



**IS THE 'URBAN GROWTH BOUNDARY' CONCEPT A VALUABLE TOOL FOR
URBAN CONTAINMENT? EVIDENCE FROM LOUIS TRICHARDT TOWN, OF
MAKHADO MUNICIPALITY IN LIMPOPO PROVINCE.**

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SUPERVISOR: Mr. Gonda T

**THIS DISSERTATION IS SUBMITTED TO THE DEPARTMENT OF URBAN AND
REGIONAL PLANNING IN PARTIAL FULFILLMENT OF THE B.URP PROGRAMME
AT FOURTH YEAR LEVEL.**

FEBRUARY 2013



DECLARATION

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University of Venda

School of Environmental Sciences

Department of Urban and Regional Planning

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Date
09/07/2013
20/07/2013

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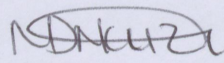
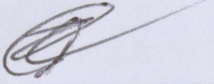
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FEBRUARY 2013

DECLARATION

I **Nkuzani Ntsako Debbie** of student number **11595160** hereby declare that this dissertation for the award of Bachelor of Urban and Regional Planning degree of the University of Venda is submitted by me and has not been previously submitted for a degree at this or any other University and it is my own work. All reference materials contained in this research have been duly acknowledged.

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Student	Ms. Nkuzani N.D		04/07/2013
Supervisor	Mr. T. Gondo		20/07/2013

ACKNOWLEDGEMENTS DEDICATION

I dedicate this dissertation to the Almighty God, who granted me the opportunity to live and study this far. I also would like to dedicate this dissertation to my late father Nkuzani Khawurisa Yediad and my precious mother Nkuzani Teleni Joyce for guiding and comforting me with their meaningful words. I also dedicate this to my brother and Sisters Nkuzani Themba, Nkuzani Busisiwe Beryl, Nkuzani Tintswalo and Nkuzani Khensani for encouraging and being with me through hail and storm. May the Almighty God bless you abundantly.

My sincere gratitude goes to my supervisor Mr. T. Gondo for his wise, judicious, guidance and advice. I also thank him for his intellectual and academic support throughout this dissertation.

I would also thank my siblings, Themba, Busisiwe, Tintswalo, Khensani and Marisa for their prayers, the sacrifices they and throughout my studies. May the Lord continue to bless and keep you safe. May your lives be wonderful to me.

I am grateful to my aunt, uncle and family for encouraging me to keep pushing until the end. Their words and prayers are my strength and never been helpful.

Special thanks to all my friends and fellow students from the Department of Urban and Environmental Planning for their cooperation. Banyi Basani, Rakunama Thilani for all the supportive and assistance and so on.

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My sincere gratitude goes to my supervisor Mr. T Gondo for his time, patience, guidance and advices. I also thank him for his intellectual and academic support throughout this dissertation.

I would also like to thank my siblings, Themba, Busisiwe, Tintswalo, Khensani and Marlies for their patience and assistance, love and throughout my studies. May the Lord continue to bless and keep you longer. You all have been wonderful to me.

I also would like to thank all my aunts and uncles for encouraging me to keep pushing until the end. Your words are planted in my heart and have been helpful.

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Keywords: Urban Growth Boundary, development, growth management, urban growth, urban containment, urban containment policy

TITLE	PAGE
Rapid urbanisation in many urban areas raises concern over sustainability of the growth, development and its effect on the environment. Urban growth boundaries are one of the land use management measures available that seek to control urban sprawl and associated centrifugal developments. This study evaluated the Urban Growth Boundary as a valuable tool for urban containment in Louis Trichardt town of Makhado Municipality. To generate empirical evidence, the study utilized the questionnaire survey method, interviews with key informants, observation and a review of related literature. This study outlined different growth management strategies that are currently in use within the municipality, how they function, their effectiveness and compatibility. Quantitative variables were analysed using SPSS and Microsoft word excel, while qualitative variables were subjected to Content Analysis. Findings revealed that Louis Trichardt is currently reeling under unavailability of land for further development. This is due to the fact that Makhado municipality has a high percentage of privately owned land which as a result causes development constraints for the municipality. Study findings reveal that Makhado Municipality has employed different strategies to manage the growth and development of the town. Strategies employed include: Land Use Management Scheme, Spatial Development Framework and Guidelines for Farm/Rural Development. Such instruments constitute an ideal legislative and policy framework for the implementation of Urban Growth Boundary as a growth management strategy. Despite their existence, the UGB tool was found to be an ineffective strategy as it could not limit Centrifugal developments in peripheral areas of the town. Associated challenges include rapid urbanisation, limited supply of land, availability of cheap land in peripheral areas and weak centripetal strategies employed by the municipality. The UGB concept however, still presents a valuable opportunity for urban containment that can be taped if appropriate centripetal strategies. The study recommended a number of strategies that seek to promote densification of land uses and further limit centrifugal developments. These strategies include: in-filling strategy that taps on improved service delivery, increase of floor area ratio (FAR) in the CBD and nodal developments.	

Keywords: Urban Growth Boundary, development, growth management, urban growth, urban containment, urban containment policy

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LUMS	Land Use Management Scheme
LAFCC	Local Agency Formation Commission
SDF	Spatial Development Framework
GMA	Greenwich Management Act
IDP	Integrated Development Plan
UGA	Urban Growth Area
WCPSDF	Western Cape Premier Spatial Development Framework
USA	Urban Service Area
DoH	Department of Housing
CBD	Central Business District

1.2 INTRODUCTION ACCRONYMS

UGB	-Urban Growth Boundary
SOI	-Sphere Of Influence
UCP	-Urban Containment Policies
LUMS	-Land Use Management Scheme
LAFCO	- Local Agency Formation Commission
SDF	-Spatial Development Framework
GMA	-Growth Management Act
IDP	-Integrated Development Plan
UGA	-Urban Growth Area
WCPSDF	-Western Cape Province Spatial Development Framework
USA	-Urban Service Areas
DoH	-Department of Housing
CBD	-Central Business District



1.0. INTRODUCTION.

Rapid urbanisation in many urban areas raises numerous concerns. There is a serious concern on sustainability of the growth, development and the effect urbanisation has on the environment. Urban edges are one of the land use management measures available to direct growth, both temporally and spatially (WCPSDF, 2005). Each town and city has its own edge. However, urban edge can somewhat be a boundary for further development of the city or town, in cases of urban growth.

An urban edge is meant to manage, direct and control outer limits of development around an urban area. The intention of an urban edge is to establish limits beyond which an urban development should as a rule not occur and to promote urban and environmental efficiency, effectiveness and economy in the interest of all. However, the use of urban edges to direct growth and to promote the environment, leads to negative consequences such as manipulation of the property market, setting limit of development of the urban area.

With the pressure of population growth in cities and towns, especially in the still developing countries, an increase in human activity and human needs causes a build-up of development intensification and human needs. Urban containment and urban sprawl is thus global occurrences with local manifestations. Containment strives to prohibit commercial or residential over-development in and around large cities and towns so that the natural environment can be sustainable and continue whilst being protected (Burgess, 2005).

The urban edge demarcation policy system is a South African approach to limit urban development from expanding rapidly to the outskirts of an urban region. Hence, this system provides containment in the form of restriction (Smit, 2009). However, the reality of modern 'urbanism' - [movement of people from rural to urban area] and development is that, cities and large towns eventually form metro poles, suburbs and neighborhoods (Daniels, 1999).

The system of urban growth boundary provides containment in the form of restriction. The urban fringe, or more plainly the zone where the urban ends and the rural starts is the determinant for compiling the boundary. However, the reality of modern urbanism and development is that cities and large towns eventually formed metro poles and suburbs (Daniels, 1999)

Previous studies have been focused on implementation of urban edges and their positive impacts towards development (Smit, 2008); therefore this study focuses on the impacts of urban growth boundary on the population growth and development of Louis Trichardt town.

1.1. BACKGROUND OF THE STUDY

Municipalities have been urged to use the relative concept of urban edge since the legacy of apartheid has brought about segregated spatial patterns, where dormitory townships and the settlement of poor communities were pushed to the peripheries of the towns. Therefore, urban edges were required to redress this legacy, to manage, direct and face urban growth pro-actively and to protect environmental and environmental resources outside of the urban edge as well as sensitive areas within the urban fringe. Rapid urbanisation and urban growth raise concerns over the sustainability of growth and the effect on the environment.

Louis Trichardt is a rapidly growing town. It is comprised of various land uses such as residential, commercial, industrial, institutional and recreational centers. Therefore, it is likely to grow beyond its boundary in a few years to come due to its rapid growth. As economy grows, people tend to move to urban areas for better services and better lives, this is the case also in Louis Trichardt. This leads to demand for housing, basic services and infrastructure development, however, this becomes restricted because of the urban edge.

This study will focus on how urban growth boundary has an impact on urban containment.



1.2. STATEMENT OF THE PROBLEM

Urban growth boundary is understood to be a great concept for managing growth of towns and cities as it is known to contain the outward growth of urban areas and to facilitate the restructuring and spatial integration of urban areas, and that it also contributes to class integration through spatial integration, the creation of opportunities for economic and social development, the re-development of under-utilised and vacant land, the conservation of aesthetic and sensitive environmental features. It is essential to contain growth and development in order to avoid future problems such as urban sprawl, unsustainable use of energy, etc .

Louis Trichardt is experiencing urbanisation and urban growth with perceived negative consequences to the built environment. Urban growth boundaries are required to contain the outward growth of urban areas, amongst others to facilitate the restructuring of the urban areas; such boundaries are more than line of separation between urban and rural areas. However, the urban growth boundary can only sustain the resources, land and environment for a short term because economy keeps growing which then leads to urban growth this then leads to demand of land, development and services but with the urban growth boundary as a restriction it becomes harder to further develop the area and provide the essential needs for the residents and everyone within the area.

1.3. AIM AND OBJECTIVES

1.3.1. Aim

The study seeks to evaluate the urban growth boundary as a valuable tool for urban containment in Louis Trichardt, Makhado Municipality of Limpopo Province.

1.3.2. Objectives

1.3.2.1. To review the legislative and policy requirements for urban containment and urban sprawl.

1.3.2.2. To assess the strategies that the municipality is currently using to manage growth and development of the town.

1.3.2.3. To identify the opportunities and constraints of using urban growth boundary as a growth management tool.

1.3.2.4. To recommend adaptable strategies for controlling town growth and development.

1.4. RESEARCH QUESTIONS

1.4.1. What are the legislative and policy requirements for urban containment and urban sprawl?

1.4.2. What are the strategies that the municipality is currently using for growth and development management?

1.4.3. What are the opportunities and constraints of using urban growth boundary as a growth management tool?

1.4.4. What are the adaptable strategies for controlling the town growth and development?

1.5. SIGNIFICANCE OF THE STUDY

Every management tools have specific advantages and disadvantages, therefore it is wise to look at both sides of these tools so as to weigh which one could be better than the other in managing growth and development, However, this study only focuses on the impacts of urban growth boundary as a growth management tool.

The study emphasizes the possible dilemmas that may be brought by the restriction of the development as a result of urban growth boundary. It also discusses the possible consequences of urban growth boundary as the town keeps growing. Therefore, the study's significance is that it will eventually help the municipality to use adaptable strategies and appropriate management tool(s) to develop the town in a sustainable approach. This study is generally important for future scholars, community and the municipality itself.

1.6.0 SCOPE OF THE STUDY

This study is confined to Louis Trichardt town as a whole and did not go beyond its geographical boundary as it would require more resources. It focused only on how effective is urban growth boundary with regards to urban containment of Louis Trichardt. The actual spatial boundary of the study is Louis Trichardt. Conceptually, this study is restrained within the environmental aspects of the area, because the proposed and on-going developments are within the environment.

1.6.1 DESCRIPTION OF THE STUDY AREA

Louis Trichardt (formerly trichardtsdorp) is a picturesque town situated at the foot of soutpansberg mountain range in the Limpopo province of South Africa. Louis Trichardt is 437 km from Johannesburg. It is the Centre of the Makhado local municipality, which comprises 16,000km² with a total population of 270,000(census 2001). Louis Trichardt is located in a fertile region where litchis, bananas, mangoes and nuts are produced. The national road N1 runs through the town. Louis Trichardt was known as Makhado for a short period.

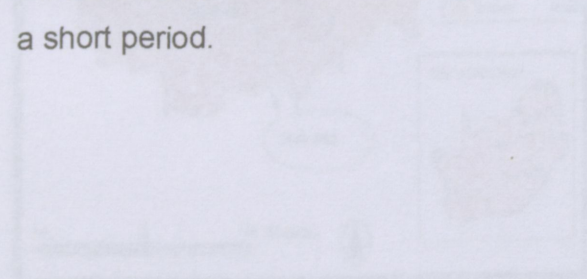


Figure 3. Map of Limpopo Province

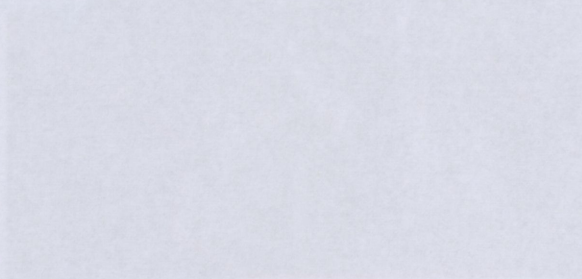


Figure 4. Map of Study area.

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Student number: 11595160

Drawing title: Locality map

Year: 2012

Checked by:

Signature:

Figure 1.1 Geographical location of study area

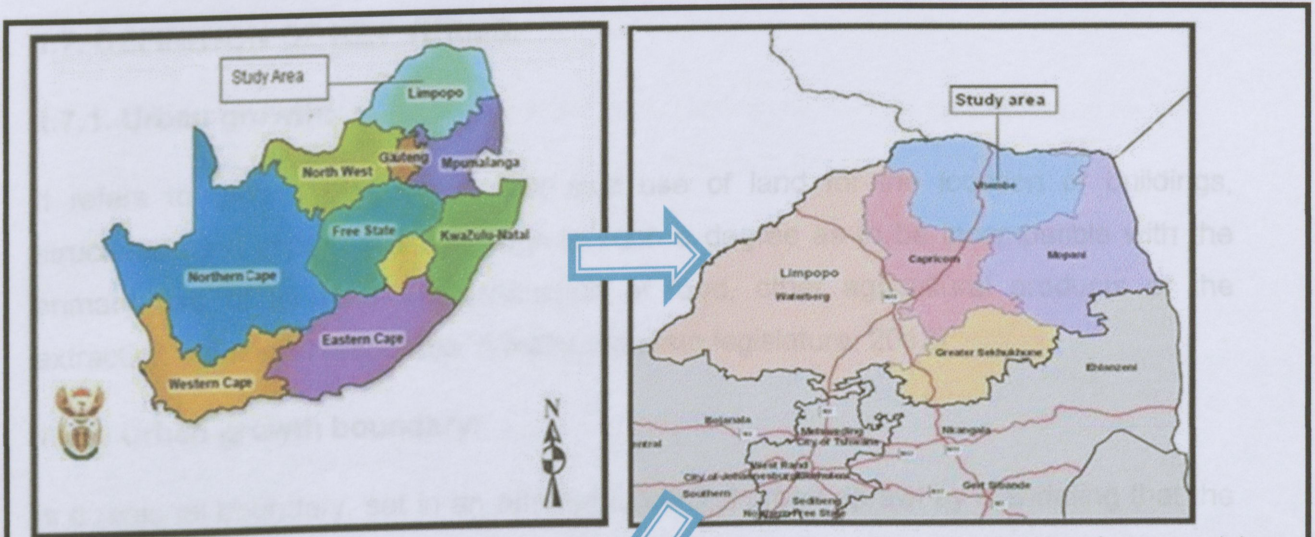


Figure 1. Map of south Africa (not to scale)

Figure 2. Map of Limpopo Province(not to scale)

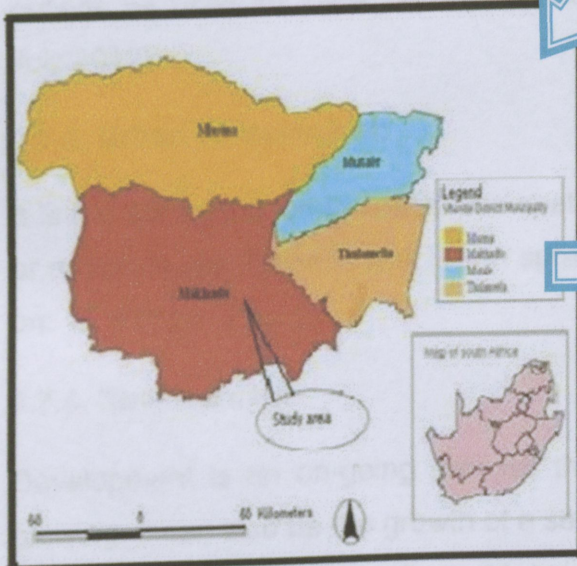


Figure 3. Map of Vhembe District



Figure 4. Map of Study area.

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Drawing title: Locality map	Year: 2012
Checked by:	Signature:

1.7. DEFINITION OF KEY TERMS.

1.7.1. Urban growth:

It refers to growth that makes intensive use of land for the location of buildings, structures, and impermeable surface to such a degree as to be incompatible with the primary use of land for the production of food, other agricultural products or the extraction of mineral resources. (Wellington state legislature, 2012)

1.7.2. Urban growth boundary:

Is a regional boundary, set in an attempt to control urban sprawl by mandating that the area inside the boundary be used for higher density urban development and the area outside be used for lower density development. (www.wikipedia.org, accessed on: 12 July 2012)

1.7.3. Urban containment:

It is the strategy used to control the spatial pattern of development within a community or region. It also helps to limit urban sprawls (www.envisioncentraltexas.com, accessed on: 12 July 2012)

1.7.4. Development:

Development is an on-going process through which something is getting better and growing. It can also be the growth of a settlement from better to good or best, it can also be growing from scratch where no buildings exist, making life better by structuring useful amenities, the building of a neighborhood can serve as an example.

