25%	0%
The general pedestrian friendliness in Parys	25%	50%	0%	13%	13%	0%	0%	0%	75%	25%	13%	63%	0%	25%	0%
The first impression of Parys	0%	50%	0%	38%	13%	0%	0%	0%	38%	63%	0%	63%	0%	38%	0%
The aesthetic appearance of Parys	0%	63%	0%	13%	25%	0%	0%	0%	38%	63%	0%	63%	0%	25%	13%
The general appearance of Parys	25%	25%	0%	38%	13%	0%	0%	0%	63%	38%	0%	75%	0%	25%	0%
The general appearance of public spaces	13%	38%	0%	38%	13%	0%	0%	0%	38%	63%	25%	50%	0%	25%	0%
The clean appearance of Parys	50%	37%	0%	13%	0%	0%	0%	0%	38%	63%	75%	13%	0%	13%	0%
The clean appearance of public spaces	63%	25%	0%	13%	0%	0%	0%	0%	38%	63%	63%	13%	0%	25%	0%

	45 % and above dissatisfactory and poor
	45 % and above satisfactory and good
	45 % and above important

6.4.3.1 Crime

The majority of stakeholders felt somewhat satisfied with the crime rate in Parys and rated it as fair. The general safety of Parys at night was rated as fair and stakeholders felt somewhat dissatisfied as well as somewhat dissatisfied regarding this parameter. The general safety of Parys during the day was mostly rated good and stakeholders felt somewhat satisfied. Stakeholders in general felt that all parameters related to crime are important for the success and future growth of Parys.

6.4.3.2 Accessibility

The accessibility of Parys via the R59 from Sasolburg, the R53 from Potchefstroom and the R59 from Vredefort was rated as good and stakeholders felt somewhat satisfied. The presence of street signage in Parys was rated as fair and the majority of stakeholders were somewhat dissatisfied with this parameter. General pedestrian friendliness was considered fair by most stakeholders, they also felt somewhat dissatisfied with the parameter. All parameters regarding accessibility were rated as important for the success and future growth of Parys.

6.4.3.3 Appearance

The appearance of Parys in terms of the town's first impression was rated as fair and the majority of stakeholders felt somewhat dissatisfied about the parameter. The aesthetic appearance of the town was rated as fair and the majority of stakeholders felt somewhat dissatisfied with this parameter. The general appearance of Parys was rated fair and stakeholders felt somewhat satisfied, however the general appearance of public spaces left stakeholders feeling somewhat dissatisfied and they rated it as fair. The clean appearance of public spaces and Parys as a town was rated poor. The majority of stakeholders also felt very dissatisfied with the parameter. Stakeholders also indicated that all parameters regarding the appearance of the town are important for the success and future growth of Parys.

6.4.4 Main problem areas for stakeholders in Parys – social aspects

From the results obtained the main problem areas for stakeholders in Parys are:

- The clean appearance of Parys, and public spaces.

6.4.5 Service delivery

From Table 25 the following conclusions can be made for each service delivery parameter as discussed in the Sections below.

Table 25. Stakeholders questionnaire results – service delivery

Service delivery	Satisfaction					Importance					Rating				
	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied	1 Of no importance	2 Of little importance	3 Unsure	4 Important	5 Highly important	1 Poor	2 Fair	3 Unsure	4 Good	5 Excellent
Refuse collection in Parys	50%	50%	0%	0%	0%	0%	0%	0%	63%	38%	88%	13%	0%	0%	0%
The frequency of refuse collection in Parys	88%	13%	0%	0%	0%	0%	0%	0%	50%	50%	88%	13%	0%	0%	0%
The timely collection of refuse in Parys	88%	13%	0%	0%	0%	0%	0%	0%	63%	38%	88%	13%	0%	0%	0%
The availability of waste bins for public use in Parys	63%	25%	0%	13%	0%	0%	0%	0%	75%	25%	63%	38%	0%	0%	0%
The provision of waste recycling facilities in Parys	75%	13%	0%	13%	0%	0%	0%	0%	75%	25%	75%	25%	0%	0%	0%
The availability of waste recycling services in Parys	75%	13%	0%	13%	0%	0%	0%	0%	75%	25%	100%	0%	0%	0%	0%
The quality of tap water in Parys over the past three months	75%	25%	0%	0%	0%	0%	0%	0%	25%	75%	88%	13%	0%	0%	0%
The availability of tap water in Parys over the past three months	38%	38%	0%	25%	0%	0%	0%	0%	25%	75%	75%	13%	0%	13%	0%
Electricity provision in Parys	0%	38%	0%	38%	25%	0%	0%	0%	25%	75%	25%	0%	0%	63%	13%
Regular availability of electricity in Parys	0%	13%	13%	38%	38%	0%	0%	0%	25%	75%	25%	0%	0%	63%	13%
General municipal rates and taxes	25%	13%	0%	63%	0%	0%	0%	0%	75%	25%	25%	13%	0%	63%	0%
General municipal services	75%	25%	0%	0%	0%	0%	0%	0%	25%	75%	75%	25%	0%	0%	0%

	45 % and above dissatisfactory and poor
	45 % and above satisfactory and good
	45 % and above important

6.4.5.1 Waste

The majority of stakeholders felt very dissatisfied with refuse collection in Parys in general as well as the frequent and timely collection thereof. Furthermore the majority of stakeholders rated these three parameters as poor. The availability of refuse bins for public use in Parys was rated as poor and the majority of stakeholders felt very dissatisfied with this parameter. Regarding the availability and provision of waste recycling facilities in Parys, stakeholders felt very dissatisfied and rated these parameters as poor. They also felt that all parameters regarding waste are important for the success and future growth of Parys.

6.4.5.2 Water

The quality of tap water in Parys was rated as poor and the majority of stakeholders felt very dissatisfied with the quality of their tap water. The availability of tap water in Parys was rated as poor and most stakeholders felt very dissatisfied regarding this issue. The results also revealed that the majority of stakeholders are currently buying bottled water to replace tap water as a drinking water resource. Furthermore the majority of stakeholders have experienced a shortage and cut off of tap water in the past three months (June, July and August). The results also indicate that stakeholders felt all parameters relating to water are important for the success and future growth of Parys.

6.4.5.3 Electricity

The provision of electricity as well as the regular availability thereof was rated as good and the majority of stakeholders were somewhat satisfied with it. The majority of stakeholders do not use solar systems as alternative energy resources. They do however feel that there is a need for alternative energy resources in Parys and that it is important to consider other alternative resources of energy such as wind power or solar systems. They also consider the provision and availability of electricity as an important parameter for the success and future growth of Parys.

6.4.5.4 General

General municipal rates and taxes were rated as good and stakeholders were somewhat satisfied with it, they also consider it as important for the success and future growth of Parys. General municipal services were however rated as poor and the majority of

stakeholders felt very dissatisfied with municipal services in general, they also consider it as important for the success and future growth of Parys.

6.4.6 Main problem areas for stakeholders in Parys – service delivery

From the results obtained through the service delivery Section of the questionnaire the main problem areas for stakeholders in Parys are:

- Refuse collection in Parys.
- The frequency and timely collection of refuse in Parys.
- The availability of refuse bins for public use.
- The provision and availability of waste recycling facilities in Parys.
- The quality and availability of tap water in Parys.
- General municipal services.

6.4.7 Environmental parameters

From Table 26 the following conclusions can be made for each environmental parameter as discussed in the Sections below.

Table 26. Stakeholders questionnaire results – environmental parameters

Environmental elements	Satisfaction					Importance					Rating				
	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied	1 Of no importance	2 Of little importance	3 Unsure	4 Important	5 Highly important	1 Poor	2 Fair	3 Unsure	4 Good	5 Excellent
The general conditions of open public spaces (empty or open spaces) in Parys	13%	63%	0%	25%	0%	13%	13%	0%	50%	25%	25%	50%	0%	13%	13%
The general conditions of public parks in Parys	38%	38%	0%	25%	0%	13%	13%	0%	38%	38%	50%	25%	0%	13%	13%
The general conditions of open public spaces on the banks of the Vaal River	63%	25%	0%	13%	0%	13%	0%	0%	50%	38%	63%	25%	0%	0%	13%
The general over all condition of the Vaal River	63%	25%	0%	13%	0%	0%	0%	0%	38%	63%	63%	38%	0%	0%	0%
The condition of the Vaal River in terms of illegal sewage leaks	88%	13%	0%	0%	0%	0%	0%	0%	38%	63%	75%	25%	0%	0%	0%
The condition of the Vaal River in terms of illegal sewage dumping	88%	13%	0%	0%	0%	0%	0%	0%	38%	63%	75%	25%	0%	0%	0%
The condition of the Vaal River in terms of illegal refuse dumping	63%	13%	0%	25%	0%	0%	0%	0%	38%	63%	63%	25%	0%	13%	0%
The condition of the Vaal River in terms of odours caused by sewage leaks	63%	25%	0%	13%	0%	0%	0%	0%	38%	63%	50%	38%	0%	13%	0%
The condition of the Vaal River in terms of odours caused by illegal sewage dumping	63%	25%	0%	13%	0%	0%	0%	0%	38%	63%	50%	38%	0%	13%	0%
The condition of the Vaal River in terms of odours caused by illegal refuse dumping	63%	25%	0%	13%	0%	0%	0%	0%	38%	63%	50%	38%	0%	13%	0%
The water quality of the Vaal River for recreational activities (rafting, fishing, picnicking etc.)	75%	25%	0%	0%	0%	0%	0%	0%	25%	75%	50%	50%	0%	0%	0%
The quality of the Vaal River in terms of aesthetic qualities	50%	25%	0%	25%	0%	0%	0%	0%	25%	75%	63%	13%	0%	25%	0%
The quality of the Vaal River in terms of a clean and healthy appearance	63%	38%	0%	0%	0%	0%	0%	0%	25%	75%	75%	25%	0%	0%	0%
The general air quality in Parys	0%	25%	0%	25%	50%	0%	0%	0%	38%	63%	0%	13%	0%	50%	38%

	45 % and above dissatisfactory and poor
	45 % and above satisfactory and good
	45 % and above important

6.4.7.1 Open spaces and parks

The general conditions of open public spaces (open or empty spaces) were rated as fair by the majority of stakeholders, they also felt somewhat dissatisfied. The general condition of public parks in Parys was rated as poor and stakeholders also felt somewhat dissatisfied. The conditions of public spaces on the banks of the Vaal River were rated as poor and stakeholders felt very dissatisfied with these conditions. Stakeholders also felt that all parameters regarding open spaces and parks in Parys are important for the success and future growth of Parys.

