

# The role of an urban hierarchy as spatial planning instrument

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## **PREFACE**

It has always been a passion of mine to understand how regions develop over time. The curiosity to understand this concept has led me through interesting studies, insightful opinions and theoretical principles. All of the last-mentioned studies relate to different dynamics at play that drives development of a region to achieve balanced regional development. Through my studies of regional planning and development over the years, I found that different instruments could be applied in the region to achieve the last-mentioned common development goal. Each of the existing spatial planning instruments applied in a region either gives structure to a region or aims to achieve a short-term goal. The collective success of different short-term goals all contribute to a much large regional vision.

Due to the nature and functioning of a region, the researcher came to the conclusion that the regions should be seen as living organisms. These living organisms develop and grow over time due to the relationship and simultaneous functioning of different organs or parts each with a specific goal. By studying the history of regional planning and the application of spatial planning instruments, I found that existing spatial planning instruments are applied in a region to create a desired isolated effect individually. The need for a spatial planning instrument that combines regional planning instruments as well as their specific roles and dynamics to guide development of a region in a sustainable and balanced manner became evident to me. The idea of this research is to illustrate the role and application of such a spatial planning instrument. This spatial planning instrument that combines all the dynamics and roles of existing instruments is the urban hierarchy of a region. The urban hierarchy of a region combines the functioning, role, relationships and dynamics within a region through various aspects. Therefore, the role of an urban hierarchy as spatial planning instrument was investigated during the course of this study.

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*Psalm 18:32-33: It is God who arms me with strength and makes my way perfect. He makes my feet like the feet of a deer; He enables me to stand on new heights.*

## **ABSTRACT**

In general, regional development over time results in an unbalanced spatial pattern and distribution of nodes. A spatially unbalanced region is likely to be directly linked to functioning and dynamics of the nodes in that specific region. Depending on the type and role of each node in a region, some nodes develop and establish themselves faster in a region, resulting in the development of a natural urban hierarchy. The urban hierarchy is therefore related to the dynamics and relationships between a set of nodes in a region. In time, certain nodes excel in development related to the relationship with other nodes in the region, hence the spatially unbalanced distribution of nodes in a region.

Over the years, regional planners studied the different factors contributing to the development of a region and its urban hierarchy. Theoretically, regional planners aimed to strategically guide the development in the region to create a more spatially balanced region and distribution of nodes. In terms of the urban hierarchy, regional planners aim to establish a gradual distribution of the number of nodes and the level of development. This spatially balanced approach is pursued through the implementation of different spatial planning instruments, aimed to guide the development of the region in a balanced nature. Spatial planning instruments such as nodes, corridors, planning regions, etc. are applied in a region in an effort to create the desired development of the region and urban hierarchy.

Despite different strategic planning efforts, unbalanced growth in the region and hierarchy prevails. These efforts and instruments that are applied are focussed on the desired effect without considering the urban hierarchy and potential of the nodes in the urban hierarchy. The actual role of an urban hierarchy in regional planning is not considered as a spatial planning instrument. In this research, the role of an urban hierarchy as spatial planning instrument is investigated. To illustrate the different effects and impact an urban hierarchy can have in spatial planning, different applications are used on a national and sub-continental scale.

The methods used in this research to illustrate the significance of an urban hierarchy as spatial planning instrument, are based on both theoretical and practical principles used today. By applying these principles, it was found that an urban hierarchy as spatial planning instrument could play a significant role in creating a more balanced spatial distribution of nodes in a region. In addition to this, an urban hierarchy can also be used to integrate and link different nodes and regions in order to establish positive and sustainable economic relationships.

**Key Terms:** Urban hierarchy; Spatial planning; Spatial planning instrument; Regional planning instruments; Unbalanced growth; Balanced growth; Spatially balanced region; Spatially unbalanced region

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# CHAPTER 1: RESEARCH ORIENTATION

## 1.1 Introduction

In this chapter, a general research orientation is provided to inform the reader of the structure, problems, questions, aims, objectives, basic hypothesis and potential need for utilising an urban hierarchy as spatial planning instrument. The general approach to the research and introduction of the central theme of this thesis are concluded in this chapter. The outline of the methodology and elements included in the research are discussed and briefly arranged in the chapters of the thesis. Firstly, it is important to consider the problems that informed the need and questions of this research theme and what the expected outcomes are.

## 1.2 Problem statement

Regions naturally consist of a predominant unbalanced spatial pattern, which have been a major area of focus in regional planning globally (Glasson and Marshall, 2007:12). As a result, various regional planning instruments are being implemented to address this challenge and promote a more balanced distribution of nodes. Nodes and corridors are primary regional planning instruments that are implemented in various ways to guide regional development into a more balanced nature (Glasson, 1985; Ainamo, 2002; Roberts and Fisher, 2006; Friedmann, 1986; Pumain, 2006). Often these instruments are implemented in isolated attempts to create or alter regional structure. A general lack of an integrated approach combining different instruments is experienced all over the world (Glasson and Marshall, 2007:14). Despite these efforts, the unbalanced nature of a region prevails as a result of the existing urban hierarchy that was established over time.

Globally, different urban hierarchies have matured and evolved which is linked to the different development stages of regions (Berry, 1964; Friedman, 1978; El-Shanks, 1984). These development stages of regions are linked to the economic activity and interaction between nodes. The interaction between the nodes is based on the specific role and locality of each node, which influences the development of the urban hierarchy (Roberts, 2014:11). The level of interaction between nodes in the urban hierarchy differs due to different node sizes, functions and distances between them (Pumain, 2006; Hauptfleisch *et al.* 2010). Apart from the internal interaction, irregular external factors from regional growth strategies can also impact the development of the urban hierarchy (Boudeville, 1972:19).

Traditionally, the most fundamental issue dealt with in regional growth strategies is whether to attempt a massive, "big-push" development effort (balanced growth), or to concentrate on raising growth rates in selective economic sectors (unbalanced growth) (Nurkse, 1953:82). Many

economists maintain that successful regional growth and development require a large-scale investment programme (balanced growth), while others believe that a more modest, selective approach (unbalanced growth) seems more feasible (Rosenstein-Rodan, 1943; Lewis, 1956). The impact these approaches can have on the development of a node and subsequently the urban hierarchy is vital. In general, these regional growth strategies are supported by existing regional planning instruments that are specifically aimed to promote growth in specific areas (Hirschman, 1958:58). The absence of an integrative growth approach, within the specific development phases of a region, combining the urban hierarchy and planning instruments is noted in various planning efforts. The lack of an integrative approach will continuously result in fragmented and unbalanced growth in regions and nodes.

Unbalanced and undiversified urban hierarchies in regions are experienced world-wide despite regional planning attempts to connect a rhythm or calculation of cities to a regional planning strategy that promotes spatially balanced regions (Pumain, 2006:169). Limited approaches with proven success where regional planning instruments are combined with the urban hierarchy are available to consider in regional planning globally. Partial successful approaches in the promotion of a more spatially balanced region are found mostly in developed countries with in more advanced development phases (Friedmann, 1986:70). A general lack of an integrative and development phase specific approach to promote a spatially balanced region is experienced in developing countries. This lack contributes to the predominantly unbalanced spatial nature of urban hierarchies and regional development. Specific research questions are formulated in the following section to address the challenges discussed.

### **1.3 Research questions**

As seen in the section above, the challenges discussed could potentially impact regional planning, approaches, applications and outcomes. The formulated research questions aim to address the challenges in the previous section as well as general aspects associated with these challenges. The questions related to the section above can be introduced as follows:

1. Will a higher level of spatial balance be achieved if spatial planning instruments target specific urban hierarchies?
2. Can appropriate urban hierarchies in regions be determined relevant to their unique development phases?
3. Is it possible to recognise similar social and economic characteristics in nodes within an urban hierarchy in a specific development phase?
4. Would planning regions in different phases of development benefit from customised policy approaches?

The research questions above led the researcher into a focussed study and research approach to address the discussed challenges. These questions serve as an indication of where and how the research can fit into regional planning globally. The questions guide the aims and objectives of the research findings.

#### **1.4 Aims and objectives**

The prevailing unbalanced spatial system of regions all over the world is the one of the major regional planning challenges. The primary aim of this thesis specifically focuses on this challenge by carefully considering the role of an urban hierarchy as spatial planning instrument. A potential opportunity exists to integrate spatial planning instruments and urban hierarchies in an encompassing approach in an attempt to address the mentioned challenge. Such an integrative approach is explored and considered as a potential approach to address the spatially unbalanced nature of regions. The following objectives of this research can potentially help to address the research questions identified in the previous section:

1. To derive unique insights by combining spatial planning instruments with urban hierarchies in an integrative approach and illustrate how these insights might assist in achieving progress towards a higher level of spatial balance in a region.
2. To determine appropriate urban hierarchies relevant to a region's unique development phase.
3. To interpret an urban hierarchy through nodes with similar social and economic characteristics, relevant to the region's development phase.
4. To determine and potentially propose customised policy approaches for a planning region in different phases of development.

From the objectives listed above, it was expected that the research questions would be addressed in this thesis and would ultimately result in a positive contribution to regional planning. The collective achievement of the aims should illustrate the role of an urban hierarchy as a spatial planning instrument in the modern regional planning era where detailed published statistics, new technology and different techniques and approaches can potentially improve effective regional planning.

The proposed approach to regional planning in this thesis should be universally acceptable, based on the development status of a region. For the purposes of this thesis, case studies were included based on South Africa (regional perspective focus) and on the sub-continental level with a specific focus on developing countries. If this integrative approach is considered, the spatial structure of regions could potentially benefit from a more interrelated regional economy unlocking growth and promoting a more diverse urban hierarchy. From a regional perspective, different investment areas and regional nodes are proposed for specific growth strategies. By potentially considering the

proposed integrative approach, the strategic structuring of the urban hierarchy of a region, might contribute towards a more spatially balanced region.

The integrative approach as proposed can also potentially influence international spatial systems. International aims can include the creation of an integrative economic environment between different regions or countries, for example the Southern African Development Countries (SADC). The SADC is used as a case study where various developing countries were included as a planning region and study area. This existing region holds potential to be integrated as a planned region with a strategically proposed urban hierarchy aimed to achieve progress towards spatial balance, depending on the region's development phase.

Much like the concept of sustainability, a spatially balanced region is a theoretical goal that is potentially pursued through different regional planning approaches. Although some approaches have made contributions towards a more spatially balanced region, this concept remains largely unachievable. The study would potentially reveal approaches to integrate and restructure urban hierarchies in developing countries relevant to its development phase. In achieving the general aim and related objectives, it is expected that considerable progress towards a spatial balanced region could potentially be made.

## **1.5 Research hypothesis**

Considering the underlying topic of unbalanced spatial systems in regions as well as the aim and objectives discussed in the previous section, a research hypothesis could be formulated. *Firstly, it is expected that if an integrative approach (where spatial planning instruments and urban hierarchies are combined) for specific development phases in regions are considered, unique insights could be revealed that will contribute towards a more spatially balanced and integrated region.* Although the spatially unbalanced nature of regions will remain, progress towards a more balanced urban hierarchy will potentially be made. These unique insights will then succeed in explaining the role of an urban hierarchy as a spatial planning instrument that could add new value and contributions to regional planning in general.

*Additionally, this research can potentially suggest that an integrative approach could only be considered in regions in advanced development phases.* In this case the current urban hierarchies in regions cannot be strategically positioned to change and diversify the structure of the urban hierarchy, which will continue to grow in a more unbalanced spatial nature. If the urban hierarchies in regions will continue to grow in a more unbalanced nature, it would suggest that unbalanced regional planning approaches should still be applied to create a more spatially balanced region. Therefore, the findings might indicate that an urban hierarchy has no specific role

as spatial planning instrument and is merely a result of natural growth and interaction within a region.

The testing of the two discussed hypotheses above is illustrated in the last chapter of this thesis. In both these hypotheses, this research should contribute significantly in terms of providing valuable insights regarding the relationship between spatial planning instruments, urban hierarchies and regional development phases. The relationships between these elements is updated with a more modern era focus including the impact of available statistics, new technology and different techniques, specifically focussed on the urban hierarchies of developing countries.

## **1.6 Methodology**

The methodology of this thesis consists mainly of two approaches, namely the theoretical investigation and the empirical research and application on different geographical scales as mentioned in the international and national spheres. These approaches and concepts in the first two parts of the thesis are combined in the third part, which specifically refer to the synthesis and recommendations of the research.

### **1.6.1 Literature review**

As part of the literature review, different regional planning theoretical concepts that specifically relate to the development and dynamics of the region were reviewed. Regional development in general consists of various themes that have an impact on the development of a region. The following three these themes formed the primary literature topics of this research:

1. The dynamics of an urban hierarchy and the relationship with central and non-central places
2. Existing regional planning instruments and their dynamics
3. Balanced and unbalanced growth in a region

A geographical approach to urban hierarchy can be interpreted as the spatial organisation of nodes (places) in a region. Urban systems, settlement patterns and growth have a great impact on the establishment of an urban hierarchy within in a region. Berry (1960:153) explained urban systems as the hierarchical organisation of activities. The urban system in this case also includes the system of nodes belonging to it in the surrounding area. The hierarchical organisation of the systems or nodes relates to the establishment of an urban hierarchy. This hierarchy of nodes are also related to the types of places and the level of interaction. Each of these places fulfils a specific role in the region and contributes to the general regional interaction, ultimately contributing to the establishment of an urban hierarchy.

Depending on the geographic location, roles and functions of these places, central and non-central places can be distinguished. Christaller (1960) studied these places in terms of the number of services and functions in the Central Place Theory. These services and functions are linked to the different economic sectors that influence the size of the central places and ultimately its rank in the urban hierarchy. The central place theory was based on the assumptions that geographical areas are uniform. This assumption was the birth of the development of an opposite theory – the non-central place theory. Richardson (1973:170) found that the geography of regions differs in terms of distribution of different types of places. The different geographies result in different and unique challenges and benefits in each of the individual central and non-central places. The dynamics between these places will potentially illustrate that central and non-central places are directly linked to the establishment of an urban hierarchy of a region in a specific phase of regional development.

These dynamics in the urban hierarchy can potentially provide insights into the application of an urban hierarchy as a spatial planning instrument. Considering the potential role as a spatial planning instrument, it is essential to first review the current use of regional planning instruments in spatial planning. This forms the second central theoretical theme applicable to this thesis. Regional planning instruments are used in regional planning to guide and facilitate the general growth and development of a region in general. The application of these regional planning instruments can be from various geographical levels including, international, national, regional etc. The regional planning instruments considered as part of the literature review of the research are nodes, corridors and the use of a planning region. The inter-relationship and dynamics between nodes should be studied to determine the impact on the urban hierarchy of a region.

Interaction and relationships between different nodes are supported through corridor development. The interaction along a corridor can be of different intensity, varying between different types of corridors and linked nodes (Glasson, 1985:78). Corridor development is successfully implemented and regularly used in spatial planning globally. This regional planning instrument consists of the ability to unlock interaction between different areas. Integration and interaction on regional level is encouraged through the implementation of this planning instrument. The integration and interaction between the different order nodes is associated with economic activity and subsequently contributing to the urban hierarchy of a region. Boudeville (1972) linked the economic activity in a region to geographical points or nodes. Between these nodal points are interaction which varies in terms of intensity and volume. The urban hierarchy of a region is linked to the interaction between these nodal points.

The interaction between nodes and different regions in terms of the mentioned activities is determined by the level of development in the region (Friedmann, 1966:17). Depending on the

frequency, type of interaction and the different origins and destinations this interaction impacts growth in a balanced or unbalanced nature. Balanced and unbalanced growth is significant in regional planning in general, with various authors discussing the types of growth in a region (Rosenstein-Rodan, 1943; Nurske, 1953; Lewis, 1956; Hirschman, 1958; Ohlin, 1959; Danino-Pastore, 1963; Temple, 2008). Regions in general exhibit unbalanced growth due to different social and economic dynamics, resulting in unbalanced spatial growth in a region. Balanced regional growth and a spatially balanced distribution of nodes are both theoretical perceptions that are continuously addressed in regional planning. Different views and research on the type of growth were reviewed and updated with the modern research on this issue.

### **1.6.2 Empirical research**

Regional planning traditionally uses only a limited number of planning instruments that can be implemented to achieve growth. This research aims to propose a new approach where the urban hierarchy can be used in an integrative approach to promote growth in strategically selected areas or nodes in specific development phases. The primary approach of the research is to illustrate that urban hierarchy can be utilised through an integrative approach on different geographical scales to support regional growth. The different geographical scales implicate that the theory and discussion should be focussed on different scales and phase of development.

From a South African perspective, the research focussed on the Northern Cape Province which consists of a predominantly unbalanced urban hierarchy and spatial system. This is mainly because of the challenging climate, the lack of development supporting infrastructure and limited interaction between towns and bigger cities (De Beers, 2009:42). The unbalanced spatial profile referred to here, is the unbalanced nature between the distribution of large, medium and small nodes and towns. The Northern Cape is home to various small nodes and only one major economic node (Kimberley) that is supported by intermediate other nodes such as Upington. From this statement, it is clear that the province consists of an unbalanced spatial system and urban hierarchy. The Northern Cape Province is also well-known for the prominent mining sector, which holds the potential to unlock great economic development in South Africa. The province has a relatively low level of development; therefore, the impact of regional planning instruments may potentially be measured more easily considering limited growth, generally an undiversified economy and vastly unbalanced urban hierarchy. Traditionally, national growth strategies were more focussed on metropolitan and more significant nodes with more advanced and developed economies.

On the sub-continental scale, the development of Africa is equally important. The SADC plays an important role in regional development in the sub-continent. If development goals are met as set out by the SADC, Africa will start to see a steadier growth pattern spatially. Regional co-operation

and integration in Southern Africa owes its origin to historical, economic, political, social and cultural factors that have created strong bonds of solidarity and unity among the peoples of Southern Africa (SADC, 2012:18). This research will be applied as a tool to help the SADC in achieving growth in Southern Africa and ultimately Africa. The entire SADC holds potential to be planned as one spatially integrated region enhancing the development of the SADC members and the strategically positioning of South Africa in Africa.

This empirical section consists of both qualitative and quantitative data. The qualitative data consists of regional development policies in South Africa and the SADC's view on development and economic growth strategies. Quantitative data formed the core of this research and included the use of different datasets. The quantitative data was combined, compared and illustrated. On both scales mentioned above, development policies and strategic visions played a significant role in the development of the applicable area. The development, vision and principles of these policies are very important in the implementation of the research. Growth policies and strategies were studied to ensure that lessons learned, best practices and the current status-quo were considered in this approach. The last-mentioned clearly illustrates the vision and rationale of each of the governing bodies' development vision from a top-down perspective.

### **1.6.3 Synthesis and recommendation**

With the last section of the thesis, the researcher aimed to combine the different components as discussed in the literature review and the empirical research. This combination included an integrated approach of the theoretical and empirical perspectives. In general, the core elements in both sections are concluded after which the impact and relevance to the theme of this thesis are discussed. Contributions and opinions to certain aspects discussed are included after considering different views and opinions of other authors.

From the empirical research, the lessons learned and successful approaches from a policy point of view are used in the conclusion of the integrative statistical approach on both the delineated study areas. During this section, the testing and findings from the discussed hypotheses are included and used to inform the recommendations of the general integrative approaches. The recommendations and the testing of the hypotheses would then potentially confirm the role of an urban hierarchy as a spatial planning instrument.

## **1.7 Thesis arrangement**

The following section serves as guidance to the general arrangement and contents of the different chapters and explains the systematic approach followed in this thesis. The chapters and contents are arranged in this specific order to firstly illustrate the theoretical principles applicable to the research after which the empirical research and evaluation are applied on both the national and

sub-continental scales. The combination of the theoretical principles and the evaluation in the empirical research are then applied in the final strategic planning chapter where the testing of the hypotheses is conducted.

This chapter (Chapter One) is the roadmap and orientation of this research. The purpose of this chapter is to provide the reader a general overview of what to expect in terms of content and structure of the thesis. In addition to providing a general overview and orientation, this chapter discussed the problem statement and reason for the research and indicated the outcomes and aims applicable to the research. This chapter aims to give the reader a general broad idea what exactly is planned in the thesis. The overview and focus of the chapter in terms of the literature review and empirical research serve as a broad outline of the general methodology and approach in this research.

In Chapter Two of the research, the researcher aims to inform the audience of this thesis of the general research approach, paradigm and research purpose. The specific paradigm in which this research was done explains specific considerations in terms of the approach to how the research was conducted. This chapter provides context into different considerations, gathering of data and how it was managed. The core logic in the methodology and sources used in this research is related to the philosophical framework of an interpretivist. Although the general approach of the research was from an interpretivist's view, some elements of positivism also surfaced. Considering both of these, a mixed method was followed in terms of the general processing of the data. This chapter provides insights regarding the research design and context, which informs the audience of what to expect from the approach and findings.

Chapter Three of the research is the first chapter that relates to the literature review. In this chapter, existing regional planning literature related to regional planning instruments in general are reviewed. The literature is grouped as regional planning instruments and includes nodes, corridors and planned regions. The grouping of these spatial planning instruments is done to illustrate the significance of the instruments in regional planning and the review the underlying functions and dynamics of each instrument. These theories, development and approaches of the spatial planning instruments are discussed and updated with modern research. The review of these instruments guides the approach and general methodology to consider in the following chapters.

Chapter Four focusses on the types of regional growth scenarios that occur in a region as well as the different methodologies of regional delineation. The different methodologies and need to demarcate regions explain different approaches applied in general to delineate regions in which spatial planning could be focussed on. The discussion of the delineation methods refers to the impact of a corridor and the significance of this regional planning instrument. As development of

the region progresses, different development phases are noted and discussed. Different growth scenarios of regions in the discussed development phases entail both balanced and unbalanced growth in a region as a result of regional planning instruments. These different approaches to the development of a region are explained in the revision of different author opinions, research and studies conducted previously and in the modern era.

In Chapter Five, the final literature theme and element of the literature triangle are reviewed. This chapter specifically focusses on urban hierarchies in general. The functioning of an urban hierarchy and urban systems is discussed to understand how urban hierarchies develop in a region. Different views of authors are included to reveal the urban hierarchy in different development scenarios. In addition to this, central and non-central places are discussed to illustrate the different relationships between the types of places and the interaction with the existing urban hierarchy and region. The links between central, non-central and urban hierarchy are included to explain the interconnection between these three elements. The paradigm shift between the different types of places in isolation to the relationships in an urban hierarchy concludes this chapter and informs the potential for an urban hierarchy as spatial planning instrument.

Chapter Six forms the first chapter of the empirical investigation of the thesis. The first part of the chapter includes the delineation of a regional perspective study area based on national spatial planning significance as well as the methods studied in Chapter Four regarding the regional delineation process. The regional delineation process on the regional perspective study area entails a preliminary evaluation of the provinces of South Africa, from where the Northern Cape Province is demarcated as the study area and planning region. A set of evaluation criteria is then considered and explain to outline the methodology and determine a regional urban hierarchy based on spatial planning and statistical significance. The evaluation of the different regions of the regional perspective study area would be conducted in the last section of the thesis. After the evaluation phase, the applicable regional plans and policies for the study area that were applied over time on regional perspective.

The national regional planning policies applicable to South Africa and the regional perspective study area were studied in Chapter Seven. These plans and policies discussed are used to depict significant lessons and approaches that were implemented over the years in an effort to create a determined structure for spatial development. The lessons learnt and approaches followed in these policies of the regional perspective study area are considered in the last section of the thesis.

The revision of the policies above reflects on the importance of strategically positioning South Africa in the global and continental economy. This will inform the delineation and need for

strategic spatial planning on a sub-continental scale discussed in Chapter Eight. Based on the outcomes and need identified in the NDP and vision of the SADC, the sub-continental study area will be delineated along the SADC country members. In the NDP South Africa is seen as the gateway into Africa. Links between South Africa, Kenya and Angola need to be established to strategically position South Africa and promote integration in the African continent. A preliminary evaluation of SADC member countries identifies the most stable countries that could be considered as possible linkages. The rest of Chapter Eight evaluates these countries through a similar approach followed in Chapter Six. This methodology based on the spatial planning and statistical significance of each country.

As seen in Chapter Seven, the value of the existing regional plans, strategies and policies are imperative to be considered in the strategic planning process. In Chapter Nine the applicable approaches and development plans of the SADC are studied. From these existing initiatives, a common focus of creating an integrated and interrelated SADC state is identified. These outcomes relate to the role of an urban hierarchy as spatial planning instrument on a sub-continental scale. Through the study of these documents, the potential role of an urban hierarchy as spatial planning instrument in the sub-continental scale study area starts to develop.

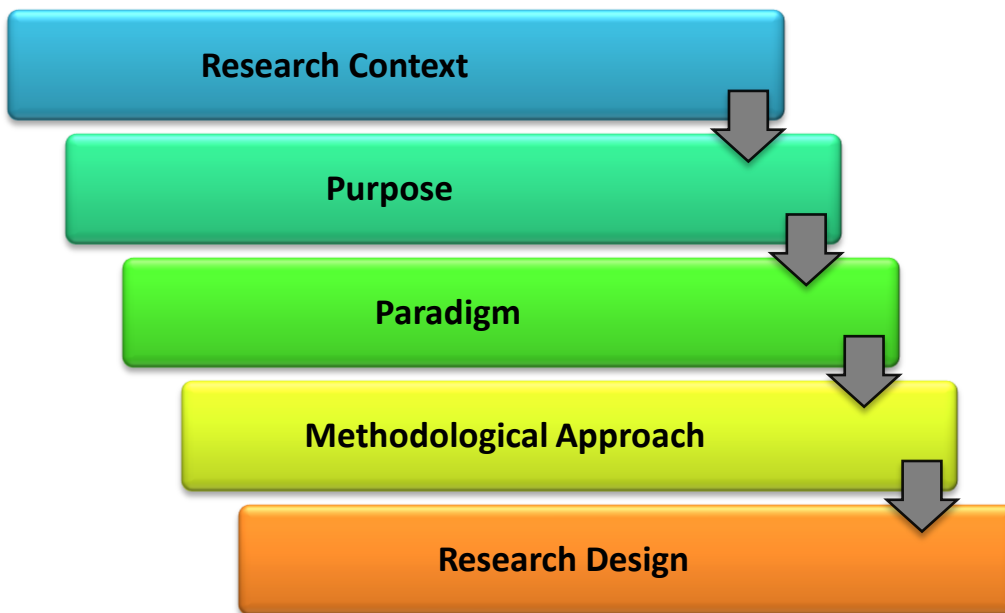
Chapter Ten, the final section of this thesis, focussed on the strategic planning process on both the regional perspective and sub-continental study areas. In this chapter, the hypotheses (Chapter One) are tested in the consideration of both study areas. Before the strategic planning processes and methodologies followed in each of the study areas, a general synthesis of the previous chapters is included to illustrate the integrative approach from a literature as well as the applicable empirical point of view. Strategic planning and recommendations in the study areas are informed by considering the integrative approach of spatial planning instruments as well as the urban hierarchies. The findings from this approach would potentially support the stated hypotheses. The recommendation and proposals made in this chapter are purely based on the proposed integrative approach of the urban hierarchy as spatial planning instrument.

## CHAPTER 2: RESEARCH METHODOLOGY

### 2.1 Introduction

The previous chapter focussed on the research orientation, including the discussion of the problems, aim, objectives and hypothesis. These served as a general introduction to the research, its necessity, what to expect and how it fits into general modern regional planning. With these elements forming the research orientation, it is equally important to understand the research approach, in which framework and paradigm the research purpose is seen and what core logic and sources apply to the research themes.

In this section, the researcher starts by first explaining the research context and purpose, after which the general approach and design follow. The philosophical logic of an interpretivist and pragmatic methodological approach all relate back to the specific research design, context and purpose. By creating an understanding of the philosophical foundation that the research was conducted on, the reader can clearly form an understanding of what to expect from this research and in what specific context it applies within the built environment and more specifically regional planning. The following figure illustrates the general outline of elements discussed in the chapter.



**Figure 2-1: Research typology**

Source: Own interpretation

### 2.2 Research context

The research orientation discussed in the previous chapter served as an introduction and guideline to give context to the research and to form an idea of the research purpose. By studying the

problems, objectives and aims discussed in Chapter One, it can be concluded that the research predominantly originated from a theoretical context, with a clear practical application. In terms of the theoretical context, Best and Khan (2006:10) state that a theory can merely be described as an attempt to develop a general explanation of a certain phenomenon, in this case modern regional planning.

Verma and Mallick (1999:6) on the other hand, differ from Best and Khan (2006:10) by stating that the main role of a theory is to guide the researcher in his/her investigation. With regard to this study, regional planning theory acted as a guide to the researcher in the investigation while attempting to develop a general explanation of the applicable theoretical topics as set out in Chapter One. The aims of this research integrated both theoretical and empirical contexts in an effort to propose a different and unique approach in regional planning.

In many research fields and different social disciplines, it is often found that the theoretical foundation of a specific topic and the practical application and implementation thereof differs from the mental image formed by the researcher and theorists. Neuman (2006:432) supports this statement by explaining that the theory or type of theory merely explains an ideal case that can be used for comparison or application purposes. Many theories are built upon clearly defined assumptions as seen in the Central Place theory (to be discussed in Chapter Five). As a result of this phenomenon, the research of different theoretical topics, the interpretation and the application always try to keep these theoretical topics relevant. The theoretical topics are kept relevant within the current era by continuously refining the applicable principles. A study of the applicable theoretical principles in any topic therefore forms the first parts of research in these fields.

In this study, the same process applied as the author began to form an understanding of the applicable topics within his philosophical framework. This research was conducted within the framework of an interpretivist theory in which different elements in the research originated through the regional planning interests of different shared meanings, descriptions and instruments applicable in the discipline of the profession. The author believes that access to reality is limited to social constructions, shared opinions and instruments. In general, the research was conducted from a subjective point of view where the author believed that different people make their own decisions and attempts to interpret the world by placing himself in the position of other people, researchers or authors. According to De Villiers (2005:12), an interpretivist aims to explore new interpretations or significance and adheres to the ontological assumption of various realities, often time and context specific. Reeves (2000:6) continues by adding that an interpretivist determines how something works by describing and interpreting different phenomena regarding processes, performances and innovations. Reeves' statement can be related to Neuman (2006:432) that theories are used for comparison and application purposes used by other research to propose

innovate and develop new applications. Klein and Myers (1999:72) emphasise that interpretive studies can provide deep insight into this phenomenon and the development thereof.

As an interpretivist, the researcher focussed on different views of various researchers in regional planning and other disciplines. De Villiers (2005:13) supports this statement, explaining that interpretivism leads to subjective findings which differ between the different researchers and themes. In De Villiers' (2005:13) research, he found that an interpretivist explores the different findings and views on regional planning of various authors on a specific topic of research. Crotty (1998:79) believes interpretivists are considered as realists and that they believe in multiple realities and the application of different opinions on a theory. Crotty (1998:79) also feels that an interpretivist has a subjective view and interpretation of a certain aspect, adding value to specifically the social studies field in general. These differences in opinion and views are further investigated, explored and described within the topics of the theoretical foundation of the research. The next step in the process and the arrangement of this thesis included the adaption of multiple methods and approaches used in regional planning aimed to reflect the different aspects of the topics.

In the following three chapters of this research, the different theoretical topic's angles, opinions and approaches from different sources and eras are investigated and interpreted. This forms a core understanding of the applicable concepts that helped the researcher to explore existing approaches and to potentially propose new avenues within these foundations. This exploration and interpretation process enabled the researcher to effectively link, examine and apply the topics in new methods in regional planning. The first part of the research topic, "*The role of an urban hierarchy...*" created the expectation and interpretation environment of a clear theoretical concept that applies to the research. This relates to the philosophical framework in which the research was done, by exploring and interpreting the different angles of the theory in this research.

The theoretical exploration and interpretation process serves to contextualise the improved implication of the research topic. The "*...spatial planning instrument*" part of the topic of this thesis indicates and leads the reader to a clear practical aim and impact based on the theoretical foundation. This approach aligns with Crotty's (1998:179) view of the interpretivist paradigm and methodology that study and interrogate the theoretical foundation in an effort to expose different applications and realities engaged in the current social structure and dynamics. By combining the two core focus areas in the topic, idea that the general context of the research would potentially be applied started to form. This potential application was also confirmed in the research aims that were discussed in the previous chapter. When referring to Chapter One of this research (Research orientation), it is equally important to understand the general purpose of conducting the research in the first place.

### **2.3 Research purpose**

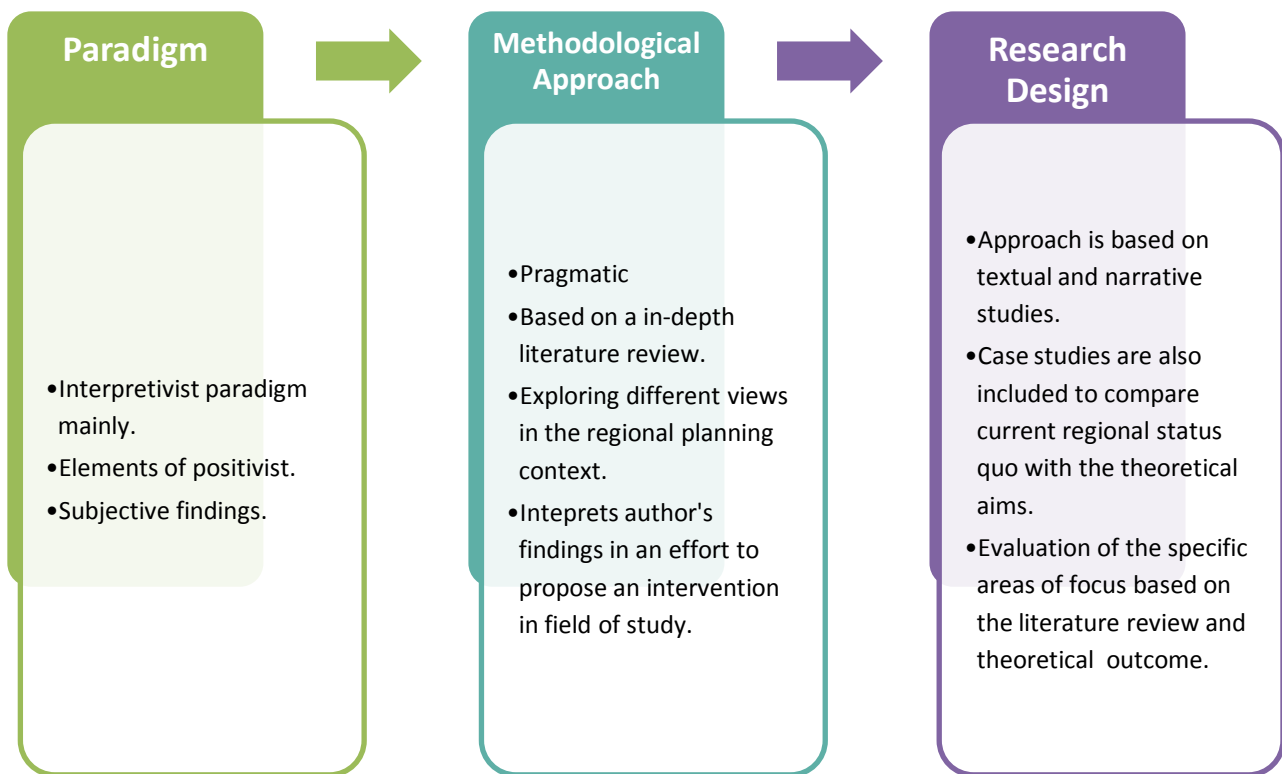
The research in general aimed to consist of a formative nature that included a range of formal steps and approaches taken in the study. With the formative expectation that is created, the reader can anticipate a qualitative feedback that is focussed on the content and performance explored later. The qualitative feedback immediately formulates the methodological approach followed during this research (to be discussed in the following sections). The benefits of this formative research purpose are that it naturally contains the study of skills that can potentially be acquired by any regional planner. This, in turn, potentially intrigues the reader that the value of the research is that, through the understanding of this topic, these skills could further enhance the regional planning ability.

These potential skills and enhanced regional planning ability are implemented through the evaluative approach (linked to the interpretivist paradigm) that is followed in different geographical levels. Based on the framework of an interpretivist, Thomas (2010:296) explains that the interpretivists do not aim to generate new theories by specifically evaluating existing opinions and angles from different researchers on a specific theoretical theme. This evaluative research determines the impact through the intervention research design. The evaluative research section analyses the impact of the particular intervention of understanding the role of an urban hierarchy as a spatial planning instrument. By thoroughly assessing the role of an urban hierarchy as spatial planning instrument, the regional planner can judge this potential contribution through the topic aimed information and observations provided by the researcher. During the discussion of the research context and purpose, clear aspects of the research design (discussed later) surfaced. It is necessary to understand these aspects of the research design and how exactly the design is integrated within regional planning of the twentieth century to further advance into the thesis and general approach. Bound to the interpretivist paradigm, this thesis has a specific approach to the study with a clearly defined strategy and design considering the regional planning context.

### **2.4 Research paradigm**

As seen from the previous sections, the research context and purpose, it was explained that the interpretive approach of the researcher plays a significant role in the overall thesis. The methodology of this research was strongly based on an interpretive paradigm. This paradigm, as mentioned before, appreciates and explores the different opinions and approaches of other theorists and regional planners before a logical intervention is proposed. This intervention (the application and role of an urban hierarchy as spatial planning instrument) is based on a clearly defined evaluation and application in Chapters Six and Eight of this thesis.

The intervention, as described above, also clearly directs the researcher into a pragmatic methodology in which he recognises that there are different ways and approaches that could be applied to achieve a certain outcome. Creswell (2003:11) confirms this by stating that many forms of pragmatism can be found in this field of study. He (2003:11) continues by revealing that many of the pragmatic approaches include a methodology of accumulating different outcomes of situations and consequences rather than antecedent conditions. This pragmatic paradigm also relates to the interpretivist's framework of accepting these differences.



**Figure 2-2: Interpretivist paradigm, approach and design**

Source: Adapted from Thomas (2010:296)

The figure above illustrates the related general approach and research design and strategy within the interpretivist paradigm for this specific thesis. This section clearly explains that this study was based on an interpretivist framework, although some elements of positivism can be found. This also allows for a unique approach, research design and strategy for the purpose of this study.

These concepts studied through this philosophical framework and paradigm can only be seen relevant if the approaches are followed by supportive actions and steps. The actions and steps mentioned here are integrated into the formative/evaluative research purpose that promises the reader to potentially gain a set of skills and apply it in their regional planning knowledge. Mouton

(2010:35) states that formative and evaluative research is likely to be associated with research designs that are dominated by a pragmatic approach to reality and data. Considering that the research methodology of this study was primarily conducted from an interpretivist framework, it was expected that a formative/evaluative research with a pragmatic philosophy would be used.

The pragmatic paradigm, in which the research methodology is nestled, is a result of the research questions discussed in Chapter One of the research. These questions form the most important factors responsible for adapting the discussed research paradigm. The nature of these research questions creates the opportunity to follow a methodology combined by both common positivist and interpretivist approaches. Henning *et al.* (2004:17) explain the main difference between the mentioned approaches by stating that positivism is focussed on revealing the truth by supporting the findings through empirical means. Although the study and approach were generally more focussed on an interpretivist approach, the researcher utilised more than one position and opinion to conduct the study which is commonly known as a pragmatic research methodology.

This methodology can also be compared to architects and structural engineers who use the best practically available materials to construct or complete the designed structure. These two professions (also linked to the built environment) do not necessarily implement multiple approaches. Different approaches are rather combined to come up with an improved solution to the problem, which can be specifically applied to the structure. This research fit within this discussion, where different methodologies were combined as a collective effort to address the research problems in Chapter One.

## **2.5 Methodological approach**

The collective effort mentioned above consists of a mixed methodology by using both qualitative and quantitative approaches. Researchers have recognised that all research methods have limitations and by rather using a mixed methodology, biases formed in any single method could be neutralised or cancelled (Creswell 2003:15). As a result, different reasons for mixing these methods were used. Greene *et al.* (1989:257) believed that the results from one method could help develop or inform another method (Greene *et al.*, 1989:257). Alternatively, Tashakkori and Teddlie (1998:61) explained that, by combining methods, it could help to provide insight into different levels of analysis.

According to Creswell (2003:18), a quantitative approach is one in which the researcher primarily uses post-positivist claims for developing knowledge, conducting experiments and collecting and analysing statistical data. A quantitative approach therefore is focussed on research testing a hypothesis by collecting various statistical based data and analysing this data through interpretation and experiments. Gephart (1999:27) states that a positivist focusses on experimental and quantitative methods to test theories through the combination of data and other

samples. Sobh and Perry (2005:1) feel that a quantitative research approach essentially involves the use of numbers (statistical data) and various samples to test theories.

From these opinions and views on a quantitative research methodology, it is clear that a positivist focus was followed in studying and analysing data and other theories. The quantitative side of the research was more focussed on the discovery of facts (research on various sources of the applicable theme) that is supported by a measurable reality (statistics retrieved from various census publications and statistical yearbooks).