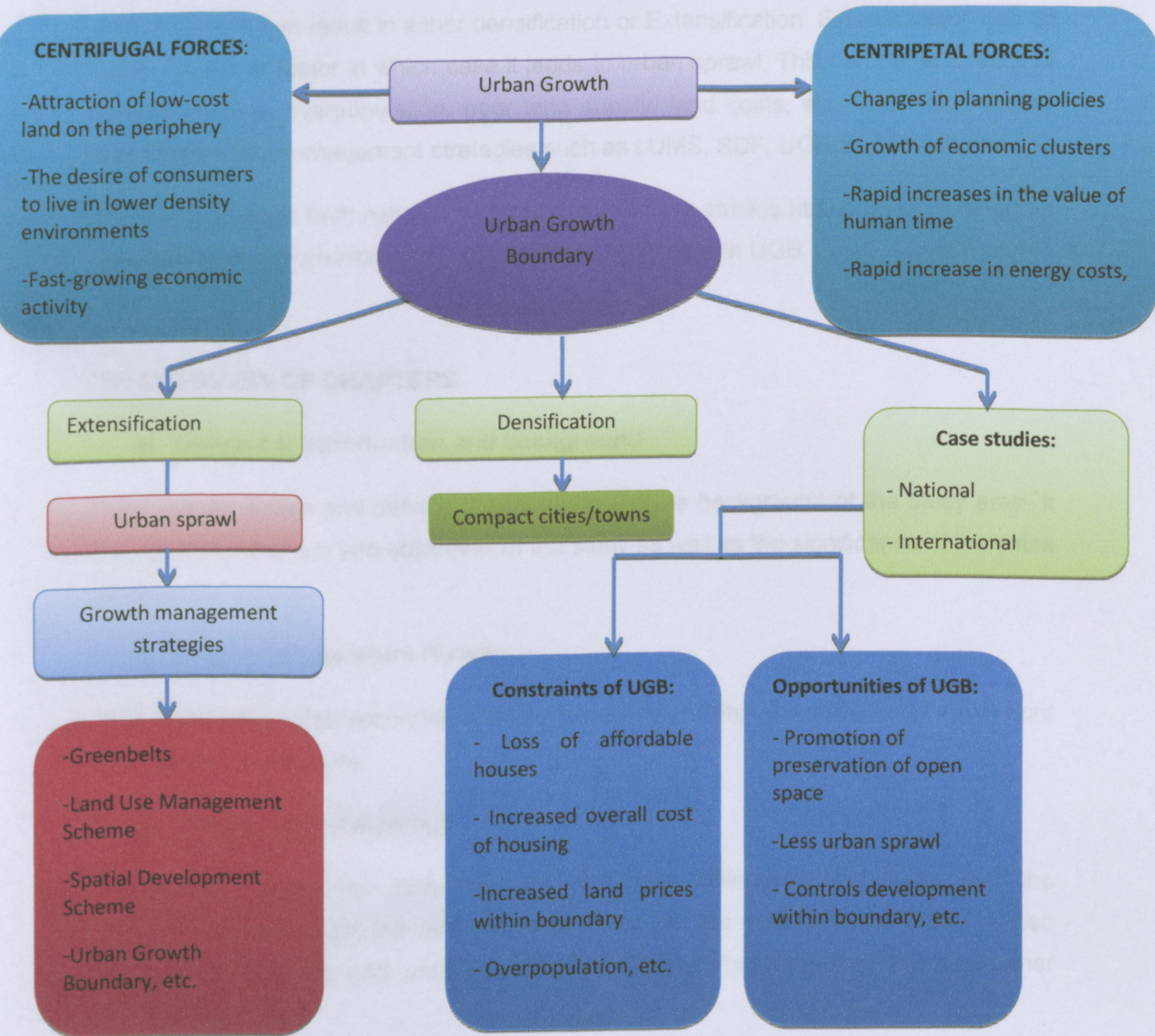
1.7.5. Urban sprawl:

This simply is the outward expansion of urban areas. It is the spreading of a city or its suburbs. It often involves the construction of residential and commercial buildings in rural or otherwise undeveloped land at the outskirts of a city.

1.8. CONCEPTUAL FRAMEWORK

The study adopted a statistic conceptual framework to clarify issues and terms as they are used in this study. Such a conceptual framework is depicted in figure 1.2

Figure 1.2 Conceptual Frameworks



Cities grow by two major forces - centrifugal and centripetal forces. There are a number of growth management strategies which can be implemented to manage growth. One of the major tool/strategy is the Urban Growth Boundary; other tools include Land Use Management Scheme, Greenbelts, and Spatial Development Framework. These strategies differ from one location to another as the rate of growth (both town and population) differs.

Urban Growth can result in either densification or Extensification. Extensification can be either slower or faster in which case it leads to urban sprawl. This can be as a result of factors such as overpopulation, poor land supply/ land costs, etc. This then requires effective growth management strategies such as LUMS, SDF, UGB and Greenbelts

The study reviews both national and international case studies based on UGB. It further explores both opportunities and constraints associated with UGB.

1.9 OVERVIEW OF CHAPTERS

Chapter 1: Introduction and background

This chapter states and defines the problem and the background of the study area. It further states the aim and objectives of the study as well as the significance of the entire study.

Chapter 2: Literature review

This chapter presents secondary data by reviewing existing knowledge and views from relevant secondary data.

Chapter 3: Methodology

This chapter presents data methods and data collection instruments that the researcher used to get the relevant information for the validity of the study. It also outlines the analysis and presentation tools of the information that the researcher identified.

➤ Chapter 4: Presentation and analysis of the research findings

This chapter simply analyses and presents the research findings.

➤ Chapter 5: Conclusion and recommendation

This chapter draws conclusion from the research findings with recommendation regarding the problem in question.

2.1. Urban sprawl

There are different explanations/interpretations as to what constitutes urban sprawl. However, numerous scholars tried to clear the definition. Bruckner (2000) has defined urban sprawl as the excessive spatial growth of cities. In an urban sprawl pattern, both residential and non-residential developments occur in a non-contiguous way outward from the central city. Galarier et al. (2004), provide a definition of sprawl based on eight distinct dimensions of land use patterns: continuity, density, clustering, concentration, regularity, centrality, mixed uses and proximity. According to this definition, sprawl is a condition where the values of these criteria are low.

Urban sprawl has been the original reason for which communities have adopted some form of containment policies (Landis et al., 2002). While there is controversy on the positive and negative aspects of urban sprawl, most planners believe that urban sprawl should be curbed by public policies or planning tools, so as to achieve a sustainable community. To prevent urban sprawl, enforcing urban containment policies (UCPs), such as greenbelts, urban growth boundaries and urban service areas, has become a popular method because of ease of implementation. (Woo, 2007)

CHAPTER 2: LITERATURE REVIEW

2.0. Introduction

This chapter presents relevant views of previous studies related to the topic of this research. This chapter explores the existing knowledge on urban growth boundary. The main aim of this chapter is to review related literature on Urban Growth Boundary and urban containment as management tools. It also presents different experiences on urban growth boundary and other strategies and tools that were used for growth management. This chapter reviews quite a few literature streams such as urban growth boundary, urban containment, urban sprawl, urban containment policies, centrifugal vs. centripetal forces and densification vs. Extensification. It also reviews relevant case studies.

2.1. Urban sprawl

There are different explanations/interpretations as to what constitutes urban sprawl. However, numerous scholars tried to clear the definition. Brueckner (2000) has defined urban sprawl as the excessive spatial growth of cities. In an urban sprawl pattern, both residential and non-residential developments occur in a non-contiguous way outward from the central city. Galster et al. (2001), provide a definition of sprawl based on eight distinct dimensions of land use patterns: continuity, density, clustering, concentration, nuclearity, centrality, mixed uses and proximity. According to this definition, sprawl is a condition where the values of these criteria are low.

Urban sprawl has been the original reason for which communities have adopted some form of containment policies (Landis et al., 2002). While there is controversy on the positive and negative aspects of urban sprawl, most planners believe that urban sprawl should be curbed by public policies or planning tools, so as to achieve a sustainable community. To prevent urban sprawl, enforcing urban containment policies (UCPs), such as greenbelts, urban growth boundaries, and urban service areas, has become a popular method because of ease of implementation. (Woo, 2007)

Sprawl also has environmental consequences such as over consumption of energy with expanded travels from the suburbs to the city, elimination of green open space that otherwise would provide environmental services, recreation, or agricultural uses. The natural outcome produced by an UCP will be the reduction of energy consumption and the preservation of green open spaces outside of cities (Burby et al, 2001).

2.1.1. Outcomes of urban sprawl

According to state of the world's affairs (2010), Urban sprawl has a negative impact on the infrastructure and sustainability of a city. Occasionally, sprawling leads to an increase in the cost of transport, public infrastructure and of residential and commercial development. Furthermore, sprawling metropolitan areas require more energy, metal, concrete and asphalt than do compact cities because homes, offices and utilities are set farther apart.

In many places, urban sprawl encourages developments that cause significant loss of prime farmland. When cities are improperly planned urban sprawl also adds to environmental degradation, (UN-HABITAT, 2010).

Haregeoin (2005), states that generally, population growth, rise in household income, subsidization of infrastructure investments like roads, ineffective land use, excessive growth, social problems in central cities and poor land policies are taken to be the main cause of urban sprawl.

Woo (2007), summarizes the effects of urban sprawl as follows:

- ✚ The increase in energy consumption and air pollution.

Some studies have consistently found that compact development is more energy-efficient than low-density sprawl, and that polycentric development is the preferred alternative in terms of energy efficiency (Balchin et al., 2000; Ewing, 1994).

- ✚ The degradation of agricultural and environmental resources

New-single family detached housing consumes agricultural and other environmentally sensitive areas (Bank of America, 1995), leading to a decrease in available land in the long term

➤ Increase in travel and congestion

It has been argued that sprawl reduces travel time although it increases trip length. The excessive residential development (urban sprawl) without consideration of employment center locations leads to longer trip length and produces negative externalities.

2.2. Urban growth

Managing urban growth is one the most challenging tasks planners have to do especially when cities/towns are constrained spatially. According to UN-Habitat state of the world's cities (2008/2009), analysis of 245 cities that are experiencing the fastest growth in the developing world shows very clearly that spatial influences of macroeconomic and industrial policies and related investments (or economic development), are the main drivers of city growth in 78 per cent of the cities analysed. Investment in transport infrastructure (roads, ports, airports) was by and large the most important contributor to city growth.

Further discussion shows that Forty per cent of the cities analysed experienced high growth rates as a direct result of the diversification, expansion or improvement of regional or urban transport infrastructure. The designation of regions or cities as special economic zones contributed to the rapid growth of one-fifth of these cities.

According to the department of environmental affairs and development urban edge policy guideline (2005), different guidelines and policies relating to different towns and cities are necessary, as the urbanisation dynamics in urban areas vary significantly. The growth phases and growth potential of urban areas would have to be considered in determining urban edges, as the edges should either contain growth in stable and declining growth areas, or allow for expansion in urban areas where efficient natural growth occurs. It seems as though more flexible edges would be required where growth needs to be focused. Tight urban edges would then be required to prevent unnecessary expansion or expansion due to continued segregated development. The urban edge

thus becomes a planning tool, not only in urban management, but also in regional growth management, promoting growth in certain urban areas, while restricting it in others, (provincial urban edge guideline, 2005)

Cheng (2002) writes that urban growth involves a number of hierarchical structures. In the spatial dimension, it includes different levels of shopping centres and road networks. On the other hand, system includes different levels of ecological units. System contains different levels of urban planning- (general plan, district plan and zoning plan). From the perspective of land development, urban growth can be divided into different scales of projects. Patterns and processes have components that are reciprocally related, and patterns and processes, as well as their relationships, change with scale. Different patterns and processes usually differ in the characteristic scales at which they operate.

2.3. Urban Growth Boundary

Urban growth boundary has been defined in a number of different ways. Douglas porter writes "urban growth boundaries restricts urban growth to a specific area around a community and prevent the spread of development into the surrounding countryside" (Porter, 1997). He further states that growth boundaries are typically based on twenty years of projected development and that they are "intended to promote more efficient use and extension of infrastructure systems, encourage more compact development, and preserve open space and natural resources in rural areas".

Fodor (1999), defines urban growth boundary as physical or legal lines drawn to separate urban areas from farm or natural ones. UGB can have important results controlling city's growth if there is an effective coordination between the governments administrating the urban land and the rural lands Fodor (1999). According to Bengston et al (2006), zoning is an auxiliary tool to enforce an urban growth boundary. Bengston and Yeun (2006) explain that the urban growth boundaries are flexible limits which can be expanded depending on the growth goals of the governments.

Furthermore, urban growth boundaries have been defined as: "a perimeter around urban area to contain urban growth. Land outside of this boundary is, maintained at much lower densities and receives no sewer or water services.

According to Anderson (1999), A UGB is loosely defined as an “officially adopted and mapped line that separates an urban area from its surrounding greenbelt of open lands, including farms, watersheds and parks, for a set period of time.” The study conveyed by Anderson (1999), reveals that growth boundaries come in several different forms. Some states create true urban growth boundaries (UGB) as described. Other states adopt urban growth areas (UGA), urban service areas (USA), and urban demarcation lines. Despite the different official terms, they all serve the same purpose: “to contain urban development within planned urban areas where basic services, such as sewers, water facilities, and police and fire protection, can be economically provided.”

Anderson (1999), writes that there are many advantages and good reasons for using UGBs, including affirming a community's identity by ensuring that it doesn't merge with adjacent communities; promoting urban and suburban revitalization; using public facilities more efficiently resulting in taxpayer savings; encouraging the development of more affordable housing and mixed use centers; stimulating community development patterns that support more accessible public transit; protecting farmlands, watersheds, and wildlife habitat; and most importantly, encouraging long-term strategic thinking about your community's future.

Despite the great deal of support for the use of growth boundaries, there is a good deal of skepticism as well.

Two of the most common concerns or complaints about UGBs are:

- Inflated housing prices: studies have been inconclusive as to whether this is true. However, in the Portland metro area, where housing costs rose by 2.85% from 1985 to 1995, the City defends its rising prices by showing statistics that areas of the country that do not have UGBs have experienced a more inflationary rate on housing costs over the same time period (Salt Lake City (5.58%), Phoenix (10.66%), and San Diego (4.81%)).
- Increased densities: according to the City of Portland, when it adopted its 2040 boundary in 1997, it applied the average density in Portland today (3,800 people per square mile) to the forecasting model. Portland claims that its density today

is already much lower than many other growing metropolitan areas like Denver whose average density is 4,000 people per square mile.

South African urban areas are characterized by spatial separation of residential areas according to income level and race, urban sprawl, disparate levels of service provision, low suburban population densities and the concentration of the poor in relatively high density areas on the urban peripheries. These factors make urban areas inequitable, inefficient, unsustainable and expensive to manage and maintain, exacerbating poverty and unemployment (Department of Housing, 1997). The introduction of urban edge management policies and guidelines could reduce some of the impacts of these 'urban characteristics' (provincial urban edge guideline, 2005).

Anderson (1999) describes six programs from different places that have established growth boundaries in some form or another. Discussion of each program is broken down into seven categories:

- Type of Boundary– As noted above, growth boundaries come in a variety of forms from urban rural demarcation lines to formal urban growth boundaries.
- Authority– Some of these six states have granted local governments authority to adopt growth boundaries by adopting growth management legislation or some other forms of legislation.
- State-level involvement– The level of involvement at the state level varies widely.
- Support– with Oregon being the exception, growth boundaries are typically brought about by the initiatives of concerned citizens and sometimes local governments.
- Opposition– Growth boundaries are not loved by all of course.
- Presumption of buildability– Whether a developer or landowner has a right to develop land is of primary concern whenever a growth boundary is established.
- Dispute resolution– as to how states handle disputes over growth boundaries varies widely.

Table 2.1 summarizes each of these seven categories

Table 2.1 Summary of seven categories

Is the 'Urban Growth Boundary' concept a valuable tool for urban containment? Evidence from Louis Trichardt Town, of Makhado Municipality in Limpopo province.

STATE	Type of Boundary	Authority	State-level Involvement	Support	Opposition	Presumption of Buildability	Dispute Resolution
Oregon	Urban Growth Boundary	State-wide legislation adopted in 1973.	Moderate	Conservation/Environmental Organizations.	Developers; private property Rights advocates.	Yes	Land Use Board of Appeals.
Washington	Urban Growth Area	Washington Growth Management Act adopted in 1991.	Limited	Conservation/Environmental Organizations; local governments	Home builders associations; property rights advocates.	No	Growth Management Hearings Board
Minnesota	Urban Service Area	Regional Planning enabling legislation adopted in 1967.	Extensive	Local governments; home builders associations;	Property rights advocates.	Reasonable Assurance.	Mediation
Maryland	Growth Corridors	Maryland Growth Act adopted in 1996.	Low to moderate.	Conservation/Environmental Organizations.	Local governments; private property rights advocates.	No	Litigation at local level.
Florida	Urban Growth Boundary	Local Government Comprehensive Planning and Land Development Regulation Act adopted in 1993.	Moderate.	Conservation/Environmental Organizations.	Property rights advocates.	Reasonable degree of certainty; non vested rights.	Mediation; Judicial review.
California	Urban Growth Boundary	None.	Limited.	Conservation/Environmental Organizations; local governments	Home builders associations; property rights advocates.	Yes, but only in some cases.	Local government control.

Source: Anderson (1999:6)

2.3.1. Local urban growth boundaries

UGBs can be created at the local or regional level. At the local level, a community will draw a single UGB to contain growth within its jurisdiction. This can also be a tool for increasing development densities through infill. However, the benefits will be localized, and the local UGB will likely push development towards rural areas of neighboring municipalities that lack strong land use controls. Similarly, if multiple communities within an area establish individual UGBs without a regional plan, development will be pushed to more remote and possibly less costly locations, where residents still have sufficient access to an urban area. (Realtors, 2008)

2.3.2. Regional urban growth boundaries

A regional scale UGB counteracts some of these issues by creating a carefully planned, large-scale network of urban growth areas and rural and natural areas. Regional UGBs should be created at the county level or higher, so that opportunities to spread development into sprawling locations at ever greater distances from urban centers are diminished, and the total amount of land that needs to be set aside for urban development to meet current and future needs is decreased. (conservationtool.org, accessed on: 22 August 2012)

2.3.3. The effect of urban growth boundary on housing prices:

The effect of UGB on housing prices depends on how it is implemented. The smaller an urban growth area is and the longer it is in effect, the greater the demand for an ever decreasing amount of buildable land will be and the more likely prices for housing, as well as commercial and industrial sites will increase. But the effect of a UGB on housing prices is not a matter of a simple supply and demand model. Housing value and prices can increase because development within a UGB is often better planned, with access to public transportation and other public amenities. Within an urban growth area, increased development densities, provision of public infrastructure and a streamlined approval process can offset increasing prices, (conservationtool.org, accessed on: 22 August 2012).

2.3.4 Case studies on urban growth boundary

The following are some case studies relating to Urban Growth Boundary (both national and international).

2.3.4.1 Portland and Riyadh urban growth boundary

Portland's UGB is a model among American efforts regarding growth management as a result; cities around the United States are adapting Portland's experience Bonilla A (2007). Fodor (1999) states that indeed, Portland's experience is the result of having 25 years of having the UGB in place, and it is the result of a regional agency work which has been effectively coordinating the growth of 24 areas comprised by the metropolitan area of Oregon, Smit (2009).