6.4.7.2 The Vaal River

The overall condition of the Vaal River was rated as poor by the majority of stakeholders, they also felt very dissatisfied. The condition of the Vaal River in terms of sewage leaks, illegal sewage dumping, and refuse dumping was rated as poor and stakeholders are very dissatisfied. The condition of the Vaal River regarding odours caused by illegal refuse and sewage dumping as well as sewage leaks were rated as poor, stakeholders are very dissatisfied with the situation. The water quality of the Vaal River for recreational activities such as fishing, rafting and picnicking was rated poor and most stakeholders felt very dissatisfied. Stakeholders rated the aesthetic qualities and the clean and healthy appearance of the Vaal River as poor and felt very dissatisfied with these parameters. All parameters of the Vaal River were rated as important for the success and future growth of Parys.

6.4.7.3 Air quality

The general air quality of Parys was rated as good, the majority of stakeholders felt very satisfied with the air quality and indicated that it is very important for the success and future growth of the town.

6.4.8 Main problem areas for stakeholders in Parys – environmental parameters

From the results obtained through the environmental parameters Section of the questionnaire the following parameters are the main problem areas for stakeholders in Parys:

- The general conditions of public parks in Parys.

- The general conditions of public spaces on the banks of the Vaal River.
- The condition of the Vaal River in terms of illegal sewage leaks.
- The condition of the Vaal River in terms of illegal sewage dumping.
- The condition of the Vaal River in terms of illegal refuse dumping.
- The condition of the Vaal River in terms of odours caused by sewage leaks.
- The condition of the Vaal River in terms of odours caused by illegal sewage dumping.
- The condition of the Vaal River in terms of odours caused by illegal refuse dumping.
- The water quality of the Vaal River for recreational activities (rafting, fishing, picnicking etc.).
- The quality of the Vaal River in terms of aesthetic qualities.
- The quality of the Vaal River in terms of a clean and healthy appearance.

6.5 The main problem areas identified

Following the results obtained and discussed in the previous Sections, the final main problem areas in Parys are identified using all the parameters that were rated as poor by business owners and stakeholders. The parameters rated as poor by both survey groups are summarised in Table 27 . Table 27 depicts the main urban and environmental problems in Parys. From Table 27 it is clear that the small town of Parys has a number of urban and environmental issues. These issues link to and are related to the unsustainability of the town depicted in Chapter 4. After a personal visit to Parys during the survey period personal observations were made including photographs taken by the researcher to verify the results obtained in both surveys, these will be incorporated in the current state of each parameter to serve as visual aid in the Sections below. The percentage poor rating for each parameter equal to or higher than 45 % is highlighted in Table 27. Parameters with a score of 45% or higher were used to identify the main problem areas. All figures depicted in the Sections below were taken by the researcher during the surveys between the 2nd and 6th of September 2013.

Table 27. Compound table of main problem areas in Parys

Public spaces and urban elements	Business owners	Stakeholders
	% Poor Rating	% Poor Rating
The general conditions of roads in Parys	92%	88%
The general condition of the road in Breë Street	67%	75%
The general condition of the side walks in Parys	67%	38%
The walkability of side walks in front of businesses	63%	50%
The availability of parking spaces in close proximity to businesses	47%	25%
The availability of traffic signs to regulate traffic in Parys	41%	63%
The availability of traffic calming measures (speed humps) to prevent speeding in Parys	55%	63%
The general maintenance of storm water drains in Parys	76%	75%
The general condition of storm water drains in Parys	69%	63%
Social Aspects	**Business owners**	**Stakeholders**
	% Poor Rating	% Poor Rating
The clean appearance of Parys	53%	75%
The clean appearance of public spaces	61%	63%
Service delivery	**Business owners**	**Stakeholders**
	% Poor Rating	% Poor Rating
Refuse collection in Parys	61%	88%
The frequency of refuse collection in Parys	78%	88%
The timely collection of refuse in Parys	74%	88%
The availability of waste bins for public use in Parys	63%	63%
The provision of waste recycling facilities in Parys	86%	75%
The availability of waste recycling services in Parys	84%	100%
The quality of tap water in Parys over the past three months	90%	88%
The availability of tap water in Parys over the past three months	74%	75%
General municipal services	82%	75%
Environmental elements	**Business owners**	**Stakeholders**
	% Poor Rating	% Poor Rating
The general conditions of public parks in Parys	43%	50%
The general conditions of open public spaces on the banks of the Vaal River	45%	63%
The general over all condition of the Vaal River	37%	63%
The condition of the Vaal River in terms of illegal sewage leaks	57%	75%
The condition of the Vaal River in terms of illegal sewage dumping	57%	75%
The condition of the Vaal River in terms of illegal refuse dumping	45%	63%
The condition of the Vaal River in terms of odours caused by sewage leaks	57%	50%
The condition of the Vaal River in terms of odours caused by illegal sewage dumping	59%	50%
The condition of the Vaal River in terms of odours caused by illegal refuse dumping	53%	50%
The water quality of the Vaal River for recreational activities (rafting, fishing, picnicking etc.)	49%	50%
The quality of the Vaal River in terms of aesthetic qualities	51%	63%
The quality of the Vaal River in terms of a clean and healthy appearance	49%	75%

6.5.1 Current state of public spaces and urban parameters

The current state of each problem parameter for public spaces and urban parameters will be discussed in detail in the following Sections.

6.5.1.1 Current state of roads

The majority of business owners and stakeholders rated the general conditions of the roads in Parys as well as Breë Street as poor as depicted in Table 27. In Section 4.3.3.3 it was concluded that of the total of 417 streets in Parys only 51 were tarred, the conclusion was also made that streets and roads in Parys are in need of serious upgrading. The current situation is depicted in Figure 14 to Figure 17. The condition of the road in Breë Street is of concern since the street serves as the main road running through Parys, furthermore a large number of businesses are situated along this road. The road in Breë Street is full of potholes and in some cases completely un-trafficable as depicted in Figure 14. This could impact on the success of businesses situated in Breë Street seeing that visitors to Parys could be discouraged by the current situation of the road. The majority of streets in Parys are in a very poor condition (See Figure 16) including the three main access roads entering Parys via the R59 (Vredefort and Sasolburg) and the R53 (Potchefstroom). The R59 from Sasolburg enters Parys through Loop Street and with the connection from Loop to Water Street the road is almost non-existing as depicted in Figure 15. Figure 17 illustrates the condition of the R53 entering Parys.

Figure 14: The condition of the road in Breë Street

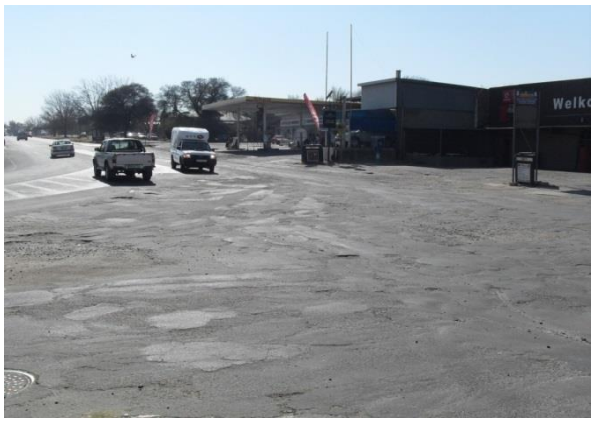

Figure 15: The condition of the R59 entering Parys via Loop Street

Figure 16: The general condition of the roads in Parys

Figure 17: The condition of the R53 entering Parys

Following the results of the sustainability and urban and environmental evaluation it is clear that the conditions of the roads in Parys are a serious problem area. After a site visit an underlying cause for the conditions of the main entrance roads as well as Breë Street became clear. There are a constant and large number of heavy vehicles travelling through Parys on a daily basis as depicted in Figure 18 and Figure 19. Other causes for the deteriorated road conditions can be ascribed to a lack of funding for repairs and maintenance.

Figure 18: Heavy vehicles driving through Parys

Figure 19: Heavy vehicles driving through Breë Street

6.5.1.2 Current state of sidewalks in Parys

The majority of business owners and stakeholders felt very dissatisfied with the condition and walkability of sidewalks in Parys and rated it as poor as depicted in Table 27. The conditions of sidewalks in Parys are very poor as illustrated in Figure 20 to Figure 23. The current conditions of sidewalks are of concern due to the fact that the majority of locals and visitors park their vehicles and stroll from one shop to the next. The current conditions of

the sidewalks in Parys are not only unsightly but also a safety hazard for the public in general. The current conditions can also impact on the success of businesses in Parys.

Figure 20: Current conditions of sidewalks in Parys (a)

Figure 21: Current conditions of sidewalks in Parys (b)

Figure 22: Current conditions of sidewalks in Parys (c)

Figure 23: Current conditions of sidewalks in Parys (d)

6.5.1.3 Current state of parking in Parys

The majority of business owners and stakeholders felt very dissatisfied with the availability of parking spaces in close proximity of businesses in Parys and rated these parameters as poor (See Table 27). Parys is very busy on weekdays as well as weekends this often leads to problems regarding parking spaces in close proximity to businesses. The lack of parking spaces can cause frustration for visitors and locals and can impact negatively on the success of businesses. The lack of parking spaces in close proximity to businesses can cause illegal parking on street reserves and sidewalks. The current state of parking in Parys in the areas where businesses are concentrated is illustrated in Figure 24, Figure 25 and Figure 26.

Figure 24: Current conditions of parking spaces in Breë Street

Figure 25: Illegal parking on sidewalks in front of businesses

Figure 26: Illegal parking on sidewalks

6.5.1.4 Current state of traffic parameters in Parys

The main problem parameters rated by business owners and stakeholders are the availability of traffic calming measures and traffic signs in Parys (See Table 27). These parameters are depicted in Figure 27 to Figure 30. Parys does not have enough traffic regulating signs and no calming measures to handle traffic and this causes frustration for visitors and business owners. Speeding vehicles can also be a danger to pedestrians and other motorists. The majority of four way stops do not have lines or efficient signage. At the R59 entry road from Sasolburg there is no signage present to display the four way stop as depicted in Figure 28.