Creswell (2003:20) states that a qualitative approach is one in which the researcher often makes knowledgeable claims based primarily on constructivist perspectives through a narrative design and interviews and on gathering different views and opinions of a certain matter with the intent of developing themes from the data. Sobh and Perry (2005:1) see a qualitative approach as a method in which researchers use words and opinions in smaller samples to test and build theories. Creswell (1998:51) supports the last-mentioned opinion by confirming that such an approach describes the experience of various individuals about a theme normally captured through interviews and different observations. From a qualitative point of view, the conceptual framework of this research concerns the results of natural development and regional growth behaviour (observations) by understanding the applicable perspectives of the research as studied in the theoretical foundation of the thesis.

According to Creswell (2003:18), a mixed methods approach is one in which the researcher tends to base knowledgeable claims on pragmatic grounds. It employs strategies of inquiry that involve collecting data either simultaneously or sequentially to best understand research problems. The data collection also involves gathering both numeric information (e.g. on instruments) as well as text information (e.g. on interviews) so that the final database represents both quantitative and qualitative information. Brysman and Burgess (1999:45) explain a mixed methodology by stating that such an approach includes taking advantage of both quantitative and qualitative approaches by combining these methods in one research. Byrne and Humble (2007:1) agree with the two mentioned views on mixed methods and conclude this approach by stating the following:

*“Mixed method social inquirers choose from a full repertoire of methodological options at any number of multiple points in an inquiry process – purpose, overall design, methods, sampling, data recording, analysis and interpretation. A truly mixed methodology incorporates multiple approaches in all stages of the study; however the researcher may choose certain points of contact as well.”*

Based on the explanation of Byrne and Humble above, it can be concluded that a mixed methodology was applicable to this study in the sense that a clear statistical data analysis and experiment was combined with the interpretation, opinions and observations of various regional

planning researchers. The following table illustrates the core differences between the three discussed methodologies. Due to the mixed methodology approach followed in this research, it is necessary to understand the principles in all three the methodologies.

**Table 2-1: Quantitative, qualitative and mixed use methodologies**

Source: Adapted from Leedy and Omrod (2010:96)

	<b>Quantitative Research Methods</b>	<b>Qualitative Research Methods</b>	<b>Mixed Methodology</b>
<b>Paradigm</b>	Positivist	Interpretivist	Combine Positivist and interpretivist views.
<b>Aim</b>	Explain and predict Testing hypothesis, prediction, control.	Describe and explain different views. Understanding and generating theories from data.	Testing a hypothesis based while exploring and interpreting different views on theories.
<b>Nature of the research</b>	Narrow focus. Product Orientated Artificial/laboratory setting. Objective	Holistic focus. Process orientated. Natural setting. Subjective	Subjective and objective views applied in the process.
<b>Data Collection</b>	Questionnaire, standardised interviews. Documents. Numeric data.	In-depth non-standardised textual data. Observation/fieldwork Documents/photographs/surveys	Mainly documents and observations.
<b>Analysis</b>	Statistical analysis. Stress on objectivity.	Thematic, comparative analysis. Study of different theories.	Combination of statistical data and the comparative study of relevant theories.
<b>Outcome</b>	Measurable results.	A theory	Measurable results used to create a theory.
<b>Relationships</b>	Limited involvement of researcher	Direct involvement of researcher.	Limited involvement in data analysis, while directly involved in understanding different views on theories.

It is clear that the proposed methodological approach therefore combines both a qualitative and quantitative approach by first observing regional development growth and behaviour, before collecting measurable statistics and components for each of the geographies. These observations and statistics are then analysed and compared in an integrative approach in this thesis. This integrative approach combines both secondary and primary data linked to this integrative approach in the pragmatic paradigm. This measurable reality and pragmatic paradigm are more

emphasised on in Chapters Six and Eight of the research, where different geographic scales are evaluated based on the determined criteria.

The theoretical investigation formed the basis of this thesis and was mostly based on the study of secondary data (different observations and opinions on a theoretical theme – qualitative method). The approach to the theoretical study was to study and understand the different elements applicable to the research. During this investigation, the dynamics, theory and application in regional planning were essential to understand. The elements included are existing spatial planning instruments, balanced and unbalanced growth, urban hierarchy and the relationship between urban hierarchy and different types of places.

The theoretical investigation focusses on the relevant core theories and opinions sourced from academic books, research articles and academic journals. The more practical elements such as the spatial planning instruments included not only primary and secondary academic sources, but also the application of these elements in regional planning through certain existing strategic planning documents. Spatial planning instrument formed one of the core theoretical elements in the study and was the first element of which to understand its theoretical principles and application.

The application of spatial planning instruments is introduced in a specific area or region. This leads the researcher to first study this “specific” region and how a region is delineated. The spatial planning instruments applied in this region intend to promote either balanced or unbalanced growth of different nodes in the region. These nodes start to interact with each other and form a network of relationships, which creates an urban hierarchy – the central theme of this research.

The dynamics and functioning of the urban hierarchy were studied in order to understand the core principles of this phenomenon. The functioning and development of an urban hierarchy were linked to the spatial balance and development of other nodes (different types of places). Based on the relationships and links between these different places, the link between the central, non-central and the urban hierarchy was also considered important.

The empirical study of this research was mainly based on various statistical sources such as socio-economic data sourced from the Quantec Easydata database (Stats SA), existing strategic planning documentation, census data, SADC Yearbook and the general geographic location of nodes on a more granular level. This section of the research related more to the quantitative research methodology. The previously mentioned sources all formed a collective bucket of sources that were applied on both the regional perspective and sub-continental focus areas of the empirical study. It was in this empirical study where different case studies created the context for the researcher to study different opinions, angles and approaches of different sources.

In general, the same approach applied on both the areas mentioned above in the empirical study. The reason for applying the same approach was to illustrate that an urban hierarchy could be applied by following the same steps and just adapting small changes in order to successfully apply the urban hierarchy as a spatial planning instrument. The main differences between these two approaches are the delineation of the respective area of study.

In the regional perspective scale focus, the delineation of the region was based on a few pre-determined sets of characteristics. These were all focussed to link South Africa internally and externally. These include areas with economic potential and illustrate a vast unbalanced spatial nature (regional development growth – qualitative observation). The municipality and nodes were evaluated through the socio-economic data sourced from Quantec Easydata.

Historic trends in the socio-economic data were interpreted before the data was analysed by using a statistical quartile approach. According to Joarder and Firozzaman (2001:86), a statistical quartile approach entitles the processing of data into appropriate comparable ranks. In the case of the socio-economic data, each indicator was ranked, after which appropriated weights were generated. A higher weight was generated for data in the higher order quartiles. After all the indicators had generated weights, a total generated weight value was calculated. The total calculated weight was then displayed in logarithmic graph as studied in the urban hierarchy literature (Chapter Five). The existing urban hierarchies based on the CSIR methodology as well as the hierarchy based on population are compared with the analysed total weight. This comparison aims not to generate new theories, but evaluate existing approaches as stated by Thomas (2010:296). The evaluation and comparison also align with the research approach explained by Mouton (2010:35) where the design is dominated by a pragmatic approach to reality and data. This discussed approach is concluded in Chapter Ten, from where the urban hierarchy recommendations follow. The approach was applied on both the regional perspective and sub-continental study areas.

The external connection with different economies and the study of existing strategic planning documents linked with the sub-continental scale delineation of the study area. The study of previous and existing strategic planning documents formed an integral part of the research, connecting the regional perspective and scale study areas. These documents included the SADC and South African planning and highlighted the need to connect South Africa with African economic giants.

The sub-continental scale study area used the SADC statistical yearbook as foundation to evaluate the most suitable route (corridor of countries) through Africa to the economic giants mentioned in the planning documentation (Kenya and Angola). The chosen countries were then evaluated based on general geographic location and socio-economic census information. The

evaluation of these countries was used to recommend areas for unbalanced investment through the application of the urban hierarchy as spatial planning instrument. The evaluation of both and regional perspective scale study areas should fit into the general vision set out in existing regional plans applicable in these areas. An accurate evaluation on both these geographies was needed before an intervention could be proposed and tested. This intervention was aimed at illustrating the role of an urban hierarchy as spatial planning instrument. The intervention was the development of a new theory that was supported by a statistical analysis, which concluded the use of a mixed methodological approach.

## **2.6 Research design**

By considering the research context, purpose, paradigm and methodological approach, the general research design needs to be formulated and discussed. Du Toit and Mouton (2013:126) explain the relevance and need for the research design in general. Burns and Grove (2003:195) explain the concept of a research design as a blueprint for conducting a study with maximum control of factors that may interfere with the validity of the findings. Parahoo (1997:142) feels that a research design can be described as a plan that explains how, when and where data is to be collected and analysed. The interpretation of Polit *et al.* (2001:167) is somewhat different by stating that the research design is the researcher's general response on the research questions or the testing of the research hypothesis. From these opinions and views, it could be concluded that the proposed research design encapsulated three aspects:

- a) providing a blueprint methodology for the research and taking control of factors and limitations impacting the research;
- b) the framework for data collection and analysis; and
- c) the response to the research questions and testing of the hypothesis.

Du Toit and Mouton (2013:126) have found that the built environment in general does not have a clear research design to apply and "borrows" certain designs from social science disciplines. Regional planning only forms part of a certain phase in the built environment, which adds to the complexity of the research design. Despite the complexity of research designs, it does play a significant role in understanding and conducting research in this niche field. In an effort to understand and formulate a research design that could be used for guidance during this research, it was essential to simplify and understand the core purpose of the design. Du Toit and Mouton (2013:126) explain the lack of a clear research design in the built environment as follows:

*"While the social sciences are abound with comprehensive and generic-like research texts, the built environment lacks similar texts to help students and researchers better understand what constitutes a prototypical 'research design',*

*which designs are in fact applicable to social research in the built environment, and when, where and how to apply such designs.”*

Considering the general lack of a clear design as explained by Du Toit and Mouton above, it is necessary to focus on the essence of a research design in general. By referring to the most basic understanding of a research design, a general design can be manually applied in regional planning in the built environment. Bryman and Teevan (2005:24) explain the essence of a research design by adding:

*“...as a logical plan involving strategic decisions with the aim of maximising the validity of findings.”*

By studying the above opinions, it could be concluded that the research design related to the “*when, where and how to*” factors of the research. Considering that the built environment (and regional planning) has no defined variations of research designs and only borrows certain typologies from the social sciences, it was necessary to first understand the design applicable to this study. Other researchers also had difficulty in developing and understanding a research design for the built environment.

Dyck (1994:143) states, *“Neither planning nor architecture, with their primary orientation to problem-solving activities, has developed unique methodological approaches for the generation of new knowledge. Both fields are eclectic in this respect, borrowing most, if not all, methods for basic and applied research from other fields”.*

Goldstein and Carmin (2006:69) also alluded to this problem with the following phrase:

*“Planning scholarship has a history of drawing from many disciplines. These interdisciplinary influences have given rise not only to alternate approaches to problem definition and solution generation but also to notable ontological, epistemological, and methodological variations in planning scholarship . . . The widespread and liberal borrowing of ideas, concepts, and tools from other disciplines is a generally accepted attribute of planning.”*

After considering these opinions of different researchers on the research design, the core logic and subtypes needed to be understood with relation to the content of the chapters of this thesis. This helped to interpret and integrate the research design with the borrowed approaches from other disciplines. From Chapter One, it can be concluded that the research methods of this study fall in the following four research designs applicable to social research in the built environment as listed in Du Toit and Mouton (2013:128):

1. Textual and Narrative
2. Case Studies
3. Evaluation Research
4. Intervention Research

In terms of the “Textual and Narrative” design, this research started by firstly studying and understanding the spatial planning instruments and the applicable theoretical backgrounds of each of the instruments used in regional planning. Du Toit (2010:121) states that “Textual and Narrative” studies form part of the core logic from an interpretivist. These studies focus on the different interpretation of certain topics.

Du Toit (2010:121) continues by adding that these studies may include texts or publications that narrate the past. According to Du Toit (2010:121), these kinds of studies are likely to include various secondary data sources. After the specific spatial planning instruments were studied, the foundations of the central focus of this research (urban hierarchy) were also included. These themes were analysed and contextualised within the paradigm of this research. Through the interpretation of these theories and principles, it was found that a theoretical intervention was needed.

Prior to the intervention, it was first necessary to relate and investigate the problem of this research through specific case studies. Du Toit (2010:163) states that “case studies’ are seen as an important design for social research in the built environment. Lauria and Wagner (2006:375) criticised the use of case studies in the regional planning discipline as they raised several concerns that the methodologies applied in these studies might not be able to resolve theoretical arguments. In this study, multiple case studies were seen as a necessity, in an effort to illustrate the potential regional planning contribution on both a national and international/ sub continental scale. The central problem of the study was contextualised within these multiple case studies and the applicable policies.

The multiple case studies mentioned above were used to diagnostically investigate to which specific geographic level the detailed research would be applied. This served to clarify at which areas specific analysis and assessments were needed. After completing an in-depth evaluation process on the applicable geographic scales, an intervention in terms of spatial planning instruments is proposed. Khakee (1998:363) supports the use of an evaluation research in planning due to the fact that the shifts in evaluation research correspond with the shifts in the planning from rational to communicative.

Eraydin and Taşan-Kok (2013:25-26) explained this shift in planning by referring to the explicit use of models as main drivers for economic, political and planning decisions in a strategic planning

system obscuring different mechanisms and not considering different interest groups. Eraydin and Taşan-Kok (2013:26) continued by adding that communicative planning and rationality started in the rise of a liberating force during the enslavement in the 1970s. From this point, communicative planning approaches started to be introduced more in forms including participative planning, negotiation and reaching overall consensus on a specific matter. Pissourios (2014:84) also explains the shift from rational to communicative approaches in planning by referring to top-down and bottom-up approaches in planning, where top-down approaches refer more to rigid political steps, while bottom-up approaches involve different stakeholders (to be discussed in more detail in Chapter Three and 4.).

Apart from the specific region evaluation, existing regional planning policies were also assessed. This research illustrates the role of an urban hierarchy as spatial planning instrument in regional planning. The intervention proposed that an urban hierarchy should be formally structured within strategic regional planning.

**Table 2-2: Applicable research designs.**

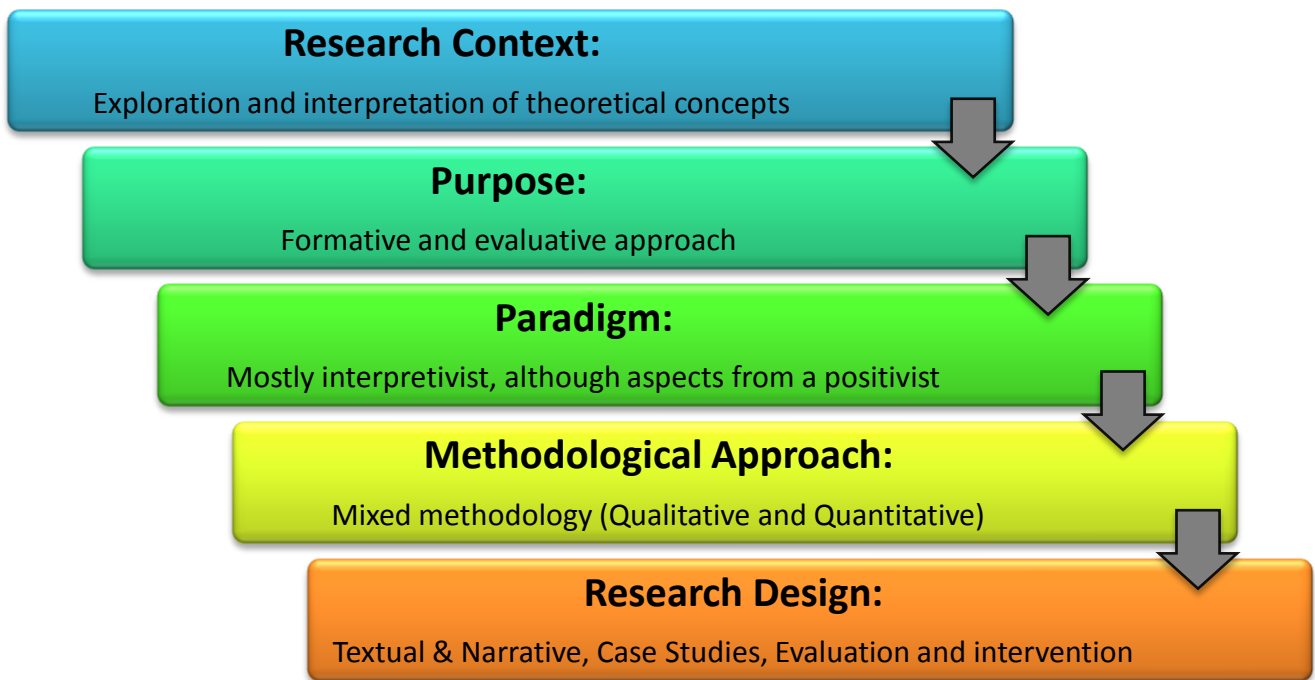
Source: Adapted and integrated from Du Toit and Mouton (2013:128)

RESEARCH DESIGN	ASSESSMENT/EVALUATION
A. Textual and Narrative	Content Analysis (Spatial planning instruments, regional delineation and urban hierarchy)
B. Case Studies	Multiple Case Studies (National and Sub-continental focus)
C. Evaluation Research	Diagnostic/clarificatory evaluation (National and Sub-continental study area evaluation)
D. Intervention Research	Assessment and analysis of regions and existing policies.

The table above concludes and summarises the research design applied in this study based on the research typologies “borrowed” from the social science disciplines.

## 2.7 Conclusion

The main purpose of this chapter was to reveal the paradigm context, approach and rationalisation of the research to the reader. This discussion aimed to describe and explain the general research methodology through the eyes of the researcher. With the research methodology now clear, the reader knows what to expect in terms of the general approach followed and can understand the value of this research within its specific research paradigm and context.



**Figure 2-3: Research typology**

Source: Own interpretation

The following chapter starts by focussing on the theoretical foundation in which different opinions and meanings of topics are discussed, as expected from the interpretivist. This serves as an exploration mission within the theoretical topics applicable to the research theme. By understanding the different opinions, the researcher was enabled to apply these principles in a practical way, in the empirical chapters of this thesis.

## **CHAPTER 3: SPATIAL PLANNING: THE REGIONAL SCALE**

### **3.1 Introduction**

Chapter Three is the first element of three main themes in the literature of this thesis. This chapter's primary focus is on the regional planning and regional planning instruments. In the initial sections of this chapter, regional planning in general is discussed by referring to the relevance of spatial planning and regional planning policies in general before specific instruments are reviewed. The sections on regional planning are also included to illustrate how regional planning in general is linked to different geographical scales and how these approaches are influenced by various elements. Regional planning instruments in this research specifically refer to nodes, corridors and planning regions.

Nodes, corridors and planning regions are approached in separate sections in this chapter. These instruments are deliberately reviewed separately in an effort to first illustrate the general purpose and dynamics of each instrument and secondly to emphasise the mutual interaction and connection between these instruments. The general approach followed in this chapter is to review and consider different authors' analysis of each of the spatial planning instruments on a regional scale. Globally, vastly different approaches to regional planning exist, but the constant use of regional planning instruments (nodes, corridors and planning regions) remains consistent. Considering the mutual use of these instruments on a global scale, it is essential to understand the inner workings and dynamics at play in each of the instruments.

### **3.2. Relevance of regional planning**

Planning a region and guiding the development of a region with a pre-determined outcome or aim is the primary function of regional planning in general (Hall and Tewdwr-Jones, 1975:3). Regional planning and development strategy are combined in an implementable plan specifically aimed to achieve certain outcomes (Glasson and Marshall, 2007:12). Regional planning needs to consider the different role-players such as the political and economic context of the region. Considering the vastly different dynamics of regions, it is imperative to understand and interpret each region's unique context in this regard. Dickinson (1964:245) explains that the dynamics in a region has a direct impact on the social and economic structure of a region. Dickinson (1964:245) continues by stating that these influences are expressed in different usage of land, economic activities and the socio-economic structure of a region. Glasson and Marshall (2007:12) support the fact that these elements are still relevant and continue to add that the regional planner should also form a clear understanding of the dimensions of control. They (2007:12) differentiate between the following control dimensions:

- a fully socialised economy (i.e. Communist States);
- a fully government driven economy (wartime conditions); and
- minimal government or social direction in an economy.

The understanding of the mentioned elements above is critical to fulfil the primary purpose of regional planning. The influences in regional planning have evolved since the 1960s up to the twentieth century, where socialised economies and the role of governments became increasingly important. Regional planning in the modern era continuously adds complexity by taking new actual topics (environment issues, different forms of migration, more complex world economy etc.) and issues into account. This purpose, according to Glasson and Marshall (2007:12), is to determine the general distribution of existing and new economic activities and developments. Hall and Tewdwr-Jones (1975:3) explain that the general purpose of planning is to provide a spatial structure of activities or uses in an improved manner prior to any formal plans.

Given the current context of regional planning and the existing views on the discipline, the overall purpose of regional planning can be concluded to achieve sustainable development through the integration and consideration of social, economic, environmental and government needs in the effective management and allocation of activities in a region. Glasson and Marshall (2007:14) support this statement by confirming that the complex stretching of spatial relations, impact of new transport factors and the ever-increasing reach of economic relations result in an increased demand for regional planning on wider scales. The vision or result of regional planning is often visually displayed on a map basis, which might seem as a simple task to fulfil. The reality is that these plans consist of intense detail on smaller scale, depending on the geographical focus.

### **3.3. Regional planning, policy and elements**

The previous section clearly explained the significance and need for increased regional planning in the modern era. This need is mostly driven by the ever-changing regional environment and dynamics. According to Glasson and Marshall (2007:14), another reason for this increased demand is possibly linked to the shift in the “pattern of state activity”, where governing bodies have an increasingly limited budget that needs to be allocated to various regulatory authorities responsible for the mostly privatised industrial and production landscape. A subtle shift in terms of available funds and capital results in an increase in private sector stakeholders who demand intervention in the planning process. Previously, a much more rigid top-down<sup>1</sup> approach was followed by the state and governing bodies. This shift and demand also relate to the changes in terms of top-down and bottom-up approaches. Glasson and Marshall (2007:15) confirm this by

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<sup>1</sup>A top-down approach is the manner in which planning is done to address a spatial problem at the highest conceptual level and works down the hierarchy to the details of the specific problem (Boudeville, 1972:23)

adding that local and national bodies have been pressurised through democratic processes and publicity.

Glasson and Marshall (2007:15) explain that regional planning to date was more focussed on the different regional dimensions. As a result of the democratic pressures and the need for bottom-up approaches to involve all stakeholders, many governing bodies established and developed a regional policy/framework. Alden and Morgan (1974:23) refer to this regional policy/framework as the national-regional policy field, while Glasson (1974:54) refers to these policies as intra-regional planning. These policies are being adapted to include and take into consideration the changing regional and economic dynamics through the involvement of different stakeholders. This has a direct impact on cross-sectoral decisions and strategies in regional planning. The dynamics of the region and the involvement of different stakeholders have helped to formulate regional planning frameworks and policies consisting of detail in various sectors. Due to the unique regional dynamics, no clearly defined blueprint regional development plan can be applied to any region in general.

Lloyd and Dicken (1972:262) aimed not to specifically list the different elements of a regional or development plan, but to highlight the significance of two fundamental elements that needed to be considered. They (Lloyd and Dicken, 1972:262) differentiated between:

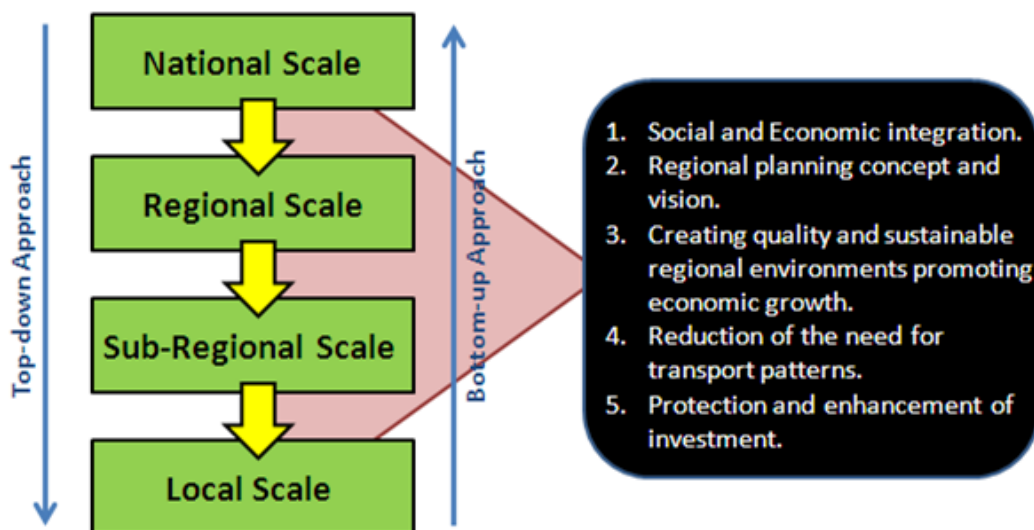
- a) the integration within a national policy framework; and
- b) a sound basis of information and research on which these policies should be based.

From the early opinion of Lloyd and Dicken above, the relevance of a sound research background and information surfaced, apart from the integration of the national framework. The sound basis of information and research could be directly linked to the level of detailed studies in all the relevant social, economic and environmental aspects in the modern era. Each of these aspects was studied in detail in an effort to consider specific limitations and opportunities in each field. The different elements of a regional plan were specifically aimed to fulfil certain functions of the plan. The key functions and purpose of the regional planning and the subsequent use of regional planning instruments can be concluded as follows (Dickinson 1964; Glasson and Marshall 2007; Hall and Tewdwr-Jones 1975; Lloyd and Dicken 1972; Batty 2008; Schweitzer *et al.* 2009; Isard, 1965):

- a) Promotion of social and economic integration where a wide range of activities/facilities contributes to the accessibility of economic and social opportunities.
- b) Putting together a regional planning concept and vision including movement networks, nodes, hierarchy etc.
- c) Creating quality and sustainable regional environments promoting economic growth.

- d) Reduction of the need for transport patterns (the price signals of transport, such as construction costs and cost of petrol given by the transport market, because they ignore environmental costs, mislead the users into believing that personal mobility is cheaper than it really is).
- e) Protection and enhancement of investment of all inhabitants by inter alia preventing inappropriate development that detracts from the overall value and dynamic of a region.

The key functions and purpose of regional plans as well as the application of regional planning instruments above illustrate the significance of regional planning on any geographic scale. Lloyd and Dicken (1972:262) primarily referred to the integration within a national policy framework. Glasson and Marshall (2007:12) briefly referred to the different geographical regions in which regional planning was conducted. It is agreed that a regional plan needs to be integrated with the national framework at the appropriate level. While all smaller geographical scales need to be directly integrated with the plan of a larger geography, all plans have an impact on the national sub-continental scale outcome. Lloyd and Dicken (1972:262) explained that the economic performance of individual regions might enhance or inhibit national growth and development. Considering the different views and opinions on regional planning, the following figure is used to conclude the different geographic levels of regional plans as well as the different aspects that need to be taken into account.



**Figure 3-1: Regional plans: Geographic levels and general aspects considered**

Source: Own interpretation

The consideration and acknowledgement of all geographical levels' applicable regional plans are compulsory in the general regional planning process. With a clear understanding of the applicable regional plans as well as the detailed understanding of the different aspects and dynamics considered in a regional plan, the focus can now be shifted towards the use of different regional

planning instruments. The following sections study the different regional planning instruments that can be utilised to guide the general development of a region to achieve certain outcomes and visions for the region, corresponding and aiding the different levels of regional plans (national, regional, local etc.).

### **3.4. Regional planning instruments**

The previous sections referred to the significance and need for specific regional plans for different geographic levels. Apart from the different levels of regional plans, it has become evident that regional plans need to be formulated for specific regions with its own unique social, political and economic dynamics. Therefore, it can be concluded that all areas are unique and each of these areas should have its own plan, implementation and outcomes. According to the United Nations (2008:29), all countries require a fixed set regional planning instruments that should enable policy makers to do effective planning, management and implementation of spatial development nationally. Irrespective of the level on which spatial planning (or regional planning) is done, the basic set of regional planning instruments should still be implemented and the same principles will still apply as general regional planning approaches. Regional planning itself does cover and include wide areas that may include cities, towns, neighbourhoods etc. depending on the level of planning.

Regional planning organically combined integrated issues such as regional disparities, depopulation, overpopulation and regional economic stagnation and attempted to address them. These issues, amongst others, need to be addressed by first considering the regional dynamics and elements before different regional planning instruments can be utilised to plan for a unique development approach and solution for that region. According to the United Nations (2008:29), these instruments should supplement each other in a consistent way to ensure a proactive and coordinated approach in development planning to manage general regional planning problems. The combination and supplementation of these instruments should become standard in regional planning. The single use of a specific instrument may also be approved in cases where a specific outcome needs to be achieved. Globally, regional planning should consider and implement the specific regional planning instruments in different areas to deliberately achieve a desired impact on regional development.

By considering the different dynamics and role-players in regional planning and regional plans, it could be concluded that such documents should consist of a high level of strategic approaches and considering before plans or policies can be implemented. To understand the dynamics of a region, a general framework of elements should first be established and isolated to give order to the region. Regional planning in general incorporates this process of isolating elements and addressing these elements individually to form an integrated regional plan. Regional planning

instruments and elements naturally develop in a region as a result of economic activity, movement networks and population concentration.

### **3.4.1. Regional planning instruments background**

Krugman (1991:486) explains the economic development of a region through the core-periphery<sup>2</sup> model. He (1991:486) illustrates that the interaction in a region between different nodes (firms) is linked to change in the spatial economic structure resulting in the economic development of the region. The development and growth of a region originate from the interaction between different nodes in the region in terms of trade, migration patterns, commuting, shopping and other social movements (Batty, 2008:769). The interaction between nodes correlates with the role fulfilled by a specific node in a region. In the case where a specific node consists of a large variety of services and goods related to shopping, it attracts the support from other nodes and provides agglomeration benefits to supplementary uses. This support results in the economic and physical growth of the node that results in a greater sphere of influences, which in turn impacts the growth and development and growth of the entire region. The interaction and dynamics between nodes are examined in Section 3.5 of this chapter. Schweitzer *et al.* (2009:422) recapitulate the previous two views by stating that nodes can represent different clustering of economic activities with mutual interactions between the nodes through links in a region. They (2009:422) continue by also adding that the function of each node or clustering of activities has a direct strategic impact on the development of the region.

The framework of planning and development starts by first identifying the interrelated set of nodes and movement networks in a region. In the previous paragraph, regional growth and development were briefly explained through the dynamics and interaction between different nodes in a region. The interaction between nodes is supported through physical connections such as roads. The level of interaction results in the growth of significance of these connections. Depending on the level of interaction, more activities are drawn to establish along these connections, ultimately resulting in the linear form of development or a corridor (Hauptfleisch *et al.*, 2010:2). Corridors and the development thereof are discussed later in Section 3.6 of this chapter. By studying the interaction network and role of such connections between nodes, distinct movement networks could be identified. These distinct networks can each fulfil a different role in a region, which is related to networks specific benefits such as economic development significance. Different roles of corridors can be used to impact the development of a region, which explains the use of corridor development as a regional planning instrument.

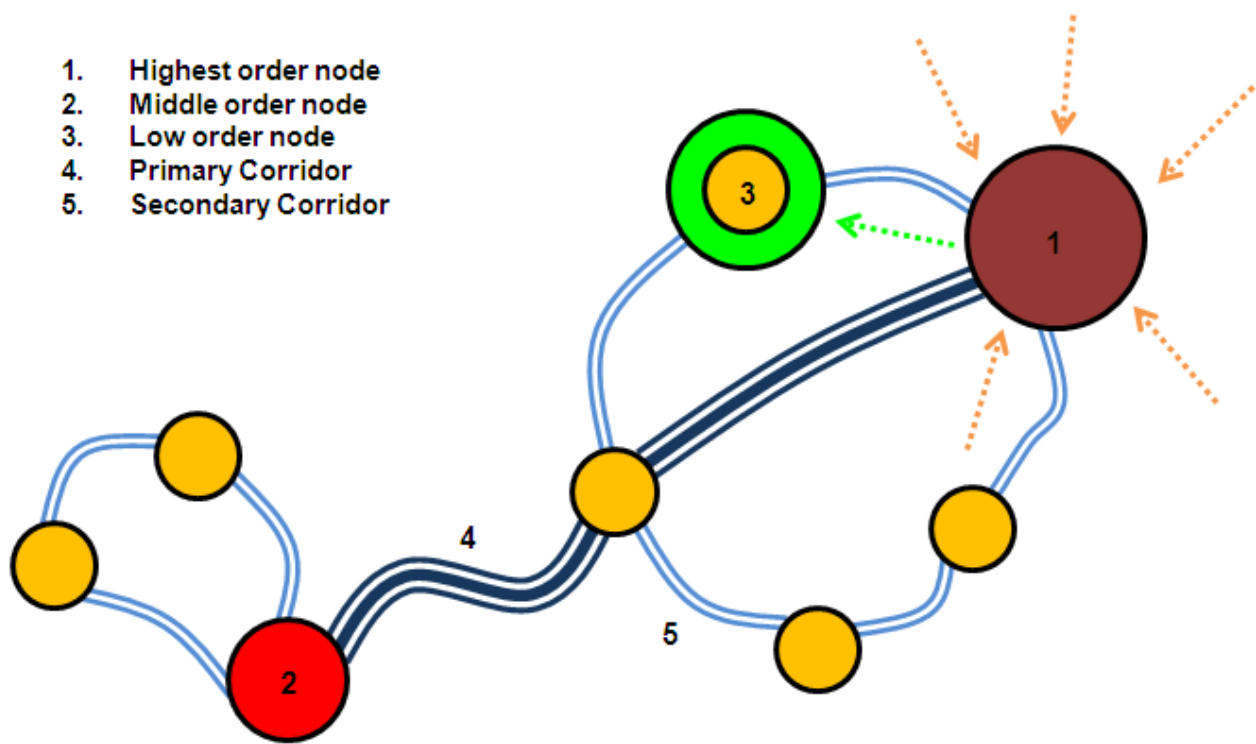
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<sup>2</sup>The core-periphery model explains development of a region through the emergence of a regional urban system. The core-periphery model consists of four stages, Pre-industrial, Transitional, Industrial and Post-industrial. The model will be reviewed in regional development phases in Chapter Four.

Movement of goods, services and people in a region is linked to a specific destination in a region. These destinations are found where higher concentration of people or other services and activities are located at. According to Alcácer and Chung (2009:13), these concentrations are known as nodes in a region. As with the case of movement networks, nodes can develop naturally, depending on different economic dynamics in these nodes. The dynamics in existing nodes can be used in similar settings, which could result in new growth at a specific location in a region. Considering the existing types of nodes and the development dynamics in the region, such nodes could be used to promote new growth (Glasson 1985:144) at an existing node in a region or new nodes could be identified to attract new development to a specific location (Boudeville 1972:19) in a region, explaining the use of nodal development as regional planning instrument.

Nodes can also develop naturally through employment opportunities or sources of life. New nodes often develop where different movement networks or corridors intersect with each other. According to Schweitzer *et al.* (2009:422), places where networks intersect, create the opportunity for people, goods and services to develop and interact and this creates and establish the rise of new nodes. Isard (1965:195) also refers to the establishment of economic activities at these nodes or clustering of activities and resources where the economic potential outweighs the inputs costs. Depending on the function, the intensity of interaction between people and the level of intensity, larger and smaller nodes start to develop. Depending on the interaction between the smaller and more significant nodes in the region, some nodes may experience higher growth than other, resulting in the establishment of a nodal hierarchy. Different nodes are established due to different reasons and functions in the region (refer to Section 3.3).

It can be concluded that nodes and corridors can be seen as the skeleton for the development of the region, guiding development and dynamics of the specific region. As discussed in the paragraph above, a hierarchy of nodes giving structure to a region could be identified. Each node in this hierarchy plays a certain role and attracts certain activities. These activities or uses are grouped around certain places or areas to benefit from supporting uses, giving rise to specific functions of nodes.



**Figure 3-2: The development of regional planning instruments in a spatial system**

Source: Own interpretation of regional planning instruments in a spatial system

In the figure above, the interaction between different nodes and corridors is illustrated. The figure also distinguishes between the greater influence of higher order nodes on the region and the surrounding smaller nodes. The numbers do not represent the chronological order of development, as these developments of regional planning instruments may develop simultaneously. Now that the condensed version of how the core regional planning instruments can give structure and naturally develop in a region has been discussed, it is important to understand how these instruments are applied in regional plans on different levels. The correct application of the discussed regional planning instruments is the responsibility of regional planners and policy makers. The current use of nodal and corridor development as regional planning instruments is discussed in the following sections.

### 3.4.2. The application of regional planning instruments

Regional planning in general involves the identification of existing elements within a region. These elements involve the identification of different nodes and corridors that are used to reveal the dynamic and interaction within a region. As discussed in Section 3.4.1, different nodes and the associated linkages fulfil a specific role in the development of the region. Although the existing elements might reveal significant insights in the general operation and activity flow within the region, a general challenge in regional planning is to successfully utilise these elements as instruments to guide growth and development of the region to achieve strategically identified goals

and objectives. Regional planning involves a combination of existing elements and the dynamics and procedures that need to be tailored regionally to specifically achieve identified outcomes (Bryson and Roering, 1996). This approach generally refers to the control and management of a region's growth (James, 1952:203). Regional planning may also apply to under developed regions that need a predetermined approach as seen in programmed regions<sup>3</sup>. Glasson (1985:78) explained that a programmed region focusses on the interaction within the region and excludes impacts and interaction from the outside.

The processes described in this section briefly illustrate the impact of nodal and corridor development in the growth and development of a region. Although these regional planning instruments are mostly a result of natural development and interaction, it is essential to consider the impact that these processes and elements have on the general growth and development of a region. Considering the impacts of these instruments, it can be concluded that nodal and corridor development can be effectively used in regional planning globally to help to achieve strategic planning objectives. It is important to note that the use of these instruments can differ from the different geographic levels of regional planning (Glasson and Marshall, 2007:75). Although the instruments can be used to create the desired impact, the implementation and use of these instruments differs in terms of the contexts, stakeholders or policy makers (Bryson and Roering, 1996).

The primary approach often pursued in regional plans or development plans of areas is to bring together the development concept of the area that includes movement, networks, nodes, hierarchies and surfaces (Glasson and Marshall, 2007:14). The approach referred to by Glasson and Marshall here refers to the holistic approach of regional planning. The actual process of compiling a regional development plan starts by identifying the natural structuring elements or regional planning instruments as identified as the first approach earlier. The combination and unity of the regional planning instruments consist of pre-determined or pre-identified conditions in the region which impacts and drive the general spatial form and growth and development directions of the region. It is also important to note that the spatial form of a region is not solely determined by the regional planning instruments, but is also greatly influenced by natural, physical and psychological barriers in the area.

According to Lloyd and Dicken (1972:262), the second step in preparing a regional plan is to differentiate between the different geographical levels of focus of the regional plan. The complete process of delineation of the region is discussed in Chapter Four. The reason why this step is significant in the approach of regional planning is mainly due to the establishment of the level on

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<sup>3</sup>Friedmann (1966:40) used a programmed region in an effort to prevent unwanted development and address regional planning problems in general. A programmed or planned region therefore includes a predetermined vision for development of a region.

which regional planning is done. Each of these levels (urban and rural) is addressed in separate plans and different levels of planning detail and development outcomes. The interaction and activity movement in a region are essential to consider in regional planning in general. Patterns of movement, networks and corridors signify the link between nodes of different uses and enhance the interaction within a region (Hauptfleisch *et al.*, 2010; Andersen and Burnett, 1998; Roeseler and Von Dosky, 1991; Boudeville, 1972; Michaelson *et al.*, 2008). It can be concluded that different nodes with specific uses and roles are supported through linking elements with other nodes in the region.

The regional planning instruments can be used to guide the development of region, nodes, hierarchies and growth direction. Depending on the types of outcomes and goals set for a region, these instruments can be applied in specific regions of different geographic scales to guide the regional development towards its goals (Albrechts *et al.*, 2003; Quinn, 1980). Each regional planning instrument has its own unique way to support the regional plan. Regional planning instruments can be used in isolation, depending on the goal that needs to be achieved (Bryson and Roering, 1996). The combination of various instruments can result in a more significant and overall impact on the region (Wilkinson and Appelbee, 1999). Each of these instruments is discussed in detail in the following sections (Sections 3.5 – 3.6).

### **3.4.3. Influence on regional structure**

Before each of the mentioned regional planning instruments is reviewed individually, it is necessary to also refer to the structuring role of these instruments. As Wilkinson and Appelbee (1999) stated, the combination of these instruments has a significant impact on the structure of the region. In Glasson and Marshall's (2007:14) approach to regional plans, they mention that the current elements and structure need to be identified and studied. They (Glasson and Marshall, 2007:14) continue by using examples such as movement networks, nodes and hierarchies. From this statement, it can be concluded that nodes and corridors (movement networks) form the basic elements in creating regional structure. The development and dynamics of each of these elements are discussed separately in Sections 3.5 and 3.6.