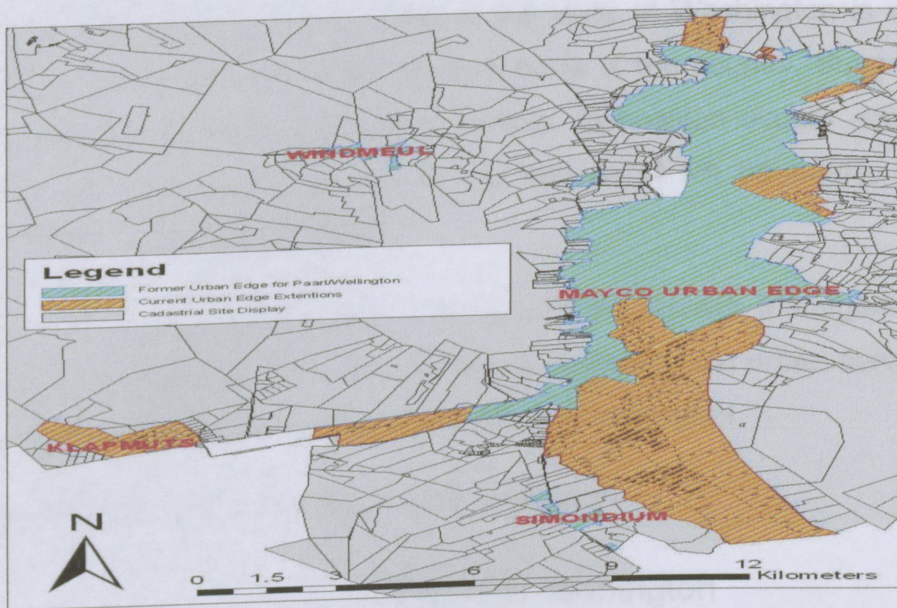
Smit further explains that the intention of the urban edge is to establish limits beyond which urban development should not be permitted. Its primary purpose is to protect land outside the line for natural resources, agriculture, conservation, rural and open space use. It also serves to direct urban growth within the existing urbanised areas and towards the urban areas (Drakenstein Urban Edge Report, 2005). Smit also states that the escalation of the pressure of, and for development, in the transition zone between the built up areas of settlements and the rural hinterland can often lead to very negative socio-economic and environmental outcomes such as:

- Damage to natural systems and the natural resource base.
- The loss of agricultural land.
- Inappropriate settlement location in disaster prone areas.
- Loss of character of towns and further undesirable visual impacts.

2.3.4.2 Paarl case study

Smit (2009), conducted a research on Paarl's urban edge and after the analysis of the findings, it was stated that the urban edge of Paarl area has to a large extent been determined by the need to promote infill development and densification, which in turn should promote urban restructuring and integration. She further explains that this is particularly applicable to the major urban Centre of wellington -Mbekweni and Paarl. The edge for this Centre is an important growth management tool. Figure 2.1 depicts the current and previous Urban Growth Boundary of Paarl

Figure 2.1 Previous and current UGB of Paarl and Wellington



The blue part presents the previous urban edge while the brown part indicates the current urban edge for Paarl and Wellington.

Provision of services differs according to spatial location, distance and occupancy within or out of the peripheries.

2.3.4.3. Washington

The Washington UGBs are called Urban Growth Areas (UGA), they are less strong than those in Oregon, because they are not required from all cities, and local governments have flexibility to prepare their own growth management plans (Nelson et al. 2004). The concept of UGA is similar to that of Oregon UGB, in that its purposes are to preserve farmland and open spaces and to direct urban growth into urban areas.

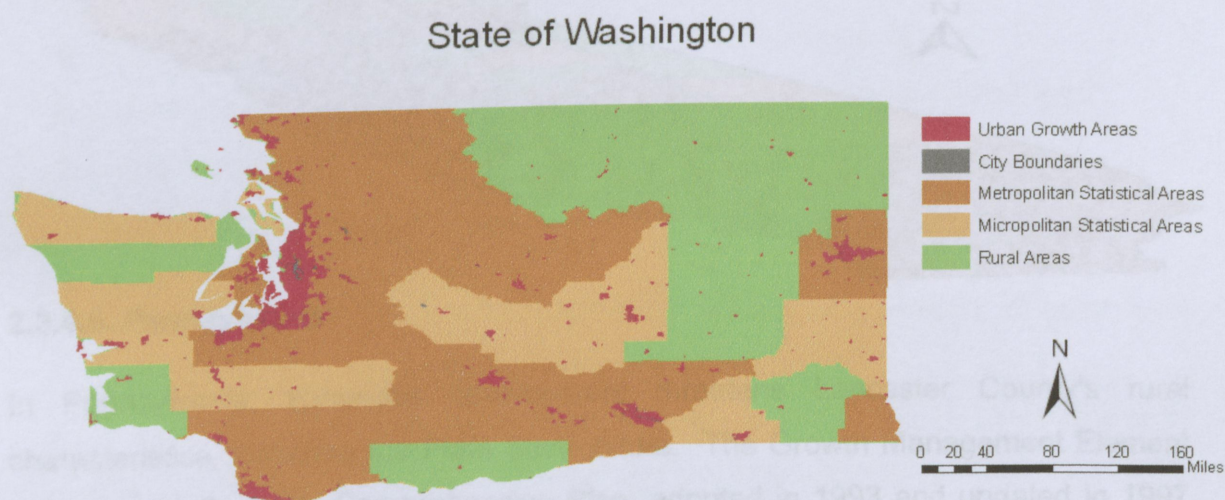
Woo (2007) states that the UGAs are designated by a country in coordinates with the towns and cities located within the country. Countries are also projected population growth to UGAs, which need to accommodate a 20-year growth. Country projections are provided by the state office of financial management. Therefore, countries, not cities or towns, have final authority in determining where the municipal UGA boundaries are located.

Support and opposition of Washington's boundary

Support and opposition of UGAs in the state of Washington is very similar to the support and opposition found in other parts of the country. Supporters are typically environmentalists and local governments. Opposition usually comes from property rights advocates who are left on the outside of the boundary, and home builder associations. (Anderson 1999).

The UGA is one of the main methods in the Growth Management Act (GMA). It designates areas where urban growth is expected and urban services are provided. Figure 2.2 depicts the UGBs in the state of Washington.

Figure 2.2 UGBs in the State of Washington



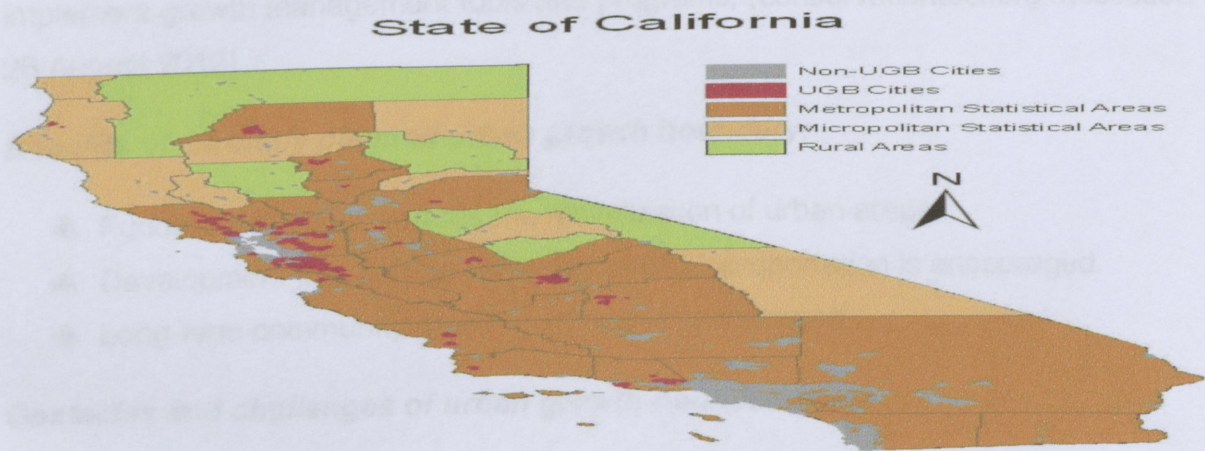
2.3.4.4. California

Although adoption of UGBs is not required in California, many communities have adopted UGBs as a planning tool to protect natural resources and curb urban sprawl, Woo 2007). The state of California has mandated each county to have a Local Agency Formation Commission (LAFCO), and each LAFCO has sole responsibility for establishing a Sphere of Influence (SOI) for a city within the county.

An SOI in California is similar to an Urban Growth Boundary (UGB) for the following characteristics: (1) they are physical boundaries within which annexation and provision of public services are permitted; (2) they are periodically reviewed to

investigate whether boundaries expansion is needed (every 5 years for SOIs, and 10 to 20 years for UGBs); (3) their purposes include preventing urban sprawl and preserving farmland and open spaces. One of the important purposes of SOIs is to avoid conflicts among cities and agencies as they continue to grow and expand their boundaries outward. For these reasons, in order to protect natural resources and prevent sprawled development more effectively, more than 65 cities have UGBs distinct from SOIs, Woo (2007). Figure 2.3 portrays UGBs in the state of California.

Figure 2.3 UGBs in the state of California



2.3.4.5. Pennsylvania

In Pennsylvania, sprawling development threatens Lancaster County's rural characteristics, including the Plain Sect culture. The Growth Management Element of Lancaster County's Comprehensive Plan, adopted in 1993 and updated in 1997 and 2006, established a county network of urban growth boundaries to address the sprawling development. Each has urban services provided or planned for within their boundaries and include both residential and mixed-use zoning at a density of at least 1 unit/acre. Residential areas are to be developed at 5.5 units/acre. Outside of Urban and Village Growth Areas, agriculture and rural economic land uses and natural areas were designated for protection from development.

Results:

Although there was great success in cooperative work between municipalities, the implementation of the growth management plan had mixed success. According to the Lancaster County Growth Tracking Report, between 1994 and 2002, a total of 11,100 acres of land and 17,869 new housing units were developed during this time

period .Most of the larger developments occurred within growth area boundaries; although some occurred outside of them, as did multiple small developments. The small developments often occurred next to or very close to existing development, showing (possibly unintentional) coordination with existing development.

Quality of life issues within developments need to be addressed, including having a greater focus on urban revitalization, encouraging alternatives to single-family, low density subdivisions, and providing parks and other open space amenities close to residential areas. Municipalities must be able to effectively and consistently implement growth management tools and programs, (conservationtool.org, accessed 26 August 2012)

Benefits of carefully planned urban growth boundary:

- ✦ Funds are directed towards the revitalization of urban areas.
- ✦ Development that can be served by public transportation is encouraged.
- ✦ Long-term community growth planning is encouraged.

Obstacles and challenges of urban growth boundaries are:

- ✦ It can be very difficult to achieve the cooperation between multiple local governments needed to successfully implement a UGB.
- ✦ If a UGB is created at a local level, the likely outcome will be pushing growth into rural areas of neighboring municipalities that lack strong land use controls rather than focusing development within the UGB.
- ✦ UGB's might increase property values in existing urban areas, which may make the cost of living too high for low-income residents.

2.3.4.6. Oregon

Oregon began its efforts to control or direct growth and development in the 1970s. Today it is considered by many to be the most successful example of managing growth in the nation. Oregon championed the use of urban growth boundaries by requiring every municipality in the state to adopt one. After three decades of requiring UGBs, Oregon has been both touted and lambasted for its aggressive stance on directing growth. But the State holds fast to its belief that the state has

benefitted from the use of UGBs and will be a better place to live in 25 or even 50 years from now (Anderson 1999).

Anderson (1999) further states that when the boundaries were originally created, cities and counties employed primitive methods in determining where the lines would be drawn. Planners had very little scientific data to support their assumptions, resulting in a very subjective process dictated by public input and primitive population forecasts. As a result, early UGBs were often drawn very broadly, limiting their effectiveness in preventing sprawl. In addition, local governments must justify the consumption of undeveloped lands, i.e. If they want to include undeveloped land inside the boundary, they must now explain why the site is ideal for urban development and why other sites inside the boundary are not ideal (Anderson 1999).

Support and opposition of Oregon's boundary

According to Anderson (1999), support for the growth management legislation was originally, and continues to be gathered by a group calling itself "1000 Friends of Oregon." Primary opposition to the boundary comes from a group calling itself "Oregonians in Action," - a group of property rights advocates.

Anderson (1999), states that opponents of Oregon's UGB program contend that boundaries eliminate the ability to speculate in the real estate market, causing developers to lose their investments if their land ends up on the wrong side of the boundary. In Oregon, one solution to this problem has been the creation of a presumption of buildability for land inside the boundary.

UGBs have been increasingly promoted by land-use planning advocates in the U.S.A as a useful and effective tool in constraining urban growth. In part, this is because previous generations of growth management tools (including adequate public facilities ordinances and annual restrictions on the amount of development that is permitted) apparently have not restricted the geographical reach of urbanisation in many U.S. metro areas. The growing support for UGBs also reflects the high profile of the UGB system in Oregon and especially in the Portland metropolitan area, which many planning advocates have pointed to as a model of "good planning".

UGBs do not appear to be as widely used in the United States as many people perceive. However, it remains perhaps the most widely discussed and controversial tool in the arsenal of urban containment policies, (Pendall et al. 2002)

2.4. Urban containment and urban containment policies (UCP)

The spectrum of tools that shape the geographical pattern of urban growth is often discussed in policy circles under the rubric of the "urban growth boundary" (UGB), usually defined as a set of land-use regulations that prohibit urban development outside a certain boundary. In reality, a wide variety of tools can affect urban containment, including not just regulation but also public ownership of land and policies regarding the timing and sequencing of public infrastructure construction (Nelson and Duncan 1995).

If urban containment is the answer to urban sprawl then the purpose thereof is not only to prohibit development but also to manage and govern it, (Smit 2009).

Urban containment is defined by Burby et al.(2001), as a set of rules and public incentives that are intended to constrain sprawl and promote infill development. He further explains that urban containment policies are designed to confine growth which otherwise can have negative effects on the economy, environment, and social relationships of a city. Moreover, Wassmer,(2006) states that urban containment policies promote high density development in specific areas inside urban boundaries and to discourage such development outside of the urban limits.

In addition to the limits imposed over development by UCP themselves, usually these policies are also complemented by urban provision policies, (Nelson and Dawkins, 2004). With this, managing the extension and improvement of infrastructure result in a cost-effective provision of services (Nelson et al. 2004). As a result, growth within the urban boundary can be done based on phasing services according to development suitability, proximity to existing public facilities, contiguity to existing development and others, (Nelson and Dawkins 2004).

Woo, (2007), indicates that there is much controversy over the negative and positive impacts of UCPs. It has been showed that imposing UCPs has contributed to the desired population density and preservation of farmland, accommodating most new

residents within the boundary and lowering the cost of new growth for local governments. Nelson et al (2004), also show that UCPs, including urban growth boundary, service extension limit/greenbelt contribute to central-city revitalisation, using a multiple regression model with the number of residential units constructed as the dependent variable.

Wassmer (2006) analyses the impacts of UCPs on the size of urban areas using regression analysis with square miles of urban areas as the dependent variable and finds that the presence of UCPs reduces the size of urban area. While on the other hand Pendall et al. (2004), argue that the negative effects of UCPs are alleged to include increases in traffic congestion and other externalities.

Although UCPs are intended to, manage growth within certain limits, they are also complemented by regulations or policies to manage growth beyond their limit. Outside urban containment limit, land is generally restricted to resource uses and to very low density residential development. The extension of utilities, especially wastewater service, is generally prohibited outside the boundary. Within urban containment boundaries, development may be encouraged with density bonuses and, occasionally discouraged with minimum density requirements. Land within an urban containment boundary but outside the city limits is often subjected to agreements governing development standards, (Bonilla 2007)

Generally, the containment of a city is based on the allocation of land needed to satisfy the demand based on the city's growth goals.

2.4.1. Purpose of urban containment

According to Pendall et al. (2002), the geographical pattern of urban growth in metropolitan areas has usually been shaped in part by natural factors such as the presence of mountain ranges and water bodies. When the large-scale metropolis emerged in the 19th century, urban designers such as Frederick Law Olmsted recognized that naturalistic elements created by humans – including park systems, parkways, and publicly owned "open space" – could also constrain and shape urban growth. The two factors – open space constraints and infrastructure location – can be viewed as the "push" and "pull" factors of metropolitan growth. By placing land out of bounds, open space constraints force urban growth away from them and therefore

in a different direction. By locating in specific areas and along specific routes, public infrastructure "pulls" urban growth toward those areas and therefore away from other locations where it does not already exist, (Pendall et al 2002).

Furthermore, UCP seeks to employ an array of public policy tools to manipulate these "push" and "pull" factors so that metropolitan area will take a particular and desirable geographical form. The goals of such a containment policy can vary widely, but they can and do include the following:

- Preservation of natural land, as well as farmland and resource extraction land whose economic value will not be able to compete with urban development,
- The cost-efficient construction and use of urban infrastructure,
- Reinvestment in existing urbanized areas that might otherwise be neglected, and
- The creation of higher-density land-use patterns that encourage a mix of uses and
- Patronage of public transit, leading to a more efficient utilization of land in urbanized areas.