Figure 27: Speeding vehicles in Parys

Figure 28: Lack of traffic signs at major entry road (R59)

Figure 29: Lack of traffic signs at four way stop

Figure 30: Traffic stop with no lines

6.5.1.5 Current state of storm water drainage in Parys

The majority of business owners and stakeholders felt very dissatisfied with the general maintenance and condition of storm water drains in Parys. They also rated it as poor (See Table 27). From Figure 31 to Figure 34 the situation is illustrated and the reasons for their responses can be seen. The storm water drains in Parys are in a very bad condition and immediate maintenance is required. The current state of the storm water drains is unsightly and dangerous.

Figure 31: Current conditions of storm water drains in Parys (a)

Figure 32: Current conditions of storm water drains in Parys (b)

Figure 33: Current conditions of storm water drains in Parys (c)

Figure 34: Current conditions of storm water drains in Parys (d)

6.5.2 Current state of social aspects in Parys

The current state of each problem parameter for social aspects will be discussed in detail in the following Sections.

6.5.2.1 Current state of the appearance of Parys

The majority of business owners and stakeholders felt dissatisfied and rated the clean appearance of Parys and public spaces in the town as poor (See Table 27). From the site inspection and Figure 35 to Figure 38 it is clear that Parys and its public spaces do not have a clean appearance. This is mainly due to littering, this occurrence could be linked to the lack of refuse bins which was also identified as a main problem area in Section 6.5.3. The clean appearance of the town could impact on the success of the businesses in the town.

Figure 35: Current conditions of the general appearance of Parys (a)

Figure 36: Current conditions of the general appearance of Parys (b)

Figure 37: Current conditions of the general appearance of Parys (c)

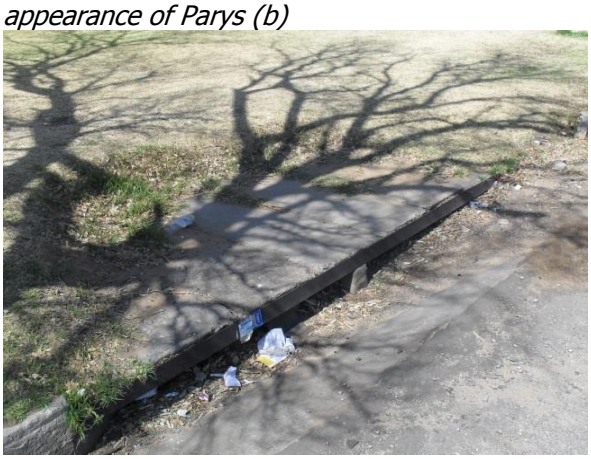

Figure 38: Current conditions of the general appearance of Parys (d)

6.5.3 Current state of service delivery in Parys

The current state of each problem parameter for service delivery will be discussed in detail in the following Sections.

6.5.3.1 Current state of waste management in Parys

The majority of business owners and stakeholders felt very dissatisfied with refuse collection as well as the timely and frequent collection of refuse in Parys. These parameters were also rated as poor (See Table 27).

Figure 39 depicts the current domestic waste situation in Parys. The current situation of waste management and refuse collection was also discussed in Chapter 4. There are currently no data bases available for the volume of municipal solid waste generated in Parys. Furthermore Parys only has one permitted landfill site and is currently not compliant with the relevant legislation or regulations. In Chapter 4 the issue of insufficient rubbish bins for residents were noted, residents without rubbish bins are not serviced. This issue is one of

great importance as domestic waste which generates in streets and open spaces could become an environmental issue and pose severe health threats to the public. Domestic waste is generally put in refuse bags and left on street reserves for collection, when waste is left unattended it attracts flies and animals scavenging for food scraps. Furthermore unattended waste can also have a bad odour due to decomposition. Unattended refuse bags often get ripped open by animals and waste spreads to open spaces and storm water drains where it ends up in the Vaal River after a rain storm. As discussed in Section 6.5.2.1 and Section 6.5.4.1, domestic waste in the streets of Parys is also unsightly and detriments the aesthetic character of the town.

Business owners and stakeholders also felt that there are not enough waste bins for public use. This also increases the occurrence of waste in the streets of Parys. Furthermore there are no recycling facilities integrated in waste management systems in Parys, this increases the volume of waste generated and sent to the landfill site. The lack of recycling services and facilities also deprive the town's residents of possible job opportunities and the community of certain benefits of recycling such as income opportunities.

Figure 39: Current conditions irregular refuse collection in Parys

6.5.3.2 Current state of drinking water quality in Parys

The survey results for the water quality Section of the questionnaires indicated that almost all business owners and stakeholders rated the tap water quality in Parys over the past three months as poor (See Table 27). A total of 95% of stakeholders and business owners in Parys are currently buying bottled water to replace tap water as a drinking water resource. In Chapter 4 the 2012 Blue Drop score for Parys was 14.33% with absolutely no improvement on the 2010 situation. Water quality indicates that the drinking water in Parys did not comply with standard targets in terms of micro and chemical compounds. The drinking water quality in Parys is an issue for concern.

6.5.4 Current state of environmental parameters in Parys

The current state of each problem parameter for environmental parameters will be discussed in detail in the following Sections.

6.5.4.1 Current state of open spaces and parks in Parys

The majority of business owners and stakeholders felt dissatisfied with the conditions of parks and open spaces on the banks of the Vaal River. They also rated these parameters as poor (See Table 27). After the visit to Parys it became obvious that the conditions of open spaces and parks in Parys are in a very poor condition. Figure 40 to Figure 43 depicts the current situation of opens spaces and parks in Parys. The lack of adequate refuse collection and public waste bins can be linked to the current situation.

Figure 40: Current conditions of public spaces on the banks of the Vaal River (a)

Figure 41: Current conditions of public spaces on the banks of the Vaal River (b)

Figure 42: Litter on the banks of the Vaal River

Figure 43: Litter in open spaces in Parys

6.5.4.2 Current state of the Vaal River in Parys

The majority of business owners and stakeholder rated the following parameters regarding the Vaal River as poor (See Table 27):

- The condition of the Vaal River in terms of illegal sewage leaks.
- The condition of the Vaal River in terms of illegal sewage dumping.
- The condition of the Vaal River in terms of illegal refuse dumping.
- The condition of the Vaal River in terms of odours caused by sewage leaks.
- The condition of the Vaal River in terms of odours caused by illegal sewage dumping.
- The condition of the Vaal River in terms of odours caused by illegal refuse dumping.
- The water quality of the Vaal River for recreational activities (rafting, fishing, picnicking etc.).
- The quality of the Vaal River in terms of aesthetic qualities.
- The quality of the Vaal River in terms of a clean and healthy appearance.

The visit to Parys during the survey revealed some of these issues while others were unnoticeable or no concrete evidence could be obtained. The major problem areas were refuse dumping in and near the Vaal River, canals flowing from the town into the river had a large amount of domestic waste and an unpleasant odour. Stakeholders pointed out that sewage is still being leaked into the river however access to the sewage plant situated just outside of Parys could not be obtained. Figure 44 to Figure 49 indicates the condition of the Vaal River in terms of refuse dumping, the aesthetic and clean and healthy appearance of the Vaal River.

Figure 44: Current conditions of water channels flowing into the Vaal River

Figure 45: Polluted water flowing into the Vaal River

Figure 46: The aesthetic character of the Vaal River

Figure 47: Refuse dumping on the banks of the Vaal River

Figure 48: The condition of certain parts of the Vaal River (a)

Figure 49: The condition of certain parts of the Vaal River (b)

6.6 Conclusion

From the discussions of the data obtained for both surveys, it can be concluded that Parys has a number of urban and environmental problems. The results from business owners and stakeholders correlate with each other in each Section of the urban and environmental parameters evaluated. These problems are also perceived as important for the success and future growth of the town as well as the success of businesses located in the town. Should these issues be left unattended they could impact on the social, economic and environmental spheres of Parys. Chapter 4 dealt with the sustainability evaluation of Parys. When considering the problem areas identified in this Chapter as well as Chapter 4, it is evident that the majority of sustainability indicators reflect in the results obtained through the two questionnaires. From Table 27 it is clear that the small town of Parys has a number of urban and environmental issues. These issues link to and are related to the unsustainability of the town depicted in Chapter 4. It can thus be concluded that Parys at this stage is not sustainable and due to this, the future growth and survival of the economic drivers of the town as well as the town itself is at stake. Therefore it is critical to address these problems and formulate certain recommendations to initiate the sustainability and dynamisms of Parys.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

In Chapter 4 Parys was evaluated in terms of certain sustainability indicators in order to determine the level and progress of the town towards sustainability and sustainable development. Chapter 4 also pointed out the problem areas that could impact on the future growth of Parys which are in need of attention. Chapter 6 evaluated Parys in terms of urban and environmental parameters through using the existing perceptions and concerns of business owners and stakeholders of the town. By quantifying the perceptions and concerns the main problem areas in the urban and environmental parameters of Parys were identified. The rating scale for each parameter in Chapter 6 was used to identify the problem areas in Parys. The parameters discussed in this Chapter thus derive from the parameters that were rated as poor by business owners and stakeholders. This Chapter will focus on the main problem areas identified in Chapter 4 and 6, and will formulate recommendations in order to improve the current situation in Parys. The recommendations are formulated using urban environmental management and town planning with the goal to initiate sustainability in economic, social and environmental spheres of the town. This Chapter will also serve as the final Chapter for this study and will conclude on the objectives set in Chapter 1. Following all the previous Chapters, investigations and discussions the objectives set out in Chapter 1 which have been met are indicated in Table 28.

Table 28. Objectives and actions

Objective	Objective reached
1. To investigate and evaluate the small town of Parys in terms of applicable United Nations Sustainability indicators.	Chapter 4 The small town of Parys was evaluated using applicable sustainability indicators derived from the United Nations.
2. To classify of the small town of Parys in terms of its economic drivers and growth factors.	Chapter 3 Parys was classified according to its economic drivers. The town was also investigated and discussed in terms of the various growth factors contributing to the town as we know it today.
3. To evaluate the role and importance of the natural and urban environment on small town economic drivers and important stakeholders.	Chapter 6 The role and importance of the natural and urban environment on the economic drivers and stakeholders in Parys was discussed and illustrated.
4. To determine the perceptions and concerns of businesses and important stakeholders on their natural and urban environment.	Chapter 6 The perceptions and concerns of business owners and stakeholders on their urban and natural environment in Parys were determined.
5. To identify the main urban and environmental components affecting the survival of Parys and the community of Parys.	Chapter 6 The main urban and environmental parameters that are threatening the survival of Parys was identified and discussed.
6. To formulate recommendations to improve the current urban and environmental situation in Parys to ensure healthy future growth and sustainable development	Chapter 7 Will formulate recommendations in order to improve the current situation in Parys given the results obtained through Chapter 6.