Krugman (1991:486) explains that regional structure is linked to the level of economic activity within a region. Economic activity and growth originate from certain places or points of origin within a region (Boudeville, 1972:19). From this, nodes can be seen as the origins of economic activity. Economic activities and growth in a node are discussed in Section 3.5. A set of different nodes or sub-centres can naturally form a region, depending on the actual geographic locations, distances and links between these nodes (Garreau, 1991). Gordon and Richardson (1996:4) also explain that, due to the dispersion of economic activity, these sets of nodes adapt to a polycentric regional structure.

The structure is further defined based on the physical links between the nodes. These links between different nodes in a region are used to promote economic interaction (Chapman *et al.*, 2003:170). Michealson *et al.* (2008:9) and Harrison and Todes (1996:70) interpreted a corridor by a combination of movement networks and economic activity. The links that corridors provide between the nodes result in the establishment of a network of nodes in a region. The interaction, network and hierarchy of these nodes are reviewed and explained in Chapter Five of this thesis. Due to the interaction between nodes and corridors, these elements are inseparable regional structuring elements (Hauptfleisch *et al.*, 2010; Andersen and Burnett, 1998; Roeseler and von Dosky, 1991; Boudeville, 1972; Michaelson *et al.*, 2008). Sections 3.5 and 3.6 focus on the development of these individual elements and the impact of these instruments spatially.

### **3.5 Nodal development as a regional planning instrument**

Nodal development is probably one of the most significant regional planning instruments of all the instruments discussed in this chapter. Regional planning and development start with the identification of nodes in the spatial system or in a region. The development and the interaction between different nodes in the spatial system can have a direct impact on the delineation, structure and performance of a region. Nodes are points in a region where economic growth and the clustering of facilities are focussed on. In order to better understand the dynamics and theory of nodes and the development linked to nodes, it is necessary to first comprehend what a node in regional planning is.

#### **3.5.1 Development of a regional node**

Economic growth is directly linked to a certain place or point of origin within a region (Boudeville, 1972:19). These points of origin refer to nodes in the spatial system that naturally form/develop. The development of nodes occurs naturally over time and can easily be identified next to communication ways (corridors – see Section 3.6). Alcácer and Chung (2009:13) also share this interpretation of a node by stating that an economic area consists of at least one node which is seen as a densely populated area serving the as the hub of economic activity. This interpretation of Alcácer and Chung is formed to identify geographic areas showing similarity of economic activities apart from mutual administrative boundaries (Alcácer and Chung, 2009:12). Nodes can also be explained as a concentration of activities in economic sectors and can be linked to dominant economic activities that can be grouped into the primary economic sector (such as mining or agriculture), secondary (manufacturing or processing of raw materials) and tertiary (service sector e.g. healthcare, retail sales) activities in regions (Weber, 1909:34).

The dominant activities are functionally linked to other activities, which can either benefit or detract from the existence of the activities (Glasson 1985:144). The functional linkages with other

activities can include uses such as a mix of higher density residential, commercial and service areas in one specific point in the region (Boudeville 1972:19). Both Boudeville and Glasson confirm that a node includes a mix of different activities that draws benefit from being clustered at one point. The functional linkages between different land uses and activities result in natural growth and development of the node. Depending on the type, extent and mutual benefits offered in this “mixed use” node, this node would naturally establish itself amongst other nodes in a region. Ainamo (2002:26) further expanded this process by finding that these nodes that were established because of a specific use ended up forming the central node in a particular network of nodes. Ainamo (2002:26) continues by stating that these types of nodes often attract new nodes and other resources to the region.

The development of the region or the node is linked to the growth of economic activity and businesses within the region. Roberts and Fisher (2006:371) share this statement by confirming that growth strategies implemented around nodes have been successful to support the economic growth by attracting new businesses to a region. The locations of these dominant economic activities are essential for their growth. The concentration of activities at ideal locations leads to nodal development, which confirms that nodes in the region are responsible for economic and development forces. Friedmann (1966:44) identified two important conditions for the location of a node, namely location inputs and location points. Geyer (1989:61) explains that these location inputs are the factors that are important for the correct location of businesses and can include the following:

- transportation costs;
- location of the market;
- the production function;
- technology; and
- demand for the product.

From the location inputs listed above, it can be concluded that they contribute a great deal to the development and establishment of a business/node. This miss-interpretation or utilisation of one of these inputs can have a direct impact on the development and growth of the business or activity. Weber (1909:37) explains that, if the location in terms of the market in a region is not strategically correct, then this particular business would not be able to maximise profits or to grow in the future. This in turn affects the development of the surrounding activities in the region and results in lower activity and interaction with other nodes. On the other hand, if these inputs are implemented and interpreted correctly, this business (or activity) can draw support from other nodes and start to position itself strategically in the region (Smith, 1971:104). Benneworth and

Hospers (2007:23) support this observation by adding that the combination and interdependence of this node's development mutually reinforces one another (regional influences).

The influence of a node on a region increases significantly over time as the node starts to develop and grow into a larger node and establish more functions (Neal, 2010:1). The increased economic growth and development can result in the establishment of growth nodes (Glasson, 1985:140). The location inputs are directly linked to the location point of the business. The actual location determines the level of inputs needed to help the business grow and develop in the region. The positioning of such a business therefore is important and needs to be informed by regional planning and research.

#### **3.5.1.1. Economic growth and activities in nodes**

The previous sections revealed that economic growth is directly linked to a specific geographic place or point of origin, namely nodes. Roberts and Fisher (2006:370) explain that there are many factors influencing the growth and development of nodes. Some of these factors include:

- Population size;
- interaction with other nodes;
- availability of natural resources and development infrastructure;
- location of activities, functions and different types of networks; and
- the physical, economic, political and cultural environment.

Roberts and Fisher (2006:370) continue by stating that economic growth policies and management strategies are some of the main role-players in economic development in areas. Dominant economic activities (Glasson, 1985:144) in these nodes such as mining activities are functionally linked to other activities which can either be of advantage or detriment to the existence of the activities. For instance, if the mines in the region increase their output, other sectors can also see an increase in the economic development. Sectors associated with mining gain more benefits than sectors that have no link to mining (Mohr and Fourie, 2004:140). Roberts and Fisher (2006:374) have a clearer focus on the central places which create strong interests in attracting improvement efforts (external influences) and improved living conditions.

Economic growth can be greatly influenced by the development and growth of a dominant sector (primary economic sectors in the case of non-central places<sup>4</sup>). According to Glasson (1985:140), this dominant activity can have the following characteristics:

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<sup>4</sup> Non-central place develop in regions as a result of a primary economic sector activity such as mining of a specific natural resource. See Chapter Five for further discussions of non-central places.

- it is a relative new and dynamic industry which stimulates growth in the area;
- the demand of the product is high on national and international level; and
- it has a big influence on other existing sectors in the area.

With these characteristics, the activity has the ability to attract other activities and functions. This ability is supported by the natural attraction of people to the location of the activity as a result of possible availability of employment opportunities or increase quality of life (linked to economic potential) (Geyer and Kontuly, 1993:302). The inflow of people and other activities (services) to this location create agglomeration benefits at this specific location (Glasson, 1985:140). Businesses utilise these agglomeration benefits to their advantage and it leads to a lower risk of establishment and better development of a business (Richardson, 1973:73). As more and more activities and businesses are drawn to this location, the node starts to grow into a larger and more significant regional node (Isard, 1956:194). Agglomeration benefits can eventually attract other economic activities to the node through a process known as the polarisation effect (Isard, 1956:194).

Polarisation can also have a negative influence on the development of the node and may even exceed the benefits associated with this process (Glasson, 1985:146). The negative influence starts when costs start to increase in terms of public services, salaries and property. The effects of increasing costs can influence the level of development of the node. Nodal development is maintained when different economic sectors succeed in attracting new businesses and activities as a result of agglomeration benefits (Tolosa and Reiner, 1970:452). If development in the node is not maintained through the constant inflow of new activities and businesses, the node might experience economic stagnation and limited growth. Economic stagnation can be prevented by replacing the old industries with new industries and attracting a diverse variety of businesses and economic sectors (Glasson, 1985:150). Research and development can improve the performance of industries and prevent them from stagnating. The modern era is associated with improved technology that is beneficial for the survival of old industries in the node. Technology improvement can further contribute to the development and growth in nodes through constant innovation that support the development in the node (Glasson, 1985:150).

Nodes often consist of the necessary prerequisites to attract economic activities (such as new industrial complexes or businesses) through agglomeration benefits or polarisation (Richardson, 1973:74). Larger and more significant nodes consist of the ability to present agglomeration benefits that attracts business and economic development comprising of shopping, work, social and cultural opportunities and public transport facilities (Alcácer and Chung, 2009; Richardson, 1973; Glasson, 1985). These newly attracted activities are associated with the development of

additional infrastructure, a larger labour force and interaction with other external economies (Lasuen, 1969:137).

The increased demand for the development of additional infrastructure, labour force and other economies mentioned by Lasuen (1969:137) is a result of the newly attracted business and economic development mentioned by Alcácer and Chung (2009:2). These two opinions refer to the growth and development of the node in the region. Coombes *et al.* (2010:1) explain that agglomeration benefits are not only essential for business development, but should be capitalised on to attract new economic sectors and their associated activities to maintain nodal growth and development. They continue by adding that these nodes need to be strategically selected to offer agglomeration benefits and this has a direct impact on policy initiatives in terms of fostering new growth and luring other facilities. The strategic selection process is directly linked to economic growth and management policies implemented. Roberts and Fisher (2006:374) state that increased economic growth puts even more emphasis on governing bodies in terms of creating and implementing nodal growth policies. The next section refers to different location strategies that have an impact on nodal development.

### **3.5.2 Location strategies**

#### **3.5.2.1. Background to location strategies**

The previous section explained that certain inputs from a location perspective play a significant role in the development of a node and ultimately a region. Various authors have explored the role of location inputs and factors on the development and establishment of a node. According to Dawkins (2003:136), the location theory primarily focusses on the determination of the optimal location of industries based on the impact of different variables such as the cost to transport materials and products. Dawkins (2003:136) continues by stating that these theories have all found that an industry changes its location if the product is delivered more cheaply in another location.

Weber (1909:34) classified different location factors into general factors which include the type of industry, regional factors (transport and labour costs) and agglomeration forces. Different types of industries or facilities are likely to cluster near each other to gain maximum benefit from the economic activities in a node. This result in an increase in various agglomeration benefits (see Section 3.5.2.3). Weber chose to simplify the location theory by only focussing on the cost of transportation and labour, although other factors also have an impact on the location decision of an industry.

### **3.5.2.2. Variables influencing the location of industries**

Weber (1909:73) explains the location theory by referring to transportation cost, cost of labour and agglomeration benefits. These three factors play a significant role in determining where an industry will establish itself in a region. This theory starts by first assuming that an industry will establish itself at the location with the lowest transportation cost relative to the market. Weber (1909:23) further introduces a location in a region where more affordable labour is available. The agglomeration factor is then brought in as the third factor and location in the region. Weber (1909:33) argues that the industry is likely to first consider relocating to the more affordable labour location in the region. However, depending on the nature and type of industry, the industry will determine if the agglomeration benefits at the third location will offer higher profits than the location at the affordable labour.

Predohl (1928:373) differs from the location theory as Weber explained it by stating that the location of an industry is more linked to the type of industry and to the cost of land. Industries consider relocation in a region by comparing the trade-offs between cost of labour, cost of land and the general production cost (linked to the type of industry). Predohl (1928:379) merely adds new factors at play when an industry decides on its location in a region. As referred earlier, the type and general production of an industry have a direct impact on the location theory. If an industry utilises less labour (more mechanised) or when an industry does not use scarce resources or raw materials, then the cost of land will be the deciding factor in process. The cost of land is linked to the costs for being located in the node or cluster where economic potential and interaction are the highest.

Hoover (1937:3) agrees with the general approach of Weber (1909) towards the location theory but adds more location factors including economic procedures, human tastes (consumer demand) and distribution of resources in a region. Hoover (1937:4) also states that industries are incentivised to establish at a location where processing costs are minimal. By relocating to this point in the region, production costs are minimal and greater potential exist to maximise profits. He continues by explaining the impact of economic procedures in a region and the consumer demand has a more precise impact on the location. The consumer demands (human tastes) refer to where the products or services are sold (directly linked to profit). In theory, the economic interaction and nature of a region will draw more attention in considering the location in a region. Nodes are normally located where most economic interactions are maximised in a region and where more demand exist. Hoover (1937:4) further continues by adding a second location (depending on the nature and distance of the industry) in a region that could primarily act as distribution point to further grow profits of the industry.

Isard (1956:22) attempted to combine all the different views and opinions on the location theory in a universal view. This view aimed to illustrate the role of each of the factors and the effect it might have on the location consideration in a region. The primary focus of this theory was to illustrate the link between a node (industries and businesses) and its location within a region by considering all factors related to this decision. Isard (1956:23) specifically referred to the industry type, the size of the industry, the relationship with the region and the transport costs related to the location. In his work, it was concluded that the optimal location would be where different linked processes (economically) were linked to the most available agglomeration benefits created by other facilities to maximise profits.

The location theories and views explained above directly relate to the concept of the development of a node and the impact it has on the development of a region. Although the location theories do not provide a direct theory for economic development around a node in a region, these theories form the core of explaining the dynamics at play of the development of a node or clustering of facilities. From Weber's (1909:23) point of view, the assumptions of the equal distribution of certain inputs can be merely seen as an approach to start formulate a theory and illustrate the effect of transportation costs and agglomeration benefits. Although this theory was successful to illustrate this effect, limited other factors were taken into account (Djwa, 1958:11).

This was the core reason why Predohl added the impact of the cost of land, the type of industry and the relation to labour (Djwa, 1958:11). From this perspective, the type of industry or facility in the case of the location theory is seen as major contributions. The type (nature, dynamic, production, inputs and outputs) of an industry or business are essential to determine the optimal location in a region. According to Lloyd and Dicken (1972:110), the consideration of the type of business or industry should be seen as the very first factor to take into account in this decision. Secondly, the cost of land is also a significant contribution (Lloyd and Dicken, 1972:110). In terms of the modern region and dynamic, it can be assumed that land will cost more at the most optimal locations where the highest economic activities are concentrated, most agglomeration benefits are available, transport costs are minimised and labour is freely available (Martin and Rogers, 1995:337). Different options of relocation in the region will then be based on other factors.

These other factors referred to in the previous paragraph, where Hoover's contribution was discussed, are of great significance. Factors such as consumer demands and strategies to open second locations as distribution points illustrate innovative approaches that businesses or industries can consider in the modern era. If these factors are then combined with the primary foundation where profits could be higher and agglomeration benefits are freely available, then the most sustainable and profitable location options will be available such as described by Isard (Djwa, 1958; Lloyd and Dicken, 1972; Martin and Rogers, 1995).

When considering these views on the location theory, the link to the development of a node becomes clear. Nodes can represent the areas in a region where the most agglomeration benefits are available and combined with possible labour options. The different types of industries and the related processes (inputs and outputs) then need to decide where or in which node in a region it will be able to maximise its profits. This process results in economic growth and the establishment of different activities (types of businesses or industries) in nodes.

### **3.5.2.3. Agglomeration benefits and nodal development**

In the previous section, it became evident that agglomeration benefits play a significant role in determining where certain industries, businesses and activities establish themselves in a region. These benefits attract various types of industries and economic activities to a nodal point in a region. This process can be directly linked to the development of a node, where a variety of different economic activities and businesses offer benefits that can be utilised by other supplementary facilities in this new node. From the previous section, it is noted that agglomeration benefits, transportation costs, cost of labour and the type of industry are all factors that influence the location of industries or activities in a region in the modern era.

Weber (1909:126) explained agglomerative factors as an advantage that offers lower production costs or a decrease in marketing that ultimately supports the effective ongoing production at a certain point in a region. This advantage Weber (1909:126) referred to can be different benefits of which lower transportation costs and concentration of labour can serve as common examples from the location theory. Marshall (1920:45) explains that three factors exist in reducing the production costs, namely a greater availability of skilled labour, more specialised suppliers and knowledge of inflows from the competing businesses in the node. The first two factors identified focus on the local demand in the market. Highly skilled labourers are more likely to be employed resulting in increased efficiency from both the supplier and consumer side (Marshall, 1920:45). The third factor in this case is the knowledge of how other businesses combine certain factors to lower overall costs (Marshall, 1920:46). Isard (1972:83) also refers to these benefits where various businesses form clusters and mutual skills and methods are combined at a single node. The cluster attracts new businesses or activities that result in gaining developmental momentum at a specific location (node) in a region.

Different clusters of certain businesses or sectors in a node in a region result in the economic growth, development and diversification of activities in the node. Ullman (1958:196) explains this process with the following phrase:

*“...starts out as a matter of homeopathic doses of mild concentration and winds up as a system of massive localization based on a wide range of internal and external economies of scale<sup>5</sup>.”*

According to Hirschman (1958:59), development in areas or clusters in a node can be supported through various technological upgrades of companies and distribution ideas. Similarities in his (Hirschman, 1958:59) and Marshall's (1920:46) opinion are noted where both the demand (local employment and suppliers) and supply side (knowledge of competitor's ways of doing business) of businesses in a node are explained. Myrdal (1957a:67) also explains the process and impacts of agglomeration by stating that, if agglomeration benefits dominate certain clusters in nodes, the economy of the node starts to develop into a self-reinforcing economy in the node. Hirschman (1958:59) specifically adds the technological innovation factor, which impacts the modern era. These agglomeration benefits lure new investment and stimulate growth in the node (Hirschman, 1958:59). From the inputs of these authors it can be gathered that the agglomeration benefit factor attracts different industries or activities with benefits that could result in lower costs and increased profitability of an industry or business, which attract new businesses and result in nodal development.

Wojnicka-Sycz (2013:18) refers to agglomeration benefits as the engine for the development of a node that creates forward and backward linkages and promotes diversified production and consumption at these nodes. Dawkins (2003:137) explains that firms or activities may cluster together at a node in a region to gain maximum advantage from external economies which results from the proximity of many supplementary firms. Hoover (1937:4) describes external economies from the following two perspectives:

- localisation economies, and
- urbanisation economies.

Localisation economies, as Hoover (1937:4) refers to, explain the result of different firms and companies, active in the same industry, clustering together at the same node or point in a region. This phenomenon disregards the fact to not be associated and to be active in the same area as competing firms. In this case, localised economies are often more attractive because a variety of different firms of the same industry can all benefit from the mutual location. In the modern era, the development of shopping malls can be used as an example of such an economy. Different fashion shops all cluster together in these locations to benefit from the economic potential.

Urbanisation economies, according to Hoover (1937:4), are when different firms and companies of different industries cluster together at a certain location in the region. This phenomenon explains

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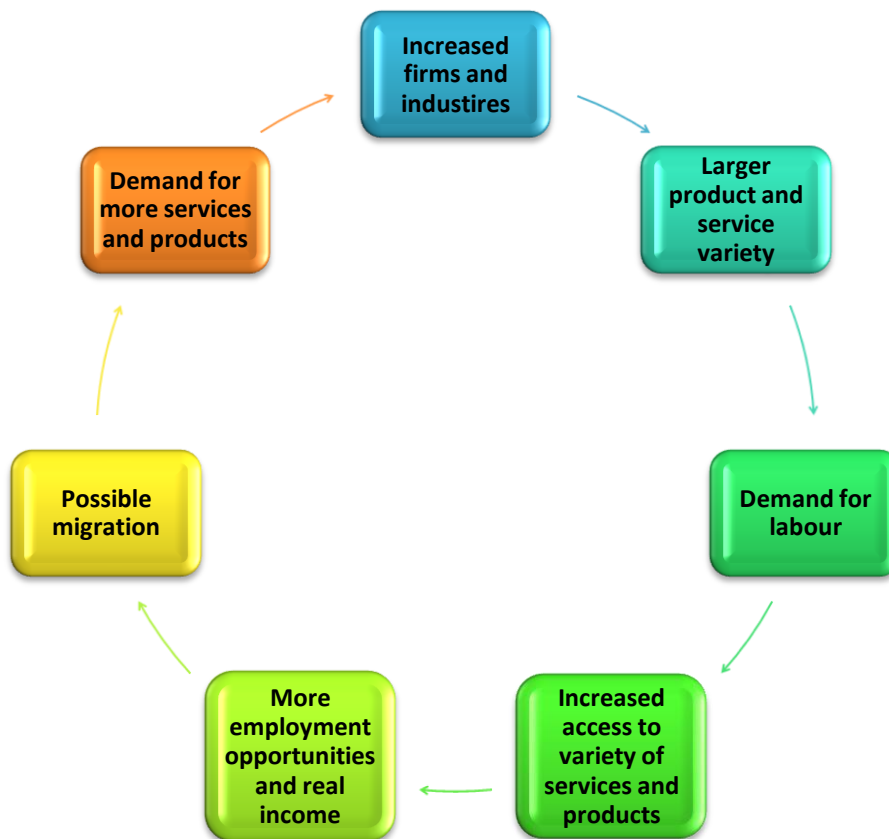
<sup>5</sup>See Section 3.5.2.4

that different businesses from different industries can offer supplementary benefits to other industry businesses. The modern era shopping mall can again be used as an example to explain this phenomenon, where food and grocery shops, fashion shops and other retail categories are all clustered at a specific location to maximise profits and to utilise the supplementary economic benefits.

Although agglomeration benefits are a theme that originated early in the 1900s with the location theory, it remains relevant today and still grows in significance (Wojnicka-Sycz, 2013; Martin and Rogers, 1995). As external benefits from different industries and sectors tend to increase in number and output of firms, they are usually referred to as external scale economies (Dawkins, 2003:137). Depending on the level of agglomeration benefits and the economic dynamic of the node, different economies of scale and size can start to develop in a region. The following section specifically focusses on the scale and size of economies.

#### **3.5.2.4. Scale and size of economies**

The development of the region, as referred to in the previous section, relies on scale economies that increase the productivity and profitability of industries and businesses in a node depending on the market size. Bathelt *et al.* (2004:12) explain that scale economies can also offer an incentive to cluster the production of various products from different industries because of the lower transport costs and ability to distribute these products from the central node to other nodes in the region. Apart from the development of the region, the provision of goods and services might also be more efficient from a governing perspective. To illustrate the dynamic of a scale economy and the impact of the size of this economy in different sectors, the following figure needs to be studied:



**Figure 3-3: Scale economy dynamic and impact on development**

Source: Own interpretation from Fujita and Mori (2005:4)

The explanation of the dynamic of a scale economy starts where more firms and industries locate to a central point in the region as a result of location determining decisions. As soon as more industries and firms of different sectors have established themselves at the node, more economic sectors with different products and services become available (Bathelt *et al.*, 2004:12). This increase in economic sectors results in an increase in a variety of labour (employment opportunities) with different skills. The demand for additional labour is supported by better access to the variety of services and products in the node. More employment opportunities in different sectors also result in the increase in real income, which serves as an incentive to migrate towards this node in the region. As migration to the node increases and gains momentum, demand increases for additional services and products which results in drawing more businesses and firms to the node and back to the start of the cycle again (Fujita and Mori, 2005:4). As this cycle continues, more and more sectors, firms and people accumulate at the node demanding more services from a governing perspective (Batty, 2008:769). The cluster of the last-mentioned in the node helps to alleviate service pressure from a scattered framework to a concentrated location.

According to Batty (2008:769), this process increases the complexity of the node, which has a direct impact on the region and the surrounds. He continues by stating that, depending on the population and the different facilities, this framework creates the basis for the structuring of nodes

in a region and the urban hierarchy. Regional planners, governments and investors often use this cycle to externally have an impact on the development of the node and region. These nodes are interpreted as growth poles in this context, which come with a specific growth pole strategy and dynamic. The following section specifically studies nodes as growth poles.

### **3.5.3 Nodes as growth poles and growth pole strategies**

#### **3.5.3.1. Growth poles in a region**

Considering the section on scale economies, a growth pole can be related to the development of a node in a region. A growth pole approach to development is linked to the cycle of describing the dynamic and impact on development of scale economies. As mentioned previously, this cycle and the external interference (investment) can be used by governments, regional planners and investors to promote development in a certain location (node) in the region. The interference described here can be seen as the attempt to produce beneficial spill-over in other economic sectors through investment. To attract external investment, the node needs to consist of an existing resource that serves as an investment magnet.

Perroux (1950:92) describes the significant need for a growth pole strategy in the following phrase:

*“The bitter truth is this: growth does not appear everywhere at the same time: it becomes manifest at points or poles of growth, with variable intensity; it spreads through different channels, with variable terminal effects on the whole of the economy”*

With this phrase, Perroux confirms that growth does not appear equally in a region. Growth in a region occurs at points where various economic activities cluster together. Growth in a region or at a node can be enticed through a growth pole strategy to attract additional investment. Wojnicka-Sycz (2013:18) describes a growth pole as a regional planning model of a cluster of activities that attracts further development at a node through its influence on the region surrounding the node. Growth poles or the development of nodes are products of scale economy dynamic and agglomeration benefits in a region (Lloyd and Dicken, 1972:118).

Perroux (1950:92) built the foundation of the growth pole theory within the economic space combined with agglomeration benefits within a certain geographical location. In his theory, he emphasised the role of a leading industry with the ability to entice new growth through interregional linkages. Perroux (1950:93) further explained that, apart from interregional linkages, impacts such as growing employed population and the ability to earn higher real income also serve as factors acting as growth stimulus. Industries focussing on service delivery depend on these factors to expand their influence in the region.

Campbell (1974:44) expanded on the role of these leading industries by stating that these industries support the prosperity of all surrounding firms and activities through the promotion of the sufficient flow between consumer and businesses of different economic sectors as well as an increased level of activity in the tertiary sectors. Increased activity in the tertiary sectors is directly linked to the increased personal real income and more advanced products and services through innovation.

The growth pole theory and inputs from Perroux specifically focussed on the innovation factor in the growth pole. Parr (1973:17) endeavoured to explain this significance of innovation as part of the growth pole theory with the following phrase:

*“...in seeking to explain the emergence of the growth pole, Perroux laid particular emphasis on the innovating entrepreneur, the propulsive industry, the subordinate (linked) industries, and the complex of industries.”*

According to Wojnicka-Sycz (2013:20), growth poles in the modern era have the ability to promote modernisation and innovation with different industries or nodes in the local surrounding region. Wojnicka-Sycz (2013:20) explains that growth poles today need to consist of the ability to serve actively in the promotion of innovation - regional, sector based and locally. This means that growth poles today need to have the ability to have a direct influence on the economic and geographic landscape. From an economic perspective, these growth poles need to be able to attract different economic sectors (economic diversification) or to support economic development in certain sectors.

From a geographical perspective, nodes in a region today need to have the ability to interact sufficiently with surrounding local nodes in the region, but also nodes beyond the local region Wojnicka-Sycz (2013:20). Interaction and the interrelationship between different nodes in the region help to develop a network of interaction, competitiveness and innovation (Perroux, 1950; Lloyd and Dicken, 1972; Campbell, 1974). Considering the role of a growth pole both from a geographic and economic perspective, the following section specifically focusses on the growth poles being applied as strategies for regional development.

#### **3.5.3.2. Growth pole strategies**

Due to the potential significance of growth poles being applied in regional growth strategies, it is necessary to consider the typical context in which such strategies are followed. According to Parr (1999:1199), growth pole strategies have been applied in both developed and developing countries to its own unique regional problems experienced. Being applicable in both developed

and developing countries, it can be assumed that these strategies can address spatial economic problems in various regions of different complexities and challenges.

According to Parr (1999:1199), the broad setting in which growth pole strategies are applied includes:

- reviving a depressed area;
- encouraging regional deconcentration;
- modifying the national urban system; and
- attaining interregional balance.

Since World War II or the late 1950s, economically depressed areas have often occurred in more developed countries. These areas were once areas showing significant economic growth and interaction, but they were negatively influenced by an external shock that “froze” the area in economic development (Myrdal, 1957b:100). These areas rarely recover and gain momentum again. Common problems experienced in these cases include high unemployment, low income, low social development, limited service delivery and infrastructural problems (Potter and Lloyd-Evans, 1998:70). Growth pole strategies are implemented in these cases as attempts to uplift these areas. According to Parr (1999:1200), these strategies can involve the movement of employment opportunities to the area or mobilising the unemployed population in terms of employment opportunities elsewhere. This strategy focusses on moving either the work force or employment opportunities to the optimal location in a region where new economic activities can develop.

Growth pole strategies are also applied to encourage regional deconcentration<sup>6</sup>. According to Parr (1999:1201), the approach addressed the economic and social dominance of a large metropolitan area on the wider metropolitan region. Potter and Lloyd-Evans (1998:79) refer to the regional deconcentration process as the process of promoting polarisation elsewhere in the wider metropolitan area. Parr (1999:1201) states that the growth pole strategy in this setting is implemented to reduce the level of regional concentration. The dominant influence of the metropolitan area on the region is therefore limited through the deconcentration process. By implementing this strategy, different growth poles in the region are supported to balance out growth and spread economic activity in the wider metropolitan region.

The third application of the growth pole strategy is focussed on a higher geographic level. In this case, a growth pole theory is applied to alter the national urban system. According to Parr

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<sup>6</sup>Regional deconcentration refers to the process in which agents of government control are relocated and geographically dispersed. Regional decentralization in this context is the transfer to lower-level central government authorities or to other local authorities, which are upward accountable to central government (Ribot, 2002).

(1999:1202), this is done to regulate the interrelated processes of urbanisation and migration nationally. Richardson (1981:269) explains that this phenomenon is normally found in developing countries where an extremely high portion of the national population is only concentrated in metropolitan areas and other large nodes. According to Turok and Parnell (2009:159), governments express specific objectives to address this highly unbalanced urban systems by promoting the development of more productive cities in the spatial economy.

The fourth general growth pole strategy focussed on attaining interregional balance. In the opinion of Parr (1999:1205), this relates to the unsatisfactory interregional structure of the national economy. In general terms, this specifically relates to the distribution of wealth in a region in relation to developed and undeveloped areas which is a major regional planning problem in the modern era. Alonso (1968:3) explains the application of this strategy by stating that this growth pole strategy prevents the thin spread of investment equally over the entire region.

From this section, the significance of nodal development in the regional planning context was reviewed in different contexts varying from the development of a node to the application of nodal growth strategies. Although different strategies of growth can be used to achieve a specific development trend, great caution should be exercised prior to the implementation of these strategies in certain regional contexts (Parr, 1999; Perroux, 1950). Nodal development and the dynamics at play in this process need to be considered in relation with the specific development phase of a region to achieve a specific outcome (Turok and Parnell, 2009). Nodes cannot be seen in isolation from corridors due to the definite link and interaction between these elements and the communal influence on regional development (Hauptfleisch *et al.*, 2010; Andersen and Burnett, 1998; Roeseler and Von Dosky, 1991; Boudeville, 1972; Michaelson *et al.*, 2008). The following section specifically focusses on corridors.

## **3.6 Development corridors**

### **3.6.1. Function of corridor development in a region**

The different regional planning instruments included in this chapter cannot be entirely separated from one another. It should however be noted that the two most basic instruments and inseparable from each other, are the nodes and corridors (Hauptfleisch *et al.*, 2010; Andersen Burnett, 1998; Roeseler and Von Dosky, 1991; Boudeville, 1972; Michaelson *et al.*, 2008). Regional planning and development policies often refer to these two instruments in a region and the interaction between them (Hauptfleisch *et al.*, 2010; Geyer, 1988; Priemus and Zonneveld, 2003; Curtis, 2012). As seen from the discussion in the section of nodes, nodes are where the concentration of activities develops within. Nodal points in regions all have some degree of interaction between each other (Alcácer and Chung, 2009; Glasson, 1985; Ainamo, 2002). This

phenomenon was seen in early settlements and especially in the Roman Empire where cities and towns traded along certain movement networks (Harrison and Todes, 1996:70). These movement networks formed the corridors between different nodes.

As interaction between different nodes in a region increased over time, some activities started to establish themselves alongside these corridors (Geyer, 1988:123). In the modern era, a variety of activities has developed along these linear areas of development (Chapman *et al.*, 2003:168). The variety of activities is mostly the result of the agglomeration benefits offered along these corridors (Weber, 1909; Marshall, 1920; Isard, 1972; Ullman, 1958; Hirschman, 1958; Myrdal, 1957a; Wojnicka-Sycz, 2013). Harrison and Todes (1996:70) explain agglomeration benefits along a corridor by stating that the movement along these corridors creates markets for a range of economic activities. Harrison and Todes (1996:70) continue by adding that corridors may even create certain “privileges” along these routes. Priemus and Zonneveld (2003:167) interpret a corridor as the development of bundles of infrastructure that link different areas in a region. Michealson *et al.* (2008:9) feel that the use of corridors in planning should enhance economic vitality, while meeting the needs of the people in a region. From these sources, it becomes evident that corridors in the twentieth century are not focussed just on linking different nodes and moving people from point A to point B. Although Priemus and Zonneveld (2003:7) refer mostly to the infrastructure, Michealson *et al.* (2008:9) and Harrison and Todes (1996:70) interpret a corridor by a combination of movement networks and economic activity.

From the above views on corridors in the twentieth century, it can be concluded that corridors have three main responsibilities, namely the linking of different nodes, the development of infrastructure and meeting the needs of the people in the population. The linking of different nodes in a region refers to the establishment of relationships between nodes in a region. The relationship and interaction between the nodes results in mutual benefit and growth of these nodes. The next responsibility is automatically linked to the linking role of corridors. Corridor development also fulfils the actual role of a road or road network between different nodes. However, with the development of road infrastructure comes the potential of establishing smaller activities or businesses along these routes (Harrison and Todes, 1996:70). Curtis (2012:83) shares this view by stating that this type of development provides an opportunity for land-use to effectively interact and integrate with transport and infrastructure principles. Williams and Marshall (1996:5) support this sentiment by stating that the core dynamic of a corridor lies within the interaction of transportation and land-use activities. Access in the region between areas is improved, while the potential for new economic opportunities also starts to develop due to the existing infrastructure. As new economic opportunities arise along these routes, the existing regional economy gets complimented and expanded which creates economic vitality of the region.

The third responsibility relates to the demand of the existing population. The demand of the population is normally linked to social and economic demands (Williams and Marshall, 1996:5). The economic side of the demand was already explained in the discussion of the previous responsibility of a corridor (Michealson *et al.* 2008:9). As the corridor develops over time, more economic opportunities are unlocked, creating more employment opportunities for people in the region (Chapman *et al.*, 2003:168). From the social side, the actual connecting between different areas increases the people's ability to interact. As the use of the corridor increases (demand increase), it is expanded or upgraded which in turn further unlocks social and economic potential (Michealson *et al.*,2008:9). Corridors can link areas, nodes, buildings and stations with each other. The role of corridors is important to link the different settlements with each other in the region (Chapman *et al.*, 2003:170). Today, the situation and roles of corridors are slightly more complicated as discussed in the previous paragraphs, but corridors still act as the direct link between different nodes.

According to Harrison and Todes (1996:70), corridors essentially develop along major movement routes of significant existing or potential movement options. This conclusion relates directly to the function that corridors fulfilled in the Roman Empire. Harrison and Todes (1996:70) continue by adding that this expected development occurs along routes which act as major regional attractors that link large cities, towns and movement networks that generate economic activity. Marrian *et al.* (2001:8) support the findings of Harrison and Todes, by explaining that corridors need to consist of the ability to draw support from a larger area and region by providing adequate movement space that allows for various other economic uses to develop along the corridor. Corridors experience a constant flow of people, goods and services. Continuous exposure to potential support is available when businesses or activities establish themselves adjacent to a corridor (Chapman *et al.*, 2003:168).

In this section, the function of corridors in a regional environment was briefly referred to. As seen from various authors, the basic functions of a corridor remained constant (Geyer, 1988; Harrison and Todes, 1996; Priemus and Zonneveld, 2003; Hauptfleisch *et al.*, 2010; Curtis, 2012). The views on the core roles of a corridor provided valuable insights in corridor development in general. However, the processes and dynamics of how corridors develop in regions should provide valuable insights in how corridor development can drive development in regions and promote a more diverse nodal interaction. Development corridors are used in every country and, as mentioned, have been around for a while in the spatial and strategic planning environment. The different views and inputs from various authors are included in the following section to illustrate how these corridors are developed and in which contexts corridor development is applied in regional planning.

### 3.6.2. Regional perspectives on corridors

Corridors and the development of corridors are interpreted differently from various regions and geographic planning scales. Depending on the specific context, the implementation corridors and corridor development may differ slightly to address a specific problem in its own context. Corridor development or the implementation of this spatial planning instrument can even attract a different 'label' depending on the context and geographic scale it is implemented in. To illustrate the different views of this spatial planning instrument, various inputs on corridor development are included in this section.

Dewar and Watson (1990:21) explain corridor development with a specific focus on possible economic opportunities and the typical geographic nature in the immediate surrounds in the following phrase:

*“A corridor can be a linear zone or area surrounding a major high-level street, containing high concentrations of transportation, land-uses and densities. It can be linked to a major services duct that accommodates a number of different engineering services. Activity corridors will accommodate major linear transport routes like heavy and light rail and freeways, large shopping concentrations, social, cultural, and sporting facilities as well as a large amount of residential accommodation”.*

Andersen and Burnett (1998:2) also explain corridor development by specifically referring to the transportation role and supporting activities in the surrounding vicinity, but specifically add the regional perspective. This regional perspective of linking different areas is concluded in the following phrase:

*“... a linear strip of land or area, connecting large activity nodes, traversing urban or inter-urban areas, surrounding a major transport facility or facilities providing an appropriate regional level of mobility and accessibility to adjacent areas, and containing a high concentration of population and mixed land uses”.* Corridors like described in this definition is most likely to *“... accommodate major linear transport routes like heavy and light rail and/or freeways, large shopping concentrations etc., social, cultural and sporting facilities as well as a large amount of residential accommodation”.*

Depending on the different contexts of corridor development, specific roles and definitions develop over time for unique regional planning situations. These roles and functions tend to be long and complex views, all with minor or small additions to the view of Dewar and Watson (1990:21).

Hauptfleisch *et al.* (2010:4) explained the general impact of a corridor by including the linking aspect as well as the transport role of a corridor:

“...the impact of development links of corridors is much broader than the direct adjacent areas to the transport infrastructure”.

From these different views, the potential of a development corridor in the regional context cannot yet be fully realised. The views focus more on the transport role, regional linking nature and the general surrounding elements surrounding a corridor. The definitions are mostly focussed on the connection between different nodes or areas and do not include the economic infrastructure and social responsibility of a corridor. The following section aims to show the different interpretations of a corridor in other contexts.

The term “corridor” or “corridor development” is widely used in the regional planning context. Although corridor development is a common spatial planning instrument, different contexts in the spatial system can refer to corridor development in other terms. Different terms that are also used to explain the essence of corridor development includes “joint development”, “transit-orientated development or planning” and “the new-urbanism/neo-traditionalism”.

- Joint development

Roeseler and Von Dosky (1991:325) define the term as, “...*concurrent or sequential investment in facilities and operations in both transportation routes and high activity nodes in mutual beneficial way.*” In terms of this definition, urban movement networks are not just seen as a mere transport route but also create the opportunity for investment of development along these routes. As development increases along these routes, clustering of activities results in the creation of new nodes. This definition is only linked to the economic development potential and linking responsibility of the corridor.

- Transit-oriented development and planning

“Transit-oriented development and planning” is only used as a new term for “joint development”. According to Boarnet and Crane (1997:191), the idea of transit-oriented development is based on the development or redevelopment of land located adjacent to railways and railway stations. Railways in this sense are the same as a corridor and the railway station refers to a node in the regional system. In transit-oriented development and planning, it is clear that the corridor links different nodes and promotes high intensity development opportunities around a movement network. This definition also refers to the linking and economic potential role of the corridor.

- New urbanism / neo-traditionalism

According to Newman and Kenworthy (1996:1), "*New Urbanism is an umbrella "movement" closely linked to TOD/P, the proponents of which "... seek to reconnect transport with land use and, in particular, to establish transit-oriented development where higher density, mixed use areas built around high-quality transit systems provide a focussed urban structure that can help loosen the grasp of automobile dependency*".

By considering the different contexts and terms of corridor development, the essence and of a corridor in the spatial system remains more or less constant. Corridors are used in general as a vital regional planning instrument that directly impacts the structure and the development of a region in any spatial context or level of planning (Hauptfleisch *et al.*, 2010; Geyer, 1986; Friedmann, 1986). The major role of corridors is to promote the interaction between nodes and areas in a region. The interaction of between nodes in a region and the significance these linkages (corridors) is an important element that impacts the level of development in a region (Friedmann, 1986:70).