2.4.2. Consequences from the implementation of UCP

Despite the fact that UCPs are intended to use effectively the space and the resources, there also could be some negative consequences from their implementation. These negative consequences may be higher land prices, lower environmental quality, and lower life quality due to the reduction of the personal space (Burby et al 2001). They further explain that scarce buildable land and high land values would produce higher pressure on hazardous lands and segregation based on income. This is due to the fact that hazardous lands could become affordable and available land (Burby et al, 2001). However, these consequences are not inevitable (Nelson et al, 2004). In fact they are not directly the result of implementation of UCPs, indeed they are the result of poorly designed or weak policies (Burby, et al., 2001)

Bonilla (2007) points out that, in order to reduce those consequences, it is important to make some consideration at the initial phase of the UCPs design process. First, it is wise and important to consider that growth has to be managed in such a way that available land is not depleted before meeting the temporal goals of the program. This can be done either way by setting timetables according to realistic urban growth projections or by rationalizing the areas in which development is desired to occur. Also, it is important to include incentives to promote in-fill and redevelopment in order to make the UCPs effective. These incentives are used to direct development to areas that are already urbanized and it would not require additional funding to provide them with services, Bonilla A (2007). He further adds that it is important to include hazard mitigation plans at the moment of designing containment programs. This will minimize the exposure to natural hazards

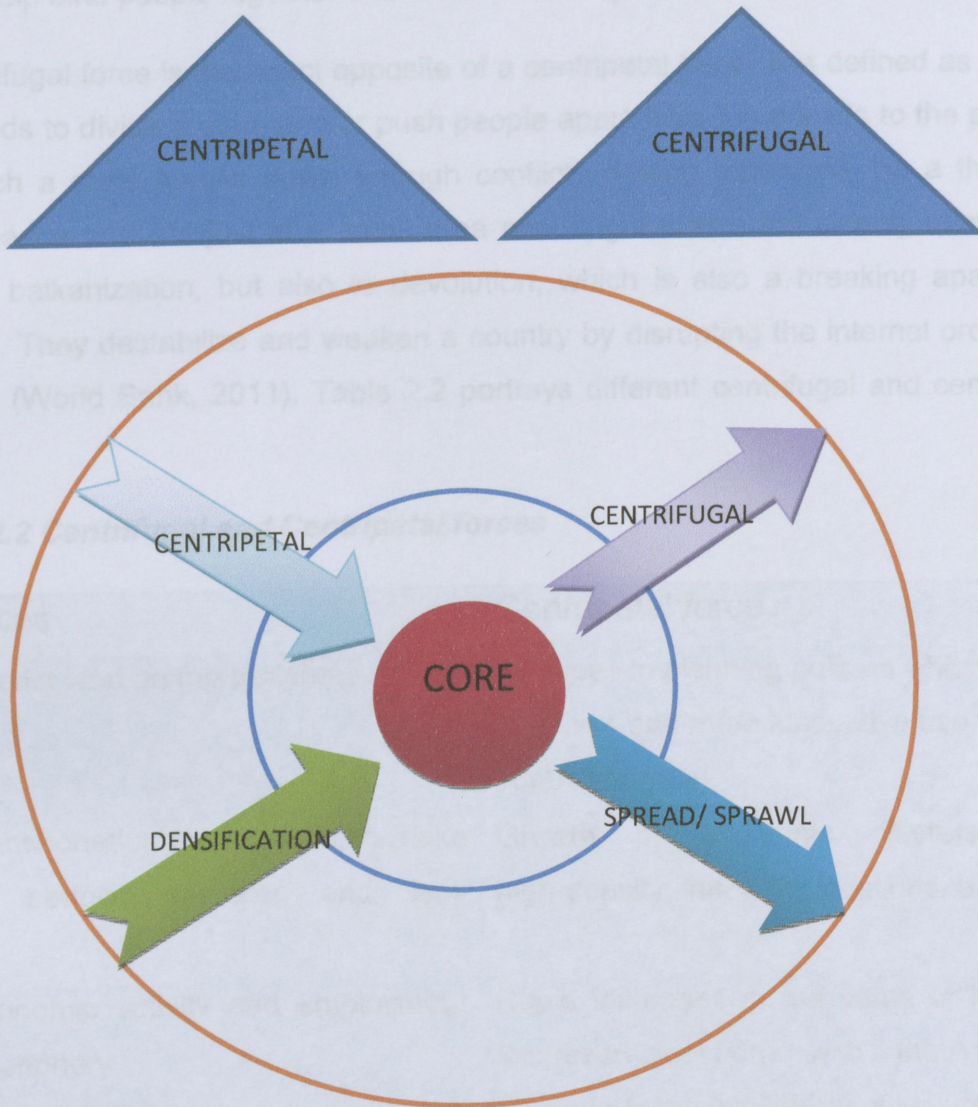
2.5. A framework for assessing urban growth and/form

There are a number of ways in which planners can assess urban growth and its form. Two major approaches are worth noting- centrifugal and centripetal force

Source: World Bank, 2011

2.5.1 Centrifugal vs. Centripetal forces.

Figure 2.4 Centrifugal vs. Centripetal forces



Source: World Bank, 2011

2.5.2 Densification vs. Extensification

Centrifugal and centripetal forces are associated with two major processes known as Densification and Extensification. Centripetal forces result in densification while

According to the World Bank (2011) report, a centripetal force is a force that tends to unify people and enhance support for a state. They provide stability, strengthen the state, help bind people together and create solidarity.

A centrifugal force is the exact opposite of a centripetal force. It is defined as a force that tends to divide a state and/or push people apart. This force leads to the process by which a state breaks down through conflicts among ethnicities, as a threat to world peace and not just in a small area centrifugal forces are closely related not only to balkanization, but also to devolution, which is also a breaking apart of a country. They destabilize and weaken a country by disrupting the internal order of a country (World Bank, 2011). Table 2.2 portrays different centrifugal and centripetal forces.

Table 2.2 Centrifugal and Centripetal forces

Centrifugal forces	Centripetal force
Attraction of low-cost land on the periphery	Changes in planning policies which enable higher densities and more innovative use of space in core city areas
Investment in transportation systems which make accessing the periphery easier and less expensive.	Growth of economic clusters that value high-density, inner city locations, e.g., finance;
Fast-growing economic activity and employment creation on the periphery	Rapid increases in the value of human time or increased concern with the use of time, particularly the availability of leisure time
The desire of consumers and workers to live/work in lower density environments on the Periphery	Rapid increase in energy costs, which makes long commutes to/from the periphery increasingly expensive as a percentage of household/firm budgets

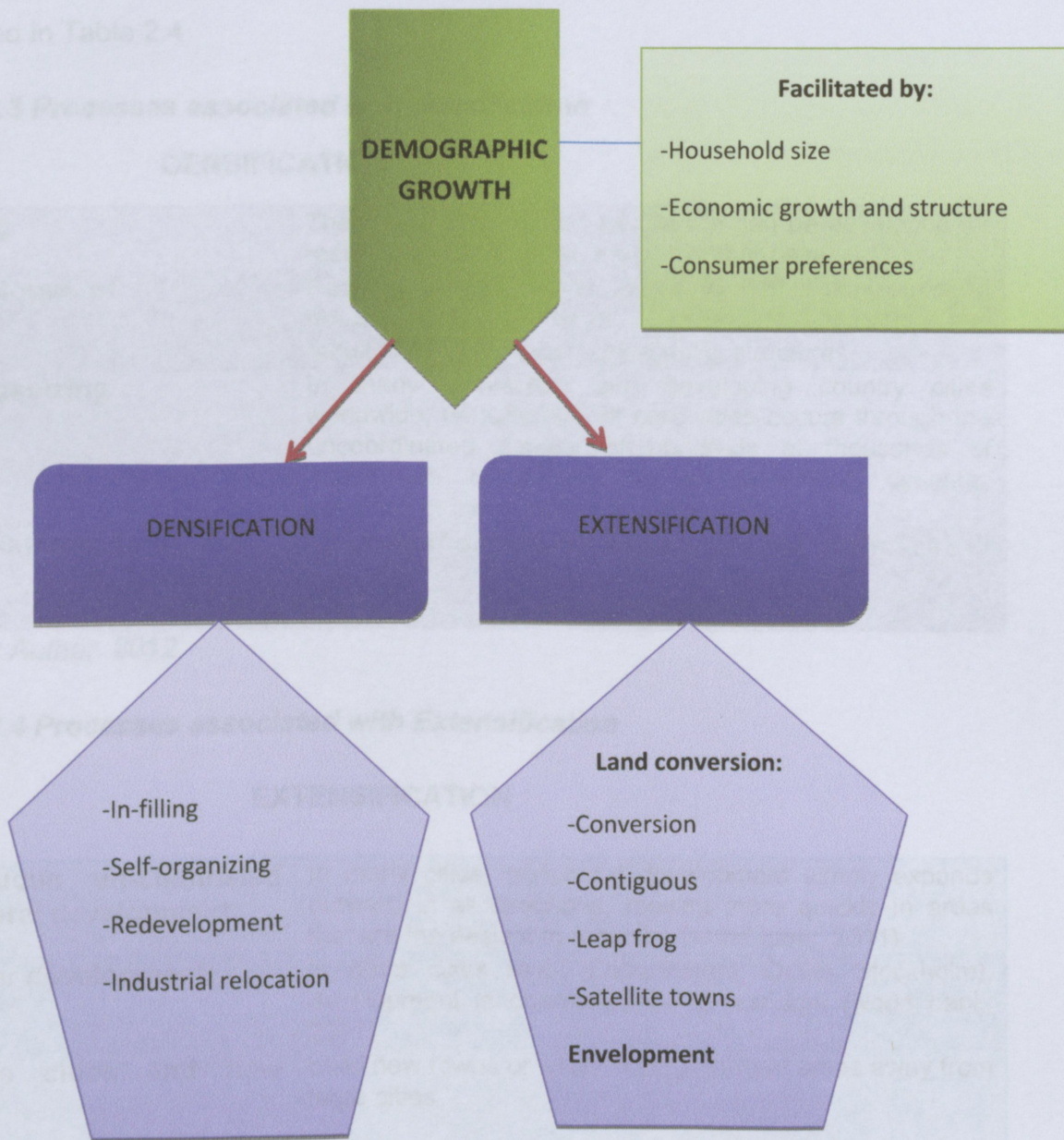
2.5.2Densification vs. Extensification

Centrifugal and centripetal forces are associated with two major processes known as Densification and Extensification. Centripetal forces result in densification while

centrifugal forces result in Extensification. This section therefore seeks to shed clarity on densification and Extensification.

There are various processes associated with Densification and Extensification. Figure 2.5 depicts such processes.

Figure 2.5 Processes associated with Densification and Extensification



Source: Author, 2012

Demographic growth leads to both **Densification** and **Extensification** and is facilitated or mediated by Household size, economic growth and structure and consumer preferences. There are various processes that help the UGB into becoming a success; these processes are associated with densification. Such processes are: in-filling, self-organizing, redevelopment and industrial relocation. These processes are explained in Table 2.3. There also are processes that lead to UGB into becoming a failure; these processes are associated with Extensification. Such processes are: conversion, contiguous, leap frog and satellite towns. These processes are explained in Table 2.4

Table 2.3 Processes associated with densification

DENSIFICATION

In-filling	These are often vacant lots, which can be developed for residential, commercial, mixed or other uses.
Redevelopment	Redevelopment usually refers to demolishing existing run-down areas, often substandard housing, and rebuilding the area with high-quality structures.
Self-organizing	In many developed and developing country cities worldwide, densification of core cities occurs through the uncoordinated actions of hundreds of thousands of households responding to an underlying dynamic, condition or incentive (world bank, 2011).
Industrial relocation	Relocation of industries to peripheries or Peri-Urban areas

Source: Author, 2012

Table 2.4 Processes associated with Extensification

EXTENSIFICATION

Contiguous un-channeled peripheral development:	In many cities, peripheral development simply expands outward in all directions, moving more quickly in areas that are the easiest to urbanize (world bank, 2011)
Corridor development:	In other cities (e.g., Copenhagen, Quito, Stockholm), development is channeled along corridors (world bank, 2011)
Satellite cities and new towns	build new towns or satellite cities in rural areas away from large cities

Source: Author, 2012

The physical expansion of built-up urban areas, horizontally and through densification, is correlated with demographic growth, although a direct relationship does not exist (World Bank, 2011). Extensification can be described as a process of extending the existing boundary while densification is the opposite, making effective use of the land within an already existing boundary

2.6 CHAPTER SUMMARY

This chapter outlined different case studies in relation to urban growth boundary as well as consequences and benefits of implementing the UGB concept. Centrifugal and centripetal forces were also articulated on this chapter. Densification and Extensification policies have been clearly outlined in relation to Urban Growth Boundary.

CHAPTER 3: RESEARCH METHODOLOGY

3.0 INTRODUCTION

This chapter presents different methods employed when collecting data required achieving the pre-determined objective of this study. It also presents the methods that have been used for the collection of data in the study area as well as analysis of the results. Both primary and secondary data have been gathered in order to compile a meaningful planning research report. This chapter entails the tools and techniques that have been used to collect present and analyse data and the Primary and secondary data collections techniques were used to collect data. This chapter further outlines the general research approaches that were used. It also includes the research design matrix. Data analysis and interpretation methods are also set out. Schedule of research activities (Appendix A) and research budget (Appendix B) are also included in the chapter.

The methodology that was adopted was based on the statement of the problem and the research objectives that were formulated earlier. The research tools and techniques that have been used in this research was aimed at collecting relevant data that enabled the researcher to fulfill the proposed research objectives

3.1. GENERAL RESEARCH APPROACH

This research is based on both qualitative and quantitative research approaches. It was rather significant to use the qualitative approach as documented data were collected and useful. The key informant interviews were used and were undertaken as the main qualitative data collection method to acquire the necessary qualitative data. The quantitative approach was also used, since statistical data was also collected, thus the questionnaire survey was used as the main quantitative technique to collect quantitative data. Quantitative methods for data presentation were employed; this includes graphs, tables and charts.

3.1.1 Qualitative methods

The qualitative methods are those methods that do not involve measurements and/or statistics. The following are the qualitative methods that have been used to collect data required for this research.

✚ Key informant interviews (KII)

KII can assist in answering the research questions. This kind of interview helps the researcher to get information that the respondents would not reveal in a questionnaire. As well as getting information that would not be available elsewhere.

✚ Observation

Observational approach is believed to help the researcher to learn about things that the participants or questionnaire respondents would be unwilling to reveal either in questionnaires or interviews. This technique helped the researcher to gather first hand data under study. It was used with the expectation of assisting the researcher to acquire/ collect data in a wide range. It also helps the researcher to get a clear view of what is happening in the study area and people's experience towards it.

✚ Baseline survey

Baseline survey is a method whereby the researcher makes a comparison between the current status of the area comparing it with its past. So, in this study the researcher looked at the previous state of Louis Trichardt and compared it with the current to try and make some deductions on what can be the causes of current conditions.

3.1.2. Quantitative methods

This is a method that relies less on interviews, small numbers of questionnaires, focus groups, to mention a few. However, quantitative method was less used compared to qualitative method as most information has been acquired through qualitative method/techniques. The technique used under quantitative method was observation.

Questionnaires

A questionnaire technique is advantageous as the responses are gathered in a standardized way. This makes questionnaire technique certainly more objective compared to interviews. This research tool allows free flow of information and data capture (Phillips, 1973, Babbie, 1978), and one of the best methods especially for the population that is too large to be observed directly (Babbie, 1995). According to Chamber (1983), Questionnaires used as data collection methods are the most commonly used in planning research. It is relatively quick to collect information using a questionnaire. Potentially, information can be collected from a large portion of a group, depending on a population size. (Hutu T, 2011).

3.2. RESEARCH DESIGN MATRIX

The study has adopted an exploratory research design, as the study wants to explore the effect to which the urban growth boundary acts as a management strategy. A research design matrix approach was used to draft the research. Where in specific research objectives, specific research questions, key variables/ research indicators, data collection instruments (including both primary and secondary data collection instruments), target group as well as research assumptions were combined respectively.

The design matrix used/ adopted for this study is portrayed in Table 3.2.1.

3.2.1. Research design matrix

Specific research objectives	Specific research questions	Research indicators/key variables	Data collection instruments	Target group	Research assumptions
1. To review the legislative and policy requirements for urban containment and urban sprawl.	-What are the legislative and policy requirements for urban containment and urban sprawl?	- Legislative and policy requirements for urban containment and urban sprawl	- Key informant interviews - Literature review	-Municipality	- Data is available and accessible - Respondents have time and are willing to respond to questions
2. To identify the opportunities and constraints of using urban growth boundary as a growth management tool.	-What are the opportunities and constraints of using urban growth boundary as a growth management tool?	- opportunities and constraints of using urban growth boundary as a growth management tool	- Literature review -Kill -Observation -Questionnaires	-Municipality - Residents	- Data is available and accessible -Respondents have time and are willing to respond to questions
3. To assess the strategies that the municipality is currently using to manage growth and development of the town.	- What are the strategies that the municipality is currently using to manage growth and development of the town?	- strategies that the municipality is currently using to manage growth and development of the town	-Key informant interviews -Observations - Questionnaires	-Municipality -Residents	- Data is available and accessible -Respondents have time and are willing to respond to questions.
4. To recommend adaptable strategies for controlling town growth and development	-What are the adaptable strategies for controlling town growth and development	-Strategies that can be employed to ensure effective control of town growth and development	- Kill - Literature review -Observation -Questionnaires	-----	-----

Source: Author(2012)

3.3 ACHIEVEMENT OF RESEARCH OBJECTIVES

3.3.1 Objective 1 "To review the legislative and policy requirements for urban containment and urban sprawl"

This objective sought to review the legislative and policy requirement for urban containment and urban sprawl. The research question that was asked was 'what are the legislative and policy requirement for urban containment and urban sprawl?' The major key variable which is going to be numerated/ measured is to analyse the legislative and policy requirement for urban containment and urban sprawl. The types of data collection instruments that have been used are both primary and secondary. The primary instrument was key informant interviews while the secondary was literature review. The key informant interview targeted the municipal officials (planning officials). The assumptions are that data were available and respondents had enough time to respond to questions.

3.3.2 Objective 2 "To assess the strategies that the municipality is currently using to manage growth and development of the town"

This objective sought to assess the strategies that the municipality is currently using to manage growth and development of the town. The research question that this objective sought to answer is 'what are the strategies that the municipality is currently using to manage growth and development of the town? The major key variable which was numerated was the strategies that the municipality is currently using to manage growth and development of the town. The types of data collection instruments are only primary. These primary data collection instruments include KII, observation and questionnaires. The KII targeted the municipal officials; questionnaires targeted the residents staying on/ close to the boundary. The assumptions are that data were available and the respondents had enough time to respond to questions.

3.3.3. Objective 3 "To identify the opportunities and constraints of using urban growth boundary as a growth management tool"

This objective was aimed at identifying the opportunities and constraints of using urban growth boundary as a growth management tool. The research question that this objective answered was 'what are the opportunities and constraints of using urban

growth boundary as a management tool?' the major key variables of this objective that were numerated were the opportunities and constraints of using urban growth boundary as a management tool. The data collection instruments that were useful for this objective were both primary and secondary. The primary data collection instruments include: KII, observation and questionnaires, while the secondary data collection instruments was literature review. The KII targeted the municipal officials; questionnaires targeted the residents staying on/ close to the boundary. The assumptions were that data were available and the respondents had enough time to respond to questions.

3.3.4. Objective 4 "To recommend adaptable strategies for controlling town growth and development"

This objective sought to recommend adaptable strategies for controlling town growth and development. The research question that this objective sought to answer is 'what are the adaptable strategies for controlling growth and development. The key variable that was numerated for this particular objective was the strategies that can be employed to ensure effective control of town growth and development. The data collection instruments that were useful for the fulfillment of this objective were both primary and secondary. The primary collection instruments include KII, questionnaires, and observation, while the secondary data collection instruments include literature review. The assumptions made were that data was available and the respondents had time to respond to questions.

3.4. DATA SOURCE/ TYPES OF DATA

Both primary and secondary data were employed for the relevance of this study. Both types of data have been used for the benefit of a meaningful, relevant information provision and accuracy of the research report.



3.4.1 Primary data

Primary data include information directly from the field; these may be administered questionnaires, personal observations as well as recording of planning data. For the validity of this research key informant interviews, site observation and questionnaires were used as primary data collectors.

3.4.1.1. Primary data sources

These are sources from which the researcher directly collects data that may not have been previously collected.

Sources of the primary data are: households, study area and municipal personnel.