7.2 National small town sustainability indicators evaluated in Parys

From the proposed National small town sustainability indicators presented in Chapter 4 the indicators evaluated for this study through the surveys and sustainability evaluation are indicated in Table 29 through check marks.

Table 29. National small town indicators evaluated in this study

Indicator number	Indicator evaluated	National Small Town Sustainability Indicators (NSTSI)
1		**Economic Indicators**
1.1		Unemployment rates
1.1a	✓	Employment and unemployment rates
1.1b	✓	Level of population with professional education (Certificate with Grade 12 and above)
1.2		Economic growth
1.2a	✗	Annual GDP growth rate
1.2b	✗	Annual GNP growth rate
1.2c	✗	Net Export Growth rates (% increase of total exports minus the value of total imports annually)
2		**Environmental Indicators**
2.1		Green Spaces
2.1a	✓	The quality of open spaces and parks (public safety & litter)
2.1b	✗	Percentage of preserved areas/ reservoirs/ waterways/parks in relation to total land area
2.1c	✗	Percentage of trees in the city in relation to city area and/or population size
2.1d	✓	Percentage of green space (public parks) coverage in relation to city area and/or population size
2.2		Appearance of the town
2.2a	✓	The overall clean appearance of the town
2.2b	✓	The overall clean appearance of public spaces
2.3		Transportation mode split. (Percentage of each mode of transportation, i.e. private, public, bicycles, pedestrians).
2.4		Surface water quality
2.4a	✓	Water quality of all surface water resources, rivers, streams and canals
2.5		Air quality
2.5a	✗	General air quality of town (measured quarterly)
2.6		Public spaces & Urban elements
2.6a	✓	General conditions of roads (% of roads in good and bad condition)
2.6b	✓	General conditions of buildings
2.6c	✓	Traffic congestion (time and duration of heavy traffic)
2.6d	✓	Storm water drainage systems (conditions and maintenance)
3		**Social Indicators**
3.1		Pedestrian friendliness of town
3.1a	✓	Condition of side walks
3.1b	✓	Sufficient pedestrian crossings
3.2		Complete neighbourhood / Compact town
3.2a	✓	Access to local or neighbourhood services within a short distance
3.3		Crime rates
3.3a	✓	Crime rates for town (% increase or decrease)
3.4	✗	Measures of income distribution and inequality
3.5		Housing
3.5a	✗	Percentage of social / affordable / priority housing
3.5b	✓	Breakdown of housing sector by property type (owner occupied / rental, single occupant/couples/family/multifamily etc.)
3.6		Education
3.6a	✓	Number of schools with environmental education programs
3.6b	✗	Adult literacy rate
3.7		Sanitation
3.7a	✓	Percentage of population with access to water-born or alternative (and effective) sanitary sewage infrastructure
3.8		Health
3.8a	✗	Mortality rate/ Life expectancy
3.8b	✓	Percentage of population with access to health care services
3.9		Service delivery
3.9a	✓	Refuse collection
3.9b	✓	Availability of public waste bins
3.9c	✓	Volume of waste generated
3.9d	✓	Provision and availability of recycling facilities
3.9e	✓	Volume of waste diverted from waste stream via recycling
3.9f	✓	Quality of tap water
3.9g	✓	Availability of tap water
3.9h	✓	Electricity provision
3.9i	✓	Energy efficiency
3.9j	✓	Alternative energy resources used
3.9k	✓	General municipal rates and taxes
3.9l	✓	General municipal services
3.9m	✓	Quality Public Space
3.9n	✓	Percentage of roadways in good conditions

7.3 Recommendations to improve urban and environmental parameters in Parys

Following the main problem areas identified and discussed in Chapter 6, this Section will propose recommendations to improve the current urban and environmental situation in Parys.

7.3.1 Public spaces and urban parameters

The main problem areas for public spaces and urban parameters are summarised in Chapter 6. The following Sections will serve as recommendations to improve the current state of these parameters in Parys.

7.3.1.1 Recommendations to improve the roads in Parys

As discussed in Chapter 6, the majority of business owners and stakeholders rated the general conditions of the roads in Parys and Breë Street as poor. These results were also confirmed during the sustainability evaluation of Parys and photos taken during the personal observations. Given the current state of the roads in Parys, the following recommendations are proposed to improve the current conditions of roads.

Recommendations:

- Create a detour for heavy vehicles entering from the R53, R 723 and the R59 (illustrated in Figure 2, Chapter 3) and increase the capability of peripheral streets to accommodate these heavy vehicles.
- Identify severe road maintenance areas.
- Set up a data base and action plan for road repairs and maintenance.
- Allocate the needed funds to repair the road.
- An alternative solution for the problem would be to set up toll gates at all four entrances of Parys for heavy vehicles only. The fees obtained can be allocated to assist in road repair and maintenance funding.

7.3.1.2 Recommendations to improve the sidewalks in Parys

The majority of business owners and stakeholders rated the general conditions of sidewalks in Parys as poor. These results were also confirmed by photos taken during personal

observations. Given the current state of the sidewalks in Parys, the following recommendations are proposed to improve the current conditions of sidewalks.

Recommendations:

- Provide efficient sidewalks for pedestrians; this will encourage pedestrian activities and accessibility to shops.
- Level, upgrade and maintain the existing sidewalks to increase the safety of the public.
- Existing sidewalks can be equipped with proper street lighting to improve public safety and encourage pedestrian activities.
- Signage obstructing pedestrian activities on sidewalks can be relocated in order to improve walkability.

7.3.1.3 Recommendations to improve parking in Parys

The results obtained in Chapter 6 indicate that the majority of business owners and stakeholders rated the availability of parking spaces in close proximity of businesses in Parys as poor. These results were also confirmed by the photos taken during personal observations. The following recommendations are proposed to improve the current conditions of parking in Parys.

Recommendations:

- Provide parking areas with sufficient trees on vacant land uses. The presence of trees will ensure that the parking area is convenient and user friendly.
- Provide parking for business owners behind their shops to prevent the occupation of customer parking.

7.3.1.4 Recommendations to improve the current traffic situation in Parys

Chapter 6 indicated that the majority of business owners and stakeholders rated the availability of traffic calming measures and traffic signs in Parys as poor. These results were confirmed by the photos taken during personal observations. Given the current state of traffic parameters in Parys, the following recommendations are proposed to improve the current conditions.

Recommendations:

- The implementation of efficient traffic signs such as signalised intersections to replace current four way stops. This will assist in handling the current traffic situations especially over weekends and relief some of the frustrations caused by the current traffic situation and lack of sufficient and visible traffic signs.
- The other option is to implement mini-roundabouts with a central island which will also help with traffic calming and the circulation of traffic.
- Decrease the current speed limit of 60 km/h to 40 km/h to slow traffic down and hinder speeding vehicles, and provide a safer environment for pedestrians and motorists.
- The upgrading and maintenance of existing four way stops to ensure visibility for motorists and reduce accidents.
- The implementation of speed humps to reduce opportunities for speeding in Parys.

7.3.1.5 Recommendations to improve the current state of storm water drains in Parys

The majority of business owners and stakeholders rated the maintenance and conditions of storm water drains in Parys as poor. These results were also confirmed by the photos taken during personal observations. Succeeding the current state of storm water drains in Parys, the following recommendations are proposed.

Recommendations:

- Clean and maintain storm water drains on a regular basis.
- Conduct regular storm water drain inspections.
- Allocate the needed funds for repairs and maintenance.
- Close all open storm water drains to protect the general public from possible accidents.
- Storm water drains should be cleaned on a weekly basis to avoid blockages and refuse from flowing into the Vaal River.

7.3.2 Social aspects

The main problem areas for social aspects are summarised in Chapter 6. The following Sections will serve as recommendations to improve the current state of these parameters in Parys.

7.3.2.1 Recommendations to improve the appearance of Parys

The results obtained in Chapter 6 indicate that the majority of business owners and stakeholders rated the clean appearance of Parys and public spaces in the town as poor. These results were also confirmed by the photos taken during the personal observations. The following recommendation is proposed.

Recommendation:

- Parys must be cleaned up and kept clean; this will also contribute to employment opportunities in Parys - provisions of public dustbins in streets are suggested.

7.3.3 Service delivery

The main problem areas for service delivery are summarised in Chapter 6. The following Sections will serve as recommendations to improve the current state of these parameters in Parys.

7.3.3.1 Recommendations to improve the current waste management in Parys

As discussed in Chapter 6, the majority of business owners and stakeholders rated the refuse collection in Parys as poor. These results were also confirmed during the sustainability evaluation of Parys and the photos taken during personal observations. Given the current state of waste management discussed in Chapter 6 Parys, the following recommendations are proposed to improve waste management in Parys.

Recommendations:

- The provision of a legislative and regulative framework which can guide waste management on all levels of government. This must include public awareness and education on the managing of domestic waste at household levels as well as the advantages of recycling and effective waste management.
- Evaluate the current landfill site in terms of location, capacity, lining and access control in order to identify the steps needed to comply with the relevant legislation and regulations such as the National Environmental Management Waste Act of 2008.
- Supply all residents with adequate waste bins so effective municipal refuse collection can take place.

- Manage and evaluate the municipal waste collection teams to ensure timely and efficient waste collections in the town.
- The establishment of a data base which can monitor the volume of domestic waste generated on a monthly basis in order to contribute to the sustainability evaluation of the town in terms of waste.
- Provide recycling facilities within reachable distance of residential areas with well-advertised incentives to motivate and inform the public.
- Start a community awareness campaign for recycling.
- Supply public areas with sufficient waste bins and service them on a regular basis.

7.3.3.2 Recommendations to improve the drinking water quality in Parys

In Chapter 6, the majority of business owners and stakeholders rated the quality of tap water in Parys as poor. A total of 95% of stakeholders and business owners are currently replacing tap water with bottled water. These results were also confirmed during the sustainability evaluation of Parys. Given the current water quality discussed in Chapter 6 and 4, the recommendations below are proposed to improve the water quality in Parys.