Jacques Boudeville (1972:17) particularly stated that economic space in a region cannot be separated by geographical aspects of a region. It can be concluded from this statement that the economic interaction between different nodes in a region cannot be seen as two individual aspects. Considering Boudeville's research as well as the different views on corridors in this section, it is clear that the economic potential and linkage responsibility of corridors still prevail and the general function of a corridor remains constant (Boudeville, 1972; Geyer, 1986; Dewar and Watson, 1990; Andersen and Burnett, 1998; Hauptfleisch *et al.*, 2010; Roeseler and Von Dosky, 1991; Boarnet and Crane, 1997; Newman and Kenworthy, 1996). The true potential of a corridor as spatial planning instrument should therefore focus on the linkage and interaction between nodes, economic activity and development infrastructure in the region.

The potential use of corridors and the implementation approach in a region should further be investigated in an effort to expose potential additional value as a spatial planning instrument. According to Michaelson *et al.*(2008:9), a corridor planning approach that consists of different linkage roles, while considering the different economic dynamics and existing interaction between nodes in a region need to be considered. This approach need to expand the current connections and enhance the social and economic behaviour in the region. They continue by adding that such an approach would require joint planning initiatives combined with all interested and effected parties. By utilising the urban hierarchy <sup>7</sup>as spatial planning instrument, such a methodology could potentially include all the responsibilities of a corridor, adding a fourth responsibility and fits the corridor planning approach referred to by Michaelson *et al.*(2008).

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<sup>7</sup>The urban hierarchy refers to the different ranking of nodes in a region (see Chapter Five).

### 3.6.3. Components of corridor development

The different views and inputs on corridors in the section above illustrated that corridors can be seen as a versatile spatial planning instrument that can be applied in different setting, to achieve different outcomes. As stated by Logan (2012:26), the different components of a corridor can be concluded as land use types, modes of transport, physical form and scale, associated linkages, as well as socio economic status of the region population.

The physical form and scale of a corridor is the first component that can be used to differentiate between urban and regional corridors. Regional corridors are planned on larger scales and consist of different forms and fulfil different roles (Michaelson *et al.*, 2008:9). Depending on the regional scale, corridors can link different order nodes in the specific region (or other regions) (Hauptfleisch *et al.*, 2010:2). The level of interaction and connectivity role of the corridor can be directly related to the form, structure and scale (Geyer, 1988:123). These corridors can also accommodate different modes of transport (Dewar and Watson, 1990; Andersen and Burnett, 1998).

The associated linkage and the socio-economic status of the region (and the population) are also linked to the level at which the corridor is planned (Logan, 2012:27). In this case, national corridors are used to link significant national nodes and capitals. These corridors merely support the trade, movement of people and goods and promoting the interaction between these nodes (Michealson *et al.*, 2008; Harrison and Todes, 1996). On a more inter-regional focus, corridors between different order nodes can serve to uplift certain nodes in a region, promote development and attract external investment to a specific node by improving its level of competitiveness in the region (Harrison and Todes, 1996:70).

Corridors can develop naturally as a result of the implementation of various smaller projects in a linear form (Chapman *et al.*, 2003:168). Logan (2012:27) shares her opinion that corridors are interpreted as a sign to create incentive that draws activity. She continues by stating that corridors can only be seen as long-term initiatives that supports spontaneous, intensification and growth between nodes. Corridors as spatial planning instruments cannot be seen in isolation and needs to be aligned with the current region's dynamics and realities (Hauptfleisch *et al.*, 2010; Geyer, 1988; Priemus and Zonneveld, 2003; Curtis, 2012). By considering these realities, both the public and private sectors are seen as stakeholders that benefits and support the development of the corridor to increase nodal competitiveness.

Corridors aim to stimulate growth and interaction between nodes in a region. This is done to promote development in a node, attract investment and support economic growth in a node (Chapman *et al.*, 2003; Michealson *et al.*, 2008). The interaction between the nodes is more

economically based with a clear geographical connection with the corridor itself (Boudeville, 1972; Geyer, 1986; Hauptfleisch *et al.*, 2010). The next section explains how interaction between nodes and within the region occurs and illustrates the potential of this spatial planning instrument to have an impact on the urban hierarchy of a region.

### **3.7 Planning regions**

A planned region, also known as a programmed region, is a region that is specifically delineated for a determined development purpose. According to James (1952:203), various aspects of a region or demarcated area can be controlled and managed in order to achieve a certain goal or objective, forming a planned region. A planned region is conceptualised before the actual implementation and natural development. After the boundaries delineation of the region's boundaries (to be discussed in Chapter Four), different methods, calculations, projections and elements can be used to manipulate the growth and development of the region. Amongst others, some of the elements which can be used to manipulate the outcome of a region's development include total population, economic sectors and planned corridors and nodes (James, 1952:203). Planned regions could also materialise at different levels of regional planning, depending on the geographic scale. The approach and methodology described are also applied in the Chapters 6 and 8.

Planned regions are focussed on the interaction within the demarcated boundaries and ignore the impacts and interaction with different areas (Glasson, 1985:78). Depending on the goals or objectives for a specific region, a region can be planned to include the impact from other areas or can be planned to focus and reserve the development of the region around certain nodes and corridors (Glasson, 1985:78). Planned regions can therefore be seen as a regional planning instrument that focusses on a specific larger geographic area also including nodes and corridors. Planned regions can also be proposed and implemented across different administrative regional boundaries, where separate governing bodies collectively work together to achieve a specific regional outcome.

John Friedman (1966) used the concept of a planned region as a way to address and improve on various planning problems in different areas or regions. The approach was to address general planning problems experienced in various regions by establishing or planning a new programmed region. The planned region can be classified into different smaller regions with a unique and special role in the area. The core, of the planned region, is the area where higher densities, concentration of activities and high growth rates are found in the area (Friedmann, 1966:40). A high inflow of people from the greater area is focussed on the core of the region. The core (or the node) of the region is where the agglomeration benefits are highest and where many economic opportunities arise as a result thereof. Due to the abundant economic opportunities, benefits and

inflow of people and support, this part of the region consists of the potential to maintain a constant growth rate (James, 1952:203). Depending on which scale the focus of the study is on, it can be concluded that the core of the region is where higher order nodes are found. The core of the region can also be related to the higher order nodes and central places in the urban hierarchy, which is discussed in Chapter Five.

Friedmann (1966:40) indicated that expansion and transitional changes surround the core of the planned region. These regions or areas surrounding the core can be described as parasitic regions. The growth and development of these regions are in most cases due to the benefits and resources at offer in the core region. As the core is expanding in terms of population, economic and commercial functions the surrounding areas also grows and develops. Normally the first areas in these regions that start to develop is the areas directly adjacent to major movement networks or corridors (Glasson, 1985:78). The areas directly located next to the corridor promote easy access to the core of the region, which result in these areas being the favourable zones for development.

As the planned region grows and develops into new geographical areas, the discovery of a new source of development can also occur. It is in these areas where a second core of the planned region can develop. In the discovery of new resources at the current core of the region, the establishment of activities and people will start in the core region and expand, along a corridor, to the origin where the discovery was made. Once the link between these areas is established a mutual relationship and interdependence start to develop within the boundaries of the planned region (Glasson, 1985:79).

As the resources starts to become exhausted, the third region of the greater planned region starts to develop. These areas are the declining transitional regions. As previously mentioned, industries and activities establish themselves close to the origin where the resource was discovered. Once the resource(s) are exhausted, the growth of the region starts to decline and development becomes stagnant. People who once lived in these areas start to migrate to areas where better opportunities arise or may arise. In the opinion of Friedmann (1966:44), the whole concept of a planned region can be concluded as follows:

*“Problems of urbanization, land use, public utilities, housing, and transportation will predominate in the metropolis, while the policy emphasis in upward transitional areas will be on problems of organization in agriculture, settlement, inter regional transportation, and industrial development. In the downward-transitional areas, population resettlement, community development, and rural land use adjustments will call for priority attention. The inter relatedness of these problem complexes underscores the need for a national approach to regional development.”*

A planned region is the regional planning instrument that could be used to manipulate the development of a specific region to promote a certain outcome (James, 1952:203). As with the other two (nodes and corridors) regional planning instruments discussed, planned regions are implemented through a top-down approach. A planned region can therefore be used, from a government perspective, to promote and control the growth and development of a particular region or area. On a larger geographical scale, a planned region can be applied on national, regional and sub-regional scale.

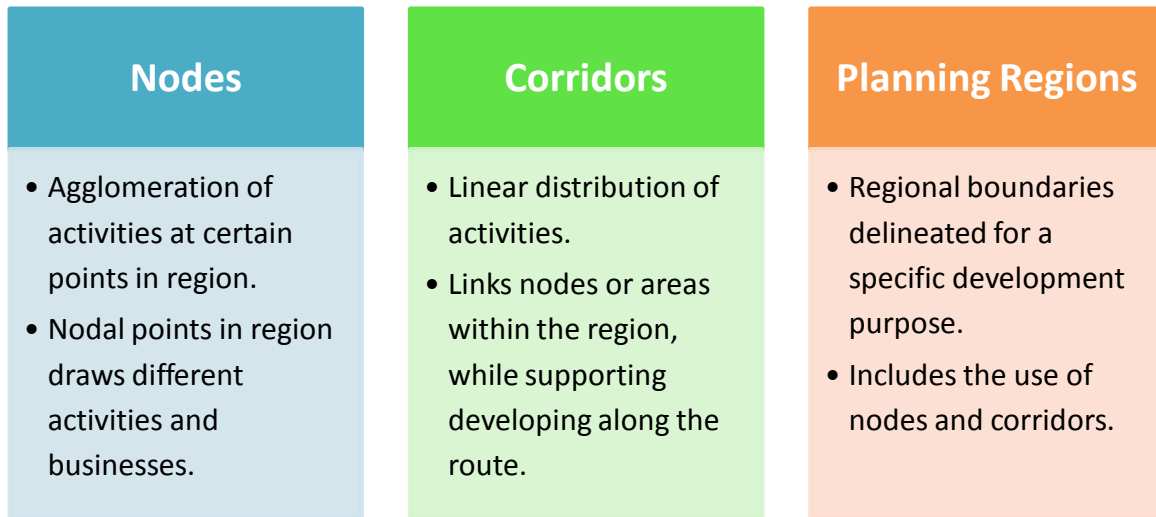
### **3.8 Conclusion**

In Chapter Three the significance and roles of the existing regional planning and regional planning instruments was studied. The initial few sections of this chapter focussed on regional planning, the purpose and dynamics of regional planning. Regional planning involves a combination of existing elements, the dynamics and procedures that need to be tailored regionally specific to achieve identified outcomes (Bryson and Roering, 1996). The general purpose of regional planning is focussed on the provision of a spatial structure of activities or uses in an improve manner (Hall and Tewdwr-Jones, 1975:3). Glasson and Marshall (2007:15) explained that regional planning up to now is more focussed on a variety of different regional dimensions and factors. Although different dimensions are considered the key function and purpose of regional planning is concluded in the following (Dickinson, 1964; Glasson and Marshall, 2007; Hall and Tewdwr-Jones, 1975; Lloyd and Dicken, 1972; Batty, 2008; Schweitzer *et al.*,2009;Isard, 1965):

- a) Promotion of social and economic integration;
- b) Compilation of the regional planning concept and vision;
- c) Creating regional environments promoting economic growth;
- d) Reduction of the need for transport patterns; and
- e) Protection and enhancement of investment of all inhabitants.

From the above-mentioned, economic growth in regions is one of the main purposes of regional planning. Economic growth in regions is significant, as this may enhance or inhibit national growth and development (Lloyd and Dicken, 1972:262). Economic growth can be enhanced and managed through the effective implementation of regional planning instruments. These instruments should supplement one another to ensure proactive and coordinated approaches in development planning are implemented to manage general regional planning problems (United Nations, 2008:9). Glasson and Marshall (2007:14) explained that the primary approach pursued is to design the development concept of the region including movement, networks, nodes, hierarchies and surfaces (Glasson and Marshall, 2007:14). The development concept or approach differs in different geographical levels.

According to Lloyd and Dicken (1972:262), the second step in preparing a regional plan is to differentiate between the different geographical levels of focus of the regional plan. If the theoretical principles and roles of the instruments are compared to each other, it became evident that some instruments could be also be interpreted differently on a regional scale. The following figure summarises the three discussed regional planning instruments in this chapter.



**Figure 3-4: Nodes, corridors and planning regions as regional planning instruments**

Source: Own compilation

The figure above illustrates the application of nodes, corridors and planning regions as regional planning instrument. The implementation of these instruments is linked to different classification on the different geographic levels illustrated. This research aims to illustrate the potential of the regional planning instruments in an integrative approach through the combination of an urban hierarchy as a supplement spatial planning instrument. Regional planning instruments are used to initiate and facilitate development into a certain preferred direction in order to promote a certain structure and pursue specific development objectives of a region. The role of an urban hierarchy as spatial planning instrument should also adapt this function and supplement the existing instruments to potentially contribute to achieving the main roles of regional planning.

Despite the efforts and implementation of these instruments in a region, development of the region does not always occur in a constant manner or desired fashion resulting in different forms and outcomes of regional development objectives. This leads to other significant regional planning problems such as spatially and economically unbalanced development, which in turn is linked to various other small-scale problems. In the following chapter, the different approaches to delineate a region's boundaries and the impact of corridors on the region (as discussed in Section 3.7) are included. The regional development phases and growth are discussed after the delineation and corridor sections.

## **CHAPTER 4: REGIONAL DELINEATION AND GROWTH**

### **4.1. Introduction**

In the previous chapter, the utilisation and implementation of regional planning instruments in regional planning globally were discussed. From the section, the use of corridor and nodal development as spatial planning instruments were reviewed to illustrate the spatial impact of these instruments on a region. This is primarily focussed on the growth and development of a region in general. In regional planning, the development and growth of a region are focussed on specific outcomes and goals through the implementation of specific spatial planning instruments as discussed in Chapter Three. Depending on the specific context of implementation and development goals of a region, development of a region can either follow a balanced or unbalanced approach. Balanced approaches are often followed where planning initiatives are evenly distributed in the region, while unbalanced approaches focus on specific delineated areas in a region (see Section.4.3)

These regions can differ from scale, structure and specific development phases or conditions (see Sections 3.4.1 – 3.4.3). Before the regional planning instruments are implemented, the specific area of focus in the region needs to be delineated. In regional planning, the delineation of a region can have major impacts on the identified development objectives. The boundaries of a region can be already delineated (in the case of a municipality or province for example) or the regional planning instruments can be used to help determine the boundaries of a region. The following section focusses on prominent methods used in the regional delineation process.

### **4.2. Regional delineation**

The regional delineation process has a direct impact on the structure of the region and ultimately the dynamics and interaction within a region (see Section 3.4.3). Depending on different regional dynamics and interaction, the regional boundaries can potentially influence the interaction of the region. Depending on the scale and structure of the region, the interaction between different nodes in the region can have an impact on the hierarchy of nodes in the region. The role and hierarchy of nodes in a region are discussed in Chapter Five later in the research. Regional delineation can also be affected by various elements. This can be a result of implementation of planning instruments as mentioned in the introduction or can also be affected by various other external influences such as politics or the sub-continental economic environment etc.

The process of regional delineation has evolved in various sectors of studies and has also been used in different professions such as in the economic environment, the trade area, regional planning, strategic planning of government bodies and even in policing. This topic relates to how

different regions are demarcated with the help of certain factors and influences (Harmse, 2009:60). For the purpose of regional planning, this research focussed on the different methods applicable in regional planning that could potentially impact the general regional dynamics and interaction.

Valuable contributions in the delineation process from different existing approaches were reviewed and other methods of delineations were also included. Some of the generally applied models in the delineation process included the gravitation model (Gray, 2014; Huff, 1964), improved field model (Wang *et al.*, 2014) and the Voronoi model (Boots and South, 1997). The demarcation of a region is not always based on a specific model but includes holistic approach such as the economic environment, politics, natural topography etc. In the following sections, the mathematical models as well as holistic approaches are reviewed.

#### **4.2.1. The gravitation model**

The gravitation model is often seen as the most significant model of all delineation models and is widely adapted and used in various professions (Harmse, 2009:60). David Huff (1964) first introduced the gravitation model for use in retail trade area delineation. Relating to the retail trade area, the original gravity model assumed that people supporting the facility preferred one facility above another for the following two reasons (Gray, 2014:15).

1. Euclidian distance to the store
2. The physical size of the store

*The gravitation model was later refined by Huff himself by (Huff,1964:35), "... including probabilities, so that boundaries between one retail site's trade area and a competitor could be blurred, or gradual, and that the surface trade area polygon varied in saturation based on the probability that consumers would stop there."*

In the first version of the gravitation model, one can relate this description to the theory and approach Lössch (1954) used in the identification of central place in the spatial system (Lössch's theory on central places to be discussed in Chapter Five). The same principle applies in the last-mentioned approach where people are willing to travel various distances in the surrounding region of a central place town. After Huff had improved the model, the gravitation model evolved from first just including two factors to including different probabilities based in consumer behaviour and preference. It became evident that the process of delineating a region was a difficult and daunting task with many variables at hand. The challenge was to try to incorporate most of the variables related to a trade area in one model.

As more and more researchers built on the gravitation model, it was found that more influences and factors could be added into the existing gravitation model. The sheer size of the facility was important, but not the major deciding factor in the model. The common way of thinking was that a large facility would dominate the demand in the region. This state of mind almost relates to the functioning of a central place in a region. Bucklin (1971:32) was one of the first who started the paradigm shift and pointed out that multiple options of facilities could exist, each with a different offering of products and services. This can be directly linked to a region consisting of various towns or nodes with different offerings in a spatial system. Depending on the type and variety of services and goods as well as the reason why people would travel to a certain node or city, the boundaries (trade area) of a region will differ.

Bucklin (1971:33) also suggested that the different boundaries between trade areas (nodes) should not be seen as distinct and clear lines but rather as graduations from one region to another. The graduation between these nodes or areas is influenced by the movement patterns or corridors between the different nodes. Consumer behaviour, patterns of movement and preference of people are challenging tasks to identify and delineate. Behaviour and movement are concentrated around main connections linking different nodes. The last-mentioned factors are seen as “softer issues” with a real-world impact. Huff (1984:48) later responded to the additions made by Bucklin by proposing a “most suitable or best representative” area which simulates growth along areas where growth is best supported. Growth is more likely to occur in areas where agglomeration benefits are concentrated, which is normally at nodes or between nodes in a linear spatial pattern.

From the gravitation model, it is evident that the delineation process is an ever-revolving process that takes more and more variables into account. The current technological state globally also has a significant impact. Considering its flexibility, the gravitation model is a popular model to adapt due to the ability to include various gravitational factors such as size of facilities, quantity and quality of products and services offered at the node, consumer demographics, movement patterns, consumers behaviour, maximum travel distance or other metrics to best suit the situation and region that is being studied. Corridors are seen as the elements that influence the interaction between different nodes that ultimately relate to the size of the facility and movement patterns.

#### **4.2.2. The Voronoi model**

The Voronoi model is often used to demarcate a region in terms of anticipated market support in the retail and commercial environment. The Voronoi model or method is also known as Thiessen polygon model and is regarded as a simple and fast way to delineate a region in the retail practice (Gray, 2014:16). This model is mostly based on mathematical calculations essentially assuming that only Euclidian distance is used to demarcate catchment areas of the retail centre’s trade or catchment area of primary support.

The approach of the Voronoi model is also similar to that of the central place theory as it was also discussed in the previous section about the gravitation model. The basic assumption and fundament of the theory is that customers of a retail centre tend to visit or support the retail centre closest to them. Holistically, this theory is not accurate, therefore, it is important to note that the function, different products, personal preference and type of centre are not taken into consideration in this model. Euclidean distance between centres is the only factor taken into account.

The limitation of this theory was exploited when Boots and South (1997:522) introduced a Thiessen polygon, taking customers behaviour/personal preference into account. This addition to the theory improved the theory up to a certain point where it could be compared to the gravitation model. This was the first addition in delineation processes that took the “softer issues” referred to earlier into account. One of the major influences in this new addition was that customers tended to divide their expenditure into various locations. According to Gray (2014:16), the splitting of behaviour between different centres was calculated as a probability that a customer would shop at different locations at any given time. This addition and contribution differ from the gravitation model, but is very similar in terms of the gradual areas and relationships between different nodes or centres.

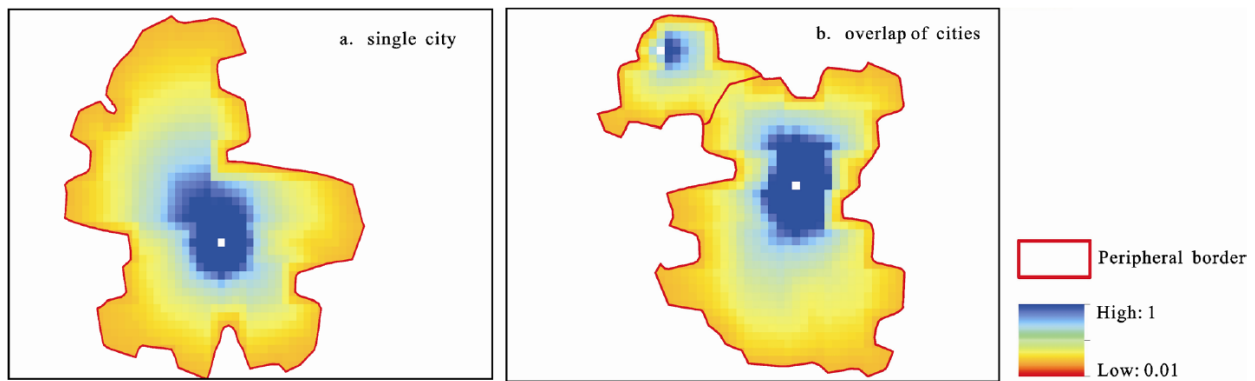
#### 4.2.3. The improved field model

The improved field model is a model based on the limitations of the gravitational model. The diffusion effect referred to in the gravitational model only occurs in an ideal, homogenous spatial area. This model attempts to accurately measure the diffusion effect as discussed in the section about the gravitational model. The approach mainly utilises a mathematical and reasonable approach as an attempt to measure the diffusion effect (Wang *et al.*, 2014:754). The measurement used in the improved field model is based on the measurement of regional accessibility. The measurement of this area is essential to delineate the area influenced by the urban activity. Wang *et al.*(2014:754) explain this mathematical calculation based on the following formula and accompanied figure:

$$F_{ki} = \frac{Z_k}{T_{ki}}$$

In this formula:

- $F_{ki}$  is the field intensity of city or node “k” at point “i”.
- $Z_k$  refers to the urban influence index of city or node “k”
- $T_{ki}$  is the time cost from city or node “k” to point “i”.
- The discussion regarding this formula is linked to Figure 4.1.



**Figure 4-1: Spatial pattern of sphere of urban influence based on improved field model.**

Source: Wang *et al.* (2014:754)

Figure 4-1a shows that the sphere of urban influence of a single city or node is confined within its outer boundaries. Any point or location in this region could be radiated by all the cities in a region. The field intensity of different nodes (blue areas) may overlap in the region due to various factors. These factors include the distance between the nodes, the hierarchy of the city in a region and the influence the city has on the urban influence scale. The interaction between different nodes in a region as well as the interdependence between different sized nodes may also have an impact on the area of urban influence.

During this process, spatial points or nodes need to be classified based on a generally accepted principle. The principle which is evident in any spatial node is the population residing in that specific node. The maximum population principle is applied at a specific node to classify that node in a given region. Wang *et al.* (2014:755) proposed that, apart from classifying different nodes alone, they connected points in equal field intensity and constituted the sphere of the urban influence of given cities by combining the outer boundaries of single cities' influence sphere, as shown in Fig. 4-1b.

Once the sphere of influence has been determined, the dynamic changes in both the scope and the size of sphere of urban influence are analysed. From this analysis, a development trend and the interdependent level of intensity between different nodes in a spatial system could be determined based on positive agglomeration benefits offered in the system. Next, four indicators are selected to help identify the patterns of urban spatial organisation. As stated by Wang *et al.* (2014:755), urban spatial organisation refers to the levels or spheres of urban influence in core cities, overlapping areas of the sphere of urban influence, the relationship between overlapping areas of sphere of urban influence and regional average overlapping areas and the completeness of urban system.

The overlapping area or hinterland of urban influence between two points in the spatial system indicates a shared hinterland or area in a region. This area demonstrates the connections between different areas in a region. The level of interdependence between different areas or nodes in a spatial system or region is determined by the size of the shared hinterland as calculated by the model. This is how the improved field model is used to calculate and measure the intensity of interaction between different nodes in a region.

This model helps to clarify the basic patterns, characteristics and development trends that spatially and ultimately define the boundaries of a region based on the influence between different nodes in that region. The interaction between different nodes in a region can help to define the boundaries of a region. In this case, significant nodes are spread through the regional boundaries, each with its unique role and function. Depending on the interaction and type of facility, different types of nodes can have different sized catchment areas.

#### **4.2.4. Holistic approaches to regional delineation**

Economic and mathematical models play an integral role in demarcating the boundaries of a region, irrespective of its role and function. Although these models have dominated this field of regional planning, most of these models are limited by some assumptions or the fact that most are based on a homogenous region. In regional planning, regions exist with different sizes and limitations. The internal and external aspects of these regions are not considered in the accurate mathematical, statistical and economic models. The reality is that there are various other aspects that come into play in the dynamics of a region, which ultimately determine the boundaries of that specific region.

The process of regional delineation is not a static or pre-determined manual utilised in regional planning all over the world. Regional delineation is a rolling process that is continuously influenced by different evolving factors. The process is often influenced by the interaction between different criteria as well. These factors or criteria that influence the boundaries of a region are often the result of geopolitical, social, technical, ecological and economic factors (Kocziszky, 2009:61). The last-mentioned factors can all be classified as holistic approaches and are concluded in the following table:

**Table 4-1: Holistic approaches to delineate regions**

Source: (Koczisky, 2009:61)

<b>CRITERIA</b>	<b>AREA</b>
E. Natural geographical aspects	Plains, mountains, rivers, lakes etc.
F. Public and state administration aspects	Districts, provincial and national boundaries etc.
G. Identity aspects	Religious (Protestant, Catholic. Etc.), cultural etc.
H. Functional aspects	Industrial, tourism, agricultural, metallurgical etc.
I. Economic aspects	Developed, developing, backward, etc.
J. Spatial structure	Urbanised and rural areas, urban hierarchy etc.

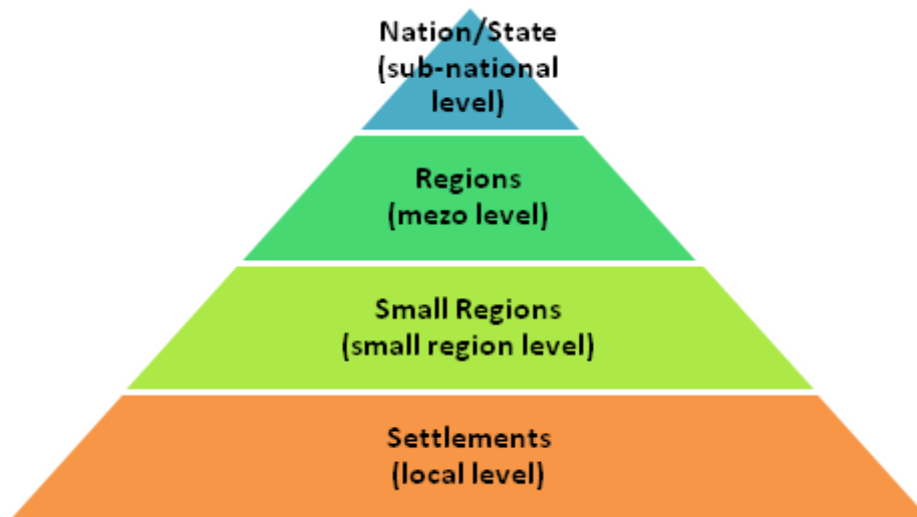
All the above listed holistic approaches to regional planning are often used as a combination between two or more of these criterions. In the following part of this chapter, each of these criteria is discussed in short to understand how exactly they are each utilised in the regional planning today.

**A. Natural geographical aspects**

Natural geography and topography are used on a very regular basis and can be applied on various levels of regional delineation. Natural geographical aspects include all physical barriers that physically constrain movement or drive the movement of people and goods in a certain direction. Countless examples of natural geographical aspects as determining factors of the boundary of a region exist.

**B. Public and state administration aspects**

Regional delineation, according to public and state administration, developed as a result of historical development and natural changes from country to country. According to Koczisky (2009:62), different spatial levels come into play in the public and state administration approaches. Koczisky (2009:62) explains the different spatial levels by using the following pyramid.



**Figure 4-2: Spatial pattern of sphere of urban influence based on improved field model.**

Source: (Koczisky, 2009:62)

Areas of public administration are often the result of either a top-down planning approach (national decisions) or a bottom-up approach (small regional bodies). Regions that are delineated based on political boundaries are normally seen as legal spatial bodies with an exact body of governance. These regions exhibit a certain level of independence, each with its own power, identity and organisational structure.

According to Koczisky (2009:63), the independence, identity and organisational structure of a region are ensured by a greater national constitution or legislation. As previously mentioned, these regions are governed by a local governing body. The governing body takes the responsibility of ensuring that the applicable region is managed sufficiently and according to the greater constitution or legislation. This responsibility and management of the region result into the establishment of a certain political identity. Political boundaries or legal spatial bodies that are governed by a certain body are directly linked to the management and decision approach. These approaches are well-known as a top-down or bottom-up approach. The two different approaches are directly linked to the “power” of the decision-making of the governing body and the residents in the demarcated region.

A top-down approach in regional demarcation is often seen in regional planning in a case where a presidential body identifies a specific area for development or if a

definite strategy is implemented directly into an area. A top-down approach is easily seen as a more capitalist approach and less of a socialist approach to regional delineation. The top-down approach is normally also followed on a large geographical scale such as often seen in national strategic planning plans. A bottom-up approach on the other hand is much more focussed on including social aspects (Botha, 2011:92). An example of a bottom-up regional delineation approach can be seen where different inputs from the region's residents are gathered to help delineate the region for a specific purpose. Political influences in delineating a region's boundaries are implemented widely and often used in various countries. These regions are governed by a local body depending on the level of planning it is applied on. The local governments are responsible for the management and strategy planning of how that certain region is managed and developed. Each region has different governing bodies that take responsibility to ensure the independence, identity and organisational structure of a region based on national legislation and constitution.

This section aimed to illustrate general delineation methods that are often used in regional planning. The delineation process is significant in regional planning when specific areas are demarcated for a specific strategic spatial intervention. Growth and development do not always occur even in a spatial system or a region as planned in regional plans. Growth within a region is favoured in certain areas or nodes. During the study of the delineation models, it was found that different variables had an impact on the growth and dynamics of a region. Corridors are the spatial planning instruments linking the areas or nodes that are favoured in terms of growth. The dependence and role of a corridor in the region was noted during the discussion of the gravitation model. The following section specifically focusses on the development of corridors and how these instruments impact the general growth and development of a region.

### **4.3. Regional perspectives on corridors**

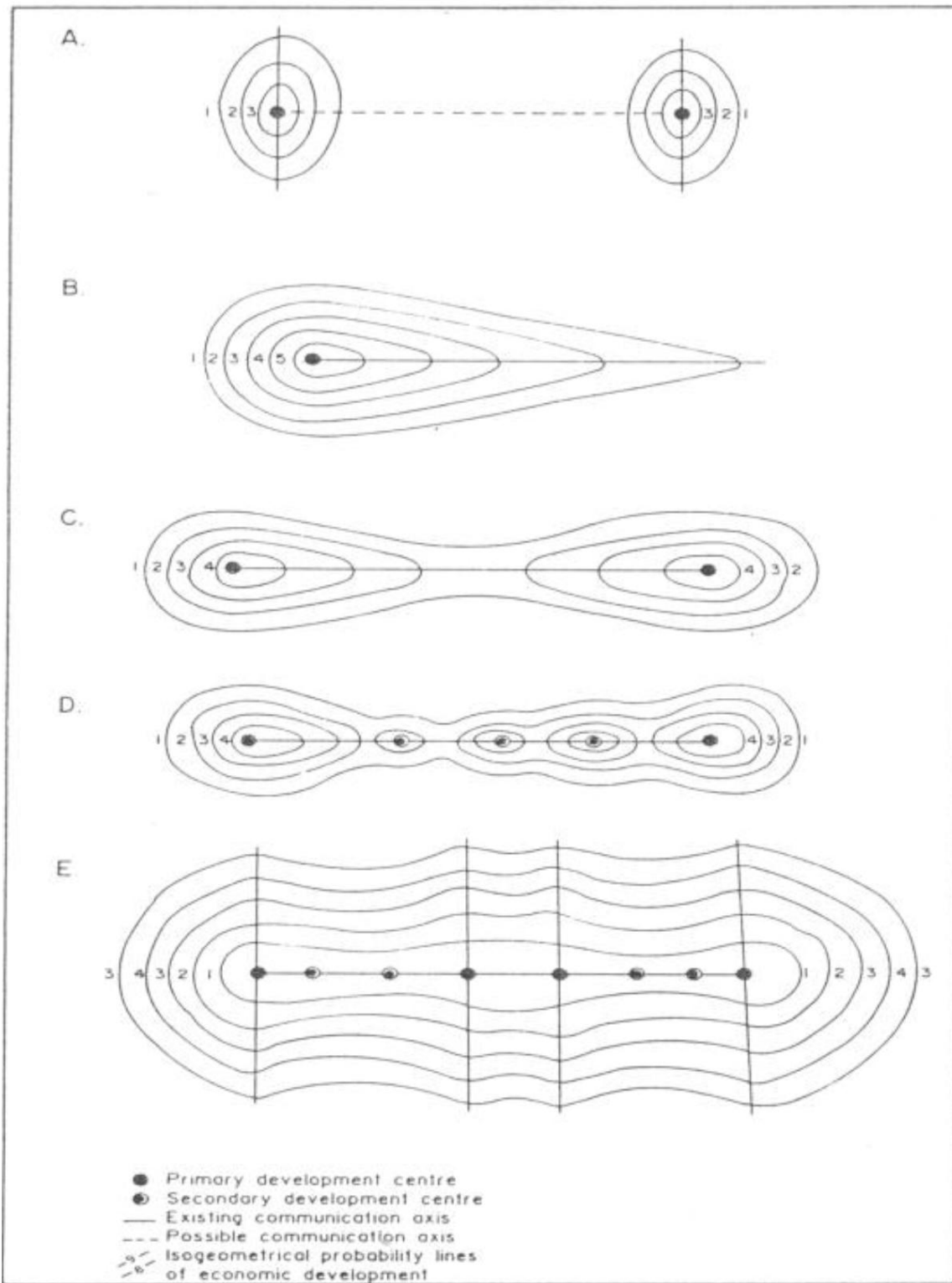
#### **4.3.1. Development of a corridor**

Section 4.3 explores the development of a corridor in a region and the linking element between different nodes in the region. This specifically refers to the development of a corridor between two different nodes and how activities are drawn to this linkage to form a linear development pattern or a corridor. Interaction between nodes is necessary to economically develop the region by attracting different economic facilities to this 'regional lifeline'. The level of development within a node also depends on the interaction between different nodes in the region (Friedmann, 1986:70). Pumain (2006:174) explains that nodes in the top of the urban hierarchy are more likely to sustain

development through internal economic interaction. According to Hauptfleisch *et al.* (2010:2), a correlation between the levels of development at a node is directly linked to the interaction between nodes along development axes. The “axes” referred to here are the same as a corridor between nodes. Hauptfleisch *et al.* (2010:2) describe the functioning of a corridor by referring to the development of a proper road network that promotes the interaction within regions.

From the previous paragraph, it can be concluded that development corridors are directly linked to the transport infrastructure. The frequency and nature of the use of a specific transport link between different nodes in a region is from where the development of a corridor originates. If a transport road or link is not frequented, it merely serves as a road through the region. Hauptfleisch *et al.* (2010:4) confirm this by stating that the impact of development links of corridors is much broader than the direct adjacent areas to the transport infrastructure. Geyer (1988:123) explains the development corridor as an actively changing spatial instrument that evolves over time. He describes the development of a corridor in the following phases and the associated figure (Geyer, 1988:123):

- the potential axis/corridor (A) or the development finger with the potential for the establishment of a development centre at the other end (B);
- the axis/corridor in an infant stage with a well-established communication axis between two primary centres (C);
- the mature stage with the corridor or axis/corridor having one or more secondary centres in between (D); and
- the axis/corridor in its old age or dormant stage where an over-concentration on the axis may lead to the development of agglomeration, diseconomies or polarisation reversal (E).



**Figure 4-3: The evolution of the development corridor**

Source: (Geyer, 1988:123)

From the figure above, it is clear that some corridors are not linked to significant development centres (or nodes) or are merely covering too large areas to realistically promote development. Geyer (1986:163) referred to these corridors as finger development with the absence of an

equilibrant node on the other end of the corridor. The interaction between the nodes needs to consider the economic forces and principles between the nodes and the region. Hauptfleisch *et al.* (2010:4) agree with Geyer by referring to the far-reaching development implications rather than just the adjacent areas and transportation role. The gravitation model can also be referred to, to illustrate the far-reaching development implications of a corridor in a region. They (Hauptfleisch *et al.*, 2010:4) continue by stating that a clear understanding of the economic forces in a region is crucial in and development planning role due to the fact that migration mainly follows economically viable areas. The evolution of the development corridor also describes the impact of corridor development in terms of the gravitation model. In the evolution, the size of different nodes has the ability to attract support from the general surrounding region. As the sizes of these nodes or areas increase, the graduation effect from the gravitation model starts to develop in the region along the corridor.

#### **4.3.2. Interaction within a region**

From the previous section, it is clear that the major role of a corridor in the current regional planning environment is the linkage role (see Sections 3.6.1 and Section 3.6.3). This section primarily focusses on this role. The linkage role of a corridor promotes interaction within a region. Regions consist of various nodal points fulfilling a specific role in the system. These nodal points are all inter-related and inter-dependent on each other which in turn impacts the hierarchy of these nodes in a region (Boudeville, 1972:19). The referred interaction between these nodes is not just focussed within the demarcated region, but is also focussed on nodal points outside the region. The region and level of planning that Boudeville based his study, can be concluded as “...*the set of neighbouring towns exchanging more with the regional metropolis than with other cities of the same order in the nation (Boudeville, 1972:20)*”. The nodal points (or nodes) cannot be seen as individual nodes in the region. Marrian *et al.* (2001:8) support the last-mentioned and findings of Boudeville by stating that strong function linkages need to exist between nodes and that with the absence of these types of linkages, interaction between nodes and the general region will be non-existent. The latter will result in impeding of regional growth and development. The region, with its nodes and interaction, should rather be seen as an entire body.

New nodes and different economic activities can be established due to the interaction and linkages to a corridor. These activities and nodes along such intersection can naturally influence and demarcate a specific region. The region with its nodes develops and evolves both in terms of activities and structure due to the continuous interaction along corridors. The development of corridors in a region can influence the region through the following four factors identified by Boudeville (1972:21):

- a) the development of infrastructure;

- b) growth in population (increased demand);
- c) structural change of urban areas (infrastructure development); and
- d) technological and communication developments.

The structural change of a region, as a result of corridor development, is the most common result of effective implementation and planning of a corridor. Planning, development and implementation of a corridor as a regional planning instrument occur at strategic planning in national, provincial and local departments (Jourdan *et al.*, 1996:4). In a demarcated region, certain nodes can be undeveloped or ineffective in terms of economic growth. The planning and implementation of a corridor can directly link these nodes in order to give them an economic injection (Chapman *et al.*, 2003:170). This method relates to the fourth corridor responsibility and application of a corridor as a planning instrument in this research (Michealson *et al.* 2008:12). Once these nodes are linked through corridors, the interaction between different nodes increases and the hierarchy of nodes (urban hierarchy) starts to change naturally.

As mentioned previously, the planning of corridors is done on a strategic planning level that pursues and implements the planning strategy via a top-down approach (Jourdan *et al.*, 1996:4). In a top-down approach, proper research should be conducted to ensure that the implementation of corridors (and other regional planning instruments) is used effectively. This research aimed to contribute to this role as well as illustrated the true potential of applying the corridor as an instrument informed by the integrated urban hierarchy spatial planning instrument.

Botha (2011:23) states that, in a top-down approach, it is worthwhile to evaluate the potential of the region before declaring it as a new development node. In this study, the aim was to evaluate and test the feasibility of nodal development and investment by implementing the urban hierarchy in an integrative approach as a spatial planning instrument. Urban hierarchy, as stated before, is directly linked to corridors. In Chapter Five, the development and theory of an urban hierarchy in a region is further investigated to illustrate the link between the existing regional planning instruments and the hierarchy.

#### **4.3.3. Transport and connections in a region**

As discussed in the previous sections, the ability to interact and connect with other nodes in a region is crucial for economic and regional development. Interaction between different nodes in a region is facilitated with the development of transport links (roads, rivers, railways etc.). Glasson and Marshall (2007:178) state that the level of transport and the ability to connect with other nodes are directly linked to the competitiveness of a node in a region. The competitiveness referred to here can be described as the ability of the particular node to attract external investment and to

convince different people and businesses (from different economic sectors) to establish themselves at this node (Jourdan *et al.*, 1996:7).