3.4.1.2. Key informant interviews

The researcher conducted key informant interviews with the municipality officials to get firsthand information on what strategies are currently used in managing urban growth, how effective these strategies are and challenges that they face with such strategies. These interviews also helped the researcher to know whether the proposed recommendations will be adoptable or not to ensure the effective implementation of the key informant interviews. See appendix C

3.4.1.3. Observation

The study employed non-participatory observations. Observational approach helped the researcher to learn about things that the participants or questionnaire respondents and interviewees were unwilling to reveal either in questionnaires or interviews. It also helped the researcher to get a clear view of what was happening in the study area and people's experience. The researcher observed the land uses or activities taking place on the urban boundary. This also helped the researcher to predict the direction of growth in which the activities will be taking place. See appendix D.

3.4.1.4 Questionnaires

The researcher also made use of questionnaires to get first-hand information relating to urban growth boundary and its role on urban containment strategy. Such questionnaires were targeted at the communities staying on the urban boundary. Major issues that were solicited in the questionnaires include:

- Service delivery and services provided
- Social challenges
- Economic challenges
- Environmental challenges
- Living conditions

The questionnaires included both closed and open handed questions. The structure of questionnaires adopted is shown in appendix E.

3.4.2. Secondary data

Secondary data includes data from internet, journals and books. Secondary data has helped the researcher to get relevant information from the internet, books and journals in relation to the study.

3.4.2.1 Secondary data sources

These are the sources containing data that have been previously collected and compiled for another purpose. The secondary data sources for this research are books, journals and internet

3.5. SAMPLING TECHNIQUES

Sampling is the act, process, or technique of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population (Mugo, 2011). Therefore in this study the sampling method was used in order to obtain the appropriate number to help draw conclusions about populations from samples by directly observing only a portion of the population in Louis Trichardt.

There are different sampling methods, but systematic random sampling and simple random sampling were applied in this study.

The rule of thumb was exercised in this study. The questionnaires were administered using the following sampling methods.

The sample was determined using the rule of thumb:

The total population for the study area is 10 000 (Makhado Municipality IDP 2011/2012), therefore according to rule of thumb; the number of questionnaires that could be administered were supposed to be 370, if the margin of error was 5%. However, due to limited time and resources the number of questionnaires to be administered has been reduced to 103.

3.5.1. Sampling procedure:

The relevant municipal officials were selected for interviews to get the required and correct information useful for this research and to help achieve the research objectives as well as to answer the research questions. Questionnaires were randomly distributed to the community members at the growth boundary.

3.6. DATA COLLECTION METHODS AND TECHNIQUES

Data collection methods define ways or tools that are used to collect the relevant and necessary data for the research in order to try and achieve the formulated objectives and answer the research questions. Methods that were used for the study were both qualitative and quantitative methods. In qualitative methods, techniques that were used were questionnaires, baseline survey, observations as well as key informant interviews (KII).

3.7. DATA PRESENTATION AND ANALYSIS

Data processing begins with analysis. The analysis process involves arrangements of raw data into a computer readable form of statistical analysis, also corrects mistakes when entering information into the computer. Both primary and secondary data are presented in bar graphs, tables and line graphs so as to facilitate the interpretation of

the results of the data that has been analysed. Data was processed using software package known as statistical package for social sciences (SPSS) and Microsoft excel. Data were analysed using average and range

3.8. CHAPTER SUMMARY

This chapter outlined the data collection tools as well as the target groups for specific data collection that were used to achieve the objectives of the research. The research design matrix is outlined and the variables are laid down.

- > Socio-demographics
- > A review of legislative and policy requirements for urban containment and urban sprawl.
- > Opportunities and constraints of using urban growth boundary as a growth management tool.
- > An assessment of strategies that the municipality is currently using to manage growth and development of the town.

4.1. Socio-demographics

This section deals with all the demographic data collected, and such data is presented under the following variables.

- > Gender of respondents
- > Age of respondents
- > Marital status of respondents
- > Occupation of respondents

4.1.1. Gender of respondents.

Data relating to gender characteristics were collected and the results are summarized in figure 4.1.

CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

4.0. Introduction

This chapter is a presentation and analysis of the data collected during the data collection period. It is in this chapter where all the qualitative and quantitative data are presented. The data presented on this chapter is based on questionnaires and Key Informant Interviews (KII). This chapter constitutes three essential sections. The sections are outlined below:

- Socio-demographics
- A review of legislative and policy requirements for urban containment and urban sprawl.
- Opportunities and constraints of using urban growth boundary as a growth management tool.
- An assessment of strategies that the municipality is currently using to manage growth and development of the town

4.1. Socio-demographics

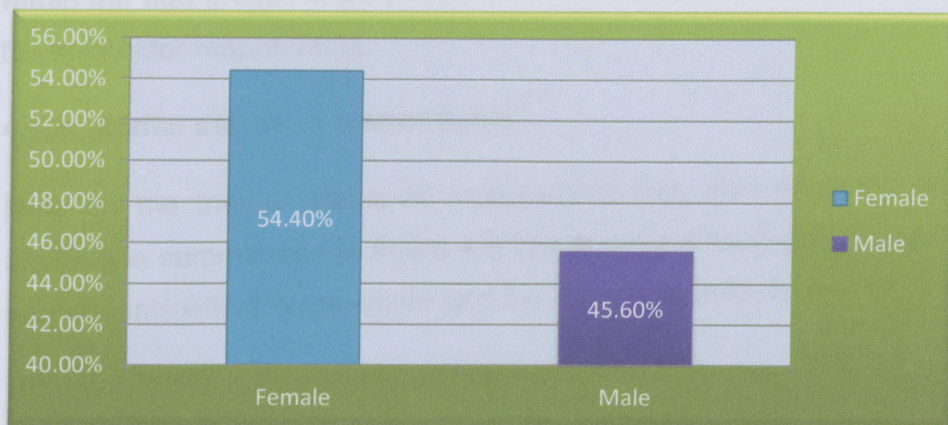
This section deals with all the demographic data collected, and such data is presented under the following variables:

- Gender of respondents
- Age of respondents
- Marital status of respondents
- Occupation of respondents

4.1.1. Gender of respondents.

Data relating to gender characteristics respondents were collected and the results are summarized in figure 4.1.

Figure 4.1. Gender of respondents



N=103 respondents.

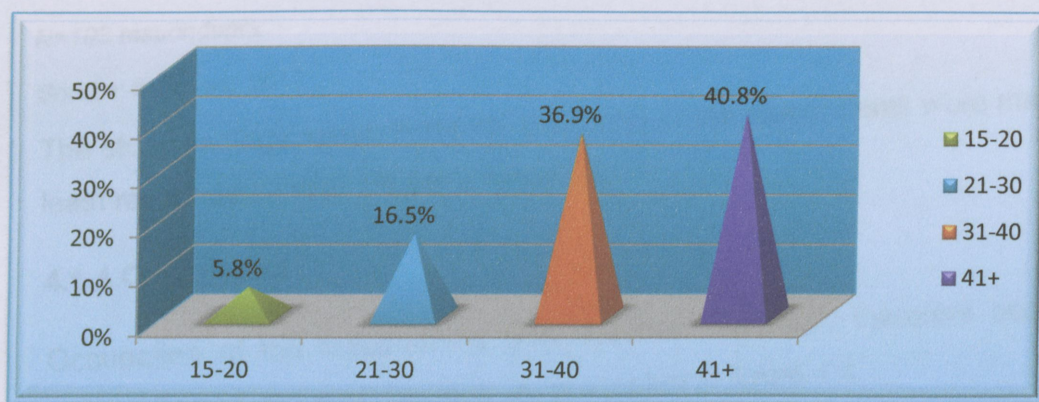
Source: fieldwork, 2012

The study results reveal that 54.4% of the respondents were female and 45.6% were male.

4.1.2. Age of respondents.

People of different age groups were involved as respondents when collecting data. Such a breakdown is summarized in figure 4.2.

Figure 4.2. Age of respondents



N=103 respondents.

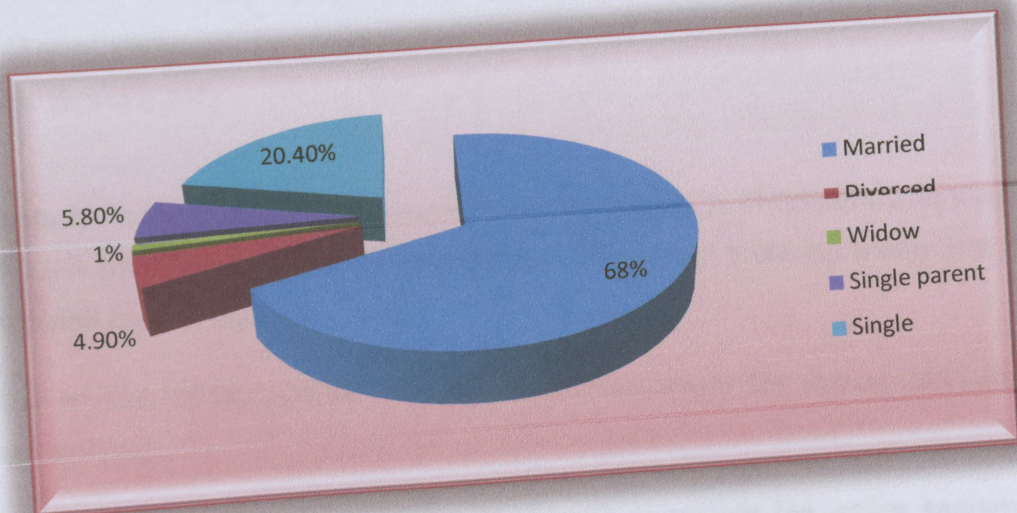
Source: fieldwork, 2012

The majority of the respondents fall within the age group 41+ (40.8%) while a few fall within the age group 15-20 (5.8%). This findings probably show that findings are viable towards older respondents.

4.1.3. Marital status of respondents.

Data on the marital status of respondents was also collected and analysed. Such analysis is summarized in figure 4.3. The figure below (figure 4.3) reveals that the least respondents with 1% are single and the most respondents with 68% are married.

Figure 4.3. Marital statuses of respondents



N=103 respondents.

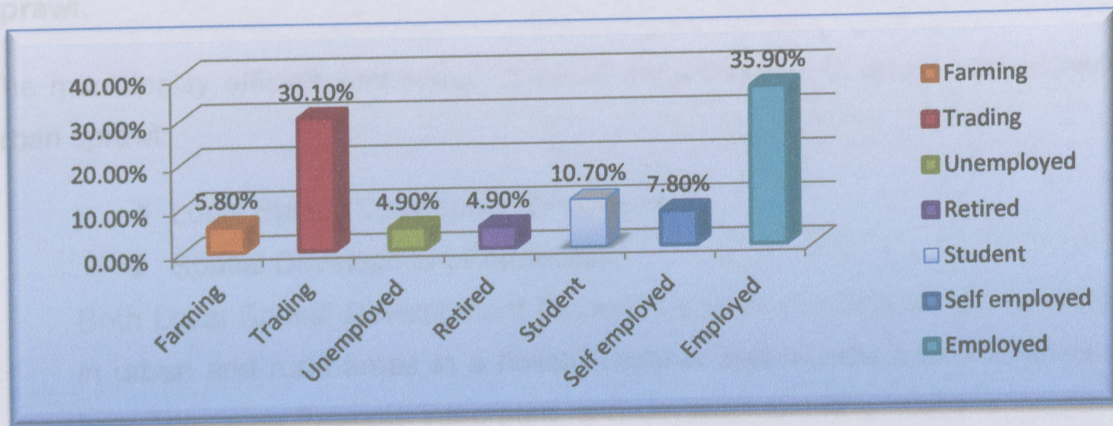
Source: fieldwork, 2012

The study findings reveal that 68% (majority) of the respondents were married while the least respondents with 1% were widowed.

4.1.4 Occupation

Occupation of the respondents was deemed important, therefore occupational data were collected and such findings are presented in figure 4.4.

Figure 4.4 Occupation of respondents



N=103 respondents.

Source: fieldwork, 2012

The study findings reveal that a sum of 35.9% (majority) of respondents was employed and 4.9% (minority) are retired/unemployed. This could probably mean that the area is dominated by employed residents.

4.2. A review of legislative and policy requirements for urban containment and urban sprawl.

One of the major objectives of this study was to review the policy requirements for urban containment and urban sprawl. Such a review has already been done in literature review section. However, it was also possible to get a review from the municipal key informants. Such a review is analysed under the following sections:

- Legislative and Policy requirements for urban containment and urban sprawl
- Effectiveness of the legislative and policy requirements
- Applicability of these legislative and policy requirements

4.2.1. Legislative and Policy requirements for urban containment and urban sprawl.

The municipality officials mentioned different requirements for urban containment and urban sprawl:



4.2.1. Legislative and Policy requirements for urban containment and urban sprawl.

The municipality officials mentioned different requirements for urban containment and urban sprawl:

- ➔ Local Spatial Development Framework
- ➔ Spatial Development Framework

Both Local Spatial Development Framework seek to Address land development in urban and rural areas in a holistic manner and not discriminate between the two. They also Promote integrated land development and mixed land use areas in which it is easier for people to live closer to places of work and social and economic opportunities. By so doing, it ensures the best possible use of existing infrastructure and resources and contribute to the correction of historically distorted spatial patterns of development.

- ➔ Guidelines for Rural/Farms Development

This requirement is responsible for monitoring development on both rural and urban farms within the municipal's jurisdiction.

- ➔ Land Use Management Scheme

Land Use Management Scheme is required to help in allocation of different land uses according to specific requirements and compatibility.

- ➔ Master Plan

The master plan consists of all proposed developments that are to take place within the municipality. It is also known as IDP.

4.2.2. Effectiveness of the legislative and policy requirements

It was possible to also gauge the strength of the current legislative and policy requirements for urban containment and urban sprawl. The effectiveness of such legislative and policy requirements on a scale of 1-10 is summarized in Table 4.1.

Table 4.1. Effectiveness of the legislative and policy requirements

LEGISLATIVE AND POLICY REQUIREMENTS	EFFECTIVENESS (1-10)
Local Spatial Development Framework	4
Spatial Development Framework	4
Guidelines for Rural/Farms Development	1
Land use Management Scheme	10

Key notes: 1=not effective, 10=very effective

Source: fieldwork, 2012

The table reveals that amongst the four policy requirements, the most effective requirement is Land Use Management Scheme, while the least effective is Guidelines for Rural/Farms Development.

According to the municipality, both Land Use Management Scheme and Densification policy are very effective within the urban edge. The municipality officials also declared that they would not like to change anything about the current growth management tools but to apply them to their very best level. They further indicated that the LUMS/ Town Planning Scheme started working in 1955 and later the master plan was also developed and it has since lapsed, however, there are boundaries beyond which they are not expected to develop in.

4.2.3. Applicability of the legislative and policy requirements

Applicability of policies differ with their contents and applicability in different locations, therefore data collected from the municipal informants show differences in applicability of the mentioned legislative and policy requirements. Such applicability ratings are presented in Table 4.2.

These findings are not reported here.

4.3.1. Constraints of the USB system

It was possible to get information on the constraints of the USB system in Makhado Municipality. Information was collected from the informants.

Table 4.2 Applicability of legislative and policy requirements

POLICY REQUIRED	RATINGS ON APPLICABILITY (1-10)
Local Spatial Development Framework	8
Spatial Development Framework	10
Guidelines for Rural/Farms Development	8
Land Use Management Scheme	10

Key notes: 1=not applicable, 10=very applicable

Source: fieldwork, 2012

The findings reveal that all these requirements are applicable, however, their applicability is not of the same applicability level. The table shows that Land Use Management Scheme and Spatial Development Framework are the most applicable as compared to the other two.

4.3. Opportunities and constraints associated with using urban growth boundary as a growth management tool.

One other major objective of this study was to identify opportunities and constraints of using urban growth boundary as a growth management tool. Such an objective is achieved under the following thematic headings.

- ➔ Constraints of the UGB concept
- ➔ Opportunities of the UGB concept
- ➔ Municipality's restriction on development of human activities
- ➔ Fixing the boundary of a town
- ➔ Living conditions in different time periods

These thematic headings are now reviewed below.

4.3.1. Constraints of the UGB concept

It was possible to get information on the constraints associated with UGB as a concept in Makhado Municipality. Interview with key municipal officials revealed that Makhado is

Is the 'Urban Growth Boundary' concept a valuable tool for urban containment? Evidence from Louis Trichardt Town, of Makhado Municipality in Limpopo province.

currently experiencing immense population growth, which increases urbanisation. A number of challenges were also discerned through the interview according to different time scales. Such findings are summarized in Table 4.3

Table 4.3 Challenges faced by municipality concerning urban growth

TIME SCALE	CHALLENGES
The last 20 years	Not sure
The last 10 years	Demand for water
This year	Energy and sewer capacity
The next 5 years	Demand for space for residential and commercial development

Source: fieldwork, 2012

The municipality also pointed out that the Urban Growth Boundary is very effective within and not on the properties outside the boundary. The officials further outlined that the constraints inherent were that privately owned land, either by private individuals or Communal Property Associations (CPA) and so had a negative impact on the land ownership since population is growing and this leads to demand for more land.

The municipal officials further outlined that to have a specific urban edge policy supported by the Local Spatial Development Framework, Land Use Management Scheme and CBD Development strategy would be the best strategy for growth management. There are also different service delivery challenges that the municipality is faced with. These challenges are:

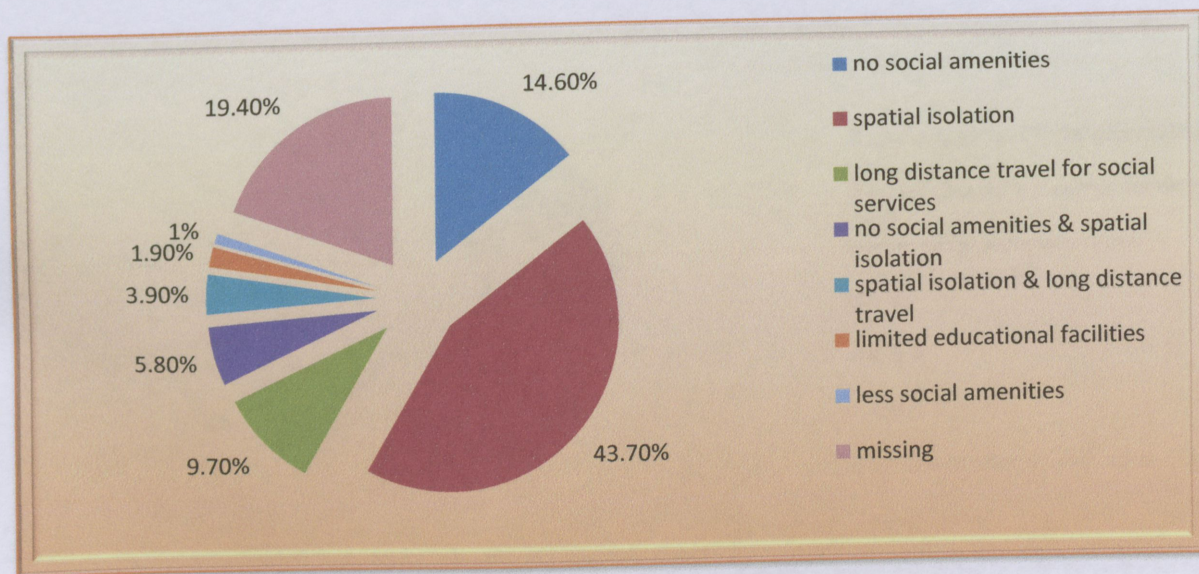
- Electricity capacity
- Demand for water
- Sewer system capacity

The municipality is currently in process of expanding the town boundary in order to develop the town further. Map 1 shows the proposed urban edge, while Map 2 shows the proposed developments

4.3.1.2. Social challenges

During data collection, respondents were asked if they could possibly be experiencing social challenges. This was meant to help make conclusions on whether the concept of UGB could be posing social problems/ social constraints to the residential areas on the outskirts of the town. Different challenges were identified. Such identified challenges are presented in figure 4.5.