Recommendations:

- Conduct the necessary chemical en micro chemical testing to establish the current water quality.
- The evaluation and inspection of the current waste water treatment system in Parys to identify current issues or malfunctions within the system. This will also assist in identifying the needed funding to upgrade the system to applicable standards.
- The regular inspection and monitoring of water quality and the waste water treatment systems. In accordance with guidelines as set by the Department of Water Affairs.
- The appointment of adequate and efficient waste water process managers and controllers.

7.3.4 Environmental parameters

The main problem areas for environmental parameters are summarised in Chapter 6. The following Sections will serve as recommendations to improve the current state of these parameters in Parys.

7.3.4.1 Recommendations to improve open spaces and parks in Parys

The results obtained in Chapter 6 indicate that the majority of business owners and stakeholders rated the conditions of parks and open spaces in Parys as poor. These results were also confirmed by the photos taken during personal observations. Given the current state of open spaces and parks in Parys, the following recommendations are proposed.

Recommendations:

- Supply parks and open spaces with sufficient waste bins which are serviced on regular basis.
- Regular cleaning of parks and open spaces by municipal personnel.

7.3.4.2 Recommendations to improve the current state of the Vaal River in Parys

Chapter 6 indicated that the majority of business owners and stakeholders rated the condition of the Vaal River in Parys as poor. These results were also confirmed by the photos taken during personal observations. The following recommendations are proposed.

Recommendations:

- The upgrading, maintenance and regular cleaning of storm water drains in Parys.
- Better waste management in Parys.
- Regular cleaning en removal of litter on the banks of the Vaal River.
- Investigate and determine the origin of water channels flowing into the Vaal River.
- Test and monitor the water flowing from water channels into the Vaal River.
- Investigate the allegations regarding sewage leaks and dumping in the Vaal River.
- Open public spaces on the banks of the Vaal River can be demarcated and visitors can be charged a fee to enter, the funds allocated can then be used to appoint cleaners to clean up litter in and around the river.

7.4 Conclusion

The compound table in Section 6.5 depicts the main urban and environmental problems in Parys. From Table 27 in Chapter 6 it is clear that the small town of Parys has a number of urban and environmental issues. These issues link to and are related to the unsustainability of the town depicted in Chapter 4. A town is unable to function efficiently in isolation from its immediate environment. In any town, the natural and urban environment forms the foundation on which all business sectors depend. This is also evident given the responses obtained through the surveys. The majority of business owners and stakeholders felt that all the urban and environmental parameters listed in the questionnaires were important for the success of the town as well as businesses situated in the town. The majority of issues depicted in the current state of urban and environmental parameters can be solved by urban environmental management, proper town planning, adequate municipal service delivery and public participation. Public participation is also needed as the majority of business owners and stakeholders felt that sustainability initiatives such as alternative energy resources and recycling facilities are needed. It can therefore be concluded that the small town of Parys has the potential to be sustainable in all spheres; social, economic and environmental. There is a lack of data sets on the majority of sustainability indicators, this also gives rise to the need to develop an integrated sustainability data base. An integrated sustainability data base with the necessary parameters for each sustainability indicator could assist the NLM and other local municipalities in South Africa to determine their current state of sustainability. It could also help the municipalities set more detailed goals and funding programs along with more sufficient research projects. The proposed National small town sustainability indicators can be used to identify the needed data base parameters. The data collected in this study can also be used in the future for follow up studies where statistical correlations can be made. Similar studies can be conducted on residential structures of small towns and this descriptive statistical analysis of Parys can be followed with a regression analysis.

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LIST OF ANNEXURES

ANNEXURE A: STAKEHOLDER QUESTIONNAIRE

Questionnaire Regarding the Urban Environmental Evaluation of Parys

Dear Stakeholder, this questionnaire should take you approximately 10 minutes to complete.

Please complete the following questionnaire regarding your impression of Parys in terms of various parameters.

Your feedback will be helpful in my research study to determine the urban and environmental issues in Parys, and helpful to formulate recommendations to improve Parys in the future.

Please approach this questionnaire seriously. Your name and surname will not be necessary this questionnaire is anonymous and voluntary.

Should you have any questions or concerns regarding this questionnaire or the study feel free to contact me.

Lee-Anne Dreyer 082 851 3010.

Urban Environmental Evaluation of Parys

In this section, a number of aspects are given in connection with several elements in Parys. Kindly evaluate each aspect according to the given five-point scale, **by encircling the corresponding number with a pen next to the element.**

Public Spaces and Urban elements

	On a 5 point scale as indicated below, how satisfactory are the following elements for you as a stakeholder?						On a 5 point scale as indicated below, how important are the following elements for the future growth and success of Parys?					
	Roads	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Roads**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
1	The general conditions of roads in Parys	1	2	3	4	5	The general conditions of roads in Parys	1	2	3	4	5
2	The general condition of the road in Breë Street	1	2	3	4	5	The general condition of the road in Breë Street	1	2	3	4	5
	Side walks	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Side walks**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
3	The general condition of the side walks in Parys	1	2	3	4	5	The general condition of the side walks in Parys	1	2	3	4	5
4	The walkability of side walks in front of businesses	1	2	3	4	5	The walkability of side walks in front of businesses	1	2	3	4	5
	Parking	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Parking**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
5	The availability of parking spaces in front of businesses	1	2	3	4	5	The availability of parking spaces in front of businesses	1	2	3	4	5
6	The availability of parking spaces in close proximity to businesses	1	2	3	4	5	The availability of parking spaces in close proximity to businesses	1	2	3	4	5
	Traffic	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Traffic**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
7	Traffic congestion in Parys	1	2	3	4	5	Traffic congestion in Parys	1	2	3	4	5
8	The availability of traffic signs to regulate traffic in Parys	1	2	3	4	5	The availability of traffic signs to regulate traffic in Parys	1	2	3	4	5
9	The availability of traffic calming measures (speed humps) to prevent speeding in Parys	1	2	3	4	5	The availability of traffic calming measures (speed humps) to prevent speeding in Parys	1	2	3	4	5
	Built environment	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Built environment**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
10	The general appearance of buildings in Parys	1	2	3	4	5	The general appearance of buildings in Parys	1	2	3	4	5
11	The general conditions of buildings in Parys	1	2	3	4	5	The general conditions of buildings in Parys	1	2	3	4	5
	Storm water drains	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Storm water drains**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
12	The general maintenance of storm water drains in Parys	1	2	3	4	5	The general maintenance of storm water drains in Parys	1	2	3	4	5
13	The general condition of storm water drains in Parys	1	2	3	4	5	The general condition of storm water drains in Parys	1	2	3	4	5

Public Spaces and Urban elements						
On a 5 point scale as indicated below, how would you rate the condition of the following elements in Parys ?						
Roads		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
27	The general conditions of roads in Parys	**1**	**2**	**3**	**4**	**5**
28	The general condition of the road in Breë Street	**1**	**2**	**3**	**4**	**5**
Side walks		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
29	The general condition of the side walks in Parys	**1**	**2**	**3**	**4**	**5**
30	The walkability of side walks in front of businesses	**1**	**2**	**3**	**4**	**5**
Parking		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
31	The availability of parking spaces in front of businesses	**1**	**2**	**3**	**4**	**5**
32	The availability of parking spaces in close proximity to businesses	**1**	**2**	**3**	**4**	**5**
Traffic		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
33	Traffic congestion in Parys	**1**	**2**	**3**	**4**	**5**
34	The availability of traffic signs to regulate traffic in Parys	**1**	**2**	**3**	**4**	**5**
35	The availability of traffic calming measures (speed humps) to prevent speeding in Parys	**1**	**2**	**3**	**4**	**5**
Built environment		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
36	The general appearance of buildings in Parys	**1**	**2**	**3**	**4**	**5**
37	The general conditions of buildings in Parys	**1**	**2**	**3**	**4**	**5**
Storm water drains		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
38	The general maintenance of storm water drains in Parys	**1**	**2**	**3**	**4**	**5**
39	The general condition of storm water drains in Parys	**1**	**2**	**3**	**4**	**5**

Kindly evaluate each aspect according to the given five-point scale, by **encircling the corresponding number** with a pen next to the element.

Social aspects

On a 5 point scale as indicated below, how satisfactory are the following elements for you as a stakeholder?							On a 5 point scale as indicated below, how important are the following elements for the future growth and success of Parys?						
Crime		**1** Very dissatisfied	**2** Somewhat dissatisfied	**3** Didn't notice	**4** Somewhat satisfied	**5** Very satisfied	**Crime**		**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
40	Crime rates in Parys	1	2	3	4	5	**55**	Crime rates in Parys	1	2	3	4	5
41	The general safety of Parys at night	1	2	3	4	5	**56**	The general safety of Parys at night	1	2	3	4	5
42	The general safety of Parys during the day	1	2	3	4	5	**57**	The general safety of Parys during the day	1	2	3	4	5
Accessibility		**1** Very dissatisfied	**2** Somewhat dissatisfied	**3** Didn't notice	**4** Somewhat satisfied	**5** Very satisfied	**Accessibility**		**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
43	The accessibility of Parys from the R59 (from Sasolburg)	1	2	3	4	5	**58**	The accessibility of Parys from the R59 (from Sasolburg)	1	2	3	4	5
44	The accessibility of Parys from the R53 (from Potchefstroom)	1	2	3	4	5	**59**	The accessibility of Parys from the R53 (from Potchefstroom)	1	2	3	4	5
45	The accessibility of Parys from the R59 (from Vredefort)	1	2	3	4	5	**60**	The accessibility of Parys from the R59 (from Vredefort)	1	2	3	4	5
46	The presence of street signage in Parys	1	2	3	4	5	**61**	The presence of street signage in Parys	1	2	3	4	5
47	The walkability of side walks in front of businesses	1	2	3	4	5	**62**	The walkability of side walks in front of businesses	1	2	3	4	5
48	The general pedestrian friendliness in Parys	1	2	3	4	5	**63**	The general pedestrian friendliness in Parys	1	2	3	4	5
Appearance		**1** Very dissatisfied	**2** Somewhat dissatisfied	**3** Didn't notice	**4** Somewhat satisfied	**5** Very satisfied	**Appearance**		**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
49	The first impression of Parys	1	2	3	4	5	**64**	The first impression of Parys	1	2	3	4	5
50	The aesthetic appearance of Parys	1	2	3	4	5	**65**	The aesthetic appearance of Parys	1	2	3	4	5
51	The general appearance of Parys	1	2	3	4	5	**66**	The general appearance of Parys	1	2	3	4	5
52	The general appearance of public spaces	1	2	3	4	5	**67**	The general appearance of public spaces	1	2	3	4	5
53	The clean appearance of Parys	1	2	3	4	5	**68**	The clean appearance of Parys	1	2	3	4	5
54	The clean appearance of public spaces	1	2	3	4	5	**69**	The clean appearance of public spaces	1	2	3	4	5