Ingram (1971:4) emphasises the importance of transportation links on the spatial connectivity, which is seen as a major advantage of a node to overcome some form of spatially operating sources of friction (for example, time and/or distance). By combining the transportation, connectivity and competitive aspects of a corridor, it can be concluded that corridors can also be considered as a highly effective spatial planning instrument. Planning and supporting the development of corridors between different nodes in a region, increase the region's ability to interact with other nodes, but also provide a level of competitiveness of the particular nodes along the corridor compared, to other nodes in the region (Michealson *et al.* 2008; Chapman *et al.*, 2003).

With this being said, it is noteworthy that Gwilliam (1970:12) warned against the specific use of a corridor as transport investment initiative in a region. The positive contribution of a transport investment between different regions is the improved ability and efficiency of the movement of people and local businesses between different regions or nodes. On the other hand, the negative effect of transport investment can occur if certain nodes do not have a competitive advantage in the regional market. By promoting a transport investment in such a case, may result in increased regional competition and within an economically vulnerable area, it may also result in limiting the market potential between the nodes.

Considering the explanation of Gwilliam (1970:12) on the two opposite effects on corridor development promotion (or transport investment), the significance of the economic dynamics between the nodes and within the region needs to be considered, before implementing this spatial planning instrument. Glasson and Marshall (2007:178) explain that corridors have the ability to alter the spatial structure of the region and to influence the urban hierarchy and clusters in a region. The collective use and planning of corridors in the region can result in a major structural and dynamic change of a region, which has a direct impact on the general development in a region. Regional development can be grouped in different phases used to describe the dynamic and developmental potential and situation of a region.

#### **4.4. Regional development phases**

##### **4.4.1. Background**

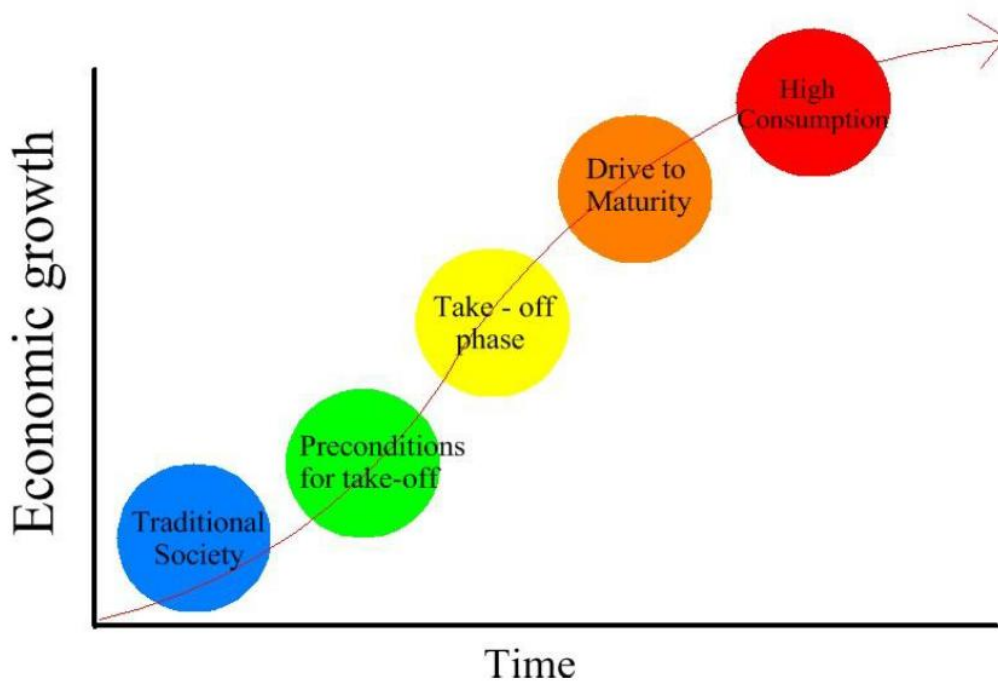
The regional development phases fulfil a specifically distinct role in the context of this research. Although the theme specifically relates to the role of an urban hierarchy as spatial planning instrument, the research questions and outcomes specifically refer to the role of regional

development phases in the potential integrative process. Regional development phases illustrate and explain the specific level of development of regions globally. These theories analyse the socio-economic status quo of a region, while it should be based on a specific problem analysis of the region in an effort to propose opportunities for development (Dawkins, 2003:135). Regional development theories include different approaches ranging from economic, social, political or cultural factors (North, 1991:98).

In the context of this study and for the purpose of this theme, regional development need to be discussed based on different phases. Mohr and Fourie (2004:624) related the phases of regional development to the regional economic conditions. Rostow (1960) found that each region progresses through different phases of development. The different phases referred to are explained in the 5 phases of regional growth in Rostow’s model for regional development. The following section specifically focusses on each of these phases of development.

#### 4.4.2. Regional development phases

According to Rostow (1960:4), it is possible to identify all societies and their related economic dynamics within five different categories: the traditional society, the preconditions for take-off, the take-off, the drive to maturity and the age of high-mass consumption. These five different categories are used to group the development phase of regions globally. The following figure illustrates the five phases as described by Rostow (1960:4).



**Figure 4-4: Rostow’s regional development phases**

Source: Botha (2011:24)

#### **4.4.2.1. The traditional society**

A traditional society is not seen as a static region in terms of development, but most activities are dominated by the agricultural sector (Rostow, 1960:4). Other activities, apart from the agricultural sector, are also found within this phase, but are mostly primary and hand-dominated activities. Although these activities are concentrated in primary economic sectors, some level of technical innovations impacting productivity is introduced in the sectors and industry production (Mohr and Fourie, 2004:624). Productivity may initially see an increase, but will soon normalise at the ceiling of productivity. According to Rostow (1960:4), this ceiling is usually reached as a result of the lack of the constant application of modern science and technology.

Mohr and Fourie (2004:624) also state that, normally, population numbers are low as a result of not many people drawn to the region for potential employment opportunities. With a limited population size and primary economic activities prevailing, low per capita income is expected in these regions. Because of the limited economic growth, stable and constant population size and primary economic activities, these regions do not experience high growth and development is minimal.

#### **4.4.2.2. The preconditions for take-off**

The second phase is specifically aimed at regions experiencing the process of transition. According to Rostow (1960:4), the transition phase is described as the period where preconditions for take-off are developed. The transition from a traditional society may take some time, as new developments and innovations are explored. Rostow (1960:4) explained that the preconditions were created from the interaction between the gradual evolution of modern science and the lateral innovation that came with the discovery of new available land converged with the use of modern technology at certain points in the region. Considering the previous phase of development, it can be concluded that momentum in new production functions and innovation is specifically experienced in the Agricultural sectors and industries in general.

The newly gained momentum results in gaining economic progress in the region, which increases general welfare and improved living conditions (Mohr and Fourie, 2004:624). Rostow (1960:4) explains that increased education results in the changes necessary for modern economic activity to take place. The new modern economic activity attracts new employment opportunities in different businesses and increases general government well-being. In this phase, the previously experienced social structure in the traditional phase transforms into regionally based political institutions in the development of the government sector. The newly experienced momentum attracts new investment in specifically transport, communication and raw material extraction. The experienced investment also results in the establishment of modern manufacturing activities and

the rise of the industrial sector in the region. All these activities still develop at a low growth rate, which is still nestled in predominantly low-productivity methods. This phase is commonly noted in many less-developed countries globally (Botha, 2011:23).

#### **4.4.2.3. The take-off phase**

The take-off phase is the phase dividing many modern societies from the less-developed regions. According to Rostow (1960:5), this is the interval where various development obstacles and resistances are overcome and economic development takes off. The rate of growth enters a normal condition as technological development in industries and agriculture surges and political powers develop into high-order political businesses. The take-off of various industries and modern production methods spreads in different economic sectors, resulting in high economic growth (Botha, 2011:24).

The high economic growth rate results in reinvesting in other industries and activities, which contributes to the rapid expansion in employment and services for the employees. The improved employment conditions and services are combined with increased income, which in turn results in an increased ability to actively take part in economic activities (Mohr and Fourie, 2004:624). With an increased ability to freely take part in economic activities, comes the rise of various entrepreneurs, which expands the economy further and attracts new investments from the private sector. Rostow (1960:5) explains that this phase may stretch over a decade or two in which the basic structure of the economy, social and political structure of the region are transformed to sustain a steady growth rate of the region in general.

#### **4.4.2.4. The drive to maturity**

The drive to maturity phase is characterised by an interval of sustained and fluctuating progress in the region (Mohr and Fourie, 2004:624). According to Rostow (1960:6), the general economic composition changes regularly as new different methods get improved through innovation, new industries accelerate in growth and older industries level off. Due to improved methods, various goods and services (imported previously) are now produced locally in the region. The society of the region requires efficient production to support the economy to prevent the general growth rate to decrease in the region. The requirement for efficient production leads to the development of technologically refined processes and industries.

Rostow (1960:5) formally defines maturity as the stage in which the region's economy consists of the ability to progress from the original industries into newer self-sustained industries focussed on a wide range of regional resources and advanced technological methods. The technological and entrepreneurial ability of the region result in increased production, which is not dependent on the economic- or political priorities but rather the technological and institutional need. The regional

society consists of the ability to absorb modern technology over different generations with a normal regional growth condition.

#### **4.4.2.5. High mass-consumption**

During this phase of development, the leading economic sectors shift towards durable goods and services produced in various economic sectors. According to Rostow (1960:6), societies in the twentieth century experience increase per capita income as well a change in the structure of the work force. The ratio between factory workers and office based (or highly skilled) develops more balanced through the region with an elevated level of urban population. Additionally, the society stopped to accept further extension of modern technology as a significant objective (Potter, *et al.*, 1999:21).

Rostow (1960:6) states that resources in the region tend to be increasingly directed to the production of consumer durables and diffusion of mass basis services. This phase is the phase where various significant economic forces such as the United States, Japan, Western Europe are grouped together (Mohr and Fourie, 2004:624). Rostow (1960:11) concludes this phase of development in the following:

*“...to offer, by public measures, increased security, welfare, and, perhaps, leisure to the working force; to provide enlarged private consumption – including single family homes and durable goods and services – on a mass basis; to seek enlarged power for the mature nation on the world scene.”*

#### **4.4.3. Core-Periphery Model**

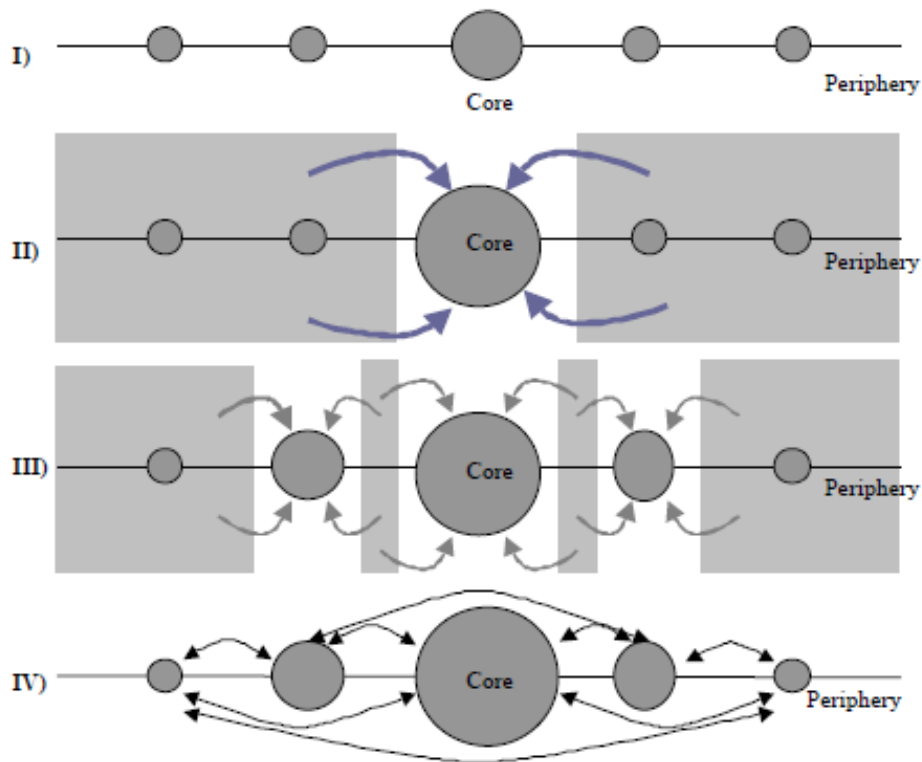
The relationship between economic development and growth of nodes in a region has been included in various academic studies. The core-periphery model is used in various considerations in regional development studies. Friedmann (1966) used this model to specifically explain economic development of less developed countries from a spatial perspective. The initial core-periphery model was based on the regional development policy of Venezuela in 1966 (Jeffrey, 1989:64). In this model, Friedmann identified four stages of development:

- The pre-industrial (agricultural) society;
- the concentration of the economy;
- economic growth spread; and
- spatial integration of the economy.

During the pre-industrial (agricultural) society phase, the region is dominated by sparsely situated rural settlements (Friedmann, 1966:36). These settlements are combined with the establishment of activities from the primary sector (agricultural or mining activities). Friedmann (1966:36) explains that small urban centres are formed around the nodes where these activities are concentrated to fulfil a service and administration function. During the second phase, the process of industrialisation starts, which results in the concentration around one or two of the nodes in the region (Jeffrey, 1989:66). The second phase is also known as the transitional state of development. In this phase the concentration of the economy from the periphery to the core results in the accumulation of capital and industrial growth (Raagma, 2003:3). According to Friedmann (1966:36), the phase sees the rise of mobility in labour of the region, accompanied by the rise of trade. He (1966:36) continues by explaining that these processes result in an increase in migration from the periphery to the core as a result of improved economic activities in the core.

During the third phase of this model, the industries mature further, resulting in rural areas experiencing the gradual deprivation that leads to the development of a regional development policy from the national government (Jeffrey, 1989:66). The regional development policy supports the spread of economic growth across the region, which causes the development of new centres in the region. The rise of these new centres in the region leads to an increase in deconcentration which is mainly the result of the lack of a labour force and rocketing prices experienced at the core (Raagma, 2003:3). These new centres also increase the mobility of the local population to travel larger distances between the place of employment and homes in the new centres. Friedmann (1966:36) explains that although deconcentration is experienced at the core, development of new centres occur that contributes to the general growth of the metropolitan region while the periphery continues to decline.

During the final phase, the spatial integration of the economy occurs, achieving equilibrium (Raagma, 2003:3). Friedmann (1966:36) explains that in this phase the distribution of economic activities should obtain an equal balance and result in regional stability. This phase combines the national integration, efficiency in the location and growth of firms and minimal imbalances in the region (Friedmann, 1966:37). Raagma (2003:5) explains that the division of labour in the phase will continue as different areas or nodes in the region specialises in specific functions. These different areas in the region will continue to increase the mobility of the local population. The following figure illustrates different phases of Friedmann's core-periphery model.



**Figure 4-4: Core-periphery model**

Source: Raagma (2003:4)

The core-periphery model of Friedmann explains the implications of spatial location. One of the significant conclusions made from this model is the dual character and structure of a region. The dynamic between the core and the largely rural surroundings explain how regions develop over time. The core-periphery model is used as a point of departure for the new economic geography theory proposed by Krugman (1991). According to Krugman and Elizondo (1996:140), the new economic geography focussed on the dynamics between the centripetal and centrifugal forces resulting in the development of spatial economies. The centripetal forces referred to in this theory include external economies and various market scale effects while the centrifugal forces include the effects of transport costs and land rents (Krugman, 1991:484).

According to Ascani *et al.* (2012:3), the new economic geography is founded on various elements that contribute to the credible theorisation of why self-reinforcing centripetal forces pull economic activities towards a specific location. They continue by adding that increasing returns to scale, monopolistic competition, transaction cost and external economies all form the basis of the new economic geography model and influence the behaviour of firms and labour in a region. The combination of these elements enables the explanation of new economic geography and uneven economic landscapes. Increasing returns to scale forms the first element in the model by considering the geography as a fundamental element in the analysis. Scotchmer and Thisse (1992:272) emphasised the importance of increasing returns by explaining that these returns

stimulate economic production in clusters. As the new economic geography allows for increasing returns, manufacturing firms are encouraged to concentrate production in space to gain maximum benefits from scale economies (Ascani *et al.*, 2012:3).

Monopolistic competition forms the second significant element in the description of new economic geography. Combes *et al.* (2008) explain that if regions operate in a monopolistic competition setting, firms are neither in a perfect competition, nor in monopoly. According to Ascani *et al.* (2012:4), the new economic geography adopts such an arrangement which result in tracing the market and demand structure while dealing with increasing returns. This arrangement creates a framework that investigates the forming of economic agglomeration in the region. Transportation costs influencing the location choices in the region are seen as the third element in the new economic geography. In contrast to the normal assumption that transportation costs in a region is equal to zero, the new economic geography include a form of transportation cost as a fraction of the value of the units shipped between locations (Ascani *et al.*, 2012:4). The remaining costs are paid as a cost of shipment.

The impact of transport costs on the location of firms, therefore depends on the level of these costs. This dynamic result, forces firms to decide to adapt to these costs by establishing in a single location or to expand the network in a second location. The location of these firms in a region is therefore dependent on the agglomeration due to the interaction between transport costs and increasing returns. External economies in the new economic geography are included as the fourth and final element to the theory. Krugman (1991:485) explains that external economies account for the level of localisation of industries or the localisation of the manufacturing sector as a whole. The effect of external economies in the new economic geography only rises in the presence of increasing returns internal to the firms which are encouraged to concentrate in a single location in an effort to reduce transportation costs (Ascani *et al.*, 2012:4).

#### **4.4.4. Recent regional development contributions**

The previous section utilised Rostow's regional development model and the core-periphery model as foundation to discuss the development in regions. Although these models serve as a foundation to explain regional development, the modern era presents different dynamics and challenges impacting these phases of development. Catin (1993) concludes different new economic geography models and identifies four major stages in the development of regions, which includes:

- preindustrial regions;
- regions with standardised industries;
- regions with technological industries; and

- metropolitan regions (with superior services).

Changes in regional specialisations result in changes in the export pattern of the region in each stage. According to Catin and Ghio (2004:187), factor proportions and associated prices determines the level of regional specialisation in phase one and into the transition of phase two. The second phase includes the process where the regional industry specialises in production and export of low technological content goods. The production and the export of these standardised groups are a result of development of scale economies and lower paid employment. Catin and Ghio (2004:187) continue by explaining that the third stage is the period where regional industries are focussed on the development of high-tech activities requiring increased productivity and a skilled labour force, while a region in the fourth stage experience pressures on exports of these goods. As a result of the pressure on exporting high-tech activities, regions develop superior services. The regional development phases explained by Catin (1993) and Catin and Ghio (2004) correspond with the development phases of Rostow.

The opportunity for growth in any region exists, the responsibility to unlock growth in these regions lies with the governing body. According to the OECD (2009:5), greater growth occurs when regions are able to mobilise local assets and resources instead of depending on the local government. The OECD proposed several suggestions to drive regional growth by taking the length of time needed to generate growth and the successful combinations of factors into account. These suggestions are concluded in the following (OECD, 2009:5):

- **Provide infrastructure as part of an integrated regional approach**

Infrastructure does not have an impact on regional growth unless regions consist of sufficient human capital and innovation. Although infrastructure is an important factor to promote regional growth, it needs to be combined with innovation and adequate levels of human capital.

- **Invest in human capital**

Growth in a region will occur if the local population are well-educated. Tertiary education or higher education therefore forms a significant factor linked to regional growth in the long-term.

- **Emphasise innovation, research and development**

Research and development have a positive effect on activity in all categories. Innovation, on the other hand, takes a longer time to have a positive effect on regional growth. Investments on research and development, combined with an educated population should contribute to positive regional growth.

- **Focus on integrated regional policies**

Sources of growth (including human capital and innovation) within regions are more important than the distances between different nodes and markets in a region. Although a region with good accessibility and interaction have a slight advantage in terms of growth, growth depends on the actual presence of human capital, innovation, infrastructure and economies of agglomeration. Regions enjoy increased ability to grow when these factors can interact and communicate with other nodes or regions.

Section 3.4 specifically focussed on regional development in terms of regional development phases and significant elements contributing to the process of regional development. As discussed in this section, it was noted that different elements can strategically position the region to develop over time. Depending on the combination and level of structure of these elements, regions can be grouped in certain regional development phases, known to classify regions in terms of the potential to grow. The following section specifically focusses on the process of regional growth.

#### **4.5. Regional growth**

The process of regional delineation, as discussed in Section 4.2, is not classified in a certain number or order of regional development as a whole. The delineation of regions can be implemented long after a spatial system has developed or during the planning phase of a region. The process of delineation of a region in an already established spatial system may be to create a structure in a specific area in order to promote efficient management of that region. The delineation process of a planned region is mainly focussed on planning and preparation for that specific region.

In both these cases regional growth does not occur equally throughout the delineated region. Growth in a region is influenced by various external factors. One of the major challenges and possibly the main reason for regional planning is to manage and guide this growth in a region in such way that development in a region is sustainable, the economy grows and that people residing in that region benefit from the growth. Regional growth can either occur in a balanced or unbalanced nature. The following sections focus on the two types of regional growth.

##### **4.5.1. Balanced growth**

The first development economist with a clear study on the growth of regions was Rosenstein-Rodan. Rosenstein-Rodan (1943:203) argued that regions require coordinated investment and management of the sectors in the industrialisation era. The investment referred to here should be based on various economic sectors in the region. Rosenstein-Rodan (1943:203) explains his argument by stating that if a single economic sector expands (or grows) the size of the market also

expands for complementary economic sectors. In theory, investment (externally supported growth) in all the economic sectors occurs; the entire market of the particular region expands, resulting in positive spin-offs for different sectors, businesses and industries. Rosenstein-Rodan (1943:205) refers to such a process of coordinated investment as the “Big-Push” for development in a region.

Rosenstein-Rodan, Nurske (1953:23) also studied balanced growth development in a region, but focussed more on linkages between different markets. As seen in Chapter Three of the thesis, the linkages between different markets geographically, has a direct impact on the development ability. Nurske (1953:23) stated that investment in different sectors can be drawn by offering incentives in the relevant markets. These incentives should be strategically planned and offered to help to accumulate capital in different sectors of a region. The need for the investment proposed is due to his view on the cycle of poverty. Nurske (1953:19) explained that one of the major issues in regional development in developing countries is the lack of income in the region. With limited income, limited savings in the region is expected that in turn results in lower internal investment and growth in sectors. If investment incentives are planned, sectors are given the capital and opportunity to develop through improved productivity and market activity. Although Hirschman was known to criticise the balanced growth theories, he agreed by stating that balanced growth in a region is a result of development of different economic sectors in a region at an equal rate. From Hirschman’s statement above, he acknowledges that different sectors should grow at an equal rate in a region, maximising profit and economic growth through investment and management.

Balanced growth in a region does not purely rely on the development of the different economic sectors, but is also related to the supply in the region. In a balanced state, the economic sectors supply enough to satisfy the demand generated by a region’s inhabitants. In terms of growth and development, balanced growth in theory means that all economic sectors grow at an equal rate and that each new development is supported by the demand in the region. In other words, it can be said that the region is in an equilibrium state. Balanced growth described here refers to the actual performance (growth) of the economic sectors as well as the balance from a demand and supply point of view in each sector.

Botha (2011:29) explains the equilibrium theory by using the following example:  
*“...when an industry supplies an amount of its product the demand from the market needs to be the same to establish equilibrium or the industry will suffer losses and may even need to be closed in the future due to financial problems.”*

This example used, might be seen as a worst-case scenario. To better explain the sensitivity of a balanced economy, one should consider the following scenario. If a new business or industry enters a balanced economic region, new demand should be generated to support this new entity.

If no new demand is generated by the region, it would cause an inequity amongst other related industries in that specific economic sector. All the other existing businesses or industries in this particular sector would now under-perform or the profits would possibly be lower to accommodate the new addition to the economy. In economic and marketing terms, this market will then be in an extreme competitive state to maximise profits. In such a case these businesses will start to initiate optimisation processes.

An extreme competitive state (or perfect competition as referred to in economics) in an economy occurs if not one of the individual role players can have an impact on the factors impacting the supply of a product (Mohr and Fourie, 2004:264). The major factor referred to here is the price at which goods or services are supplied in a region or in an economy. The supply of products and services in a region are determined based on the current supply, demand and dynamics within the region. In order to compete in such a market, individual businesses should accept the given norm of supply and decide which quantity of services or goods they would offer in the region at those principles.

A perfect competition in a region or in an economy is linked to the following conditions (Lösch, 1957; Stigler, 1957; Fujita, 1989; Krugman, 1995; Ottaviano and Thisse, 1999; Mohr and Fourie, 2004):

- A large number of residents (buyers) and businesses (sellers) should be present in the region.
- No collusion or agglomeration benefits may exist between the businesses.
- All products and services offered in the region is identical and of a constant quality.
- No restraints to should exist to enter or leave the market in the region.
- All the individual businesses should have complete understanding of the market conditions in the region.
- No external influences from a governing body is allowed.
- All the factors impacting the supply of the goods and services is mobile and not fixed in a region.

By studying the conditions needed for a perfect competition in a market, it can be concluded that, based on market dynamics and naturally impacts of a region, a theoretical perfectly balanced region and competition is not possible to achieve. Lewis (1956:41) also studied balanced growth by considering the prices of products and level of competition between different economic sectors. He states that in the absence of balanced growth in a region, prices in that particular sector are expected to be high compared to other sectors. In the event of an economic downturn, the losses in the particular sector and the total economy may be big, posing a risk for investment. For this

reason, Lewis supported the balanced growth concept to limit risk and promote overall economic growth (Lewis, 1956:41).

Hirschman (1958:58) states that in regional planning an ultimate economic balanced state would not be achieved unless external factors impacting the economic state come into play. He uses the example of colonialism in regions to explain his theory. In this case, an external governing body needs to increase investment in the economy of that region for each sector by applying a fiscal policy. A fiscal policy can be described in short as the external impact or involvement from the government on the economy of the region. Governments all need to buy services and products, implement tax and borrow external funds to finance the costs and expenditure of government projects. It is the responsibility of the government to decide the number of projects that will be funded and how costs of these projects will be funded. These approaches are seen all over large governing bodies such as the SADC, BRICS and even the European Union (Wilson, 2003:7). Development projects in these regions are supported by the approval of the higher governing body. According to Mohr and Fourie. (2004:424), a fiscal policy determines the level and composition of government spending, tax and loans of a region or country. The fiscal policy of a country or region is directly impacted by external practical implications linked to the formulation and implementation of such an economic policy. The implementation of a fiscal policy has a direct impact on the sub-continental regional economy regarding the level of production and income (Mohr and Fourie, 2004:525).

In conclusion it can be said that many regional economic policies strive to create a balanced economy. The following benefits from a balanced growth approach to regional development can be concluded through the study of the different views of development economists in this section (Rosenstein-Rodan, 1943; Nurske, 1953; Lewis, 1956; Lösch, 1957; Stigler, 1957; Hirschman, 1958; Fujita, 1989; Krugman, 1995; Ottaviano and Thisse, 1999; Mohr and Fourie., 2004):

- increase market size;
- attract external economies;
- improved use and accumulation of capital;
- external investment;
- rapid rate of development;
- economic diversification;
- encourage private sector investment (incentives);
- breaking the cycle of poverty;
- increase in income and taking part in economic activities; and
- development of social overhead costs.

While all these benefits sound positive, the performance and growth of economies in any region is linked to various factors including the availability of natural resources, capital stock, technology and innovation as well as individual and economic choices made from both a top-down and bottom-up approach (Abel *et al.*, 2008:9). All these elements are influenced by the sub-continental economic policy that the governing body of a region chooses to pursue and implement, depending on the vision for development of the region. By taking all these elements into account it was seen that various factors have an impact on the economy. This is often the result in the creation of an unbalanced economic state. One or more factors can only have a slight different result in the economy, disrupting the balance or perceived balanced economic state.

In order to improve the region's economy or to restore economic balance, unbalanced growth approaches need to be implemented (Hirschman, 1958:59). Hirschman feels that the different phases in a region's economy can only be influenced by implementing unbalanced growth measures as an attempt to counter act the unbalanced economic state. One of the most logical approaches or attempts as mentioned here is to implement a fiscal policy as discussed earlier. The government can target certain areas which are underdeveloped and invest in projects that aim to uplift these areas to such a level where it creates balances with other areas or sectors (Mohr and Fourie, 2004:525). By applying fiscal policy in this way, government investment is utilised in an effective way and helping or guiding the growing economy of a region (Wilson, 2003:8).

The reality is that due to demand and supply factors in different economic sectors as well as other external factors, each economic sector grows or develops at a different rate (Mohr and Fourie, 2004:528). To achieve ultimate equilibrium or balance between these sectors is merely a theoretical aim or ideal of a region. Hirschman (1958:60) confirms this conclusion by stating that the development within a business or company is also linked to technological development as well as the distribution and combination of different ideas and marketing concepts (Holland, 1976:34). In the twentieth century the economic market is constantly changing and adapting to various influences which affects the demand and supply side in these sectors (Mohr and Fourie, 2004:525).

A balanced growth dynamic is also not favourable for strategic planning processes. In the balanced growth of a region, it is easy to equally investment in all economic sectors (Nurske, 1953:23). Unbalanced growth however needs strategic planning. A balanced growth scenario also does not differentiate between the level of development of different regions or countries (Lewis, 1956:41). The same approach is applied in both cases without considering development potential. Development is supported in all economic sectors in a balanced growth scenario, whether the sectors are capable of production and making profits or not. Although a balanced

growth scenario is theoretically the best in terms of economic development that is equal in all sectors, this scenario ignores vital aspects addressed in regional planning (Hirschman,1958:58).

A balanced regional economy or equilibrium between different economic sectors is a state which should be pursued in most regional policies (Rosenstein-Rodan, 1943:205). The continuous changes in supply in attempts to satisfy the demand in a region contribute to natural economic growth (Mohr and Fourie, 2004:264). As discussed and supported by Hirschman (1958:63) in this section, the only way to pursue economic equilibrium is to introduce unbalanced growth in order to lure new investments to stimulate new economic momentum and growth. In the following section, an unbalanced economic state and growth are studied to understand how this process could be used to promote an economic equilibrium in a delineated region.

#### **4.5.2. Unbalanced growth**

In the balanced growth section, the principle of unbalanced growth was briefly mentioned. In this section, the process of where unbalanced growth is used as an attempt to establish a balanced economic state is studied. Unbalanced growth and the associated reasons for this growth are discussed. As already established in the previous section and confirmed by Hirschman (1958:58) unbalanced growth in a region is found in most regions in the regional planning today. Other theorists also confirmed this by classifying a balanced economy of a region as being elusive and contentious in the past and are expected to remain like this in the future (Ohlin, 1959:340; Danino-Pastore, 1963:168; Temple, 2008). The unbalanced growth in a region is the result of the impact of many external and internal factors in the development of the region.

Based on research on the issue of balanced, unbalanced growth and the relationship between the two, it becomes evident that these issues have been at the centre of various regional planning debates. Due to the strong relationship between these two themes have been discussed together since the early 1940s (Gardiner *et al.*, 2012:6). According to Gardiner *et al.*(2012:7), balanced growth is seen or explained as sectoral diversification. This explanation was countered by theorists focussing on the unbalanced growth in a region as a model of growth based on sectoral specialisation (Fleming, 1955:243; Sheahan, 1958:186; Hirschman, 1958:60, Streeten, 1959:171). According to Gardiner *et al.* (2012:8), unbalanced growth generates external economic interaction in fast-growing economic sectors, which result in the potential stimulation of growth in other opportunities through the interrelationship between the different economic sectors.

Hirschman was probably known as the largest sceptic of balanced growth (Gardiner *et al.*, 2012:6). He explained that the simultaneous growth coordination of investment is simply too much to ask for developing countries (Hirschman, 1958:59). He explained that a dynamic unbalanced growth of a region creates the ideal conditions for growth in an economy. Unbalanced growth can

occur through forward or backward linkages or by gradually unveiling latent capacities needed for growth. These capacities referred to in this instance include increased productivity through entrepreneurs. Despite the type of growth in a regional economy, the management of the growth in a region is vital to ensure that unsustainable economic growth in the region is not the ultimate destination of on the economic path.

Hirschman (1958:60) confirms this by stating, *“If an economy is to be kept moving ahead, the task of development policy is to maintain tensions, disproportions and disequilibria.”*

Most regional growth theories predict unbalanced growth of a region as an inherent feature of the economic system (Fleming, 1955:243). The spatial differences of different regions can have a direct impact on the economic growth of regions rather than theoretical policies planned and implemented to alter the unbalanced growth into a balanced growth scenario of a region (Hirschman, 1958:59). Due to the nature of businesses (from various economic sectors) to cluster together as a result of agglomeration benefits offered at a certain point, the reinforcement of unbalanced growth is inevitable (Hoover, 1937:6). According to Gardiner *et al.*(2012:8), growth in productivity and growth in output interact in a cumulative manner and result in the increase of imbalance in the region.

In essence, unbalanced growth focusses on the need for investment in strategically chosen economic sectors rather than equal investment in all the sectors as explained in the balanced growth section (Rosenstein-Rodan, 1943; Nurske, 1953; Hirschman, 1958). In such a scenario of unbalanced growth, economic sectors grow at different rates. This phenomenon is probably the single most important fact of unbalanced growth prevailing in regional planning today. An unbalanced growth scenario is often also linked to an expected change in the economy. Hirschman (1958:60) confirmed this by stating that economic imbalances in a region create the ideal foundation for growth in a region. Investment should first be focussed more on the most significant economic sectors in a region. If investments are being made in these sectors, the economic development is enhanced and draws the support of supplementary economic sectors. The increased profits in the significant economic sectors can then be applied in other supplementary sectors more efficiently.

Rowthorn (2010:356) introduced a model of uneven and combined regional growth with a more focussed approach on the export base of a region. The Rowthorn model of uneven regional growth emphasises the central role of the region's economic structure and especially the base of potential export of a region. The long-term economic stability and growth of a region is directly linked to the strength and potential of exporting goods and services (Rowthorn, 2010:356).

Therefore, if a region exports or provides less goods and services, it will have a negative impact on the economic growth and development of a region.

Rowthorn (2010:356) continues by stating that the levels of migration in a region also have a direct impact on how a region's economy grows. This means that if great pull factors in the adjacent or other regions result in increased and easy out-migration, it would have a direct impact on the employment and ultimately the export base of the region. If appealing employment opportunities, incentives or improved living conditions draw some of the population in one region, employment levels will also show a decline. The decline in employment figures at the region of origin will show a definite decline due to the fact that the educated and skilled population is more likely to be more mobile in terms of relocation due to financial feasibility.

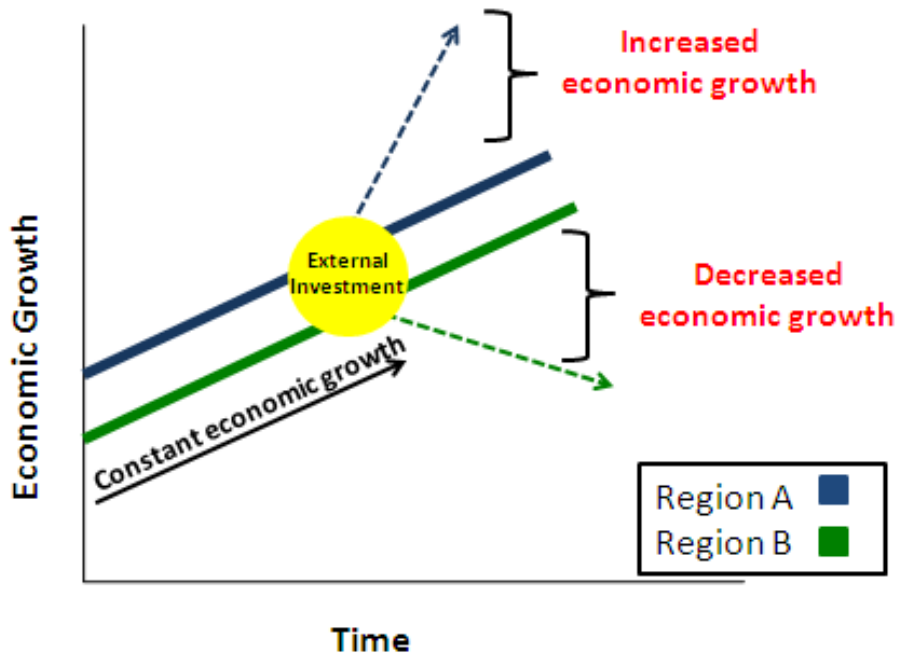
As the more educated and skilled population migrates to another region, the origin region's businesses and sectors would not be as productive as in the past. Less productive businesses and sectors result in less goods and services provided and exported and ultimately can result in a negative economic growth rate.

Gardiner *et al.*(2012:7) confirms this by concluding that, "...the initial decline will set in train a long-run multiplier as emigration leads to a downward spiral of shrinking population and falling employment."

The importance of proper urban and regional planning as well as the management of a region is clearly visible if this effect of migration and emigration between regions is considered (Rowthorn, 2010:356). Regional planning and management should be done to such a level where the levels of out migration are minimised in order to keep the skilled and educated population of the region as an important asset (Turok and Parnell, 2009:159). Urban planning and management should be implemented to such an extent that urbanisation is not that attractive to the young, educated and skilled population. These steps would probably involve restructuring and planning of migration policies as well as incentives offered within a region (Bathelt *et al.*, 2004:13).

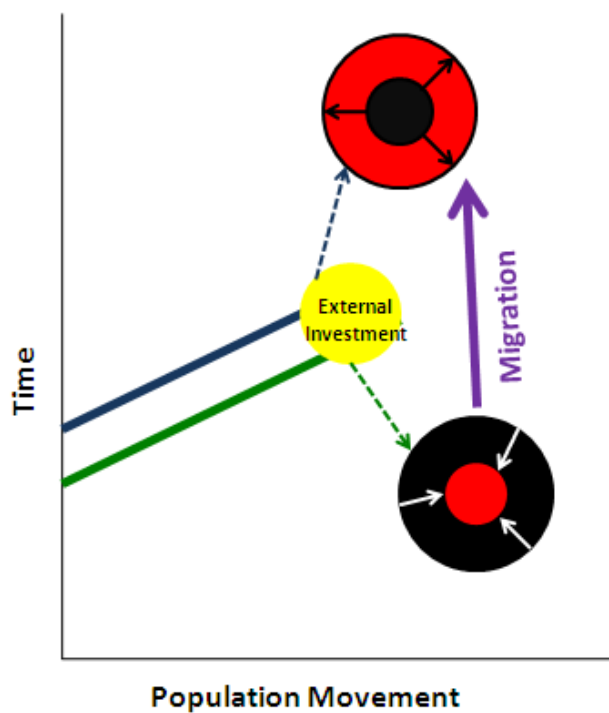
This unbalanced or uneven model of Rowthorn also resembles the much earlier theory regarding unbalanced regional development proposed by Holland in 1976 to some extent. The theory of Holland states that the flow of labour and capital is not only responsible to counteract imbalances in the region's economy, but also operate to accentuate such imbalances (Holland, 1976:34). Holland (1976:34) felt that labour and capital factors are not focussed to promote a balanced economic growth in an unbalanced state, but rather operate to accentuate the unbalanced state in the economy. In Holland's argument two regions (Region A and B) are considered to grow at the same rate in terms of the economy, technology change, employment and output (Gardiner *et al.*, 2012:8). At some stage investment in Region A suddenly increases dramatically due to political

interference or a top down project. For further explanation the following figures should first be studied that illustrates Holland's argument.



**Figure 4-6: The Influence of external investment on economic growth in a region**

Source: Own interpretation of (Holland, 1976:34)



**Figure 4-6: The Influence of external investment on population movement in a region**

Source: Own interpretation of (Holland, 1976:34)

As soon as external or top-down interferences promote new investment in Region A, the growth rate of the region increases due to additional available resources. Due to freedom of movement between Region A and B, some of the people employed in Region B will migrate to Region A in search of better employment opportunities or perceived improved quality of life. Region A can accommodate higher employment opportunities due to the new investment in a project. As Region A continues to employ more workers, the economic output and growth will increase. In Region B on the other hand, economic sectors will experience a loss of employment and lower economic output resulting in lower economic growth. Therefore, it was concluded that employment and capital factor flows result in the growth in employment and economic output and ultimately economic growth of the region (unbalanced). Long periods of interference can have a direct impact on the regional imbalance as well as the per capita regional income and growth (Gardiner *et al.*, 2012:9).