Figure 4.5 Social challenges



N=103,

Source= fieldwork

The findings reveal that a large number of respondents, (43.7%) has a problem of spatial isolation, which could somehow be possibly caused by the concept of UGB. This becomes a constraint in a sense that people become isolated and be located far from social services from the municipality.

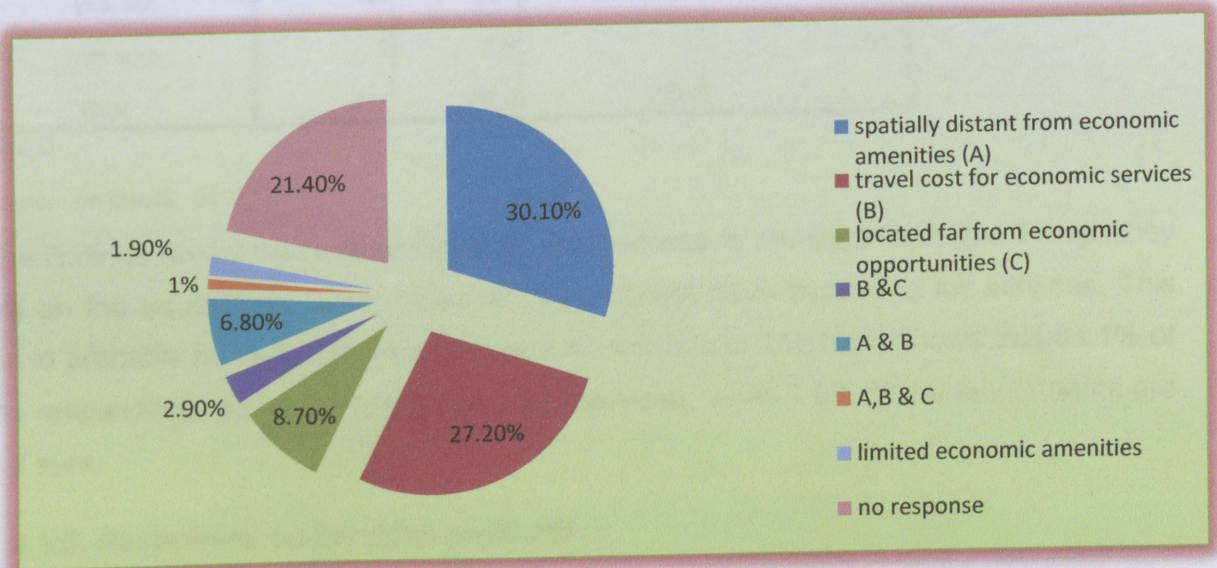
4.3.1.4. Access to municipal services

Service delivery is essential for every individual within the jurisdiction of the municipality whether within the UGB or outside. Therefore, respondents were asked questions on service delivery and were also given a chance to give their views on what could

4.3.1.3. Economic challenges

The study also sought to gather information on economic challenges facing the households on the urban boundary of Makhado municipality. This was expected to help make conclusions on whether the concept of UGB could be posing economic problems to the residential areas on the outskirts of the town. Different challenges were also identified. Such findings are portrayed in figure 4.6.

Figure 4.6.economic challenges



N=103 respondents.

Source: fieldwork, 2012

The findings reveal that a large number of respondents (30.1%) have a problem of the area being spatially distant from economic amenities and the travel costs for economic services.

4.3.1.4. Access to municipal services

Service delivery is essential for every individual within the jurisdiction of the municipality whether within the CBD or outskirts. Therefore, respondents were asked questions on service delivery and were also given a chance to give recommendations on what could

be done to better the current situation. Findings on residents' access to municipal services are presented in table 4.4.

Table 4.4 Access to municipal services

Responses	Frequency	Percent	Valid Percent	Cumulative Percent
yes	35	34.0	34.0	34.0
yes, but	66	64.1	64.1	98.1
not sure	2	1.9	1.9	100.0
Total	103	100.0	100.0	

N=103

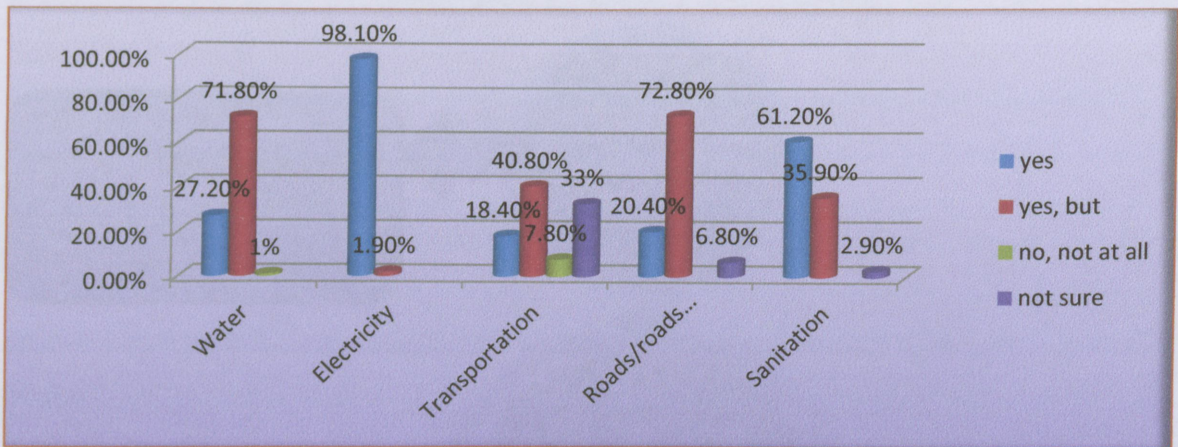
Source: fieldwork, 2012.

The findings reveal that respondents do have access to municipal services though they are on the edge of the town, however, they do not have access to full services. This could probably be due to the location of their residence. The table shows that 64.1% of the respondents do not have full access to services, while 1.9% of the respondents are not sure.

4.3.1.5. Responses on services provided

There are different municipal services provided. A section showing different services provided by the municipality was disclosed to the respondents. The figure 4.7.further shows different response towards services provided by the municipality.

Figure 4.7. Responses on services provided by municipality



N=103 respondents.

Source: fieldwork, 2012

From the findings, it is safe to conclude that the area does not have problems with electricity; however they have problems with water supply and road/roads infrastructure. Respondents revealed that they have problems with how they are being supplied with water because the municipality provides water at certain hours but still expects the residents to pay full amount for water provision/usage.

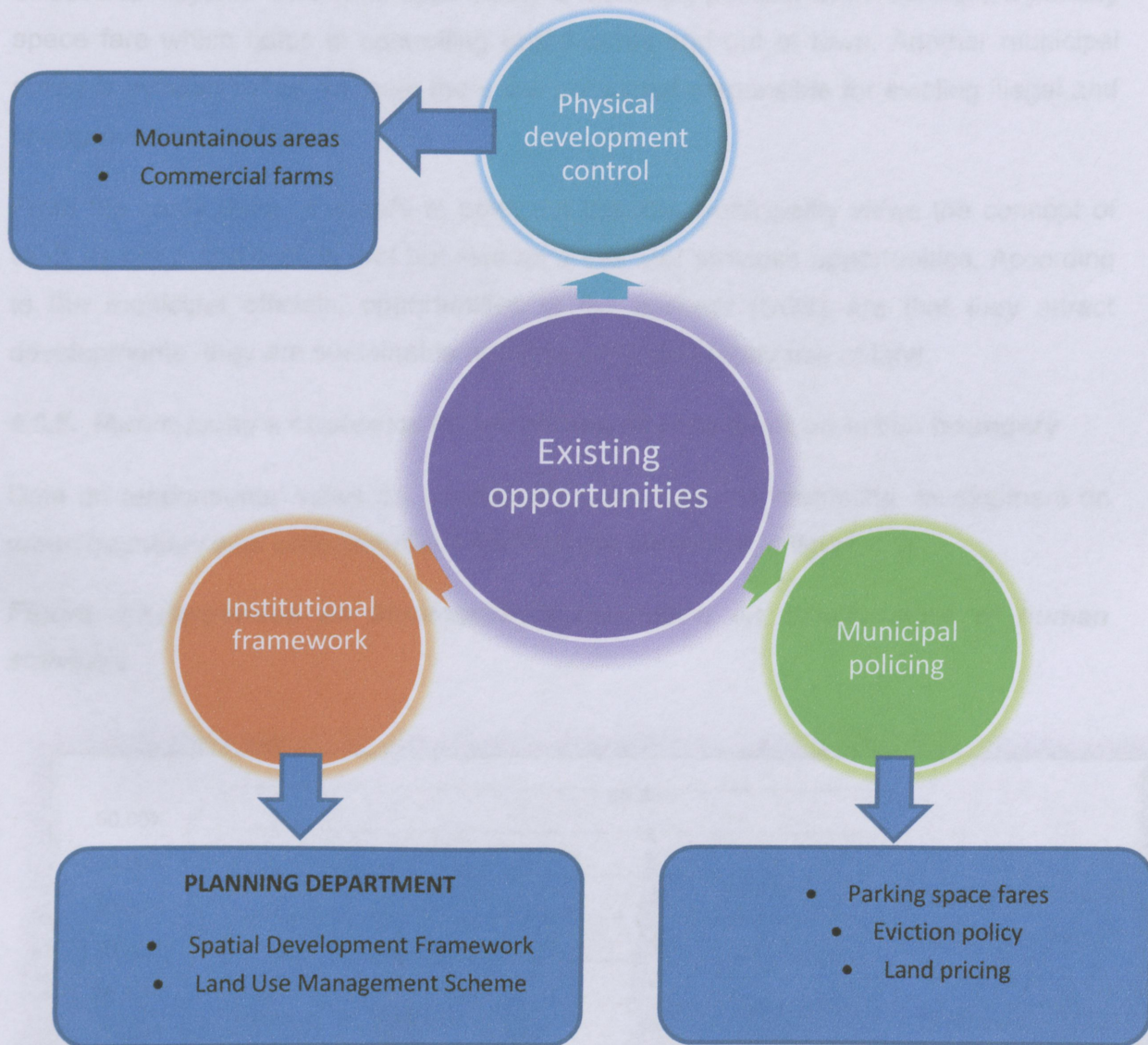
4.3.2. Opportunities associated with the use of the UGB concept

It was possible to get information on opportunities associated with the use of UGB concept. Such findings are depicted in figure 4.8.

Source: fieldwork, 2012

The study reveals that there are existing opportunities, however and these opportunities are institutional framework, municipal with good financial management control. The municipal officials pointed out that the municipal financial management skills as institutional framework, but such as good financial management control and control activities within the boundary. Financial management control activities

Figure 4.8 Opportunities associated with the use of UGB



Source: fieldwork, 2012

The study reveals that there are existing opportunities associated with UGB; these opportunities are institutional framework, municipal policy and physical development control. The municipal officials pointed out that the municipality has management tools as institutional framework, tools such as SDF, TPS/LUMS working to conserve land and control activities within the boundary. Physical development control includes

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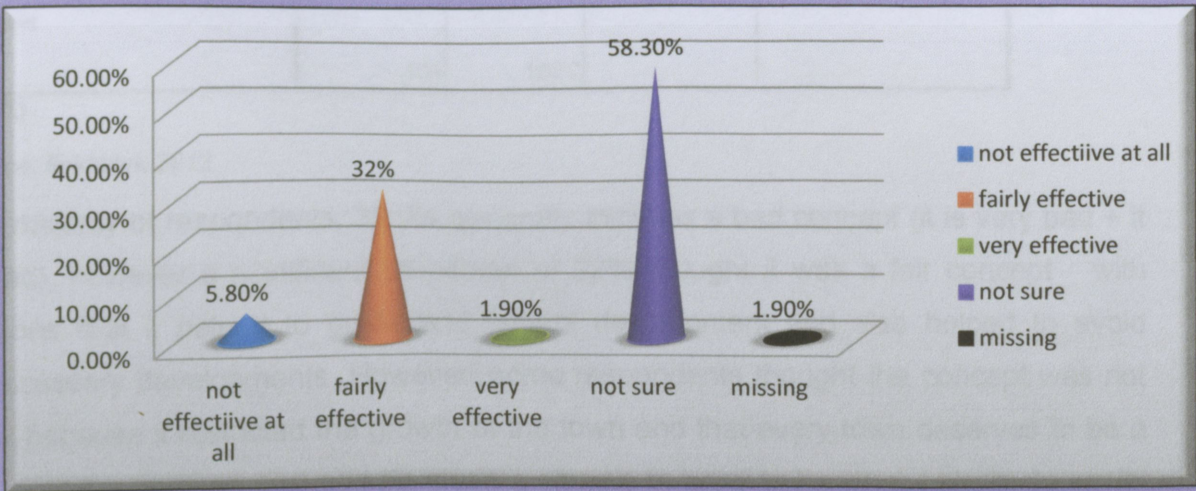
mountainous areas as well as commercial farms where people cannot develop towards or develop beyond. One other opportunity is municipal policing which includes a parking space fare which helps in controlling traffic within and out of town. Another municipal policy is eviction policy, wherein there are personnel responsible for evicting illegal and unapproved development.

From the study done, it is safe to point out that the municipality views the concept of UGB as not a constricting tool but also as a tool that provides opportunities. According to the municipal officials, opportunities of the concept (UGB) are that they attract developments, they are sustainable and they promote orderly use of land.

4.3.3. Municipality's strategies on restricting development on urban boundary

Data on respondents' views on municipality's strategies on restricting development on urban boundary was collected. Such findings are presented in figure 4.9.

Figure 4.9. responses on Municipality's restriction on development of human activities



N=103

Source: fieldwork, 2012.



The findings reveal that 58.3% (majority) are unsure of how effective it is; while 32% think the restriction is fairly effective. The residents are probably not familiar with how the municipality is restricting development of human activities.

4.3.4. Fixing the boundary of the town

Data on respondents' views towards fixing the boundary of a town was collected and analysed. Such analysis and findings are presented in Table 4.5

Table 4.5. Responses on fixing the boundary of a town

responses	Frequency	Percent	Valid Percent	Cumulative Percent
it is very bad	21	20.4	20.8	20.8
it is bad	16	15.5	15.8	36.6
it is fair	33	32.0	32.7	69.3
it is good	31	30.1	30.7	100.0
Total	101	98.1	100.0	
No responses	2	1.9		
Total	103	100.0		

N=103

Source: fieldwork 2012.

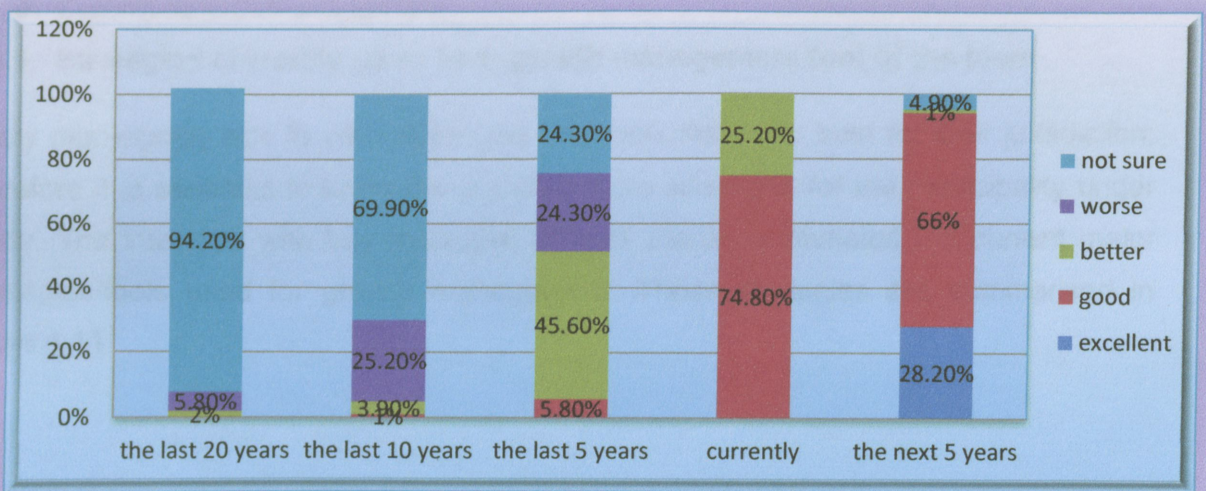
The majority of respondents, 35.9% generally thinks is a bad concept (it is very bad + it is bad), however a significant proportion of 32% thought it was a fair concept with reasons that it helped to guide and control development and also helped to avoid unnecessary developments. However, some respondents thought the concept was not ideal because it restricted the growth of the town and that every town deserves to be a city at some point so it should be given a chance to grow to be what everybody would be proud of and other management and control tools should be used effectively.



4.3.5. Living conditions at different time periods

When collecting data, respondents were asked to characterize their living conditions according to different time periods (the last 20 years, the last 10 years, the last 5 years, currently and the next 5 years). Everything keeps changing with time; therefore it is important to know the different living conditions of different time periods in order to draw valid conclusions. The findings are presented in figure 4.10.

Figure 4.10 Living conditions at different time periods



UNIVERSITY OF VENDA
UNIVERSITY OF VENDA

N=103

Source: Fieldwork, 2012

The findings reveal that a large number of respondents (94.2%) were not sure of how the living conditions were 20 years ago. However, 66% of the respondents predicted that in the next 5 years there would be good living conditions. And currently, 74.8% respondents have good living conditions.



4.4. Assessing the strategies that the municipality is currently using to manage growth and development of the town.

The other major objective of the study was to assess the strategies that the municipality is currently using to manage growth and development of the town. Such analysis is presented under the following headings.