On a 5 point scale as indicated below, how would you rate the condition of the following elements in Parys ?						
	Crime	**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
70	Crime rates in Parys	**1**	**2**	**3**	**4**	**5**
71	The general safety of Parys at night	**1**	**2**	**3**	**4**	**5**
72	The general safety of Parys during the day	**1**	**2**	**3**	**4**	**5**
	Accessibility	**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
73	The accessibility of Parys from the R59 (from Sasolburg)	**1**	**2**	**3**	**4**	**5**
74	The accessibility of Parys from the R53 (from Potchefstroom)	**1**	**2**	**3**	**4**	**5**
75	The accessibility of Parys from the R59 (from Vredefort)	**1**	**2**	**3**	**4**	**5**
76	The presence of street signage in Parys	**1**	**2**	**3**	**4**	**5**
77	The walkability of side walks in front of businesses	**1**	**2**	**3**	**4**	**5**
78	The general pedestrian friendliness in Parys	**1**	**2**	**3**	**4**	**5**
	Appearance	**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
79	The first impression of Parys	**1**	**2**	**3**	**4**	**5**
80	The aesthetic appearance of Parys	**1**	**2**	**3**	**4**	**5**
81	The general appearance of Parys	**1**	**2**	**3**	**4**	**5**
82	The general appearance of public spaces	**1**	**2**	**3**	**4**	**5**
83	The clean appearance of Parys	**1**	**2**	**3**	**4**	**5**
84	The clean appearance of public spaces	**1**	**2**	**3**	**4**	**5**
85	The general appearance of buildings in Parys	**1**	**2**	**3**	**4**	**5**
86	The general conditions of buildings in Parys	**1**	**2**	**3**	**4**	**5**

Kindly evaluate each aspect according to the given five-point scale, **by encircling the corresponding number** with a pen next to the element.

Service delivery

On a 5 point scale as indicated below, how satisfactory have the following elements been for you as a stakeholder over the past three months (June, July, August)?

	Waste	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied
87	Refuse collection in Parys	1	2	3	4	5
88	The frequency of refuse collection in Parys	1	2	3	4	5
89	The timely collection of refuse in Parys	1	2	3	4	5
90	The availability of waste bins for public use in Parys	1	2	3	4	5
91	The provision of waste recycling facilities in Parys	1	2	3	4	5
92	The availability of waste recycling services in Parys	1	2	3	4	5

	Water	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied
93	The quality of tap water in Parys over the past three months	1	2	3	4	5
94	The availability of tap water in Parys over the past three months	1	2	3	4	5

	Please mark yes/no after reading the following questions regarding water use and provision	Yes	No
95	Are you currently buying bottled water to replace tap water as a drinking water resource?	1	2
96	Have you experienced a shortage in tap water in the last three months?	1	2
97	Have you experienced a cut off in tap water in the last three months?	1	2

On a 5 point scale as indicated below, how satisfactory have the following elements been for you as a Stakeholder over the past three months (June, July, August)?

	Electricity	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied
98	Electricity provision in Parys	1	2	3	4	5
99	Regular availability of electricity in Parys	1	2	3	4	5

	Please mark yes/no after reading the following questions regarding the use and provision for alternative energy systems	Yes	No
100	Do you currently make use of solar systems as an alternative energy resource?	1	2
101	Do you feel there is a need for solar systems in Parys?	1	2
102	Do you feel that it is important to consider alternative energy resources such as wind or solar panels in Parys?	1	2

On a 5 point scale as indicated below, how satisfactory have the following elements been for you as a Stakeholder over the past three months (June, July, August)?

	General	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied
103	General municipal rates and taxes	1	2	3	4	5
104	General municipal services	1	2	3	4	5

On a 5 point scale as indicated below, how important are the following elements for the future growth and success of Parys?						
Waste		**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
105	Refuse collection in Parys	1	2	3	4	5
106	The frequency of refuse collection in Parys	1	2	3	4	5
107	The timely collection of refuse in Parys	1	2	3	4	5
108	The availability of waste bins for public use in Parys	1	2	3	4	5
109	The provision of waste recycling facilities in Parys	1	2	3	4	5
110	The availability of waste recycling services in Parys	1	2	3	4	5
Water		**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
111	The quality of tap water in Parys	1	2	3	4	5
112	The availability of tap water in Parys	1	2	3	4	5
Electricity		**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
113	Electricity provision in Parys	1	2	3	4	5
114	Regular availability of electricity in Parys	1	2	3	4	5
General		**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
115	General municipal rates and taxes	1	2	3	4	5
116	General municipal services	1	2	3	4	5

On a 5 point scale as indicated below, how would you rate the condition of the following elements in Parys ?						
Waste		**1** Poor	**2** Fair	**3** Unsure	**4** Good	**5** Excellent
117	Refuse collection in Parys	1	2	3	4	5
118	The frequency of refuse collection in Parys	1	2	3	4	5
119	The timely collection of refuse in Parys	1	2	3	4	5
120	The availability of waste bins for public use in Parys	1	2	3	4	5
121	The provision of waste recycling facilities in Parys	1	2	3	4	5
122	The availability of waste recycling services in Parys	1	2	3	4	5
Water		**1** Poor	**2** Fair	**3** Unsure	**4** Good	**5** Excellent
123	The quality of tap water in Parys over the past three months	1	2	3	4	5
124	The availability of tap water in Parys over the past three months	1	2	3	4	5
Electricity		**1** Poor	**2** Fair	**3** Unsure	**4** Good	**5** Excellent
125	Electricity provision in Parys	1	2	3	4	5
126	Regular availability of electricity in Parys	1	2	3	4	5
General		**1** Poor	**2** Fair	**3** Unsure	**4** Good	**5** Excellent
127	General municipal rates and taxes	1	2	3	4	5
128	General municipal services	1	2	3	4	5

Kindly evaluate each aspect according to the given five-point scale, **by encircling the corresponding number** with a pen next to the element.

Environmental elements						
On a 5 point scale as indicated below, how satisfactory are the following elements for you as a stakeholder?						
	Open spaces and parks	**1** Very dissatisfied	**2** Somewhat dissatisfied	**3** Didn't notice	**4** Somewhat satisfied	**5** Very satisfied
129	The general conditions of open public spaces (empty or open spaces) in Parys	1	2	3	4	5
130	The general conditions of public parks in Parys	1	2	3	4	5
131	The general conditions of open public spaces on the banks of the Vaal River	1	2	3	4	5
	The Vaal River	**1** Very dissatisfied	**2** Somewhat dissatisfied	**3** Didn't notice	**4** Somewhat satisfied	**5** Very satisfied
132	The general over all condition of the Vaal River	1	2	3	4	5
133	The condition of the Vaal River in terms of illegal sewage leaks	1	2	3	4	5
134	The condition of the Vaal River in terms of illegal sewage dumping	1	2	3	4	5
135	The condition of the Vaal River in terms of illegal refuse dumping	1	2	3	4	5
136	The condition of the Vaal River in terms of odours caused by sewage leaks	1	2	3	4	5
137	The condition of the Vaal River in terms of odours caused by illegal sewage dumping	1	2	3	4	5
138	The condition of the Vaal River in terms of odours caused by illegal refuse dumping	1	2	3	4	5
139	The water quality of the Vaal River for recreational activities (rafting, fishing, picknicing etc.)	1	2	3	4	5
140	The quality of the Vaal River in terms of aesthetic qualities	1	2	3	4	5
141	The quality of the Vaal River in terms of a clean and healthy appearance	1	2	3	4	5
	Air quality	**1** Very dissatisfied	**2** Somewhat dissatisfied	**3** Didn't notice	**4** Somewhat satisfied	**5** Very satisfied
142	The general air quality in Parys	1	2	3	4	5

On a 5 point scale as indicated below, how important are the following elements for the future growth and success of Parys?						
	Open spaces and parks	**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
143	The general conditions of open public spaces (empty or open spaces) in Parys	1	2	3	4	5
144	The general conditions of public parks in Parys	1	2	3	4	5
145	The general conditions of open public spaces on the banks of the Vaal River	1	2	3	4	5
	The Vaal River	**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
146	The general over all condition of the Vaal River	1	2	3	4	5
147	The condition of the Vaal River in terms of illegal sewage leaks	1	2	3	4	5
148	The condition of the Vaal River in terms of illegal sewage dumping	1	2	3	4	5
149	The condition of the Vaal River in terms of illegal refuse dumping	1	2	3	4	5
150	The condition of the Vaal River in terms of odours caused by sewage leaks	1	2	3	4	5
151	The condition of the Vaal River in terms of odours caused by illegal sewage dumping	1	2	3	4	5
152	The condition of the Vaal River in terms of odours caused by illegal refuse dumping	1	2	3	4	5
153	The water quality of the Vaal River for recreational activities (rafting, fishing,picknicing etc.)	1	2	3	4	5
154	The quality of the Vaal River in terms of aesthetic qualities	1	2	3	4	5
155	The quality of the Vaal River in terms of a clean and healthy appearance	1	2	3	4	5
	Air quality	**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
156	The general air quality in Parys	1	2	3	4	5

On a 5 point scale as indicated below, how would you rate the condition of the following elements in Parys ?						
	Open spaces and parks	**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
157	The general conditions of open public spaces (empty or open spaces) in Parys	**1**	**2**	**3**	**4**	**5**
158	The general conditions of public parks in Parys	**1**	**2**	**3**	**4**	**5**
159	The general conditions of open public spaces on the banks of the Vaal River	**1**	**2**	**3**	**4**	**5**
	The Vaal River	**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
160	The general over all condition of the Vaal River	**1**	**2**	**3**	**4**	**5**
161	The condition of the Vaal River in terms of illegal sewage leaks	**1**	**2**	**3**	**4**	**5**
162	The condition of the Vaal River in terms of illegal sewage dumping	**1**	**2**	**3**	**4**	**5**
163	The condition of the Vaal River in terms of illegal refuse dumping	**1**	**2**	**3**	**4**	**5**
164	The condition of the Vaal River in terms of odours caused by sewage leaks	**1**	**2**	**3**	**4**	**5**
165	The condition of the Vaal River in terms of odours caused by illegal sewage dumping	**1**	**2**	**3**	**4**	**5**
166	The condition of the Vaal River in terms of odours caused by illegal refuse dumping	**1**	**2**	**3**	**4**	**5**
167	The water quality of the Vaal River for recreational activities (rafting, fishing,picknicing etc.)	**1**	**2**	**3**	**4**	**5**
168	The quality of the Vaal River in terms of aesthetic qualities	**1**	**2**	**3**	**4**	**5**
169	The quality of the Vaal River in terms of a clean and healthy appearance	**1**	**2**	**3**	**4**	**5**
	Air quality	**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
170	The general air quality in Parys	**1**	**2**	**3**	**4**	**5**

THE END!!! THANK YOU FOR YOUR TIME!!!!!!