Unbalanced growth processes support growth in the strong and prolific economic sectors (Holland, 1976:37). This can be somewhat problematic in the sense that if a particular economic sector utilises scarce natural resources, the negative effect on the environment will continue and is not sustainable. In terms of an unbalanced growth scenario it is proposed to apply these principles for a shorter time, only to gain maximum profits to invest in other sectors which show the potential for development (Krugman, 1995:61). Due to the possible ongoing support in possible unsustainable economic sectors, investors may also be discouraged in the sense that risks become too big in the long-term (Rogerson, 1998:187). Unbalanced growth however, is more realistic and promotes strategic regional planning (Gardiner *et al.*, 2012:9). By continuously gathering more accurate information and improve on regional planning, more sustainable investment and economic growth decisions are likely to be supported in regions.

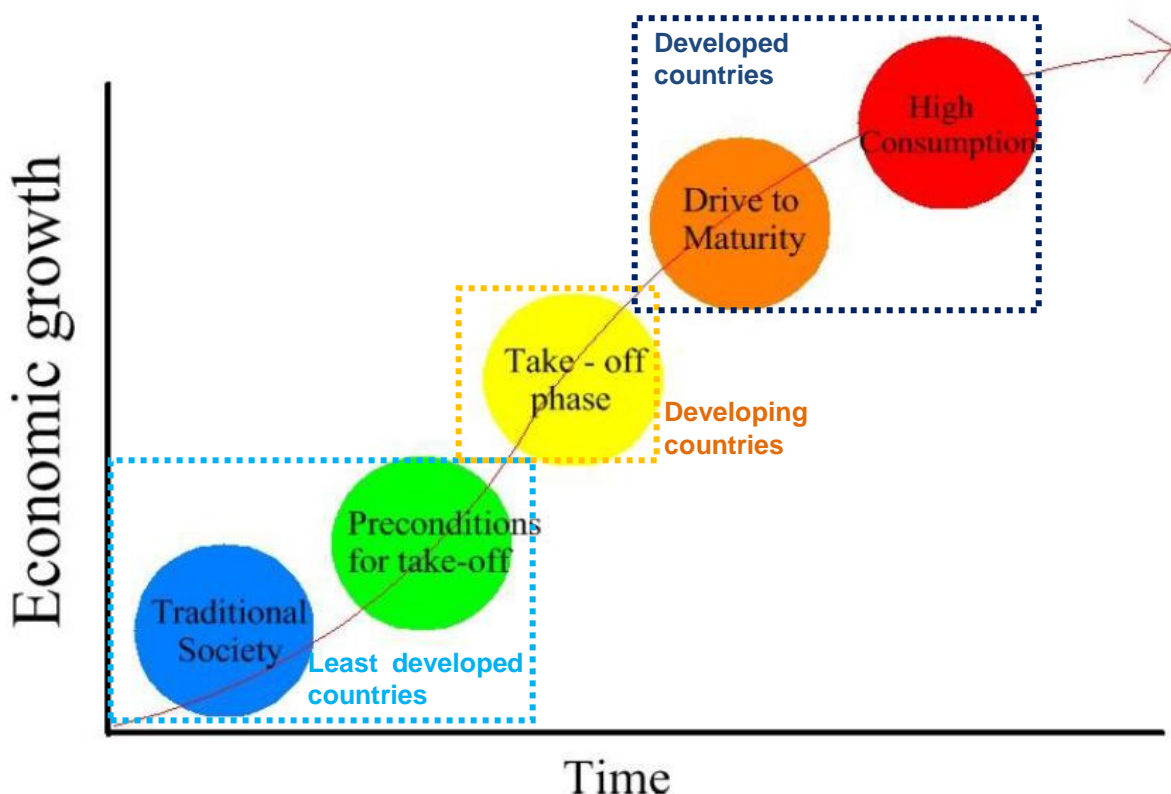
Unbalanced growth in a region is more common in regional planning. The key in effective regional planning is to continuously aim to create balanced growth between different regions (Hirschman, 1958:58). During this section of unbalanced growth, it was found that external influences or interference can be used as an attempt to achieve a more balanced growth between regions. To implement such changes, or external interference it is of utmost importance that such projects should be implemented at the most strategically chosen nodes in the region. This research aims to identifying these strategically chosen nodes by using urban hierarchy (discussed in the following chapter) as a regional planning instrument.

#### **4.6. Conclusion**

The purpose of this chapter was to first study different approaches that are used to demarcate regions based on different delineation methodologies. During this process it was found that some approaches used are mathematically and statistically based while other are influenced by the more

physical and natural boundaries. Most of these different approaches supports each other and can be combined to demarcate a specific region. Holistic delineation methods were also included, which is generally more used in regional planning. These factors or criteria that influence the boundaries of a region are often the result of geopolitical, social, technical, ecological and economic factors (Kocziszky, 2009:61). Holistic approaches were applied in this research to delineate a study area both on sub-continental and regional perspective levels in the empirical chapters of this thesis.

The second part of this chapter focussed on the growth and development of regions. The phases of regional development were first studied, as these phases explain the specific level of development of regions globally in developed, developing and least developed countries. Regional development phases include different approaches ranging from economic, social, political or cultural factors (North, 1991:98). In the context of this thesis, regional development specifically relates to the concept of economic growth. Mohr and Fourie (2004:624) also used regional economic conditions to explain the phases of regional development. The following figure illustrates how the different regional economic development phases are grouped in general in developed, developing and least developed countries.



**Figure 4-7: Developed and developing countries and regional development phases.**

Source: Adapted from (Botha, 2011:24)

When the regional development phases are considered, different countries can be grouped in general. The grouping of different development phases and countries are significant to consider in the integrative approach of an urban hierarchy as spatial planning instrument. The research questions and aims of the thesis specifically relates to the grouping of different development regions and potentially proposing specific regional planning interventions according to these groupings. Theoretically, the aim is to promote balance in a region, irrespective of the phase of regional development.

In theory, investment (externally supported growth) in all the economic sectors occurs; the entire market of the particular region expands, resulting in positive spin-offs for different sectors, businesses and industries. Rosenstein-Rodan (1943:205) referred to this process of coordinated investment as the “Big-Push” for development in a region, which can be related back to the phases of regional development. The reality often is that without investment one of the major issues in developing countries is the lack of income (Nurske, 1953:19). Investment strategies, which Rosenstein-Rodan (1943:205) referred to, are normally unbalanced growth approaches in a region. Gardiner *et al.*(2012:8) explained that unbalanced growth generates external economic interaction in fast-growing economic sectors, which result in the potential stimulation of growth in other opportunities that could contribute to gaining momentum in regional development. However, Hirschman (1958:59) explained that simultaneous growth coordination of investment is simply too much to ask for developing countries. It can therefore be concluded that a new integrative approach in these areas need to be developed. Such an integrative approach can specifically incorporate the urban hierarchy as a spatial planning instrument. In the following chapter, the urban hierarchy and urban systems are studied to potentially consider in the last-mentioned approach.

## **CHAPTER 5: URBAN HIERARCHY**

### **5.1. Introduction**

In the previous chapter the general regional delineation process that are used in regional planning in general were reviewed. After these demarcation processes were reviewed, regional growth and development of a specific demarcated region illustrated different growth contexts of regions. Here it was found that regions grow economically balanced or unbalanced by nature. The growth of a region can be directly linked to development of an urban hierarchy within a region. The urban hierarchy that is investigated in this chapter, refers to the spatial development of a region. It is important to understand the dynamics of a region both from an economic growth perspective as well as from a spatial distribution point of view. Both these perspectives play an integral role of this research.

In this chapter, the main focus is on the existing theories, growth and development of an urban hierarchy within in a region. The urban hierarchy is one of two major focal points in this research. Chapter Three focussed on regional planning instruments in general. In this chapter, the urban hierarchy and urban systems are studied to complete the theoretical foundation of this research. The section on the urban hierarchy aims to focus on the interaction, dynamics and the different elements of an urban hierarchy of a region. The establishment and development of an urban hierarchy will potentially provide insights in how spatial planning instruments and the urban hierarchy could be combined in an integrative regional planning approach.

The urban hierarchy of a region is directly linked to the urban system or system of nodes of a region. The interaction between different sized nodes in a region impacts the existing hierarchy in the region. The functionality of the urban system in any region plays a significant role in the economic growth and liveability of the region. The sections in this chapter first focus on urban systems, which are used to illustrate the interaction in a region and highlight the important role of the urban hierarchy. When studying the urban system and realising what impact the urban hierarchy does play in urban systems, it becomes clear that the urban hierarchy can potentially be used as a spatial planning instrument.

### **5.2. Urban systems**

#### **5.2.1. Background**

The interaction and functionality of the urban system ultimately determine the growth and development of a region. The main nodes and smaller nodes all interact with each other on a constant basis in order to ensure the growth, development and functionality of a region. The

system between the settlements or nodes in a region ensures that core nodes receive the support and inflow of the smaller settlements and vice versa. This ensures a mutual beneficial relationship. Various authors focussed on the concept and functionality of the urban system and the impact of the system on regional development.

Most of these authors initially start with the focus on the relationship between different settlements in a region. The relationship, interaction and the effect of different elements linked to the urban system is reviewed. Berry (1964:147) famously stated that any major change experienced in a city has direct consequences on the other cities in the system. He aimed to conclude and bring together various opinions on the urban system at that time. During his studies he found that the increase of computing technologies and availability of data enable regional planning researchers to develop scientific methods to explain the urban system. These methods were based on the following parts (Berry, 1964:147):

- *“Simple inductive generalizations drawn from observable facts about the world, and*
- *Abstract logical constructs. ... Ten years ago, urban studies were in an either/or situation -- either inductive generalizations or logical constructs existed, the former as likely as not produced by urban geographers and the latter by urban economists. ... The importance of the last decade has been that the twain has met through the medium of regional science. Moreover, the meeting came just when quantitative methods of analysis, facilitated by rapid developments in computer technology, began a technological revolution which has wrought havoc throughout the sciences.”*

Berry (1964:158) argued that cities and sets of cities are systems inclined of similar analysis as other systems. These systems are characterised by the same generalisations, constructs and models. Although Berry’s argument sounds abstract, the approach is fairly simple if the work of Zipf is studied in this context. Zipf studied the regularity in the distributions of similar sets of urban nodes of various sizes linked to their population size (Zipf, 1941:12). According to Zipf’s methodology, the following equation can be used to explain the urban system:

$$P_r = \frac{P_1}{r^q}$$

The equation simply explains that the  $r$ -ranked city will be expected to have a similar size in terms of population that is equal to the top-ranked city divided by the rank (Wyly, 2012:3). In other words, this model could be used to determine the size of the population of the second ranked city

by dividing the population of the largest city by the rank of the second largest city. This model was used to determine the size and rank of cities to determine the role of the particular city in the urban systems (Wyly, 2012:3). Although this model can be seen as a theoretical guide, sudden growth spurts in the largest ranked cities or smaller ranked towns has a direct impact on the urban system. This model however succeeded in explaining the relationships between different sized nodes in the urban system.

Friedman (1978:21) and El-Shanks (1984:33) realised that the city could not be studied apart from the urban system due to the strong interrelationship between the two regional planning concepts. The strong relationship between a single city and the immediate surrounding urban system was one of the main points of departure in understanding an urban hierarchy. The relationship referred aligns to the approach and methodology of this research by combining regional planning instruments with the actual dynamics and functioning between nodes.

The relationship between an urban system, urban hierarchy and the functioning of the region was a topic that enticed various planners to focus on. In Renaud's (1981:16) study, he found that the size of the city is linked to the location within the urban hierarchy of the urban system. The second conclusion that Renaud (1981:16) made was that a city's or settlement's function is influenced by the size of the city as well as its role in the growth and development process of the larger region. This conclusion corresponds with the intermediate levels of spatial organisation proposed by Pumain (2006:171). The intermediate levels of spatial organisation are discussed section of the "*Obscurity of Urban Systems*" discussed later in this chapter. The conclusion could also be linked to the central place theory developed by Walter Christaller (see Section 5.5). He (Christaller, 1966:1) found that such a place develops a service area which serves the people and towns in the surrounding area (role and function of this place).

Belsky (1983:3) and Richardson (1977:17) linked the role and function of a city with the rank of the city or settlement in the urban system. The rank and function of each node in the urban system plays a role in the development and growth of the urban system. Depending on the level of study, it can also be said that the rank and role of each node is linked to a larger sub-continental scale, depending on the urban system's growth (Wyly, 2012:3). The growth and state of the region, whether it is on national, regional or local scale is linked to the interaction and growth of the urban system. Rondinelli (1982:357) studied the influence of a stable urban system in different levels of regional focus. Rondinelli (1982:367) discussed the role which a balanced urban system plays in ensuring the provision of efficient central services in the region.

The provision of efficient services through the urban system also has a concentric effect on larger regional scales (Belsky, 1983:3). If a local urban system effectively provides services for a small

region, it spills over into the larger and surrounding regions. This promotes the interaction as well as cross border interaction of a local (or regional or national – depending on level of study) urban system. The service area and impact of the role of a node is not limited by administrative boundaries in normal regional trade conditions (Dickinson, 1964; Friedman, 1978; El-Shanks, 1984; Belsky, 1983; Blackman, 1995). It is for this reason that people all over the country travel to larger metropolitan areas for highly specialised services and products, irrespective of their province of origin. On a larger geographic scale, one can also see the same type of dynamic between large nodes located on the border of a country.

Based on these findings and explanations it is clear that the urban system is firstly defined by the interrelationship between settlements and towns. This relationship between different nodes in the region defines the functional hierarchy (urban hierarchy) of the elements in the urban system, which is linked to the growth of these elements (Belsky, 1983:3). The growth of the different sized nodes is linked to the change of its rank in the hierarchy, physical size and function it fulfils within the urban system (Dickinson, 1964:240). The changes experienced in local urban systems affects other surrounding urban systems and ultimately effecting the higher order of urban systems and region's functionality (Richardson, 1977:19).

The rapid changes, economic interaction and regional innovation also impacts the urban system of a region and further expands the definition and function of the urban system as initially found (Wyly, 2012:8). These findings were based on more recent urban systems and hierarchies. Matured or developed urban systems are more complex and, when studied, can illustrate new or additional characteristics (Blackman, 1995:40). Modern urban systems are based on the existence and growth of development of the older urban systems (Wyly, 2012:8). This clearly illustrates the interdependence of the various urban systems, whether from the past or based on a contemporary system.

According to Pumain (2006:169), different levels of geographical focus of the urban system can be described in the following phrase, *“Urban systems (and more generally, settlement systems) can be represented as the hierarchical organisation of human activities into three levels, on three different geographical scales: the elementary units (urban actors, housing units, factories or offices buildings, transportation networks etc.), the city as a whole, and the system of cities belonging to a given territory.”*

Maksoud (2003:1) explains the interrelated nature and functioning of an urban system by stating, *“The urban system represents the frame within which all urban settlements are organized and interacted with each other regarding their sizes and*

*functions. Any urban settlement couldn't be studied away from the urban system located in it."*

It is clear that urban systems have been an interesting and popular research field. As time progresses, the new modern urban systems are based and built upon the foundation laid by the older and already established urban systems. Older cities and regions in Europe for example are much more complex than urban systems in Sub-Saharan countries' urban systems (Blackman, 1995:40). It is therefore expected that urban systems in developing countries differ from urban systems in developed countries. The older and more intertwined the urban system is the more complex the dynamics and existing hierarchy is to determine (Maksoud, 2003:2). It is important to also refer to the dynamics and existence of an urban system in developing countries as represented in the sub-continental and regional perspective area of study in this research (to be discussed in Chapter Six).

### **5.2.2. Urban systems in developing countries**

The process of globalisation has had an impact on urban systems not just in developed countries but also developing countries, especially those that are targeted by global economics for investment. The investment of global economies can be seen in especially the capitals of these developing countries by looking at the number of foreign businesses present in these capitals. The effect is noted in various developing countries in Sub-Sahara such as Kenya and Zambia for example. In Nairobi and Lusaka, the presence of various national businesses such as Price Waterhouse Coopers, KPMG, Knight Frank, Broll etc. (Anon, 2012; Haub, 2011:13) confirm global investment and expansion of business networks.

In developing countries one of the general problems experienced in the cities is the inability to manage and benefit from the new values in the economy an urban space as a result of foreign investment. According to Maksoud (2003:1), the urban systems of developing countries experience various other problems such as the enormous rate of urbanisation because of new employment opportunities in the cities invested in, the continuous migration between rural and urban areas and the urban concentration and congestion in only one or two major nodes in the entire country. All these problems point towards a regional unbalanced system with vast difference between higher order hierarchy nodes and other smaller nodes in the country.

The regional planning documents and strategies in many developing countries do not plan and accommodate growth spurts or sudden increased investment and job creation from an external source. The major planning choices in many developing countries come back to a choice between (Maksoud, 2003:2):

- equity in the spatial system (Result: Low development rates); and
- economic growth (Result: High urban concentration)

Maksoud (2003:2) confirms that many developing countries have not yet gone through the process of polarisation reversal in order to achieve a more balanced urban system. The process of polarisation reversal refers to the turning point in the spatial pattern of growth and development in a region (Richardson, 1977:23). This change in the spatial pattern is a result of a declining or the complete stop of concentration in urban areas and where the deconcentration in urban areas starts to commence (Keen and Townroe, 1981:1). The impact of this phenomenon is that urban systems in developing countries remain simple and focussed, while the urban hierarchy in these cases only develop in a more spatially unbalanced nature.

An unbalanced urban system that has not gone through the process of polarisation reversal yet, often struggles to incorporate the effects of globalisation and foreign investment. The impact of the inability to handle and incorporate external investment, polarisation reversal or the change in spatial pattern compared to developed countries' urban systems result in the research of Maksoud (2003:2) to determine which factors do play a role in the development of the urban systems in developing countries in the world. The point of departure in this research was to determine not just the factors impacting the urban system but which also may have an impact on the future development of urban systems as the countries go through different phase of development.

According to this research, the following factors discussed might have an impact on the future development and change in developing countries' urban system (Maksoud, 2003:3):

### **Population growth**

The population growth in all countries differs from one another. Population growth rates in developing countries are much higher compared to the growth rates of developed countries. According to Haub (2011), world population grew to 7,06 billion in mid-2012 after passing the 7 billion mark during 2011. Haub (2011) found that the 97% of this growth was accounted for by developing countries. It is expected that by 2025 the highest regional percentage increase amongst the developing countries will be in Africa. Noteworthy is that the expected population increase in developing countries are sensitive to various factors including fertility rate, family planning, improved health conditions and mortality rates. Nonetheless developing countries should show a dramatic increase in population if trends continue according to historic growth.

## **Industrial development**

The process of industrialisation is expected to have an enormous influence in the developing countries and started in the 1920s (Mendes *et al.*, 2014:123). Examples of industrialisation in developing countries are already seen in Zimbabwe, Zambia and Kenya where large industries are established to be more proficient than previous methods (Mendes *et al.*, 2014:123). Industrialisation will be the main factor contributing to increase satisfaction of needs in the ever-growing population. Industrialisation is expected to support the shrinking agricultural sector (sensitive to droughts and climate change) and to be the catalyst for growth of information and processing industries rather than extracting industries such as the mining sector (Fransman, 1982:323). The investments made in these cases are immense and confirm the need for effective planning, investment strategy and locations as researched in this thesis.

## **Transportation facilities**

As investment from developed countries and large economies in developing countries increase in infrastructure in countries like Kenya for example, the transportation facilities are rapidly improving in developing countries in Africa (Mendes *et al.*, 2014:123). Currently, China is responsible for the construction of many highways in Kenya. The increased infrastructure in the transportation network in Africa has resulted in a different concept of place, distance and accessibility. People residing in areas decentralised from the main urban centres can now travel larger distance much easier to get access to proper health facilities, education and larger retail variety (Maksoud, 2003:3). As the impact of distance between areas gradually disappear, regions and cities are effectively linked to each other with modern, fast and secured transportation infrastructure. With the improved access and connectivity between areas in the countries more inflow to urban centres is experienced where people take part in economic activities resulting in growth and the alteration or strengthening of the existing urban system (Maksoud, 2003:3).

## **Communication technology**

In the modern era today, communication and information play an integral role in supporting development and growth in regions. Improved communication and the availability of information have shown changes in both the way of life of people as well as the urban population distribution all over the world. As the availability of information and improved communication are introduced more and more into developing countries like Africa, it is expected to result also in a similar change of distribution of population around urban centres. According to Maksoud (2003:3), urban settlements are expected to develop more separately and segregated, depending on the efficiency of remote sensing and communication facilities. The result will be that while urbanisation continues towards large urban centres, people will be less likely to travel to smaller settlements to

get access to basic means of communication and information. Existing and dominating linkages between the main centres in the countries are expected to be supported resulting in a clear urban hierarchy and a more unbalanced spatial region.

By studying these four factors that is expected influence the urban systems currently and in the future, it becomes clear that urban systems differentiate from country to country depending on different factors. Each of these individual urban centres reacts differently to changes in the national or regional spaces. To understand how the dynamics of different urban systems work, it is important to understand the differentiation experienced in urban systems in general. In the following section the aim is to create a better general understanding of the difficult concept of urban systems in general.

### **5.2.3. Urban systems in developed countries**

According to Berry (1969:283), one of the primary objectives in research done on urban systems was to group British towns into categories with broad similarities or to test if the classification made sense. Different variables were used to start forming or proposing urban systems, which included population, population structure, change in population, households and housing, economic and employment indicators, social class, health and education (Moser and Scott, 1961; Ahmad, 1965; King, 1961; Price, 1942). Berry (1969:283) explained that it was necessary to explore patterns in which towns varied, because most of the different indicators overlap and are not seen as independent factors. He (1969:284) found that social class, growth and overcrowding showed most correlation in this method.

Hodge (1967) focussed his work on urban systems on a variety of independent studies of the urban system of the United States. He (1967) concluded that specific core dimensions that impact the urban system can be identified as:

- The size of the node in the region including both population and economic dimensions;
- Socio-economic characteristics of the residents;
- Family structure and population;
- Mobility of the population and new growth; and
- Ethnic heterogeneity; and location of the node within the national spatial economy.

Hodge (1967) also acknowledged the role and impact of the labour force and employment, but combined it with the specific roles and types of nodes in a region. Manufacturing towns, Mining towns, College Towns, Trade centres, Military towns and town with a significant role in public administration were specifically mentioned. The findings of Hodge (1967) in this regard can be linked to the economic development phases of Rostow (see Section 4.3). Berry (1969:285)

explained that although not all the mentioned dimensions are commonly used, the primary variables used include population size and labour force, which is used to describe the functional size and economic power of the nodes in the region. He (1969:285) continues by stating that depending on the focus of the urban system different dimensions can be combined.

According to Roberts (2014:11), the role of mega-cities and primate cities are often used to explain the urban systems and economic development. Roberts (2014:11) feels that the role of secondary cities in developed countries is becoming increasingly significant. Rondinelli (1983:47) explained that a secondary city is normally a city with a population exceeding 100,000, excluding the largest city in the region. Friedman (1986:69) states that secondary cities in a region are significantly smaller than cities in the higher rankings. By including secondary cities in the urban system, a specific approach to development in developed countries can be noted.

From Roberts' (2014:11) work, it can be concluded that role of secondary cities in developed countries has become increasingly significant in the twentieth century and that this approach has a direct impact on the urban hierarchy of these countries or regions. The urban hierarchies of different countries are discussed in Section 5.4. Roberts (2014:11) explains the significant difference between developed and developing countries urban systems are the lack of connectivity and relationship of secondary cities in the national, regional and global context, resulting in slower economic development. Roberts (2014:11) concludes that urban systems in developed countries are much more constant than urban systems of rapidly developing countries and regions due to continuous innovation and modernisation.

### **5.3. Differentiation in urban systems**

#### **5.3.1. Background**

Major nodes in regions are normally the focal points for the clustering of power and social interaction. Most activities are focussed on these nodes which are also well known as places of social and technological innovation, labour and a growing economy in planning today (Pumain, 2006:169). Throughout history and different eras, it was observed that cities developed in different ways due to more or less the same establishment reasons. As time went by, cities experienced a metamorphosis in terms of size and structural elements. According to Pumain (2006:169), maximum city size increased through demographic, economic and technological progress. A city in a region came in different shapes and sizes all owing it to the unique circumstances in the environment and time it was found (Batty, 2001:643). Pumain (2006:169) supported Batty's statement by finding the following in her research:

*“A less known fact is that all through historical times, as well as today in every country, in wider regions such as Europe or even in the entire world, city sizes*

*differentiate in a surprising regular manner: the number of cities follows an inverse geometric progression in relation to their size. It is therefore not surprising if the notion of hierarchy seems almost intrinsic in urban systems....”*

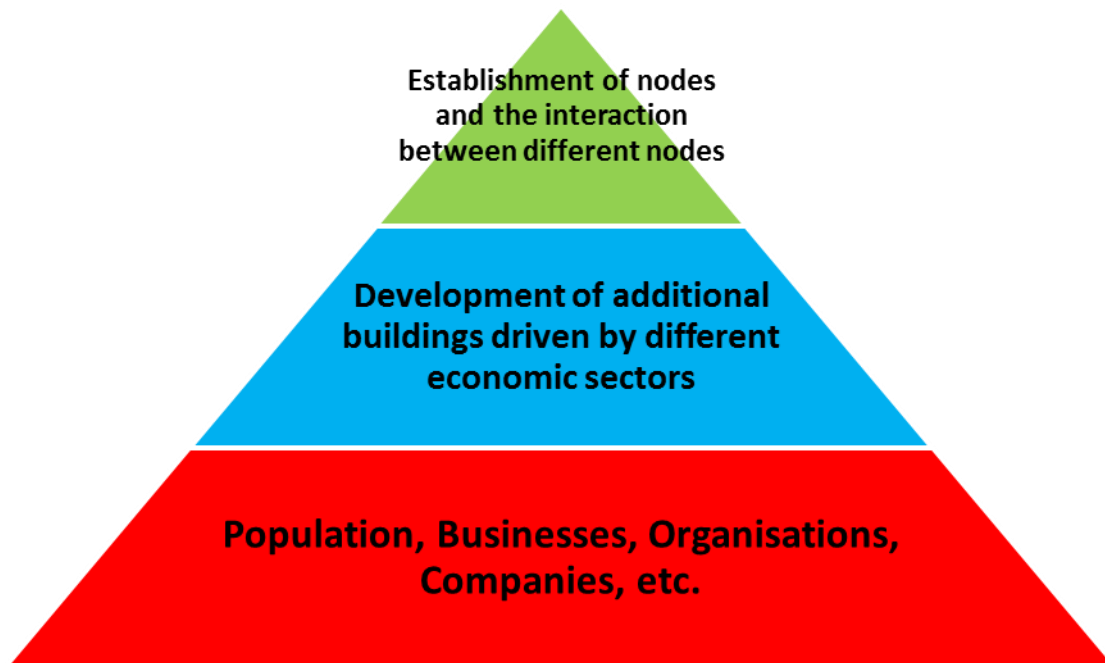
This hierarchy Pumain referred to in the abovementioned finding, is a very complex and complicated structure. This hierarchy is put together from different social impacts, governing bodies, economic environments, cultural heritage and other statistical variations ultimately building a highly distorted distribution of city sizes. The challenge of this skewed distribution or informal hierarchy is to connect a formal rhythm or calculation of cities to a regional planning strategy that promote spatially balanced regions.

Pumain (2006:169) confirms this by stating: *“A big challenge for urban research is both to disentangle the two possible sources of explanation for the existence of urban hierarchies, and to discover how they can be articulated in formalized theories enabling further predictions”*.

One of the major theorists of this concept was Brian Berry who focussed his research mostly on urban systems and regional planning. Berry (1964:147) stated famously that cities as systems within systems of cities were the way to think of and helped to explain the concept of an urban system. To illustrate the differentiation of urban hierarchy the focus and ideas of this section is focussed on the second part of Berry’s last-mentioned expression. Therefore, the focus in this section is on the systems of cities (also referred to the urban system). Pumain (2006:170) suggested using the term *“hierarchical organisation”* to explain urban systems based on three levels of analysis namely, the scale of study, and the term *“hierarchical differentiation”* for the concept of an urban hierarchy consisting of a variety of cities with different size, power, growth and role it plays in the local, regional and national space.

### **5.3.2. Hierarchical organisation**

The term *“hierarchical organisation”* is a crucial part and concept to start understanding how urban systems and hierarchies are determined. Pumain (2006:170) explains that this concept is linked to the level of study and recognises three main levels of more or less separate and independent entities following a possible similarity with the hierarchical organisation of living organisms. To better explain these three levels, the following figure should be referred to during this discussion.



**Figure 5-1: Hierarchical organisation of an urban system**

Source: Own interpretation of (Pumain, 2006:170)

The first level and basis of the pyramid consist of basic elements persons, businesses, organisations, companies etc. that are capable of deciding and organising activities, planning to build houses or structures and can also travel and commute from one point to another with different modes of transport (Lane *et al.*, 2009:123). The way these different entities co-exist and interact with each other is one of the first determining factors that result in the identification or establishment of the location of a city (Golledge *et al.*, 1966:244). These interactions between these entities can vary between different times and different intensity levels that all has an impact on the location and development of the city (Berry, 1961:573).

This brings us to the second or middle level of the pyramid of hierarchical organisation. In this level new properties and developments, in addition to the existing activities in the first level of the pyramid, start to develop and form a certain character of the city (Lane *et al.*, 2009:123). This phenomenon can be seen quite easily in different cities all over the world. To use a quick example the New York silhouette versus the silhouette of France can easily form a general idea of character of these two world cities. Some of these new properties or developments are normally a result of the intention of a single entity or institution, but is more likely the result of agglomeration benefits and clustering of different activities (Beckmann, 1958:244).

Large activity nodes in a region are easy to recognise and to start building on a hierarchy (Berry, 1961:573). Cities consist of spatial development patterns and historic change in the urban morphology which might help to determine how the city progressed in the hierarchy and size (Beckmann, 1958:244). The lifespan and morphological change of persons, institutions and

businesses are not easily recognisable (Russo, 2000:517). The lifestyle and progress in the urban system of the last three mentioned factors could be difficult to determine. The progress in these three has an impact on how nodes interact with each other to initialise development and urban growth (Lane *et al.*, 2009:123). To conclude, by studying the pyramid referred to above, the top of the pyramid is easy to determine a hierarchy based on observation. However, as we go down the pyramid, the role players become increasingly difficult to determine the interaction and history which ultimately determines the urban system (Beckmann, 1958; Berry, 1961; Lane *et al.*, 2009).

### **5.3.3. Differentiation in the urban hierarchy**

Cities, as discussed in the previous section, form a new level of spatial organisation in the urban system. As a region is studied and analysed, towns and cities can easily be identified. The links and networks between these nodes of different order form an environment which plays a significant role as discussed in the development corridor section in Chapter Three. According to Christaller (1933:67), the link between these nodes can be described as areas which specialise in non-agricultural activities that fulfil a central complementary function. Depending on the level of study, the hierarchy of nodes and role players can be difficult to determine. The hierarchy in metropolitan areas are much more detailed and difficult to identify (Lloyd and Dicken, 1972:30). A starting point to determine the hierarchy in such an instance is to identify the nodes that fulfil a central place role in the region. To explain this, the process of determining the hierarchy in a region needs to be studied.

Reymond (1981:44) chose to differentiate mining towns (non-central places) from the normal central place node. The difference between central and non-central places is discussed later in Chapter Five. Mining towns or nodes exploit the resources only where the resources are available (Geyer, 1989a:386). These towns or nodes only benefit from capital and profit which originates due to mining activity and the trade of the natural resource products or ore. Mining towns are normally associated with transport infrastructure such as train and harbours that are used to spread or trade the material. An example of this phenomenon is where the raw materials being extracted from mines in the inland is transported to a harbour for exports

Cities on the other hand are more dependent on the interaction between different nodes in the region which forms the regional network, as in the case of metropolitan areas (Berry, 1961:573). The level of interaction between different nodes plays an important role in the development and growth of the city (Lane *et al.*, 2009:123). As development and growth continues, the city can progress in the urban hierarchy and fulfil its unique role and specialisation in the urban system (Beckmann, 1958:245). Therefore, nodes in a region cannot be seen in isolation but rather than a link or brick in the network of the urban system. According to Pumain (1992:73), the urban system

regulates the dynamic of each individual city that forms part of the urban network in the region. The development and progress of each individual city or node in the region impacts the network or urban system (Lloyd and Dicken, 1972:30).

Pumain (2006:170) supports this description and interaction of the urban system by concluding: *“Systems of cities are defined according to new emerging properties, such as a fairly regular spatial organisation, marked differentiation in size and specific features of urban co-evolution corresponding to the multiple interdependencies between the cities.”*

These urban systems in a region have different life spans than each of the attributes of an individual city (Lane *et al.*, 2009:125). The specific attributes can include the physical size of the city, the economic performance or the social liveability of the city (Golledge *et al.*, 1966:244). Due to the long-life span of urban systems, the global configuration is fixed in many countries (Berry, 1961:573). It can be concluded that although external influences can propel the dynamics in an urban system, the system should remain fixed or fairly constant for many countries. The urban hierarchy on the other hand is not fixed and can be altered if external investment and growth strategies are implemented, resulting in unbalanced regional growth. This is one of the aspects this research aims to implement through external investment (unbalanced growth) to alter the urban hierarchy and therefore using urban hierarchy as a regional planning instrument to promote balanced growth.

#### **5.3.4. Indecisiveness of urban systems**

Based on the discussions in the previous two sections, it can be concluded that an urban system or urban systems is considered as a difficult and complex system to understand and study. An urban system is so complex because it can be interpreted or applied in different hierarchical levels and the level of interdependence between different nodes in the system. Pumain (2006:172) illustrates the complexity of urban systems by comparing it with a biological or physical system where clear nodes and roles can be identified. Due to the obscurity and different roles and functions of each node in a region, it is concluded that certain elements are difficult to distinguish in a spatial system. Secondly, the separation of the urban phenomenon is not easy, as this is linked to different levels of spatial organisation as discussed in the regional planning instrument in Chapter Three.

An urban system on the other hand consists of a structure of complex nodes, responsibilities and spatial organisation which is not easily separated from one another (Beckmann, 1958:245). Nodes of different sizes, location, physical form, economic environment and responsibility play a

part in the interdependent relationship between the nodes (Lane *et al.*, 2009:125). Apart from the actual interdependence and natural co-existence of these nodes, the spatial organisation also plays a crucial role in studying an urban system. Pumain (2006:170-171) attempts to explain the complexity of urban systems and different levels of spatial organisation in the following sentences:

*“While the urban phenomenon as a scientific object for investigation can be envisaged using three levels of spatial organisation, i.e. the individual actors, the city itself and the system of cities, in the real world some intermediate levels, such as neighbourhoods or quarters inside cities, or regional subsets of cities inside a country, can sometimes also be considered as more or less autonomous subsystems. Although the identification of the three levels of organisation is clear in a conceptual framework, it is often difficult to recognize them in reality.”*

Based on this explanation, it is clear that the three most basic levels of an organisation are the individual role players responsible for activities in an area, the city or node itself and lastly the system of cities where different nodes have an impact on the development of the other (Lane *et al.*, 2009:123). This basic spatial organisation of an urban hierarchy corresponds with the pyramid of hierarchical organisation discussed earlier in this chapter. The guidance of Pumain (2006:171) however warns that there are other intermediate levels of organisation also at play in this pyramid.

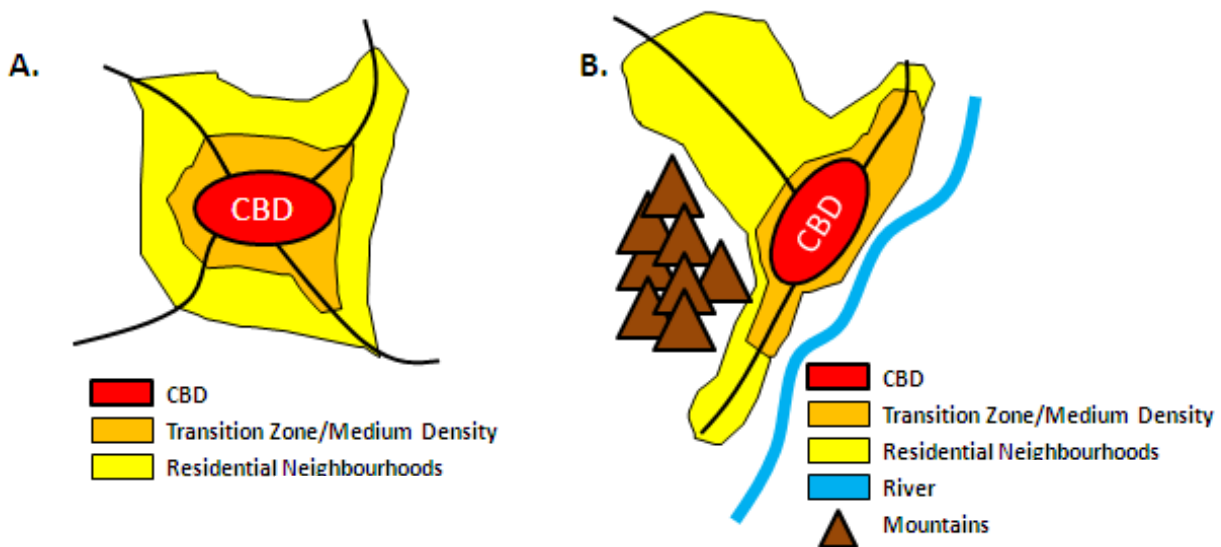
One can conclude from this that the pyramid of spatial organisation can be used to identify a first level of urban hierarchy at play in an urban system (Berry, 1961:574). The intermediate levels referred to can however result in slight alteration of this urban system (Lane *et al.*, 2009:124). The intermediate levels in the pyramid should be considered when strategic regional planning is done. These levels might indicate a possible change of the function and role of a specific node in an urban system, ultimately changing the urban hierarchy and functionality if the urban system (Russo, 2000:519).

To better understand and illustrate the possible impacts, roles and responsibilities of the intermediate levels of spatial organisation a few examples of these levels is discussed (Beckmann, 1958:246). These examples are discussed to sensitise the reader to the small (physical) but massive (strategic) impact these levels may have on an urban system and why they are so difficult to easily differentiate on regional level (Russo, 2000:517). The intermediate levels Pumain (2006:171) referred to can include various levels. For explanation purposes, the intermediate levels as used by Pumain were used for discussion purposes.

Neighbourhoods or quarters inside a city fulfil the similar basic role in providing housing opportunities associated with a small scale local node as discussed in Chapter Three in the section of nodes. The size and location of neighbourhoods or living quarters of a city can directly impact the total size, total population and urban form of a city (Roberts and Fisher, 2006:370). The size of the neighbourhood can be linked to the total population residing in that specific neighbourhood. As a node develops or grows, provision should also be made for the growing population (Neal, 2010:1). As the population of a city increase, the number of employment can either increase or unemployment could increase (Mohr and Fourie, 2004:158).

If employment levels increase as the neighbourhoods grows, it can mean that the city's economy is growing as more people can participate in the local economy resulting in more consumer spending and investment (Mohr and Fourie, 2004:158). The expanding economy and growing population and employment levels can have a possible result of the city moving up in the urban hierarchy (Alcácer and Chung 2009:13). On the other hand - the negative scenario - neighbourhoods can grow as a result of urbanisation or perceived employment opportunities at the city, resulting in an increase of unemployment levels of the city. Increase unemployment levels can have devastating results on a city's local economy.