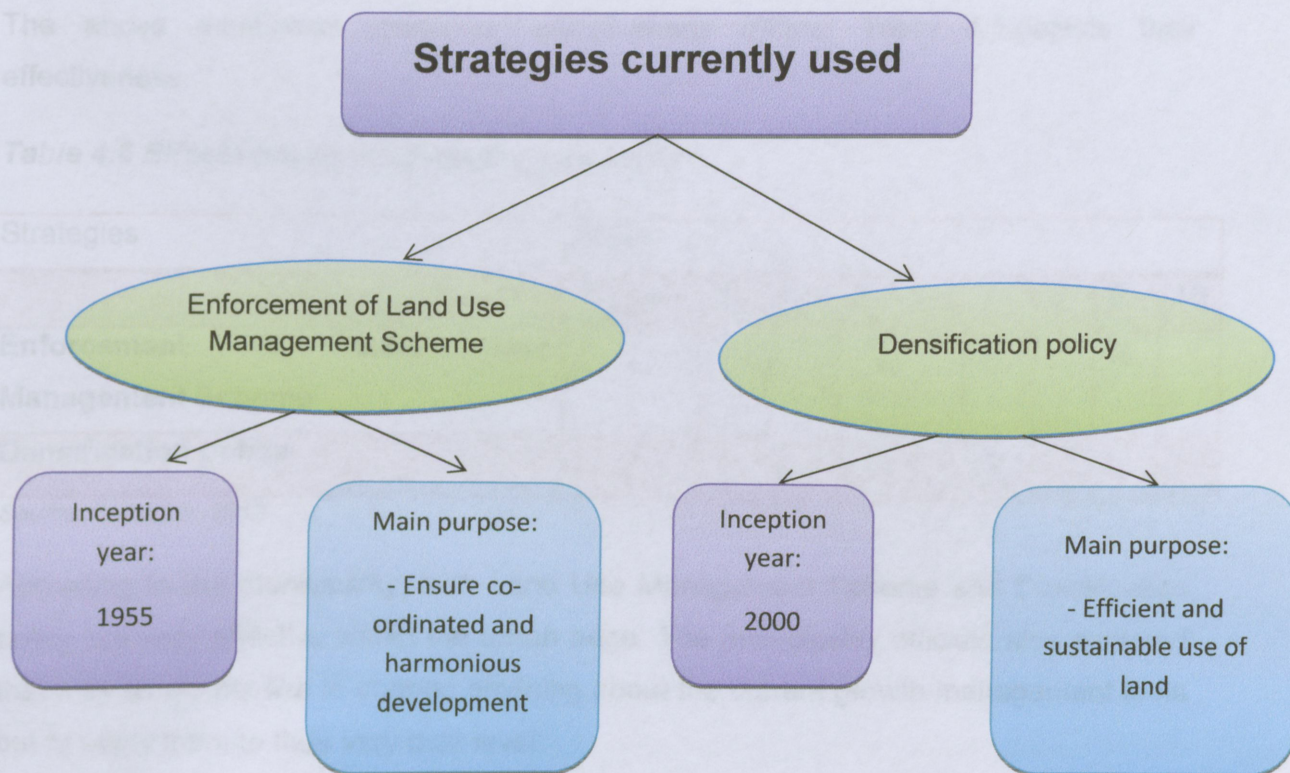
- ➔ Strategies currently used as a growth management tool of the town
- ➔ How long the strategies have been in use
- ➔ How effective are these strategies
- ➔ Current land delivery system

4.4.1. Strategies currently used as a growth management tool of the town

Every municipality has its own strategies and tools that work best for their jurisdiction; therefore it is essential to know the currently used strategies for the municipality under study. The interview with key municipal officials therefore revealed the current major strategies/tools used for growth management. These strategies are summarised in figure 4.11



Figure 4.11. Strategies currently used



Source: fieldwork, 2012

Currently, the municipality is trying to control development through land use management scheme/ town planning scheme. This strategy is geared towards strengthening the use of UGB as a growth management strategy/tool. The purpose of this strategy is to ensure co-ordinated and harmonious development of the area to which it relates in such a way as will most effectively tend to promote the health, safety, good order, amenity, convenience and general welfare of such area as well as efficiency and economy in the process of such development.

One other strategy is densification policy. This strategy sought to ensure effective use of land. It also possesses considerable potential to support or enable urban repair through redevelopment, self-organizing, infilling, etc.

4.4.2. Effectiveness of strategies employed

The above mentioned strategies' effectiveness differs. Table 4.5.depicts their effectiveness.

Table 4.6 Effectiveness of strategies employed

Strategies	Scale									
	1	2	3	4	5	6	7	8	9	10
Enforcement of Land Use Management Scheme									X	
Densification policy							X			

Source: fieldwork, 2012

According to the municipality, both Land Use Management Scheme and Densification policy are very effective within the urban edge. The municipality officials also declared that they would not like to change anything about the current growth management tools but to apply them to their very best level.

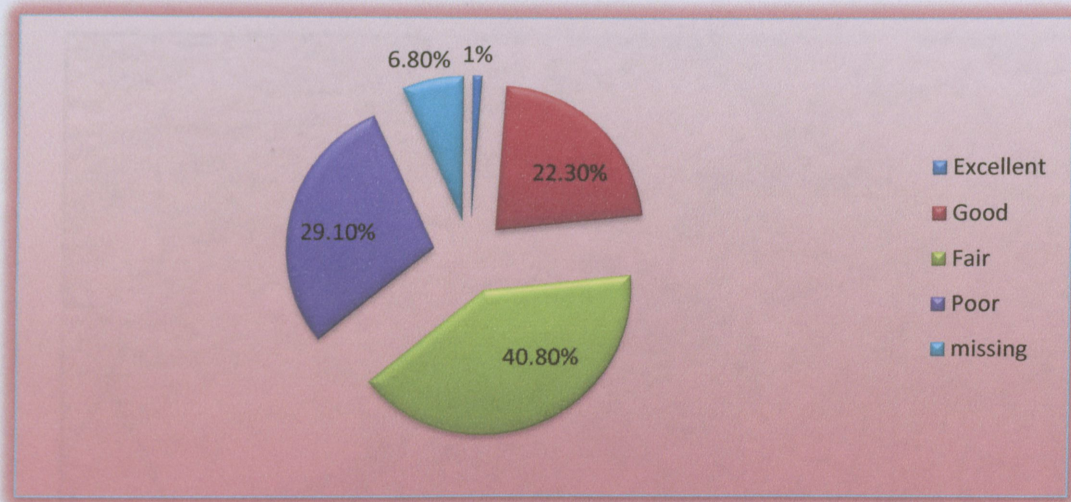
They further indicated that the Urban Growth Boundary Tool was never applied in the municipality since the LUMS/ Town Planning Scheme started working in 1955 and later the master plan was also developed and it has since lapsed, however, there are boundaries beyond which they are not expected to develop in.

The municipal officials disclosed that the current strategies are not effective enough. Such an analysis is backed by further evidence that the municipality is currently planning to expand the urban boundary or to increase pressure of land for development. Map 1 and 2 show the proposed boundary and developments.

4.4.3. Current land delivery system

The study also approached perceptions of respondents on current land delivery system. Such findings are presented in the figure 4.12.

Figure 4.12 Current land delivery system

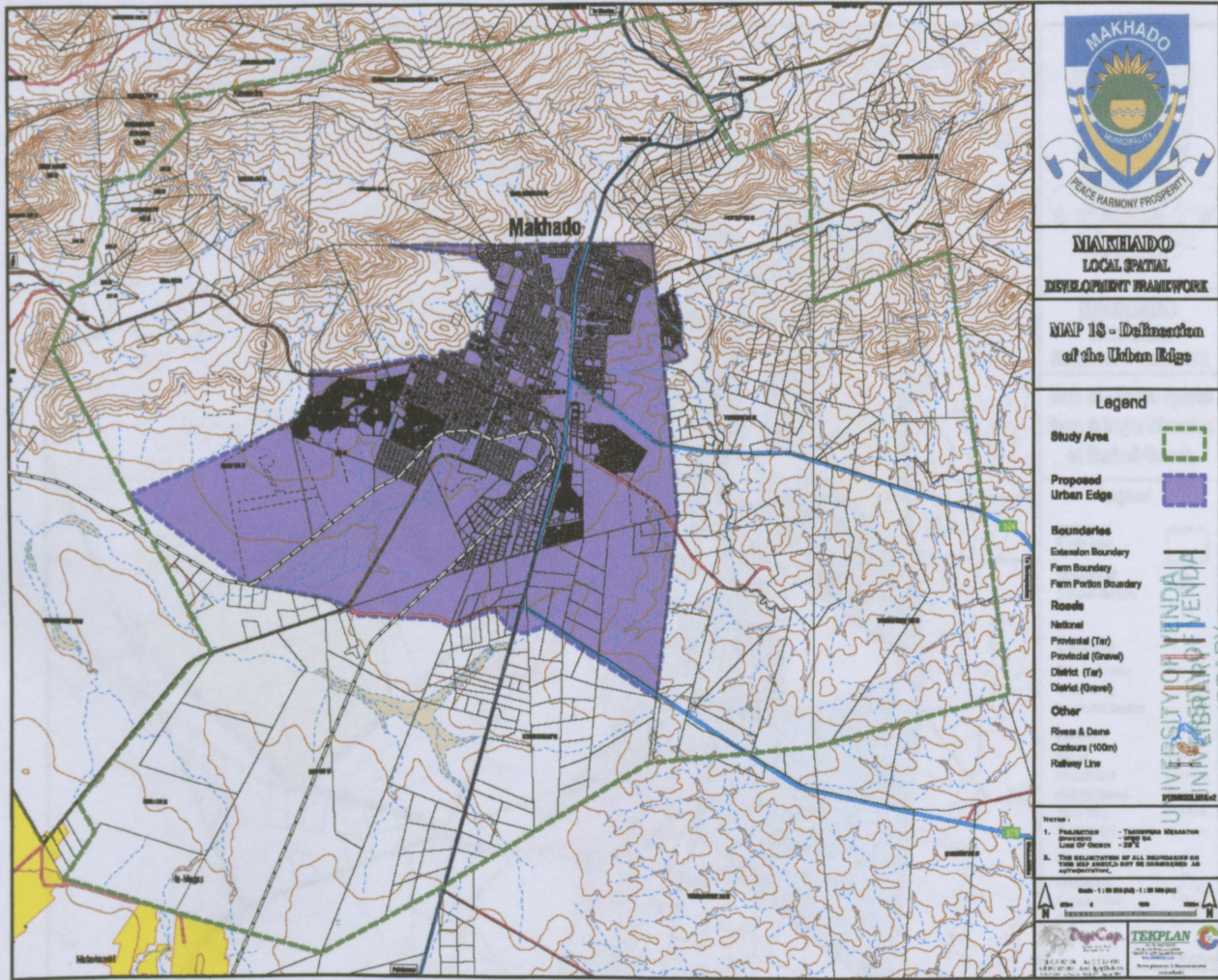


N=103 respondents

Source: fieldwork, 2012

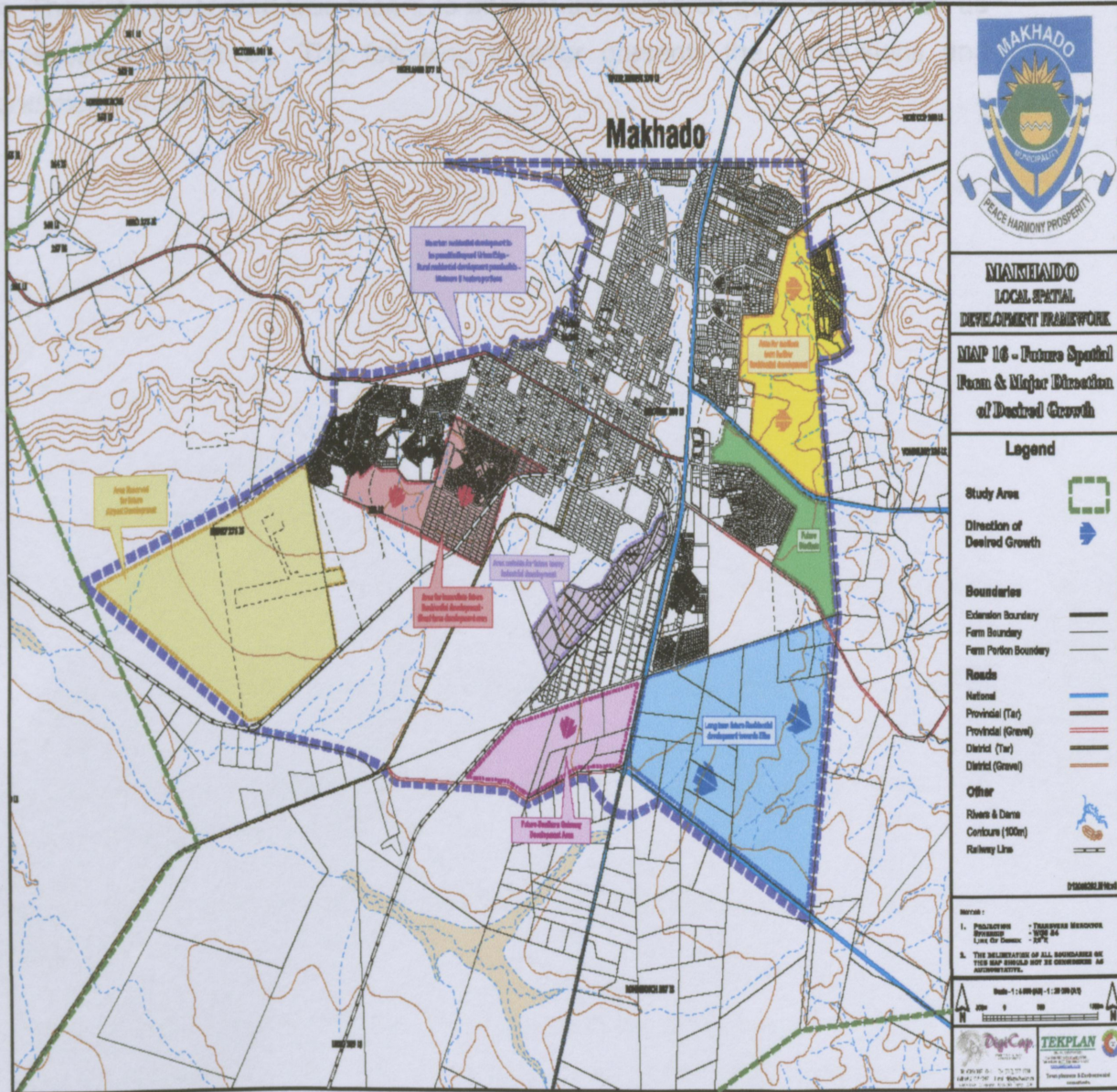
The findings show that a proportion of individuals 40.8% see the land delivery system as a fair one, because it does not work well for UGB as a growth management instrument. While 29.1% see it a poor system, because poor land delivery will force people to get cheaper land at the urban boundary

Map1. Existing and proposed urban boundary



Map.2. proposed developments within the proposed urban boundary

The purpose of this chapter was to analyse and present different findings during data collection.



4.5. Chapter summary

The purpose of this chapter was to analyse and present different findings during data collection. The data presented was meant to answer the research questions as well as fulfill the research objectives. The following chapter presents the conclusions and recommendations of the study.

This chapter is divided into three major sections:

- 1. Major findings
- 2. Recommendations
- 3. Areas for future research

4.5.1 Major Findings

The chapter seeks to draw major conclusions on each objective outlined earlier in chapter one. For this reason this section has been divided into the following sections:

- 1. A review of the legislative and policy requirements for urban containment and urban sprawl
- 2. Opportunities and constraints of using urban growth boundary as a growth management tool
- 3. An assessment of strategies that the municipality is currently using to manage growth and development of the town.

4.5.1.1 A review of the legislative and policy requirements for urban containment and urban sprawl

The first objective was to review the legislative requirements for urban containment and urban sprawl. Study findings reveal that urban containment and urban sprawl within the municipality is managed through a variety of legislative instruments and policies. Amongst these include: Local Spatial Development Framework, Spatial Development Framework, Land Use Management Scheme, Master plan and Guidelines for Rural Farms Development. Of all the mentioned policies, LUMS is effectively working in

Chapter 5: Conclusions and recommendations.

5.0 Introduction

This chapter draws conclusion on major research findings. It also recommends appropriate strategies that can help in minimizing identified challenges as well as to better the current situation regarding urban growth boundary. This chapter is divided into three major sections:

- Major findings
- Recommendations
- Areas for future research

5.1. Major Findings

This section seeks to draw major conclusions on each objective outlined earlier in chapter one. For this reason this section has been divided into the following sections:

- A review the legislative and policy requirements for urban containment and urban sprawl
- Opportunities and constraints of using urban growth boundary as a growth management tool
- An assessment of strategies that the municipality is currently using to manage growth and development of the town.

5.1.1. A review the legislative and policy requirements for urban containment and urban sprawl.

The first objective was to review the legislative requirements for urban containment and urban sprawl. Study findings reveal that urban containment and urban sprawl within the municipality is managed through a variety of legislative instruments and policies. Amongst these include: Local Spatial Development Framework, Spatial Development Framework, Land Use Management Scheme, Master plan and Guidelines for Rural/Farms Development. Of all the mentioned policies, LUMS is effectively working in



guiding development so as to sustainably make use of the little available land. The very least effective policy is Guidelines for Rural/Farms Development.

The legislative environment for urban containment and urban sprawl compares well with similar legislative environment mentioned by Woo, (2007). Urban sprawl has been the original reason for which communities have adopted some form of containment policies (Landis et al., 2002). While there is controversy on the positive and negative aspects of urban sprawl, most planners believe that urban sprawl should be curbed by public policies or planning tools, so as to achieve a sustainable community. To prevent urban sprawl, enforcing urban containment policies (UCPs), such as greenbelts, urban growth boundaries, and urban service areas, has become a popular method because of ease of implementation. (Woo, 2007)

5.1.2. The opportunities and constraints of using urban growth boundary as a growth management tool.

The second objective was to identify the opportunities and constraints of using urban growth boundary as a growth management tool.

Major constraints which were identified in the study include:

- Spatial isolation
- Poor service delivery
- Social challenges
- Economic challenges

A number of opportunities were also identified. These include: municipal policing, institutional framework, physical development control and physical development control.

These opportunities and constraints have been reviewed and identified by other scholars such as (Burby et.al, 2001). The identified consequences by Burby et.al are higher land prices, lower environmental quality and lower life quality due to the reduction of personal space. However, other scholars such as Bonilla (2007) points out that in order to reduce those consequences, it is important to make some considerations at the initial phase of the UCPs design process.

It is wise and important to consider that growth has to be managed in such a way that available land is not depleted before meeting the temporal goals of the program. This can be done either way by setting timetables according to realistic urban growth projections or by rationalizing the areas in which development is desired to occur. Also, it is important to include incentives to promote infill and redevelopment in order to make the UCPs effective. These incentives are used to direct development to areas that are already urbanized and it would not require additional funding to provide them with services.

Every other growth management policy has its own advantages and disadvantages and opportunities and threats. From the study done, the constraints of this very concept (UGB) are that the land is privately owned either by private individuals or communal property associations which restrict town developments and towns from growing spatially into a city and this leads to high expenses for services and expensive land within the city. While the opportunities are that they attract development(s) as the population growth rises and that there is sustainable use of land.