ANNEXURE B: BUSINESS OWNER QUESTIONNAIRE

Questionnaire Regarding the Urban Environmental Evaluation of Parys

Dear Business owner, this questionnaire should take you approximately 10 minutes to complete.

Please complete the following questionnaire regarding your impression of Parys in terms of various parameters.

Your feedback will be helpful in my research study to determine the urban and environmental issues in Parys, and helpful to formulate recommendations to improve Parys in the future.

Please approach this questionnaire seriously. Your name and surname will not be necessary this questionnaire is anonymous and voluntary. Should you have any questions or concerns regarding this questionnaire or the study feel free to contact me.

Lee-Anne Dreyer 082 851 3010.

Thank you for your time.

SECTION A

In this section, kindly read the question and **encircle the number next to the applicable answer with a pen.**

1. Main source of income	
Who are your main source of income or your main clients? Mark the corresponding number by encircling it.	
Locals from Parys	1
Visitors from out of town	2
A mixture of Locals and visitors	3
Other	4

In case of answer D (other) please specify?

2. Number of businesses generating income			
Apart from this business do you own any other businesses that generate income?			
1	Yes	2	No

3. Residential status			
Do you live in Parys on a permanent basis?			
1	Yes	2	No

4. Business age structure			
When did you start or open your business in Parys? Mark the corresponding number by encircling it.			
2000	1	2007	8
2001	2	2008	9
2002	3	2009	10
2003	4	2010	11
2004	5	2011	12
2005	6	2012	13
2006	7	2013	14

5. Business premises status	
What is the ownership status regarding the business premises? Mark the corresponding number by encircling it.	
I Own the premises	1
The premises is rented	2

6. Number of employees
How many permanent employees does your business have including yourself? (Enter number in space below)

7. Sector	
Which of the following sectors best describes your business? Mark the corresponding number/s by encircling it.	
1	Agriculture services
2	Agriculture products
3	Mining and Quarrying
4	Manufacturing
5	Electricity
6	Gas
7	Water
8	Construction
9	Motor industry, service, retail, trade, repair
10	Wholesale trade (new or used goods or products)
11	Catering
12	Accommodation
13	Other trade (arts & crafts)
14	Restaurant/ food
15	Transport services/ trucking
16	Storage
17	Financial services
18	Property/ estate agency
19	Community & social services
20	Events, recreational activities and services
21	Other

In case of (other) please specify?

SECTION B

In this section, a number of aspects are given in connection with several elements in Parys. Kindly evaluate each aspect according to the given five-point scale, **by encircling the corresponding number with a pen next to the element.**

Public Spaces and Urban elements

	On a 5 point scale as indicated below, how satisfactory are the following elements for you as a business owner?						On a 5 point scale as indicated below, how important are the following elements for the success of your business?					
	Roads	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Roads**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
1	The general conditions of roads in Parys	1	2	3	4	5	14 The general conditions of roads in Parys	1	2	3	4	5
2	The general condition of the road in Breë Street	1	2	3	4	5	15 The general condition of the road in Breë Street	1	2	3	4	5
	Side walks	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Side walks**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
3	The general condition of the side walks in Parys	1	2	3	4	5	16 The general condition of the side walks in Parys	1	2	3	4	5
4	The walkability of side walks in front of your business	1	2	3	4	5	17 The walkability of side walks in front of your business	1	2	3	4	5
	Parking	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Parking**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
5	The availability of parking spaces in front of your business	1	2	3	4	5	18 The availability of parking spaces in front of your business	1	2	3	4	5
6	The availability of parking spaces in close proximity to your business	1	2	3	4	5	19 The availability of parking spaces in close proximity to your business	1	2	3	4	5
	Traffic	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Traffic**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
7	Traffic congestion in Parys	1	2	3	4	5	20 Traffic congestion in Parys	1	2	3	4	5
8	The availability of traffic signs to regulate traffic in Parys	1	2	3	4	5	21 The availability of traffic signs to regulate traffic in Parys	1	2	3	4	5
9	The availability of traffic calming measures (speed humps) to prevent speeding in Parys	1	2	3	4	5	22 The availability of traffic calming measures (speed humps) to prevent speeding in Parys	1	2	3	4	5
	Built environment	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Built environment**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
10	The general appearance of buildings in Parys	1	2	3	4	5	23 The general appearance of buildings in Parys	1	2	3	4	5
11	The general conditions of buildings in Parys	1	2	3	4	5	24 The general conditions of buildings in Parys	1	2	3	4	5
	Storm water drains	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**	**Storm water drains**	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
12	The general maintenance of storm water drains in Parys	1	2	3	4	5	25 The general maintenance of storm water drains in Parys	1	2	3	4	5
13	The general condition of storm water drains in Parys	1	2	3	4	5	26 The general condition of storm water drains in Parys	1	2	3	4	5

Public Spaces and Urban elements						
On a 5 point scale as indicated below, how would you rate the condition of the following elements ?						
Roads		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
27	The general conditions of roads in Parys	**1**	**2**	**3**	**4**	**5**
28	The general condition of the road in Breë Street	**1**	**2**	**3**	**4**	**5**
Side walks		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
29	The general condition of the side walks in Parys	**1**	**2**	**3**	**4**	**5**
30	The walkability of side walks in front of your business	**1**	**2**	**3**	**4**	**5**
Parking		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
31	The availability of parking spaces in front of your business	**1**	**2**	**3**	**4**	**5**
32	The availability of parking spaces in close proximity to your business	**1**	**2**	**3**	**4**	**5**
Traffic		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
33	Traffic congestion in Parys	**1**	**2**	**3**	**4**	**5**
34	The availability of traffic signs to regulate traffic in Parys	**1**	**2**	**3**	**4**	**5**
35	The availability of traffic calming measures (speed humps) to prevent speeding in Parys	**1**	**2**	**3**	**4**	**5**
Built environment		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
36	The general appearance of buildings in Parys	**1**	**2**	**3**	**4**	**5**
37	The general conditions of buildings in Parys	**1**	**2**	**3**	**4**	**5**
Storm water drains		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
38	The general maintenance of storm water drains in Parys	**1**	**2**	**3**	**4**	**5**
39	The general condition of storm water drains in Parys	**1**	**2**	**3**	**4**	**5**

Kindly evaluate each aspect according to the given five-point scale, by **encircling the corresponding number with a pen** next to the element.

Social aspects

On a 5 point scale as indicated below, how satisfactory are the following elements for you as a business owner?

	Crime	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied
40	Crime rates in Parys	1	2	3	4	5
41	The general safety of Parys at night	1	2	3	4	5
42	The general safety of Parys during the day	1	2	3	4	5
	Accessibility	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**
43	The accessibility of Parys from the R59 (from Sasolburg)	1	2	3	4	5
44	The accessibility of Parys from the R53 (from Potchefstroom)	1	2	3	4	5
45	The accessibility of Parys from the R59 (from Vredefort)	1	2	3	4	5
46	The presence of street signage in Parys	1	2	3	4	5
47	The walkability of side walks in front of your business	1	2	3	4	5
48	The general pedestrian friendliness in Parys	1	2	3	4	5
	Appearance	**1 Very dissatisfied**	**2 Somewhat dissatisfied**	**3 Didn't notice**	**4 Somewhat satisfied**	**5 Very satisfied**
49	The first impression of Parys	1	2	3	4	5
50	The aesthetic appearance of Parys	1	2	3	4	5
51	The general appearance of Parys	1	2	3	4	5
52	The general appearance of public spaces	1	2	3	4	5
53	The clean appearance of Parys	1	2	3	4	5
54	The clean appearance of public spaces	1	2	3	4	5

On a 5 point scale as indicated below, how important are the following elements on the success of your business?

	Crime	1 Of no importance	2 Of little importance	3 Unsure	4 Important	5 Highly important
55	Crime rates in Parys	1	2	3	4	5
56	The general safety of Parys at night	1	2	3	4	5
57	The general safety of Parys during the day	1	2	3	4	5
	Accessibility	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
58	The accessibility of Parys from the R59 (from Sasolburg)	1	2	3	4	5
59	The accessibility of Parys from the R53 (from Potchefstroom)	1	2	3	4	5
60	The accessibility of Parys from the R59 (from Vredefort)	1	2	3	4	5
61	The presence of street signage in Parys	1	2	3	4	5
62	The walkability of side walks in front of your business	1	2	3	4	5
63	The general pedestrian friendliness in Parys	1	2	3	4	5
	Appearance	**1 Of no importance**	**2 Of little importance**	**3 Unsure**	**4 Important**	**5 Highly important**
64	The first impression of Parys	1	2	3	4	5
65	The aesthetic appearance of Parys	1	2	3	4	5
66	The general appearance of Parys	1	2	3	4	5
67	The general appearance of public spaces	1	2	3	4	5
68	The clean appearance of Parys	1	2	3	4	5
69	The clean appearance of public spaces	1	2	3	4	5

Kindly evaluate each aspect according to the given five-point scale, **by encircling the corresponding number with a pen** next to the element.

On a 5 point scale as indicated below, how would you rate the condition of the following elements ?