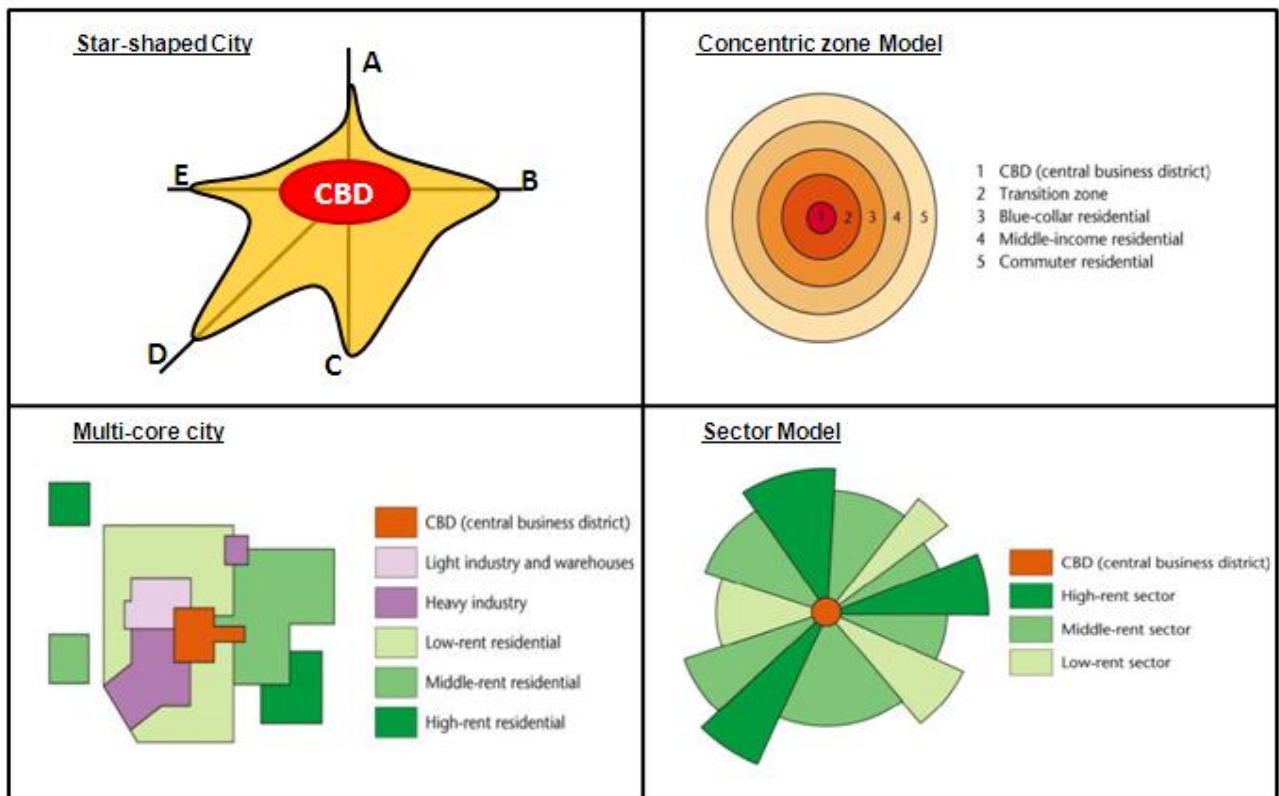
In terms of the location of neighbourhoods or living quarters in a city it is necessary to study two scenarios of locations of neighbourhoods. The location of neighbourhoods is normally in correlation of urban models as discussed in Chapter Three. Sometimes the form and layout of a city could however be influenced by natural or physical barriers that drives development of neighbourhoods and nodes into the opposite direction (Neal, 2010:1). These two scenarios can be illustrated in the following figure.



**Figure 5-2: The influence of neighbourhoods on the urban morphology and urban system**

Source: Own compilation based on urban morphology.

Figure 5-2A illustrates the normal layout of a city that corresponds with various urban models such as the star shaped city, multi core city, concentric model etc.(refer to Figure 5-3). In this control figure the impact of neighbourhoods or living quarters is spread out and more balanced spatially through the urban space. In this case, neighbourhoods need to expand and develop rapidly to show a definite effect in the short-term. Figure 5-2B on illustrates if the form of the urban space is directly impacted through natural and physical barriers. If these barriers block the growth of neighbourhoods the city would naturally develop in a linear fashion and along major transport routes as illustrated in the star shaped model.



**Figure 5-3: Urban Models**

Source: Bollens and Schamndt (1965:51)

As discussed in Chapter Three under the Section 3.6 of corridor development, this linear type of development along the transport routes leading out of the city used as an example in Figure 5-2B can either lead to the promotion of urban sprawl or the establishment of a development corridor. As the development corridor expands towards the next node in the region, the interaction between these two nodes increase. The increased interaction and size of the city can lead stronger economic interdependence and over a long run possible alter the urban hierarchy of the region.

Regional or local subsets of nodes play an equally important role in the intermediate levels of spatial organisation (Lloyd and Dicken, 1972:29). Regions as discussed previously in Chapter Four can be studied on various levels. The levels of spatial organisation can differ from the levels

of the regional study. To illustrate the different levels of spatial organisation and sets of sub nodes or sub city networks, the interaction between nodes from a provincial perspective is studied.

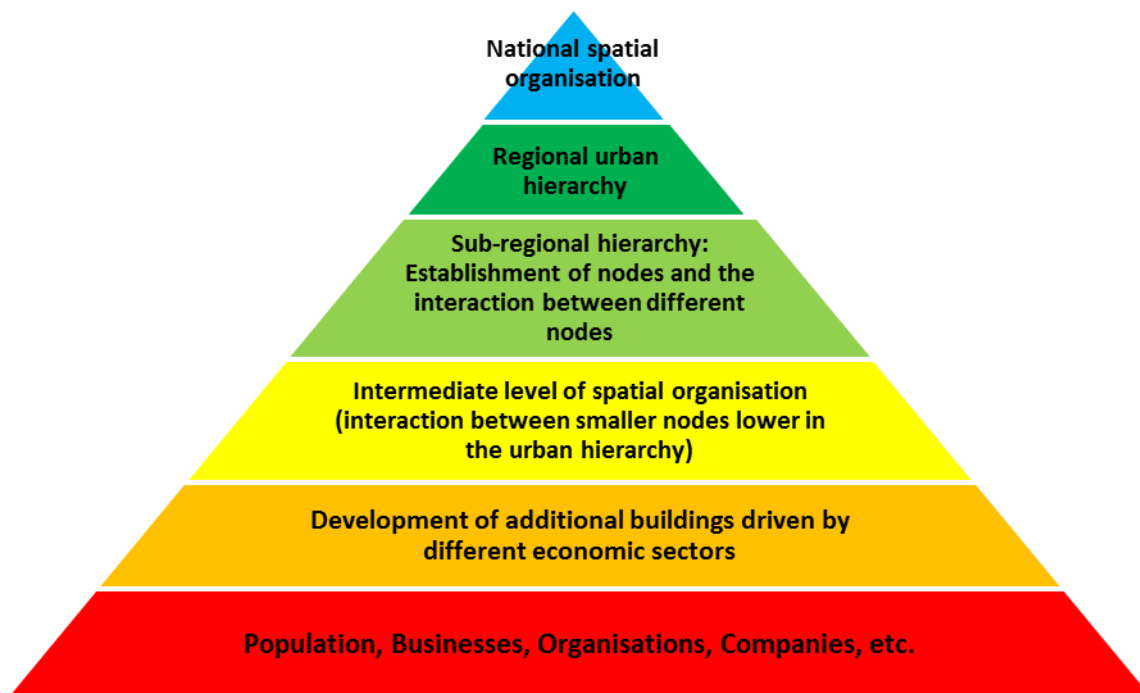
From a regional level, a definite urban hierarchy and urban system can be determined. The interaction between these different nodes is supported by various aspects such as transport corridors and economic activities (Alcácer and Chung, 2009:14). This urban system on regional level is fairly straight forward to determine (Berry, 1964:147). From the sub-regional level, it is not as clear how these main nodes are supported by the intermediate level of subsets of nodes. Based on the level of study, a metropolitan area in a region can be used to illustrate the importance of the subsets of nodes (Lloyd and Dicken, 1972:30). By studying a metropolitan area and the immediate surrounding areas, it becomes clear that various small nodes or subsets with their own role in the area start to play a role in the establishment of the greater urban system and hierarchy (Zipf, 1941:12). Smaller nodes in a metropolitan area fulfil a specific role and function in the metropolitan area.

Each of these nodes helps to support the general economic interaction within the metropolitan area (Wyly, 2012:3). Within these few centres, the intermediate levels include various smaller towns or settlements which are largely dependent on limited economic sectors. Local residents in these small towns or nodes are only served with basic and convenient goods and services. Higher order goods, larger variety of services, specialised services and larger retail variety offered in the main nodes draws the support from the intermediate level towns or nodes (Mohr and Fourie, 2004:158).

As these people flow out to the larger nodes, they participate in the larger economies that ultimately show an increase growth rate in comparison with the intermediate level's economies (Renaud, 1981:16). The interaction between the main hierarchy (larger nodes) and is supported by these economic activities on a regular basis, resulting in strengthening the existing hierarchy (Mohr and Fourie, 2004:158). If, however, an improved level of services and larger variety of goods are offered in the local and smaller economies, some of the outflow may be retained resulting in an increase of economic activity in the smaller economies. If this scenario persists and even grows, the particular intermediate level node will show growth economically, employment wise and in population, stepping up in the urban hierarchy and slightly altering the urban system (Alcácer and Chung 2009:14).

Based on the discussed scenarios above based on the examples as mentioned by Pumain (2006:171), it is clear that the intermediate level of spatial organisation plays equally important roles in the urban system of any region. The existence and functionality of an urban system is influenced not mainly by the interaction of the main nodes and top of the urban hierarchy, but

rather by the complete interaction and activities between all the nodes in the spatial organisation of a region (Lloyd and Dicken, 1972:30). To give a more accurate illustration of the hierarchical organisation of an urban system the following figure is proposed.



**Figure 5-4: Indecisiveness of urban systems**

Source: Own compilation based on Pumain (2006:107)

This pyramid of hierarchical organisation is an attempt to conclude the obscurity of the existence and spatial organisation of an urban system. When studying the urban system, urban hierarchy and functionality of a region it is always important to first consider the level of study. In this section, it is clear that the indecisiveness of an urban system in any region or level of study is largely influenced by the urban hierarchy of a region. Each of the existing nodes, higher in the urban hierarchy and the medium and smaller nodes in the intermediate level of organisation all influence the region's urban hierarchy. In the following section the theoretical background of an urban hierarchy is studied.

## **5.4. Urban hierarchy**

### **5.4.1. Urban hierarchy in general**

In the previous section the urban system was studied to understand the dynamics, the interrelationship and result of interaction between nodes or settlements in a region. During this study it was clear that the rank and size of settlements or nodes play have a direct impact on the urban system of a region (Alcácer and Chung, 2009:13). The urban hierarchy (i.e. rank and size

of a settlement) in a region and in an urban system is one of the most important factors that have an impact on the development and growth of a region. It is due to this reason and study from where the potential of the urban hierarchy as a regional planning instrument was realised. To expose the potential of the urban hierarchy as a regional planning instrument, it is necessary to first understand the core theory of this important planning concept.

The concept of an urban hierarchy amongst different cities and settlements has had an impact on many studies of urban geographers, economists, regional planning and socialists. In many of the studies from different fields, the urban hierarchy of a region refers to nothing more than the urban population's size and distribution (Zipf, 1941:33). In more advanced cases the urban hierarchy of a region may refer to the functional differentiation (Duncan *et al.*, 1960:17) or integration into a web of globalisation (Alderson and Beckfield, 2004:811). Depending on the field of study, the urban hierarchy is used to illustrate different factors.

The urban hierarchy is a complex system that is linked to more than just population size and distribution. Duncan *et al.*(1960) refer to the functional differentiation, but this is also linked to the population size. With a larger population size, it is expected that a particular node in the hierarchy fulfils a much larger function in the region, spilling over in a much larger regional scale's urban hierarchy that eventually leads to the integration of different regions. Depending on the way the urban hierarchy is studied all three of these views on the urban hierarchy is still applicable and would be used in the methodology of the empirical research.

The rankings of cities, towns and settlements involved in the cases described above are often validated by the immediate visible and obvious dominant places in a region. The dominant and largest places in a region form the top of the urban hierarchy. Smaller towns or settlements are placed in a declining order down the urban hierarchy. According to Beaverstock *et al.*(1999:445), these urban hierarchies do not always illustrate the theoretical underpinnings of the urban hierarchy and are used to illustrate certain urban features through an empirical approach.

To illustrate the essence of the urban hierarchy, urban settlements should be studied as urban clusters where the residents residing in these places take part in secondary and tertiary activities in the region. According to Pumain (2006:169), the interpretation of an urban hierarchy is as follows:

*“The interpretation of urban hierarchy is enriched by consideration of the spatial organisation of human habitat across the globe, according to a geographical approach.”*

Although the major point of departure of the theory of the urban hierarchy is the spatial organisation (as referred to in the above phrase), the geographical level of study plays equally important role in the definition as well. Alderson and Beckfield (2004:811) explain that an urban hierarchy can be seen as an integrated web of systems that could expand globally. By starting to dissect the urban hierarchy, the focus should first be on a smaller and more specific region. As with the case of the urban systems discussed in the previous section, level of study of an urban hierarchy is directly linked to the geographical region (Lloyd and Dicken, 1972:30). The urban hierarchy of a local region will differ from the urban hierarchy of a sub-region, region and also in the national space (Henderson, 1974:641).

Apart from the geographic reference, it is also important to note that an urban hierarchy is also sensitive to time, innovation and development (Florida, 2002:7). Due to the revolution of agriculture and industries, urban settlements have developed more freely and in various geographical places (Berry *et al.*, 1958:146). Urban settlements hosting various employment opportunities are one of the main reasons for the increase of urbanisation locally and abroad (Henderson, 1974:641). Perceived or real employment opportunities draws people living in rural settlements to these places in search for better employment opportunities and improved quality of live (Florida, 2002:7). The result of this increased rate of urbanisation is not just seen in the increased population size but also physical size of the settlement and economic activities (Howkins, 2002:17). The combination of these elements may result in the alteration of a local urban hierarchy.

These changes in urban settlements are seen in the twentieth century where access between settlements is improved, the economy is growing and the availability of information and technology is more widely spread (Castells and Hall, 1994:21). According to Neal (2010:1), many urban economies depended primarily on the factors located within the settlement or its immediate hinterland, therefore the traditional ranking of cities is based on a size-based hierarchy as described in the central place theory. It should however be noted that due to the modern availability of technological innovation and economic forces leads urban settlements to be more dependent on the interaction between the different settlements in the region than the actual availability of factors inside the actual settlement's hinterland (Bell, 1997). This new development in the modern era complicates the urban hierarchy concept even more and leads to another dimension of this field of study (Bell, 1997). With this being said, the actual interaction between different nodes in a region forms the basis of the urban hierarchy.

The relationship and interaction between settlements in a region are mainly economically based through the trade and investment in local economies and services (Beckmann, 1958:574). The

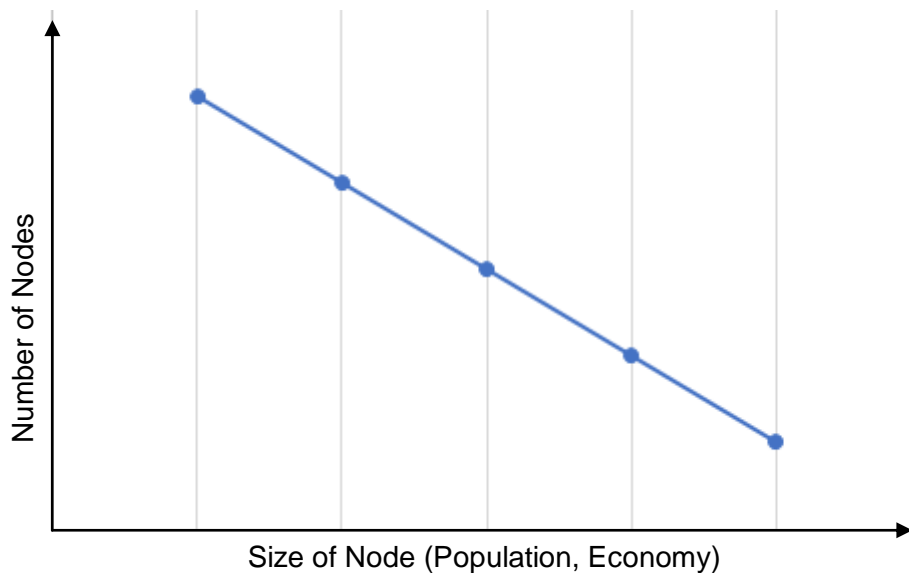
new modern spin on the interaction between settlements result in a more network based hierarchy in which dominant, large cities are found at the top of the urban hierarchy and serve as the foundation of the region's urban hierarchy from where most intercity relationships and interaction originate from (Friedmann, 1986:70). The interaction and functionality of the urban hierarchy does not however change the basis on which the core urban hierarchy is based on (Berry *et al.*, 1958:146). Different settlements are based in different location due to other general factors as well (Lloyd and Dicken, 1972:30). Apart from the central and non-central places the following factors play a role in the location of the settlements (Friedmann, 1986:70):

- Human factors  
Human factors referred to in this case is the history of development and growth of cities, cultural believes, political influences and social factors.
- Economic factors  
The economic factors referred to on a high level are the external and internal investment strategies, transportation networks and infrastructure and the ease of trade.
- Physical factors  
Physical factors impacting the location of settlements refer to the actual topography and relief, drainage networks, minerals and water supply.

These three factors are the traditional overall determining factors of the location of settlements, however in the modern era the availability of infrastructure in terms of water, roads, and electricity also becomes a major factor especially in large regions and with the effect of climate change kept in mind (Berry *et al.*, 1958; Lloyd and Dicken, 1972; Friedmann, 1986; Fujita, 1989; Alderson and Beckfield, 2004). The next section focusses on how the urban hierarchy differs between developed and developing countries, to illustrate the effects of the factors mentioned on the distribution of urban nodes in a region.

#### **5.4.2. Developed and developing countries urban hierarchy.**

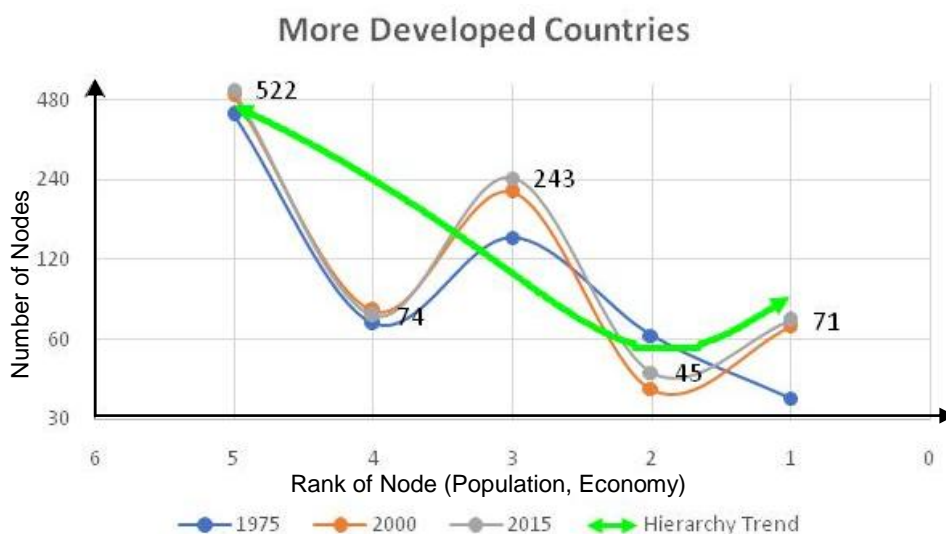
Before the differences in distribution of the urban hierarchy between developed and developing countries are illustrated and explained, it is necessary to first consider a spatially balanced urban hierarchy of a region. A spatially balanced urban hierarchy is a theoretical concept that explains that a spatially balanced urban hierarchy consists of equally distributed size and number of different urban nodes in a region (Vining, 1955:152). To illustrate the spatially balanced urban hierarchy in a region, the following figure needs to be considered.



**Figure 5-5: Spatially balanced urban hierarchy**

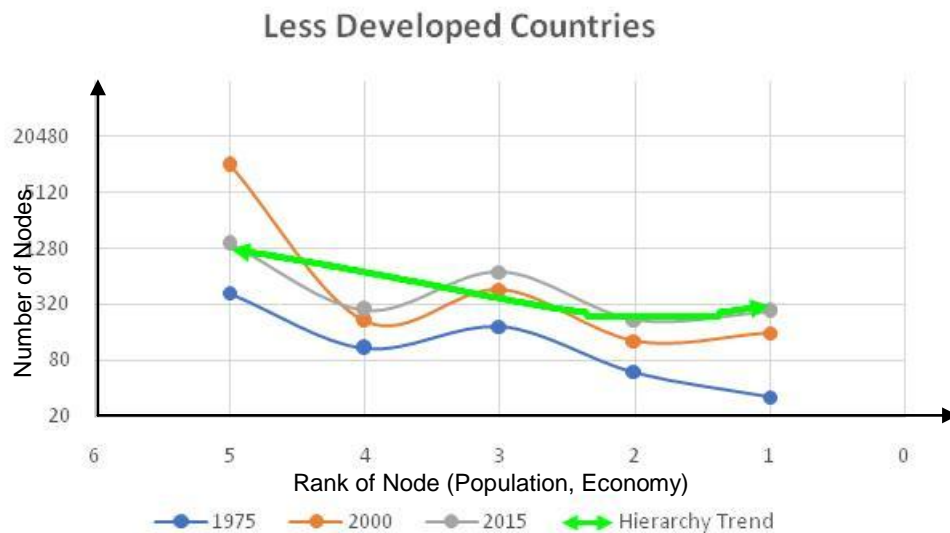
Source: Own interpretation of Vining (1955:152)

From the figure above, it can be concluded that the number of urban nodes is directly related to the actual size of the node. A direct correlation of the number of nodes and the size of the nodes is noted in this case. Larger nodes in the hierarchy are limited, with large populations and economic contributions (Vining, 1955:152). As the size of the nodes decreases, the population number and economic significance also decrease (Henderson, 1974:648). However, due to interaction between the nodes and level of dominance of specific nodes in a region, the urban hierarchy differs from a spatially balanced region in theory (Friedmann, 1986:70). Depending on the economic conditions and development phases (see Section 4.3), urban hierarchies varies in terms of spatial distribution and size of nodes in developed and developing countries/regions (Friedmann, 1986:70). The following figures illustrate urban hierarchy in these countries:



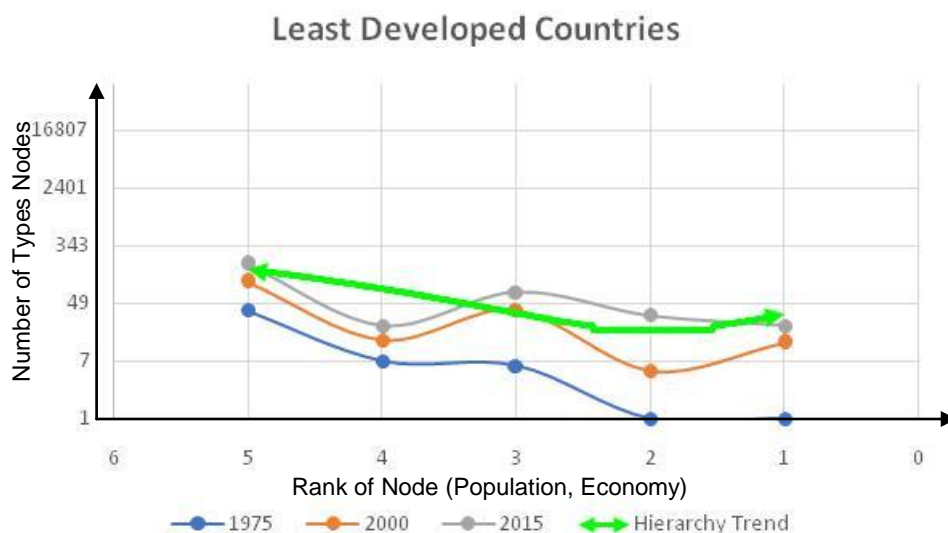
**Figure 5-6: Developed regions urban hierarchy**

Source: Constructed from United Nations (2016:76)



**Figure 5-7: Less developed regions urban hierarchy**

Source: Constructed from United Nations (2016:76)



**Figure 5-8: Least developed regions urban hierarchy**

Source: Constructed from United Nations (2016:76)

The figures above firstly illustrate the general urban hierarchy and distribution of nodes in a region of developed, less developed and least developed countries in general. From the overall urban hierarchy, it can be concluded that developed countries shows an urban hierarchy pattern which can be more related to the theoretical aim of spatially balanced regions. The number of larger nodes in a region is more, with a clear decrease in number of nodes if the size decreases. In the less developed and least developed countries or regions it is noted that limited larger sized nodes are found in a region with a significant increase in smaller nodes.

Secondly, the figures also show the change in urban hierarchy in the three different types of countries. From the figures it can be concluded that developed countries exhibit a much more constant urban hierarchy pattern. Less developed and least developed countries show a significant change in the urban hierarchy distribution of the country. The level on spatially unbalanced nature of development increases over time. This may possibly be due to the inability of these countries to advance from one stage to the next of economic development as explained in Section 4.3. The economic development and rank of the nodes are directly related to the specific types of places (Berry *et al.*, 1958; Henderson, 1974; Florida, 2002; Howkins, 2002; Neal, 2010).

The location of central and non-central places in a region remains a vital part of the urban hierarchy due to historic development in the region (Beckmann, 1958:574). The location of different types of places in the urban hierarchy and their respective influences (economic activity and level of development) are significant to study in this research to expose the potential of the urban hierarchy as regional planning instrument. Therefore, it is also essential to also take the dynamics and factors at play in central and non-central places into account. In the following section, the difference between these two types of places are studied.

## **5.5. Central and non-central places**

### **5.5.1. Types of places**

Depending on the type of role, function or economic activities different types of nodes are established in the spatial system. There are two different types of nodes. These nodes can be divided into central place nodes or non-central place nodes. To understand the difference between these two places one first needs to understand how these places differ in terms of fixed criteria of characteristics. Theorists identified the following characteristics in the past:

#### **A. Placement**

The major most distinct difference between central and non-central places is the type of role the place or node fulfil within a region (Lloyd and Dicken, 1972:21). In general, central places are ranked higher in the urban spatial hierarchy than non-central places. Non-central places are normally smaller than central places and are found slightly decentralised in a region (Christaller, 1966:69). The decentralised location of non-central places is mostly based on factors such as the natural resource, which limits the interaction between different nodes (Beckmann, 1958:574). In contrast to this, central places develop naturally and are located in a more “normal” network of nodes which enables higher level of interaction and therefore a more progressive role in interaction and ultimately the urban hierarchy (Fujita, 1989:41).

## **B. Services offered**

According to Lösch (1954:95), central places consist of a more diverse foundation of services and a greater variety of goods. Non-central places only provided basic services and function necessary in the region. The limited number of services and goods are mostly the result of only one or two economic sectors present in non-central places. In non-central places, only a few existing businesses offer agglomeration benefits while there are many more agglomeration benefits and thus opportunities offered to businesses to establish themselves in central places. (Christaller, 1966:69). This level of services and goods offered at a certain place creates the potential of taking part in interaction between nodes more efficiently. With increase products and services on offer, increased potential to interact with other nodes and establish relationships in a region exist.

## **C. Service area**

The service area of central places is bigger than those of non-central places. This is due to more, larger and well-established businesses and franchises. According to Lösch (1954:95), people tend to travel large distances to central places that offer a bigger variety and specialised products or services. People would rather travel to central places, making the service area larger. Non-central places or lower ranked central places only offer the necessary products and services. The service areas referred to here is directly linked to the location and services on offer in the previous two paragraphs. The service area is therefore linked to the actual role and function of a place in the region.

## **D. Population size**

More people tend to live in central places because these places offer so much more in terms of services, products and employment opportunities. Non-central places provide fewer products, services and work employment and therefore have a smaller population size (Richardson, 1973:53). The mere size of a population of a place can directly impact the ranking of a place in the urban hierarchy (Zipf, 1941:33).

## **E. Opportunities**

The presence of large and a variety of businesses in central places, create more and better employment opportunities (Castells and Hall, 1994:21). This usually attracts people away from smaller non-central places to central places. Increased employment opportunities are normally associated with increase ability to be active economically.

## **F. Social structure**

More people in central places tend to establish themselves as professionals (doctors, lawyers, pharmacists, etc.) because of better work opportunities for these professions. More qualified people move to central places and the social structure becomes more

professional. These kinds of professions and opportunities are far less in non-central places. This results in a less professional social structure (Isard, 1956:194).

With more people, more services, products and better qualifications in central places it is apparent that the supply and demand of services and products will increase, thus influencing the economy directly. From the factors described above, it is clear that a central place is located more favourably in the urban hierarchy. This is often one of the main reasons for the spatially unbalanced nature in regions. The development of a central place and the dynamics thereof is important to understand to later implement and recommend changes in the urban hierarchy. The following section focusses specifically on the development and dynamics of central places.

### **5.5.2. Central place theory**

The central place theory was originally developed in Southern Germany by Walter Christaller (1966). In this theory, every central place in a region represents a certain role in the function it fulfils in a hierarchy of places. These functions are influenced by the goods and services it supplies. The number of services and functions available at a central place determines the location and the size of the central place (Christaller, 1966:18). A central place with all its functions develops a service area which serves the people and towns in the surrounding area. People in that service area will also travel to the central place to make use of its functions. One can thus link this area with economic distance. Christaller (1966:22) identified this idea and described it as:

*“An economic distance is determined by the costs of freight, insurance, and storage; time and loss of weight and space in transit; and, as regards passenger travel, the cost of transportation, the time requires, and the discomfort of travel.”*

The central place is dependant of various factors such as population, social structure, financial well-being and the demand for certain products. The way people are scattered through-out the service area is important. The impact and contributions these people add, can greatly impact the service area and the hierarchy of the central place (Christaller, 1966:27). It is on this basis that some researchers argue against the validity of the central place theory. Due to the fact that central places form part of a hierarchy or network of places Meijers (2007) argues that the central place theory needs to be replaced by the network theory, which better subscribes the functioning of a central place in a region. Pacione (2009:127-128) also questioned the relevance and practicality of the central place theory on the following aspects:

- not applicable to all kinds of settlements,
- it is economically deterministic,
- it oversimplifies the human behaviour,

- it does not take policy decisions into account and
- it is static.

Godfrey (1999:585) defends the application of the central place theory by adding that this theory is only applicable to the demand created for goods and services internally. By taking Godfrey's point of view, it can be argued that the conditions of the central place theory are only applicable to the internal service area. Pumain (2006:174) explains this internal demand by stating that cities create wealth and prosperity by their own regional perspective situation. Although the principles in this case may sound more applicable, the general functioning and role of a central place reaches far more than the internal demand based on the interaction and the relationships between nodes spatially depending on factors such as the internal social structure.

The professional and social structure of the population can directly be linked to the financial well-being of the population within the central place. In turn, this financial well-being will have a direct effect on the demand for certain products and services. The demand in the central place will force the place to supply more of these products and services. As the pressure on the supply increase, the cost of goods and services will be impacted directly to maximise profits in the central place (Botha, 2011:40).

A central place consists of an inner and outer limit. The inner limit of a central place is the area surrounding the central place. This area consists of adequate supply of a central product or service to satisfy the people living in the area. The outer limit of the central place refers to the maximum distance people will travel to make use of the product or service at the central place (Christaller, 1966:34).

Products and services offered at central places may be divided into not-essential and essential products and services. These products and services cluster together in central places due to agglomeration benefits as discussed earlier. Blotevogel (2005:1307) directly refers to central places as agglomerations or clusters of institutions and functions that supply goods and services to their respective market areas. People will rather travel a further distance to a central place to locate both essential and non-essential products and services in the same area (essential and non-essential product cluster together due to agglomeration benefits). It is necessary to note that the theory of the central place is based on a standardised geographical area, scattering of people and their income and that there are various routes which link points. Christaller (1966:53) said that:

*“As a rule, the same central good can be produced and offered more cheaply in a larger town than in a smaller town, because production in greater quantities is cheaper and the larger amount sales permits a lower cost per unit.”*

Central places can be ranked according to variety of products and services offered. Central places of lower ranks are more common than central places of high rank. A central place of lower rank will offer a limited variety of products and services. Higher ranked central places will offer the same products and additional specialised services. Higher ranking places therefore offer bigger service areas. Knitter (2013:8) confirms this by concluding that places of a higher order offer all the function of lower order places and they also additionally offer functions not available in the lower order places.

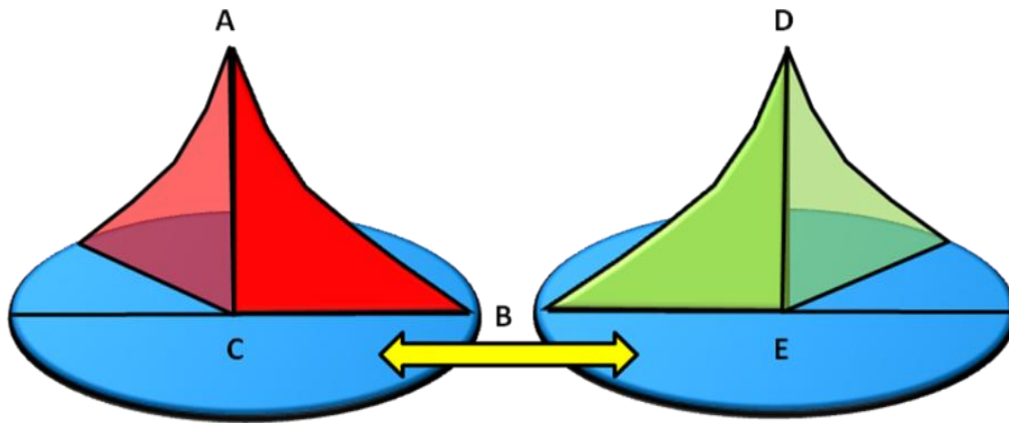
The rank of the central place determines the possibility of finding other central places in that area (Christaller, 1966:67). If a central place of medium rank is found in a region, there will not be central places of the same rank nearby. Depending on the location and ranks of the central places, this phenomenon would continue until only one central place of highest order is located in the area. The less places with the same rank, the higher the rank of the central place (Botha, 2011: 40).

August Lösch (1954:47) used the demand for products and services as base of his central place theory. Lösch explained how economic activities in a region are arranged. In this theory, Lösch assumed that the area applicable was a homogeneous area, the raw materials and population were evenly spread, and the business opportunities were even (Lösch, 1954:94).

Lösch noted that the primary goal to arrange economic activities was to determine which form of spatial economics would ensure a balanced state. To achieve a balanced state in an area the following conditions are needed (Lösch, 1954:94-97):

- the place where people settle need to offer the maximum benefits;
- the total area should support any establishment of businesses;
- economic activities should not be inhibited by geographic factors;
- no monopolies;
- demand for services and products are even;
- the economic system should not allow another establishment of a business except when another business withdraws from the economy and
- competition is even at boundaries of service areas.

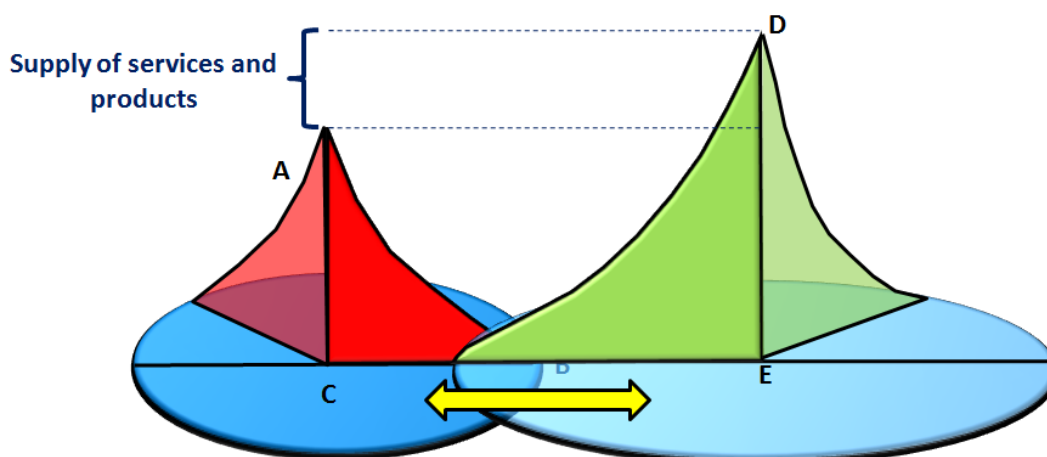
In this theory, the cost of the product and service plays an important role. If the cost of the product or service increase, the number of sales decreases. On the other hand, if the costs decrease, the number of sales would increase. It is also of significance that a cost of a product cannot be too high for it would not be rewarding to buy the product anymore. If the cost is too low, the business would not make profit on the product anymore. The following figure was adapted from Lösch, who used the following figure to illustrate how distance implicates demand.



**Figure 5-9: The relationship between distance and demand.**

Source: Own interpretation of Senekal (1974:22)

Production takes place at Point C. Line BC represents the distance of the service area of point C. Product cost at point C will be the lowest, because only the production costs are used to determine the overall cost. The highest number of sales (demand) would be recorded at this point (Point A). The bigger the service area grows from Point C to B, the bigger the increase in production costs. This increase in distance leads to an extra increase in transportation costs together with the production costs. As the distance increase, the less profitable it will be to buy the product and the product demand becomes less. In effect, the further you move away from Point C, an increase will be noted in product cost and a decrease in demand. This figure can only be applicable if the circumstances named are relevant. When competition is added to these circumstances, businesses (places) start to establish themselves closer to each other, offering agglomeration benefits to one another. In this case the following figure should be studied.



**Figure 5-6: The impact of a larger variety of services and goods on a hinterland**

Source: Own interpretation of Senekal (1974:22)

As seen from the figure illustrated above, the service areas now change forms. The closer the businesses establish next to each other, the bigger the service areas grow. Individual demand areas now form a compilation of areas with a bigger combination of production and demand. This bigger geographical service area now provides a higher demand of product between line BC. Since these businesses are so close to each other, they also offer products to one another, making production and transportation costs less. Product cost is now lower and sales/demand higher closer to Point B. A more stable demand gradient forms further away from each business' centre point. Competition therefore results in agglomeration benefits and a bigger service area. These dominant economic activities link together functionally and form in effect a growth point of node. The conditions and the theories explain in this section do however apply to the theory of central places. In addition to the central place theory, non-central places were also identified and studied.

### **5.5.3. Non-central place**

The central place theory of Christaller was based on assumptions that geographical areas are uniform. These assumptions lead to the development of the opposite theory – the non-central place theory by Richardson. Any region's geography varies from another region (Richardson, 1973:170). This makes each study of central and non-central places unique with its own challenges and benefits. Places that do not develop from the economic market also play an important role in the system of the central place structure within the spatial economy.

During the industrialised era, prior to the industrialisation process, central places were often classified as non-central places. It was also interpreted as young, under-developed central places (Geyer, 1989a:386). Factors, known as location constants, lead to the development of central places. These factors are predetermined at certain locations and they often determine the location of non-central places and the spatial economy's structure. These location constants may be divided into the following categories (Richardson, 1973:172):

- a fixed natural resource;
- a city which is settled for a long period of time (mostly due to historical influences), and
- a special place that offers benefits (for example location benefits or heterogeneity of land).

The economy of these places does not play as important role as in central places. Even though the economy determines the existence of the non-central place, much more is offered than economic activities (Lloyd and Dicken, 1972:30). Location constants offer various opportunities and reasons why the non-central place exists (Geyer, 1989a:386). When a fixed natural resource exists in the area, it is apparent why the place exists. A typical example is a mining town or village that developed due to the mine (natural resources such as iron ore, gold, manganese etc.). The

people working at the mine would settle close to the mine and a non-central place would be established with basic services.

The second location constant mentioned, refers to a place that developed due to its historic influences (Chisholm, 1962:13). These remote locations explain the non-central nature of the town. Although these places might play a somewhat central place role in the immediate surroundings, it can be considered as non-central places when compared to the regional spatial system (Knitter, 2013:8). The third location constant refers to the heterogeneity or good location of the land (Richardson, 1973:47). An example of such a location may be a town located amongst rich natural resources supporting the mining sector and surrounded by large scale agricultural activities. These nodes might also enjoy proximity benefits of being located near nodes of higher hierarchy.

The demand for product and service is an important factor to consider. This affects the location of places and the development of a structure between points in a district. The location constants also play a big role in the determination of the development of the mentioned structure (Richardson, 1973:47). Non-central places can also be identified by the functions. When a place depends on one dominant economic factor for continued existence, the likelihood is good that this place may be a central place. The challenge lies in situating these non-central places on the correct path to ensure industrialisation will take place and develop more/other functions to form central places.

The development of non-central places is unique and has different reasons for its existence. Therefore, it is necessary to prepare essential steps to help put these places on the path of industrialisation. These developments would then occur more sustainable. Non-central places tend to be smaller places than normal and offer great potential for development.

#### **5.5.4. Central place vs. non-central place**

The primary difference between central places and non-central places is where the place is ranked in the hierarchy of places in the region. Central places are big places and normally found at the top of the hierarchy in the region. Non-central places are regarded as less important and smaller and are usually found in the lower order of the hierarchy (Christaller, 1966:69). This difference in the placement in the hierarchy is because of the services offered. Gringmuth-Dallmer (1996) supports the hierarchy of places as described by Christaller and further adds that the more products and services on offer, the more complex the hierarchy is. Gringmuth-Dallmer continues by proposing that the hierarchy of nodes is linked to four stages:

- the lowest rank are the autarchic, agricultural settlements
- the next rank comprises of craft and commerce settlements that produce seasonal goods and depend mostly on the supply by their surroundings

- the third rank consists of settlements that create a dependency of the surrounding settlements due to the offering of at least one central function, i.e. a function with a regional meaning or importance, such as reign or cult
- the highest rank equals complex centres that offer all or nearly all central functions,
- leading to the highest importance in the wider surrounding or region.

Central places cover a more diverse base of services and goods while non-central places have limited services and functions, mostly only providing the people in the area of fundamental necessities. More services and products (see Section 5.5.1) are available in central places because of more agglomeration benefits offered here. There are more opportunities for investments and establishment of new businesses offered in central places while only a few existing businesses offer agglomeration benefits in non-central places.