5.1.3. To assess the strategies that the municipality is currently using to manage growth and development of the town.

The third objective was to assess the strategies that the municipality is currently using to management growth and development of the town. The findings show that the strategies that are currently in use to manage growth and town development are enforcement of Land Use Management Scheme and the Densification policy (within the town). These strategies have been in use for quite some time. The Densification Policy has been in use since the year 2000, while Land Use Management Scheme (Town Planning Scheme) has been in use since the year 1955. Both Densification Policy and Land Use Management Scheme (LUMS) are very effective.

An evaluation of these strategies reveals that these strategies are not effective, since the municipality is facing some challenges on growth management and development control.

The findings also reveal that the growth management strategies used in Makhado municipality do not compare well with other strategies used in some other provinces such as Western Cape Province.

According to the department of environmental affairs and development urban edge policy guideline (2005), different guidelines and policies relating to different towns and cities are necessary, as the urbanisation dynamics in urban areas vary significantly. It seems as though more flexible edges would be required where growth needs to be focused. Tight urban edges would then be required to prevent unnecessary expansion or expansion due to continued segregated development. The urban edge thus become a planning tool, not only in urban management, but also in regional growth management, promoting growth in certain urban areas, while restricting it in others (provincial urban edge guideline, 2005).

5.2 Recommendations

This section seeks to recommend a number of strategies based on challenges which have been outlined in chapter 4. This section is divided into the following sub-sections:

- Reviewing institutional framework for Makhado Municipality
- Limited available land
- Service delivery
- Densification strategy

5.2.1. A review of institutional framework for Makhado Municipality

One of the major challenges identified by the study is a weak growth management and urban containment strategies. This study recommends that the municipality should have at least a specific urban edge policy supported by the Local Spatial Development Framework, Land Use Management Scheme and CBD development strategy that would work harmoniously together in order to have sustainable development and preservation of the little available land.

It is important to note that a single/stand-alone growth management mechanism, while addressing a single urban growth issue, needs to be assisted by an array of growth

management mechanisms that would contribute to the effectiveness of the specific mechanism, and that could prevent negative consequences from a stand-alone growth management intervention.

5.2.2. Limited supply of land

One other major challenge that the study managed to identify was limited available land. The municipality has reached a point of very little available land for development.

Makhado municipality has high percentage of privately owned land which as a result causes development constraints for the municipality. It is very costly for the municipality to reclaim land from the private owners, thus making it difficult for municipality to develop Makhado town. The municipality has not made effective mechanisms to combat the problem. Therefore, this study recommends that there should be public-private partnership (PPP). This would effectively work in helping the municipality acquire land adjacent to their own land through partnership in order to further develop the town.

5.2.3. Improved Service delivery

One other challenge that was identified is service delivery on the residential areas on the outskirts of the town. The study revealed that residents experience a problem of water provision, roads condition as well as nearby dumpsites. It is recommendable that the municipality should consider residential areas on the outskirts the same way as those within the fringe. These residential areas should be provided with sufficient water and should be free from nuisance caused by the nearby dumpsites.

There is poor consultation between the municipality and the Makhado community doesn't include its people in the decision making process.

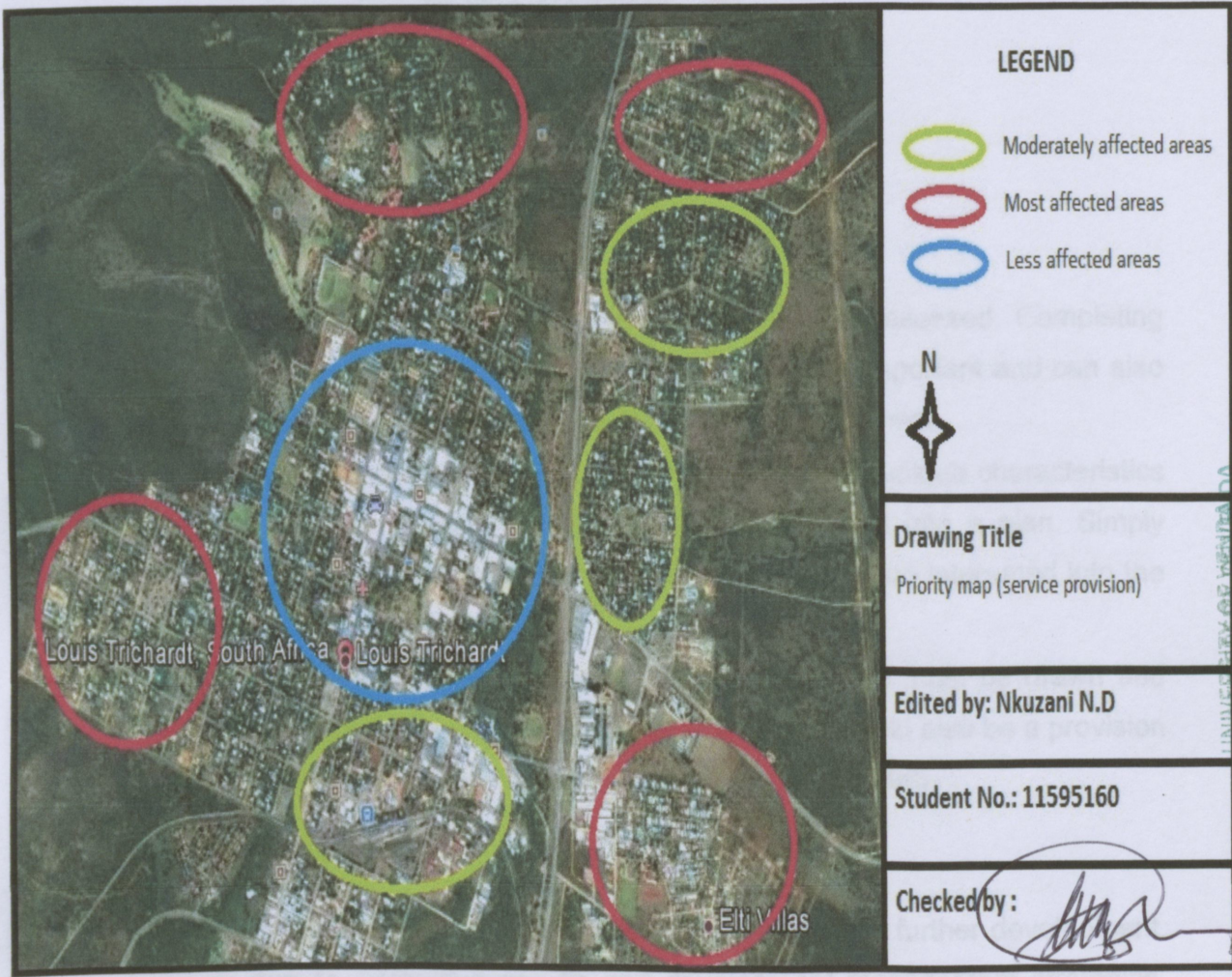
Makhado town has a rapid population growth which involves a large number of migrants staying within town without tenure security.

Findings also reveal that service provision differs from one area to the next within the boundary. It is recommendable that the municipality should not only improve the

Is the 'Urban Growth Boundary' concept a valuable tool for urban containment? Evidence from Louis Trichardt Town, of Makhado Municipality in Limpopo province.

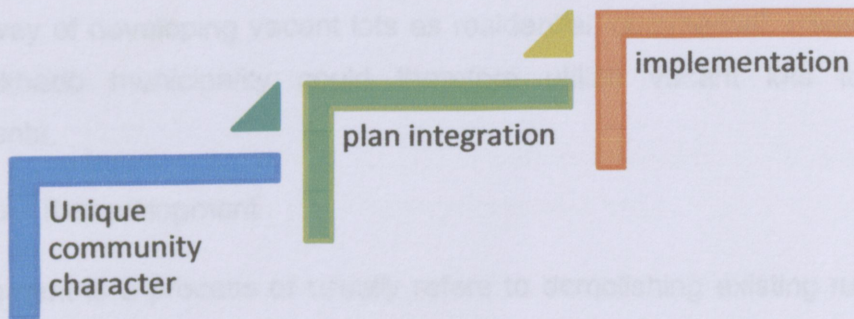
services on the urban boundary but within the boundary to avoid attraction of further development around the edge. Map 3, depicts priority areas for service delivery.

Map 3. Priority map (service provision)



Overall, for local communities considering establishing an urban growth boundary program this report can recommend a number of critical steps to achieve success:

Figure 5.1. Steps to making UGB a success



Source: Author, 2012

- First, the unique character of the community should be assessed. Completing such a survey can determine what the residents view as important and can also identify any hurdles that may affect the boundary's effectiveness.
- The second recommendation of this study is that once the unique characteristics of a community are established, they must be integrated into a plan. Simply recognizing the issues is not enough; somehow, they must be integrated into the program.
- Lastly, the program must be implemented. Boundary lines must be drawn and the parameters to achieve success must be set. There should also be a provision for review and revision of the boundary (kolakowski et.al, 2000).

5.2.4 Densification strategy

Makhado town is currently reeling under unavailability of land for further development. This is probably due to ineffective growth and development management strategies. Therefore, this study recommends a number of strategies that seek to promote densification of land uses and further limit centrifugal developments. These strategies include:

➤ In-filling

This is a way of developing vacant lots as residential, commercial, mixed or other land uses. Makhado municipality could therefore utilize vacant lots for sustainable developments.

➤ Redevelopment

Redevelopment is a process of usually refers to demolishing existing run-down areas, often substandard housing, and rebuilding the area with high-quality structures. It is therefore recommendable that Makhado municipality should demolish existing decayed buildings and run-down areas in order to have sustainable and effective developments that will prevent urban sprawl.

➤ Increase of floor area ratio (FAR) in the CBD and nodal developments

This study also recommends that Makhado municipality should consider high rise/vertical buildings as this will help in saving space and resources. This will prevent urban sprawl and promote development within the boundary.

These strategies are geared towards making the UGB tool as well as other strategies a success.

5.3. Areas for future research

Because of limited time and other constraints the study only managed to review issues relating to urban containment through urban growth boundary (UGB) as a tool. The scope is wide for other future researchers to also review or analyse issues relating to:

- Impacts of Urban Growth Boundary on the pattern of urban growth
- Interaction of Urban Growth Boundary and other effective current growth management tools.

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Is the 'Urban Growth Boundary' concept a valuable tool for urban containment? Evidence from Louis Trichardt Town, of Makhado Municipality in Limpopo province.

Appendix A: Research Activities

Research Activity	Time Frame
Development of proposal	June 2012
Development of chapter 1	July 2012
Conceptual clarification (chapter 2)	August 2012
Research planning and designing (chapter 3)	Early September 2012
Testing of research instruments	End-October 2012
Research execution	Early-November 2012
Data processing	Mid-November 2012
Submission of first draft	Mid-November 2012
Submission of second draft	End-November 2012
Submission of third draft	End-November 2012

Is the 'Urban Growth Boundary' concept a valuable tool for urban containment? Evidence from Louis Trichardt Town, of Makhado Municipality in Limpopo province.

Appendix B: Research Budget

List of items	Quantity	Unit cost	Estimated budget
Papers	5 x realms	R40.00	R200
Cartridge	2 x cartridge	R300	R600
Transport cost	750 km	R25	R500
Food	7days	R40	R280
Assistance ship	2 assistants	R150	R300
Binding	6 x books	R200	R1200
Language editor	2 editors	R500	R1000
Subtotal			R4880
Contingency whole (1% of subtotal)			R48,80
Total Budget			R4928

3. On a scale of 1-10 (where 1-effective and 10-not effective) applicable are these requirements in this Municipality?

Requirements	Effectiveness (1-10)

4. What are the strategies do you currently use as a growth management tool of the town?

5. For how long have/has the above mentioned strategy/ies been in use?

6. How effective are these strategy/ies?

Appendix C: Key informant interviews

University of Venda

School of environmental sciences

Department of urban and regional planning

Target: Planning officials

Section A

Position held

Department

Section B

1. What are the policy requirements for urban containment and urban sprawl in this municipality?

2. On a scale of 1-10 (where 1=effective and 10=not effective) effective are these requirements in this Municipality?

Requirements	Effectiveness (1-10)

3. On a scale of 1-10 (where 1=effective and 10=not effective) applicable are these requirements in this Municipality?

Requirements	Effectiveness (1-10)

4. What are the strategies do you currently use as a growth management tool of the town?

5. For how long have/has the above mentioned strategy/ies been in use?

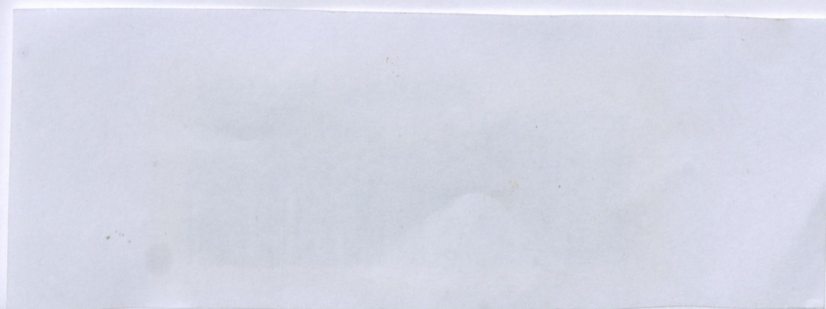
6. How effective are these strategy/ies?

Is the 'Urban Growth Boundary' concept a valuable tool for urban containment? Evidence from Louis Trichardt Town, of Makhado Municipality in Limpopo province.

7. What would you like to change about the current growth management strategy/ies?
8. When did the UGB tool start operating in this municipality?
9. What was the situation before the introduction of UGB?
10. What are the challenges you faced with urban growth in:

Time scale	Challenges
The last 20 years	
The last 10 years	
This year	
The next 5 years	

11. How effective do you think Urban Growth boundary is in this town?
12. What would you say are the constraints of this concept (UGB)?
13. What would you say are the opportunities of this concept (UGB)?
14. With the rapid growth of this town, what can you say would be the best strategy for growth management?
15. What service delivery challenges have you faced with relation to urban growth?
16. What are the containment policies that can be enacted?



Is the 'Urban Growth Boundary' concept a valuable tool for urban containment? Evidence from Louis Trichardt Town, of Makhado Municipality in Limpopo province.

Appendix D: Observational Checklist

1. Existing land uses	
Industrial	
Residential	X
Commercial	X
Institutional	X
Recreational	X
Churches	
Illegal activities	
2. Level of development	
High	
Medium	X
Low	

INSTRUCTIONS

1. Kindly complete the questionnaire by filling in all spaces provided.
2. Use a cross (X) on appropriate boxes.

SECTION A: Administrative

Date: _____

Place of interview: _____

Questionnaire Number: _____



Appendix E: Household Questionnaires

University of Venda

School of environmental sciences

Department of urban and regional planning

2012

Topic: The assessment of urban growth boundary impacts on urban containment of Louis Trichardt, Makhado municipality

Greetings, my name is Nkuzani Ntsako Debbie. I'm from the university of Venda, Department of Urban and regional planning. You have been randomly selected to participate in my research work as part of my requirements for the award of Bachelor Degree in Urban and Regional Planning. This questionnaire serves as a tool to collect information on Louis Trichardt town. The information you provide will ONLY be used for the purpose of this research. I assure you of utmost confidentiality of information you will provide.

INSTRUCTIONS:

1. Kindly complete the questionnaire by filling in on spaces provided
2. Use a cross (X) on appropriate boxes

SECTION A: Administrative:

Date :

Place of Interview :

Questionnaire Number :

SECTION B: Socio Demographics

1. Gender

1	Female
2	Male

2. Age

A	15-20
B	21-30
C	31-40
D	41 +

3. Marital status

1	married	2	Divorced/separated	3	widow	4	Single parent	5	Single
---	---------	---	--------------------	---	-------	---	---------------	---	--------

4. Occupation

1	Farming	2	Trading	3	Unemployed	4	Retired	5	Student	6	Self employed
---	---------	---	---------	---	------------	---	---------	---	---------	---	---------------

7 Other(specify).....

Is the 'Urban Growth Boundary' concept a valuable tool for urban containment? Evidence from Louis Trichardt Town, of Makhado Municipality in Limpopo province.

Section B: Service delivery related questions.

6. Do you have access to municipal services in this locality?

1	yes
2	Yes, but
3	No, not at all
4	Not sure

Explain.....

7. If yes, please tick the appropriate answer from the table below.

Type of service	Yes	Yes, but	No, not at all	Not sure	Comments (if any)
Water					
Electricity					
Transportation					
Roads/roads infrastructure					
Sanitation					

8. How far do you travel to get social and economic services?

.....m

9. What can you say about the current land delivery system?

1	Excellent	
2	Good	
3	Fair	
4	Poor	

10. How would you like the Municipality to improve on their service delivery strategies?

.....

.....

.....

.....

.....

.....

SECTION C: urban Growth Boundary related questions

11. Do you think it is proper for municipality to fix the boundary of a city/town forever?

1	It is very Bad	
2	It is Bad	
3	It is fair	
4	It is good	

Please provide reason(s) for the above answer.

.....

.....

.....

.....

12. How effective do you think has been the municipality in restricting the development of human activities?

1	Not effective at all	
2	Fairly effective	
3	Very effective	
4	Not sure	

Is the 'Urban Growth Boundary' concept a valuable tool for urban containment? Evidence from Louis Trichardt Town, of Makhado Municipality in Limpopo province.

Please provide reason(s) for the above answer.

.....

.....

.....

13. On a scale of 1-10, (where 1=worse off and 10=better off), how would you characterise your living conditions in:

Time scale	Excellent	Good	Better	Worse	Not sure	Comments(if any)
The last 20 years						
The last 10 years						
The last 5 years						
currently						
The next 5 years						

14. What environmental challenges have you experienced in your locality? Rank them according to their severity.

Challenges	Rank
Challenge 1:	
Challenge 2:	
Challenge 3:	

15. Which of the following social challenges have you experienced most in your locality? (you may cross more than one response)

1	No social amenities	
2	Spatial isolation	
3	Long distance travel for social services	

If other, please specify

.....

.....

.....

Is the 'Urban Growth Boundary' concept a valuable tool for urban containment? Evidence from Louis Trichardt Town, of Makhado Municipality in Limpopo province.

16. Which of the following economic challenges have you experienced most in your locality? (You may cross more than one response)

1	Spatially distant from economic amenities	
2	Travel cost for economic services	
3	Located far from economic opportunities	

If other, please specify

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.....

17. What is your reason for staying on this residential area?

1	Low cost houses	
2	Close to work	
3	Availability of job opportunities	

18. Please outline the challenges you face on daily basis.

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19. What should be done to resolve the identified challenges?

Solutions	By whom?
1.	
2.	
3.	

20. Additional comments

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***** Thank you for your time *****