	Crime	1 Poor	2 Fair	3 Unsure	4 Good	5 Excellent
70	Crime rates in Parys	1	2	3	4	5
71	The general safety of Parys at night	1	2	3	4	5
72	The general safety of Parys during the day	1	2	3	4	5

	Accessibility	1 Poor	2 Fair	3 Unsure	4 Good	5 Excellent
73	The accessibility of Parys from the R59 (from Sasolburg)	1	2	3	4	5
74	The accessibility of Parys from the R53 (from Potchefstroom)	1	2	3	4	5
75	The accessibility of Parys from the R59 (from Vredefort)	1	2	3	4	5
76	The presence of street signage in Parys	1	2	3	4	5
77	The walkability of side walks in front of your business	1	2	3	4	5
78	The general pedestrian friendliness in Parys	1	2	3	4	5

	Appearance	1 Poor	2 Fair	3 Unsure	4 Good	5 Excellent
79	The first impression of Parys	1	2	3	4	5
80	The aesthetic appearance of Parys	1	2	3	4	5
81	The general appearance of Parys	1	2	3	4	5
82	The general appearance of public spaces	1	2	3	4	5
83	The clean appearance of Parys	1	2	3	4	5
84	The clean appearance of public spaces	1	2	3	4	5
85	The general appearance of buildings in Parys	1	2	3	4	5
86	The general conditions of buildings in Parys	1	2	3	4	5

Service delivery

On a 5 point scale as indicated below, how satisfactory have the following elements been for you as a business owner <u>over the past three months</u> (June, July, August)?

	Waste	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied
87	Refuse collection in Parys	1	2	3	4	5
88	The frequency of refuse collection in Parys	1	2	3	4	5
89	The timely collection of refuse in Parys	1	2	3	4	5
90	The availability of waste bins for public use in Parys	1	2	3	4	5
91	The provision of waste recycling facilities in Parys	1	2	3	4	5
92	The availability of waste recycling services in Parys	1	2	3	4	5

	Water	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied
93	The quality of tap water in Parys over the past three months	1	2	3	4	5
94	The availibility of tap water in Parys over the past three months	1	2	3	4	5

	Please mark yes/no after reading the following questions regarding water use and provision	Yes	No
95	Are you currently buying bottled water to replace tap water as a drinking water resource?	1	2
96	Have you experienced a shortage in tap water in the last three months?	1	2
97	Have you experienced a cut off in tap water in the last three months?	1	2

On a 5 point scale as indicated below, how satisfactory have the following elements been for you as a business owner over the past three months (June, July, August)?

	Electricity	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied
98	Electericity provision in Parys	1	2	3	4	5
99	Regular availability of electricity in Parys	1	2	3	4	5

	Please mark yes/no after reading the following questions regarding the use and provision for alternative energy systems	Yes	No
100	Do you currently make use of solar systems as an alternative energy resource?	1	2
101	Do you feel there is a need for solar sytems in Parys?	1	2
102	Do you feel that it is important to consider alternative energy resources such as wind or solar pannels in Parys?	1	2

On a 5 point scale as indicated below, how satisfactory have the following elements been for you as a business owner over the past three months (June, July, August)?

	General	1 Very dissatisfied	2 Somewhat dissatisfied	3 Didn't notice	4 Somewhat satisfied	5 Very satisfied
103	General municipal rates and taxes	1	2	3	4	5
104	General municipal services	1	2	3	4	5

On a 5 point scale as indicated below, how important are the following elements on the success of your business?						
Waste		**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
105	Refuse collection in Parys	1	2	3	4	5
106	The frequency of refuse collection in Parys	1	2	3	4	5
107	The timely collection of refuse in Parys	1	2	3	4	5
108	The availability of waste bins for public use in Parys	1	2	3	4	5
109	The provision of waste recycling facilities in Parys	1	2	3	4	5
110	The availability of waste recycling services in Parys	1	2	3	4	5
Water		**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
111	The quality of tap water in Parys	1	2	3	4	5
112	The availibility of tap water in Parys	1	2	3	4	5
Electricity		**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
113	Electericity provision in Parys	1	2	3	4	5
114	Regular availability of electricity in Parys	1	2	3	4	5
General		**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
115	General municipal rates and taxes	1	2	3	4	5
116	General municipal services	1	2	3	4	5

On a 5 point scale as indicated below, how would you rate the condition of the following elements ?						
Waste		**1** Poor	**2** Fair	**3** Unsure	**4** Good	**5** Excellent
117	Refuse collection in Parys	1	2	3	4	5
118	The frequency of refuse collection in Parys	1	2	3	4	5
119	The timely collection of refuse in Parys	1	2	3	4	5
120	The availability of waste bins for public use in Parys	1	2	3	4	5
121	The provision of waste recycling facilities in Parys	1	2	3	4	5
122	The availability of waste recycling services in Parys	1	2	3	4	5
Water		**1** Poor	**2** Fair	**3** Unsure	**4** Good	**5** Excellent
123	The quality of tap water in Parys over the past three months	1	2	3	4	5
124	The availibility of tap water in Parys over the past three months	1	2	3	4	5
Electricity		**1** Poor	**2** Fair	**3** Unsure	**4** Good	**5** Excellent
125	Electericity provision in Parys	1	2	3	4	5
126	Regular availability of electricity in Parys	1	2	3	4	5
General		**1** Poor	**2** Fair	**3** Unsure	**4** Good	**5** Excellent
127	General municipal rates and taxes	1	2	3	4	5
128	General municipal services	1	2	3	4	5

Kindly evaluate each aspect according to the given five-point scale, **by encircling the corresponding number** with a pen next to the element.

Environmental elements						
On a 5 point scale as indicated below, how satisfactory are the following elements for you as a business owner ?						
	Open spaces and parks	**1** Very dissatisfied	**2** Somewhat dissatisfied	**3** Didn't notice	**4** Somewhat satisfied	**5** Very satisfied
129	The general conditions of open public spaces (empty or open spaces) in Parys	1	2	3	4	5
130	The general conditions of public parks in Parys	1	2	3	4	5
131	The general conditions of open public spaces on the banks of the Vaal River	1	2	3	4	5
	The Vaal River	**1** Very dissatisfied	**2** Somewhat dissatisfied	**3** Didn't notice	**4** Somewhat satisfied	**5** Very satisfied
132	The general over all condition of the Vaal River	1	2	3	4	5
133	The condition of the Vaal River in terms of illegal sewage leaks	1	2	3	4	5
134	The condition of the Vaal River in terms of illegal sewage dumping	1	2	3	4	5
135	The condition of the Vaal River in terms of illegal refuse dumping	1	2	3	4	5
136	The condition of the Vaal River in terms of odours caused by by sewage leaks	1	2	3	4	5
137	The condition of the Vaal River in terms of odours caused by illegal sewage dumping	1	2	3	4	5
138	The condition of the Vaal River in terms of odours caused by illegal refuse dumping	1	2	3	4	5
139	The water quality of the Vaal River for recreational activities (rafting, fishing, picknicing etc.)	1	2	3	4	5
140	The quality of the Vaal River in terms of aesthetic qualities	1	2	3	4	5
141	The quality of the Vaal River in terms of a clean and healthy appearance	1	2	3	4	5
	Air quality	**1** Very dissatisfied	**2** Somewhat dissatisfied	**3** Didn't notice	**4** Somewhat satisfied	**5** Very satisfied
142	The general air quality in Parys	1	2	3	4	5

On a 5 point scale as indicated below, how important are the following elements on the success of your business?						
	Open spaces and parks	**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
143	The general conditions of open public spaces (empty or open spaces) in Parys	1	2	3	4	5
144	The general conditions of public parks in Parys	1	2	3	4	5
145	The general conditions of open public spaces on the banks of the Vaal River	1	2	3	4	5
	The Vaal River	**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
146	The general over all condition of the Vaal River	1	2	3	4	5
147	The condition of the Vaal River in terms of illegal sewage leaks	1	2	3	4	5
148	The condition of the Vaal River in terms of illegal sewage dumping	1	2	3	4	5
149	The condition of the Vaal River in terms of illegal refuse dumping	1	2	3	4	5
150	The condition of the Vaal River in terms of odours caused by sewage leaks	1	2	3	4	5
151	The condition of the Vaal River in terms of odours caused by illegal sewage dumping	1	2	3	4	5
152	The condition of the Vaal River in terms of odours caused by illegal refuse dumping	1	2	3	4	5
153	The water quality of the Vaal River for recreational activities (rafting, fishing,picknicing etc.)	1	2	3	4	5
154	The quality of the Vaal River in terms of aesthetic qualities	1	2	3	4	5
155	The quality of the Vaal River in terms of a clean and healthy appearance	1	2	3	4	5
	Air quality	**1** Of no importance	**2** Of little importance	**3** Unsure	**4** Important	**5** Highly important
156	The general air quality in Parys	1	2	3	4	5

On a 5 point scale as indicated below, how would you rate the condition of the following elements ?						
Open spaces and parks		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
157	The general conditions of open public spaces (empty or open spaces) in Parys	**1**	**2**	**3**	**4**	**5**
158	The general conditions of public parks in Parys	**1**	**2**	**3**	**4**	**5**
159	The general conditions of open public spaces on the banks of the Vaal River	**1**	**2**	**3**	**4**	**5**
The Vaal River		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
160	The general over all condition of the Vaal River	**1**	**2**	**3**	**4**	**5**
161	The condition of the Vaal River in terms of illegal sewage leaks	**1**	**2**	**3**	**4**	**5**
162	The condition of the Vaal River in terms of illegal sewage dumping	**1**	**2**	**3**	**4**	**5**
163	The condition of the Vaal River in terms of illegal refuse dumping	**1**	**2**	**3**	**4**	**5**
164	The condition of the Vaal River in terms of odours caused by sewage leaks	**1**	**2**	**3**	**4**	**5**
165	The condition of the Vaal River in terms of odours caused by illegal sewage dumping	**1**	**2**	**3**	**4**	**5**
166	The condition of the Vaal River in terms of odours caused by illegal refuse dumping	**1**	**2**	**3**	**4**	**5**
167	The water quality of the Vaal River for recreational activities (rafting, fishing,picknicing etc.)	**1**	**2**	**3**	**4**	**5**
168	The quality of the Vaal River in terms of aesthetic qualities	**1**	**2**	**3**	**4**	**5**
169	The quality of the Vaal River in terms of a clean and healthy appearance	**1**	**2**	**3**	**4**	**5**
Air quality		**1 Poor**	**2 Fair**	**3 Unsure**	**4 Good**	**5 Excellent**
170	The general air quality in Parys	**1**	**2**	**3**	**4**	**5**

THE END!!!

THANK YOU FOR YOUR TIME