In central places the service area is bigger than those of non-central places. This is due to the presence of franchises and other large and well-established businesses. People (from central and non-central places) are prepared to travel large distances to the central place which offers more (and specialised) products and services than the closer but lower ranked central places and non-central places (Lösch, 1954:95). Non-central places only offer the necessary products and services for the residents. People would then rather travel to central places, making the service area bigger.

The population size of central places is bigger than the non-central place population (Richardson, 1973:53). Central places have much more to offer in terms of services, products, employment opportunities etc. Better and more employment opportunities are then created due to the presence of large businesses. The previous mentioned opportunities attract people to the central place. More opportunities to develop as professionals emerge. People start to establish themselves as professionals (doctors, lawyers, pharmacists, etc.) in central places as expected. With the establishment of these professionals, the population develops more of a structure than before. With more qualified people streaming to the central place the social structure becomes more professional. In non-central places these kinds of opportunities are far less than in central places which results in a less professional social structure (Isard, 1956:194).

With more people, more services and products and better qualifications in the central places it is understandable that the supply and demand of services and products will increase. These demands and supplies of products and services influence the economy directly. Understanding the development of central places, lead to the beginning of the theory of non-central places. These factors were studied thoroughly and compiled in table form as illustrated above. Different economic and location factors contributed in separating the two types of places. The differences

between the two places were studied to see what effects it had on the development of the place. As these two types of places fulfil their separate role in the spatial system a general urban hierarchy of the region could be identified. This urban hierarchy is directly linked to the central place functions, economic growth, centrality and relationship between other nodes in the hierarchy. In the following sector, the link between urban hierarchy and central and non-central places is studied.

## **5.6. Urban hierarchy and central and non-central places**

One of the main issues experienced in economic and regional theories is that the models applied in regions tend to oversimplify the reality and actual dynamics of the region and its nodes or places. These models and theories utilise general assumptions to illustrate the functionality of the region in the most simple and straight forward way as possible. The actual reality and role-players in the functionality and the factors at play result in a very complex and interconnected system in reality. The regional planning process should take all these factors into play and present a simple solution or model that plans for development of a region.

The foundation of most of the approaches used in regional planning is to start to identify the power nodes (central nodes) and areas where most of the activities are focussed on in a region. According to Krugman (1996:399), this approach starts with the size and distribution of metropolitan areas. As discussed on so many occasions in this research the geographical level of study is essential. In some cases, depending on the level of study, the region may not even include metropolitan areas as part of the region. In these cases, the nodes displaying the most activities and largest size form the basis of the study as well as the top of the urban hierarchy.

The approach to plan a region starts by first studying the different sizes of cities as a result from the central place network (Lösch, 1954:94;Christaller, 1966:53) of the region. Central places in the region can be studied as emerging and growing places as a result of the scale of economies and the supply of products and services. The only reasons that prevent these places of clustering in a single location in a region are the dispersed nature of natural resources. The dispersed nature of resources in the region creates tension between the local economies and transportation costs.

One could argue that if these natural resources are evenly distributed in the region, that settlements or places would developed naturally, balanced and with equal sizes. The reality is that the natural resources are not equally distributed through the region and the urban places or settlements developed at irregular distances between each other. The irregular distances between these nodes result in stronger or weaker relationships between the nodes. The level of relationships or interaction between nodes is largely linked to the variety of products and services at offer in the nodes or in specific neighbourhoods with a unique offer of services. Christaller

(1966:54) argued that a hierarchy between different places are established due to the type and variety of goods and services at offer.

### **5.6.1. The link between neighbourhoods and central places with the urban hierarchy**

In many studies regarding the urban hierarchy of a region the focus was aimed at the differences between settlements on higher, middle and lower order of the hierarchy (see Section 5.4). The findings of these studies clearly indicated that centres or settlements on the lower order of the hierarchy had limited services and goods to offer and only served the local communities. According to Webber (2004:2), these types of places might include a Post Office, an outlet of a multiple retail chain, perhaps a secondary school and a church. These types of places are not located as far apart from each other as the higher ranking urban centres. Higher ranking places offer larger variety of retail goods and services, specialised services, entertainment, public facilities etc. These higher order centres are located much further apart from one another (Mohr and Fourie, 2004:158).

Regarding the studies of neighbourhoods that have been conducted, it is the actual size of the neighbourhood that is more relevant to this thesis. Although many neighbourhood classifications of neighbourhoods exist, depending on the size of the settlement and the surrounding land uses, most neighbourhoods have a general set of elements that corresponds. The demographic base of the neighbourhood is directly linked to the services that serve the local residents residing in the neighbourhood (Webber, 2004:2). Neighbourhoods having a larger demographic base is more likely to have more available services and spread evenly for convenience purposes. Roberts and Fisher (2006:370) explain that the population size of a node impacts the actual urban hierarchy. The size of the neighbourhood represents the population size of the node in the region.

The link between the urban hierarchy and neighbourhoods with the central place theory is largely based on population of the node (Zipf, 1941:33). The variety of goods and services on offer is related to the number of central place functions that specific settlement fulfils. Although larger demographic neighbourhoods and a larger variety of neighbourhoods are found in the urban centres higher up in the urban hierarchy, neighbourhoods of different size and functions are also located in smaller settlements (Webber, 2004:2). The number of employment opportunities is also the actual population size (labour force) and the available services and functions in a central place (Mohr and Fourie, 2004:160). This is linked to the employment sector and types of occupancies in these settlements.

In this section, the links between the urban hierarchy, central places and neighbourhoods were studied. It was found that there is a definite link between the population size, urban hierarchy and

employment opportunities in a central place. Therefore, a paradigm shift from central places to foundations of urban hierarchy needs to be observed and studied. In the following section, this paradigm shift from central places to bases of urban hierarchy is studied to illustrate the interdependence and co-existence of these two factors.

### **5.6.2. From central places to foundations of urban hierarchy**

Central place studies and research acknowledge the link between the level of centrality and the variety of goods and services. Few of these central place studies have focussed on the population element of the central places as discussed in the section above. According to Garrison (1960:121), many empirical studies of central place hierarchies, assumed that areas with a larger base of population tend to offer a larger variety of goods and services. This statement of Garrison correlates to the link between urban hierarchy, central places and neighbourhoods discussed in the previous section.

To determine the paradigm shift from central places to a basis of urban hierarchy it is necessary to relate back to the theory of central places in each original theoretical foundation. Preston (1971:137) states that these theories propose a network-based urban hierarchy, while other applications and empirical investigations rather refer to a sized-based urban hierarchy. To illustrate the significance of sized-based urban hierarchy, many other studies compiled evidence that suggested that urban functions (central place functions) were organised according to a sized based urban hierarchy (Berry and Garrison, 1958:149; Schettler, 1943:61). These types of empirical investigations have been ignoring the role and function of transportation links between the different settlements.

The importance of transportation links and interaction between different nodes in a spatial system was first realised by Christaller (1966:53). Christaller suggested that the links and relationships between different nodes should rather be considered as important central place indicators rather than the sheer size of the population at a settlement. If urban centres or nodes in a spatial system is seen as living organisms the relationship, size and interdependence between these nodes should be seen as a set of central place indicators that form a network of urban centres that support an urban hierarchy of the region.

In the current planning era the linkages and relationships between different urban centres are strengthened by the availability of new technology and improved means of efficient transportation. McKenzie (1927:28) pointed out that technological advance and transportation is the catalyst of competition and interaction between different centres in the urban hierarchy. The links between different nodes in the urban hierarchy promotes the efficient flow of workers from one centre to another due to labour opportunities.

It can therefore be concluded that a clear paradigm shift from a hierarchy of central places are seen to a network basis of urban hierarchy. It should be noted that an urban hierarchy is not just related to the central place hierarchy of function, but rather influenced by a set of factors that all contribute to the establishment of a network of urban hierarchies that promotes sufficient functioning of an urban system in a region (Preston, 1971; Berry and Garrison, 1958; Schettler, 1943). When attempting to utilise the urban hierarchy as a spatial planning instrument to, all these factors should be considered to identify the correct strategic nodes in the spatial system. This would form an integral part of the criteria proposed in the empirical investigation that would that would propose a new balanced urban hierarchy network.

## **5.7. Conclusion**

In this chapter the dynamics of urban systems and urban hierarchy was studied. The start of the chapter focussed on the urban system. The reason for starting the study with the urban system theory was to illustrate the effect and the relationship that an urban hierarchy can have on the functioning of a region and the surrounding region. Friedman (1978:21) and El-Shanks (1984:33) realised that the nodes in a region could not be studied apart from the urban system due to the strong interrelationship between the two regional planning concepts. The size of a node is linked to the location, role and function of the node in the urban system and hierarchy, which in turn influences the development process of a region (Richardson, 1977; Renaud, 1981; Belsky, 1983). This relationship explains the importance of an urban hierarchy and the effect the hierarchy can have on urban systems between regions.

Vining (1955:152) explained that a spatially balanced urban hierarchy is a theoretical concept consisting of equally distributed size and number of different urban nodes in a region. However, due to interaction between these different nodes the urban hierarchy differs from the theoretical spatial balanced. Depending on the economic conditions and development phases discussed in Chapter Four, urban hierarchies varies in terms of spatial distribution and size of nodes in developed and developing countries/regions (Friedmann, 1986:70). Various authors concluded that the economic development of a region and the specific ranks of nodes are related to the different types of places in a region (Berry *et al.*, 1958; Henderson, 1974; Florida, 2002; Howkins, 2002; Neal, 2010).

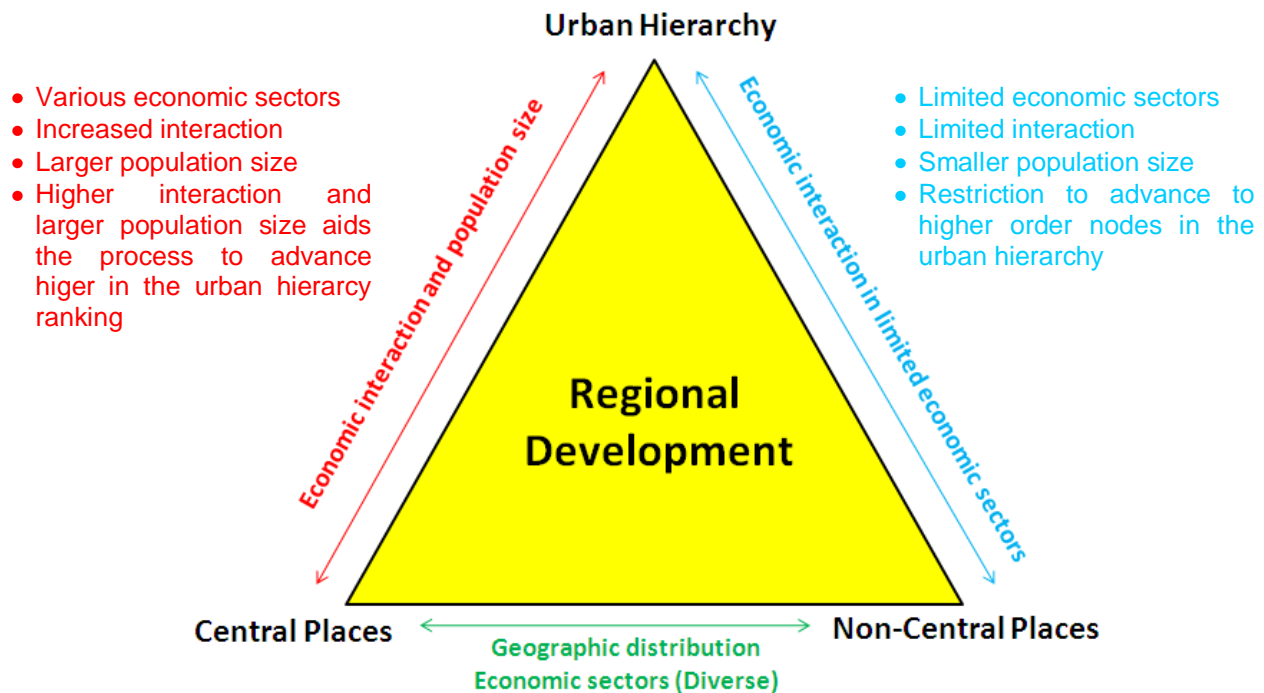
From this conclusion, it is evident that central and non-central places in a region are considered as a part of the urban hierarchy (Beckmann, 1958:574). Various economies depended primarily on the factors located within the settlement or its immediate hinterlands, therefore has a direct influence on the traditional ranking of cities as described in the central place theory. Apart from central places, the non-central places also impact the urban hierarchy. The following table illustrates the comparison between central and non-central places in a region.

**Table 5-1: Comparison between central and non-central places**

Source: Own compilation

<b>Hierarchy / Placement in the region</b>	Normally in the top of the hierarchy in the region.	Lower in hierarchy in the region.
<b>Products and services</b>	Many and diverse products and services in the place.	Limited products and services – only the basic necessities are complied with.
<b>Service Area</b>	Big service area is provided. People travel large distances to this place.	Only a small service area is provided. People prefer to go to central places.
<b>Population Size</b>	Population is larger than non-central place.	Population size smaller than the central place.
<b>Social Structure</b>	More professional structure, with qualified people such as doctors and other professions.	Social structure is less professional. And more focussed on basic skills with lower levels of professionals.
<b>Supply and demand</b>	The supply and demand of goods and services is bigger.	The supply and demand are smaller than central places.

The table above shows the fundamental differences between the different types of places within a region. Due to the vast differences between these two types of places, different dynamics and dimensions should be considered in the link with the urban hierarchy of a region. The following figure shows the link between central places, non-central places and the urban hierarchy of a region.



**Figure 5-10: The links between central places, non-central places and the urban hierarchy.**

Source: Own compilation

The figure above illustrates the linking elements between the urban hierarchy, type of place and regional development. Interaction between central places (nodes) in a region contributes to the economic development and growth, which impacts the rank in the urban hierarchy. On the other hand, the same principle applies to non-central places, except that economic activity is mostly concentrated in limited economic sectors and activities in the non-central place. Limited economic activities in non-central places, therefore limits progress in the urban hierarchy rankings. In order to overcome this development obstacle, non-central places need to be centrally located, to promote interaction and also consist of the ability to diversify in terms of economic sectors. Depending on the level of economic activity, this process and links between these elements directly impact regional development.

The following chapters start to focus on the empirical section of this thesis. Before the physical testing of data from different statistic sources are considered in a quantitative approach, the background and the rationale of the geographical study areas (sub-continental and regional perspective) should first be reviewed in terms of the history, policies, functioning and dynamics on each level. In the following chapter, the background on the national area of investigation is studied as well as the general methodology and approach that will apply on a regional perspective.

## **CHAPTER 6: SPATIAL PLANNING: REGIONAL PERSPECTIVE**

### **6.1. Introduction**

The first section (Chapter Three to Five) of the thesis, the literature principles applicable to this research was studied to understand the dynamics and fundamental aspects of these principles. The background and literature foundation should now be applied to illustrate the role of an urban hierarchy as a regional planning instrument. Evident from the literature is the interdependence of regional planning instruments and how urban hierarchies are established in the spatial system (Sections 3.5 – 3.7 and Section 5.4). In this research one of the outcomes is to illustrate the role of an urban hierarchy from a regional level up to a sub-continental level.

In this chapter, the focus is on the explanation of the research approach, identify a study area from a regional perspective and argue the relevance of this focus to this research. After the regional perspective study area had been identified, a pre-determined set of factors and instruments that illustrated the role of an urban hierarchy as a regional planning instrument was applied on the study area. The approach used in existing regional planning instruments as discussed in Sections 3.5 – 3.7 was included. This also enabled the researcher to determine the role and impact of these instruments in general regional planning, before the evaluation of the study area was conducted. The evaluation and application of the regional perspective's study area aimed to illustrate gaps and unsustainable areas for investment that could help to promote regional balance.

### **6.2. Regional perspective approach and methodology**

South Africa's national landscape is well-known as spatially unbalanced with an established urban hierarchy. In South Africa a clear contrast can easily be identified between the different urban and rural areas. Nationally, the main top urban hierarchy is built around the interactions and relationships of the metropolitan areas. On a smaller scale, the hierarchy of nodes between metropolitan areas each consist of a distinct regional dynamic and relationships. On a provincial level, the same principles can also be seen where the capital of the province falls within the top order nodes of the urban hierarchy in most cases and is supported by different intermediate cities. The lower order and hierarchy from here is clearly unbalanced with a wide range of large towns, service towns and smaller nodes.

The aim of this research is to illustrate the role of an urban hierarchy as spatial planning instrument (Section 1.3). In the context of this chapter from a regional perspective, the role of an urban hierarchy is to promote regional balance in the applicable region. The approach to create a spatially balanced region is to revise the existing urban hierarchy. The revision of the existing urban hierarchy should be of such a nature that a more even distribution of different order nodes

can be found in the region. A more even and gradual urban hierarchy would then promote improved interaction and relationships between the applicable nodes (Section 5.4). This alteration would require certain nodes or towns in the region to be targeted for external investment and development through an unbalanced approach. This unbalanced investment approach is aimed to promote balance within the region. Theoretically, the approach described in these paragraphs should work in reality; however, the main challenge would be to identify the appropriate nodes (relative to the region's development phase) for external investment. A revised approach to the urban hierarchy in this case would be used to identify potential nodes consisting of a more sustainable investment nature.

Due to the different urban hierarchies in South Africa, it is decided to illustrate and evaluate this approach on a region with a clear and definite unbalanced spatial system. The identified region will be interpreted as a planning region in which the evaluation will be conducted (Section 3.7). The first step in this chapter is to delineate or identify the province on which the role of an urban hierarchy as spatial planning instrument would be tested. This province or study area should conform to certain identified requirements, which confirms that the region should be studied as a planning region in its own capacity. These requirements are aimed to identify a largely unbalanced spatial system with both internal and external strategic links and unutilised potential for development. Each of the nine provinces in South Africa will undergo this evaluation or pre-determined filtration process.

Once the province or study area is identified, the actual application of the urban hierarchy would commence. This application should be different from the already tested approaches in regional planning today. As seen in Chapter Five the population and other factors were used as indicators of the hierarchy. The difference in this approach is to combine the existing spatial planning instruments with specific socio-economic investigations. By combining spatial planning instruments' role and responsibilities (in Sections 3.5 – 3.7), with the socio-economic significance, this approach will be supported by the actual performances based on published statistics.

The first step is to evaluate the current status of the spatial planning instruments in the province based on existing nodes, hierarchy and corridors. The second step is to evaluate these nodes in the province based on the actual economic performances and social potential. The statistics used in this evaluation is sourced from official Stats SA data. It is important to note that the smallest geographic level of data published by Stats SA in this regard is on sub-regional level (different municipalities). The latest published data is used in combination with the previous 5 years from date of data release. This limitation is countered by considering the existing nodes and hierarchy based on settlement typology (Section 6.6.1.1). By using the existing hierarchy and larger nodes,

one can relate the data from sub-region level (municipalities) to the capitals in each region, where most of the activities are concentrated in most cases.

The combination enables the researcher to evaluate the latest status quo and correlate it with the previous 5 years' performance. This step is included to identify development trends and potential areas for investment with a developed economic base and existing infrastructure and agglomeration benefits (Section 3.5.2). The last step is essential in the recommendation process for external investment. This step enables the researcher to identify more sustainable nodes for investment based on the current spatial dynamic, economic performance and social potential.

### **6.3. Regional perspective study area defined**

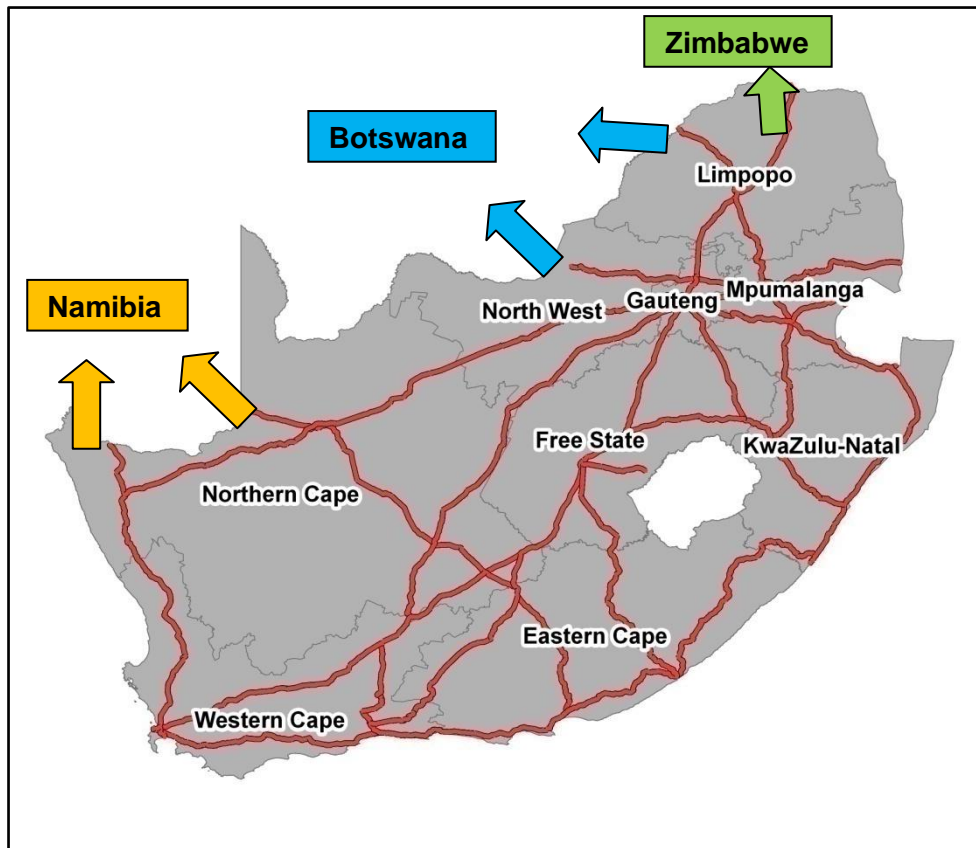
The regional perspective study area refers to a planning region that is locally based in South Africa. To clearly illustrate the role of an urban hierarchy from a regional perspective, the approach is to identify a planning region that represents the following pre-conditions:

- A large enough urban and established urban hierarchy;
- national significance (identified in a high level strategic document);
- vastly unbalanced regional profile;
- important internal and external economic linkages;
- potential for economic growth; and
- an investment prone area.

Each of the provinces of South Africa was considered in the next step of the identification of the study area. A regional perspective study area focussed on a provincial scale held various benefits in terms of strategic planning documents (provincial and national plans) and regional planning instruments that have already been implemented on a higher planning order. This would ensure that planning structures are established with a clear vision of how, why and where the future vision for the province points to through strategic documents.

When considering which province to identify as the study area, the road linkages to external economies was important. As seen in Sections 3.6 and 4.3, as well as the role of linkages in the urban hierarchy (Section 5.4), it is believed that this should play a crucial part in the empirical research. The linkages from South Africa should be seen as the gate to access the rest of Africa (refer to Section 7.3.2.3). The direct road linkage to external and internal economies eliminated the southern provinces of South Africa including the Eastern Cape, Kwa-Zulu Natal, Western Cape, Free State, Gauteng and Mpumalanga provinces. The provinces left were the Northern Cape, North West and Limpopo. These three provinces were then compared to the pre-conditions

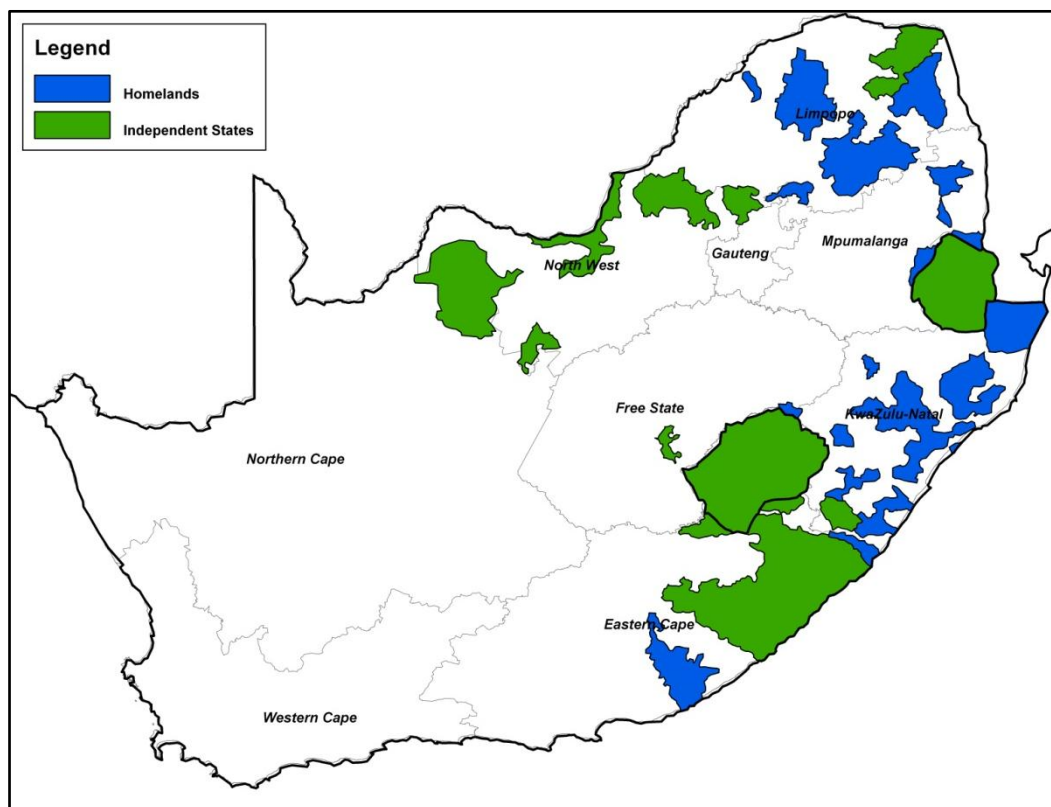
listed above. The figure below illustrates the exclusion of the first 6 provinces of South Africa as potential study areas.



**Figure 6-1: Excluding provinces from the regional perspective study area**

Source: Own compilation

Now that the first six provinces were excluded, the next step was to exclude two other provinces of South Africa. Starting with the established urban hierarchy, the three provinces in question are all three hosts to an established urban hierarchy. Although vast areas in all these provinces are considered as rural areas, they still have an established urban hierarchy. Upon further investigation into the history of the established urban hierarchy and present urban systems, a valuable and defining factor was found (see Chapter Seven). During the 1980's the Good Hope Plan (Section 7.3.1.2) was a regional policy, which specifically referred to definite homeland boundaries (DFA, 1982:34). The homelands were traditional areas seen as separate entities demarcated in South Africa where black people could live. According to Botha (2011:80), the residents in the homelands needed official passes to travel through South Africa. Although previous regional policies also implemented during the apartheid era, the map indicating the clear boundaries of the homelands was found in the Good Hope Plan.



**Figure 6-2: Homelands in the Northern Cape, North West and Limpopo Provinces**

Source: DFA, (1982:34)

From the figure illustrated above, it is clear that large areas of the Limpopo, North West and Northern Cape provinces were hosts to traditional homelands. One of the effects of the apartheid era was the creation of unbalanced regional and economic regions. The development in these areas was often constrained and the end result was widening the gap and resulting unbalanced regional spatial systems. Although South Africa is a democracy since 1994 and many upliftment and reconstruction plans were implemented such as the Reconstruction and Development Programme and the Rural Development Framework (RDP, 1994:145 and RDF, 1997:49), many effects from the apartheid era are still visible in poor access to services and a lack of proper infrastructure in these areas.

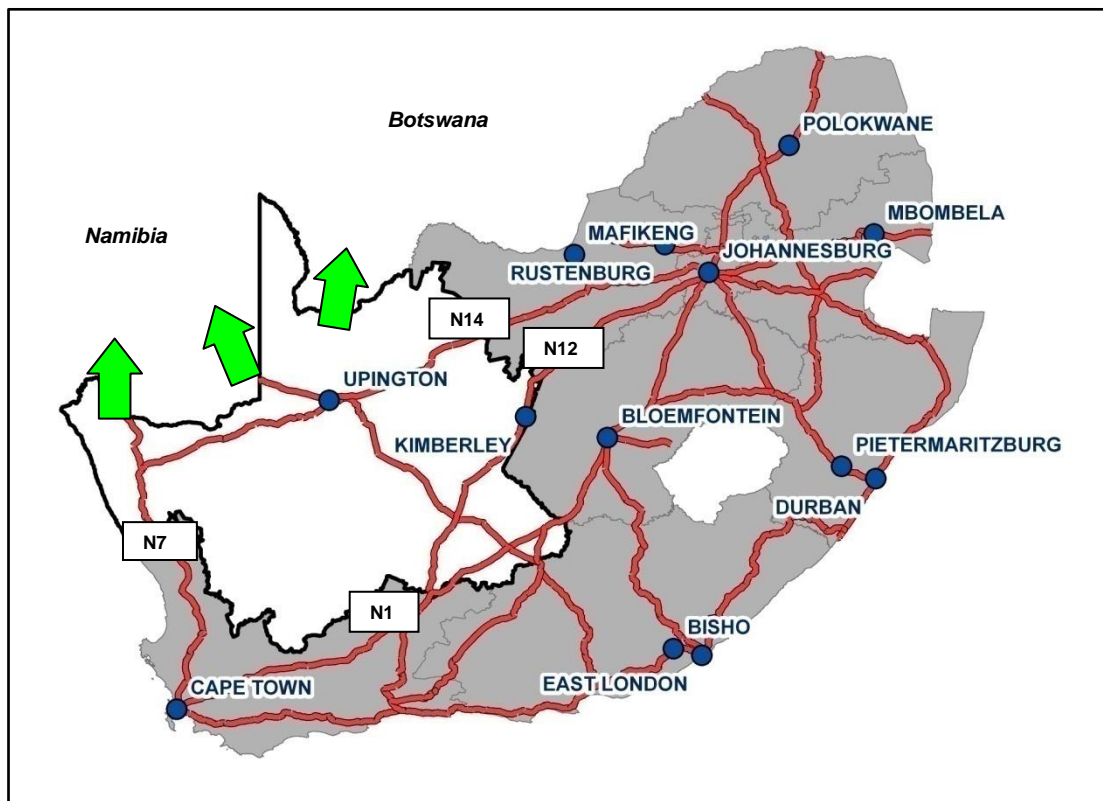
As seen from Figure 6-2 the Northern Cape Province is the province with the least effects of the remaining provinces of the previous traditional areas. The urban hierarchy established in this province was mostly the result of interaction, infrastructure, agricultural hubs and mining activities. This creates various options and influences into the urban hierarchy of the province. The Northern Cape Province is also the largest province in South Africa and plays an important role in the primary economic sector (Department of Economic Development, 2007:1). Distances between different sized nodes and areas in a region impact the spatial system and urban hierarchy of the region. The effect of different sized nodes and distances between the nodes contributes to the

unbalanced spatial system, making this province an appropriate choice for the regional perspective study area.

The reason for the establishment of the urban hierarchy as referred to in the paragraph above also links the criteria of selection to the second aspect regarding national significance. As already explained the Northern Cape Province is also responsible in the contribution of the economic growth nationally from mostly the primary economic sector (mining and agriculture). Large scale commercial farming is found scattered through the Northern Cape Province. Many mining activities are also scattered through the province and are the result of the establishment of the highest order node (Kimberley) in the Northern Cape (Department of Economic Development, 2007:2). Despite the continuous pressure on the mining sector in South Africa, many mining towns still experience growth. Other mining towns that realised the fragile and unsustainable economic future have implemented strategies to promote diversification of the economies, attracting new activities to these towns or centres.

The different reasons for establishment of towns and urban areas in the Northern Cape also create a vastly unbalanced spatial profile. The unbalanced spatial profile referred to here is the difference between the distribution between large, medium and small nodes and towns. The Northern Cape is home to various small nodes and only one major economic node (Kimberley) that is supported by intermediate other nodes such as Upington. From this statement, it is clear that the province consists of an unbalanced spatial system. This creates the opportunity to illustrate the role of an urban hierarchy as a spatial planning instrument that promotes regional balance.

The national significance of the economic contribution of the Northern Cape Province is indirectly linked to the internal and external economic linkages between other provinces. The internal economic linkages referred to in this criterion means the linkages with major national economic nodes (in different provinces) connected with the Northern Cape Province. According to the NCPSDF (2012:100) the connection and integration with surrounding provinces and economic nodes is an important strategy for development for the Northern Cape. The Northern Cape Province is linked with the economic hub of South Africa (Gauteng) via the N14 corridor. As seen from Figure 6-3 illustrated below, it is clear that this N14 corridor links the northern parts of the Northern Cape Province directly with Gauteng. The N12 development corridor is also a major corridor and link with Gauteng and Kimberley, which is located more centrally in the province.



**Figure 6-3: Corridor links between Northern Cape and Gauteng**

Source: Own compilation

Upon further study of Figure 6-3 it is clear that the Northern Cape and its capital (Kimberley) are also linked to another prominent national economic node in the Western Cape (Cape Town). Other existing and important linkages and corridors can also be seen with link of the N7 national road along the Western Coast. The link to the iron ore heart of the Northern Cape Province with Saldanha is also an important economic driver and link to external economies (NCPSTF, 2012:102). The external economies referred to in this criterion however, refer to linkages to external economies in African countries.

As mentioned in Chapter One of this research, South Africa is often seen as the gate to the rest of Sub-Saharan African Countries. The Southern Africa Development Community (SADC) is yet another factor greatly contributing to the economic relationship between these countries and South Africa. The external linkages refer to linkages on land and not just through ports, as is the case with Saldanha and Port Nolloth. The direct links to Namibia, Botswana, Zambia and Angola is of great concern in the economic trade environment and exports. The Northern Cape Province is therefore seen as the most appropriate study area for the various options and links to internal and external linkages.

The geographical location, links with internal and external economies, well established primary economic sectors and available area for development makes the Northern Cape an ideal area with

the potential of economic growth. Although the primary economic sectors (agriculture and mining) already contribute and have contributed to economic development provincially and nationally, it still has a lot of potential to be unlock in the secondary and tertiary economic sectors. During the last quarter of 2015 and first quarter of 2016 the province has experienced enormous pressure on the primary sector outputs.

Although the primary sector has contributed a lot to the development of the Northern Cape Province and is continuing to promote economic development, the primary sector still has a lot of potential for further economic growth. The Northern Cape Province is well-known for its vast basis of unexploited mineral wealth (Department of Economic Development, 2007:20). The potential for further primary sector development is linked to the prices of commodities in the macro economy. Apart from the potential for new primary sector developments, the existing primary sector activities also hold potential to attract new economic sectors and pursue economic diversification. The Department of Economic Development (2007:20) confirms this by stating:

*“New minerals legislation enacted in 2004 has raised the prospect of the transformation of the mining industry through the de-concentration of ownership, increased access to mineral resources on the part of junior and small-scale mining companies and black economic empowerment. At the same time, the new legislation is intended to stimulate new growth in the industry and bring about increased levels of minerals processing and related economic development in the province.”*

The well-established primary sector was responsible for the development of a sound infrastructural base in the province. The continuous pressure on the primary sector, development policies and obligations of large companies has resulted in the investment in different communities and local economies to promote economic diversification. In the 20th century sustainability of development is a major issue in the world-wide development space. This resulted in the establishment of economic diversification plans in towns (especially mining towns) susceptible for economic stagnation and potentially becoming a ghost town. Apart from these policies the province has also seen the establishment of major development investment i.e. the establishment of the new Sol Plaatjie University in Kimberley, various solar panel projects and the Square Kilometre Array (NCPSDF, 2012).

The remaining ‘locked’ potential for development in the province is also linked to the possibilities for investment. Many private developers are continuously seeing the potential for development in various towns in the Northern Cape Province. The establishment of retail centres, light industrial developments various hospitality uses focussed on the tourism sectors and the development of

additional educational facilities proves that various external investors are willing to invest in the province.

The Northern Cape Province is seen as the most appropriate study area based on the aspects listed in the beginning of this section. The regional perspective study area is identified as the Northern Cape Province. The Provincial boundaries are determined by physical boundaries (Rivers), administrative (political) boundaries as well as the influence from the wards delineated by the Municipal Demarcation Board<sup>8</sup>. These boundaries related to natural boundaries and to a more holistic demarcation process as discussed in Chapter Four. Now that the study area is identified / delineated, the next step is to study how existing regional planning instruments are applied in regional planning in the study area before criteria is established for the evaluation of the province to identify and illustrate the role of an urban hierarchy as a regional planning instrument.

## **6.4. The application of regional planning instruments**

### **6.4.1 The application of nodes**

The regional planning approach requires that development planning commence in the context of five distinctive spheres of nodes. These nodes are arranged on international level, national level, provincial level, district municipal level and local municipal level. Therefore, it is important to understand and recognise the inter-relationship of different nodes.

To explain how nodes are applied in regional planning and strategic planning documents, the Northern Cape Province was used as an example. The reason for the use of the Northern Cape example is linked to the delineated National level study area as seen in Chapter Six. The application of the node as spatial planning instrument in the province is of great significance to this research. The Northern Cape Province, like other regions, are faced with many planning challenges such as depopulation, urbanisation, unbalanced growth and infrastructural challenges. The various nodes applicable in this province are as follows (The Department of Cooperative Governance, Human Settlements, and Traditional Affairs 2012:274):

#### **a) Regional nodes**

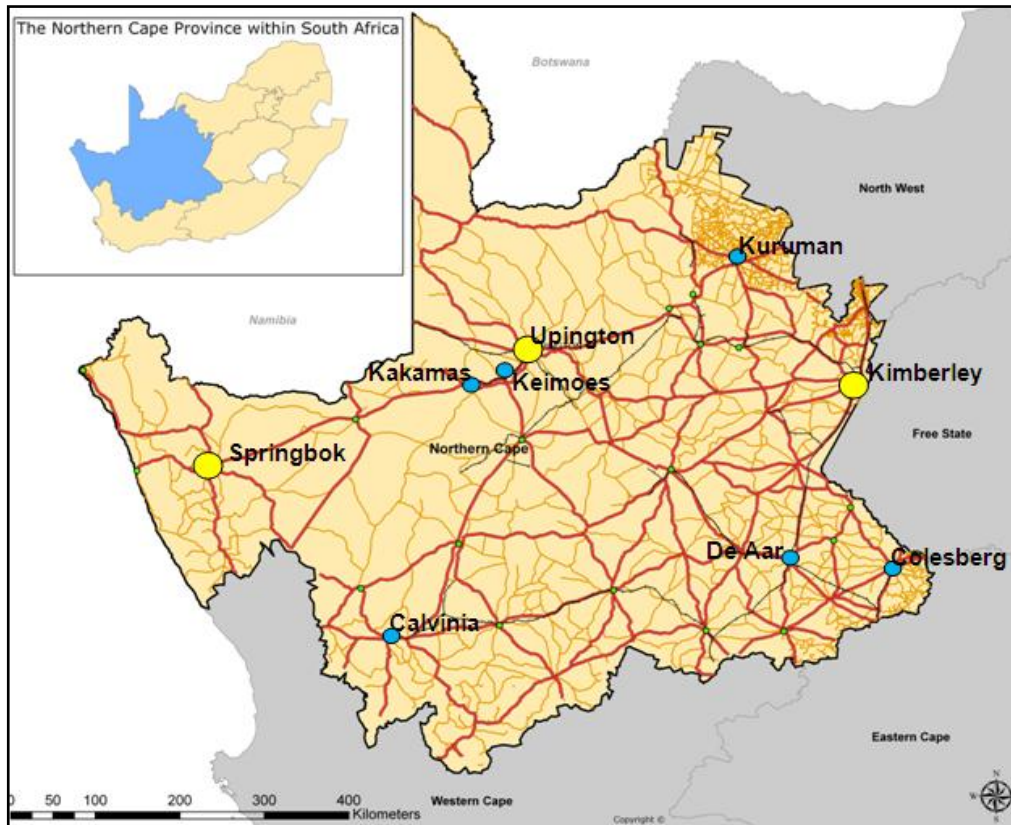
These are areas or towns of significance in terms of the top order hierarchy, location, economic significance and agglomeration of function (products, services and economic activities), which have a major impact on the dynamic of a region.

#### **b) Sub-regional node**

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<sup>8</sup> The Municipal Demarcation Board is an entity which was given the mandate to determine the municipal boundaries in South Africa. This mandate is provided through the Municipal Demarcation Act 1998 and the Municipal Structures Act 1998.

The sub-regional nodes are areas/towns of significance in terms of the assorted districts or smaller regions within the sub-region.



**Figure 6-4: Regional and sub-regional nodes in the Northern Cape Province**

Source: Mapped created by author by using ArcMap.

Based on the different types of nodes used on a regional scale, it is clear that nodes and the development of nodes are done in different spheres and hierarchy of planning. Depending on the type of node and level of planning, nodes can have specific principles that need to be considered to ensure effective implementation in the spatial system. By studying the principles of application of nodes as a planning instrument, it is clear that there is a distinct link with the literature principles of the development of a node as discussed in Chapter Three.

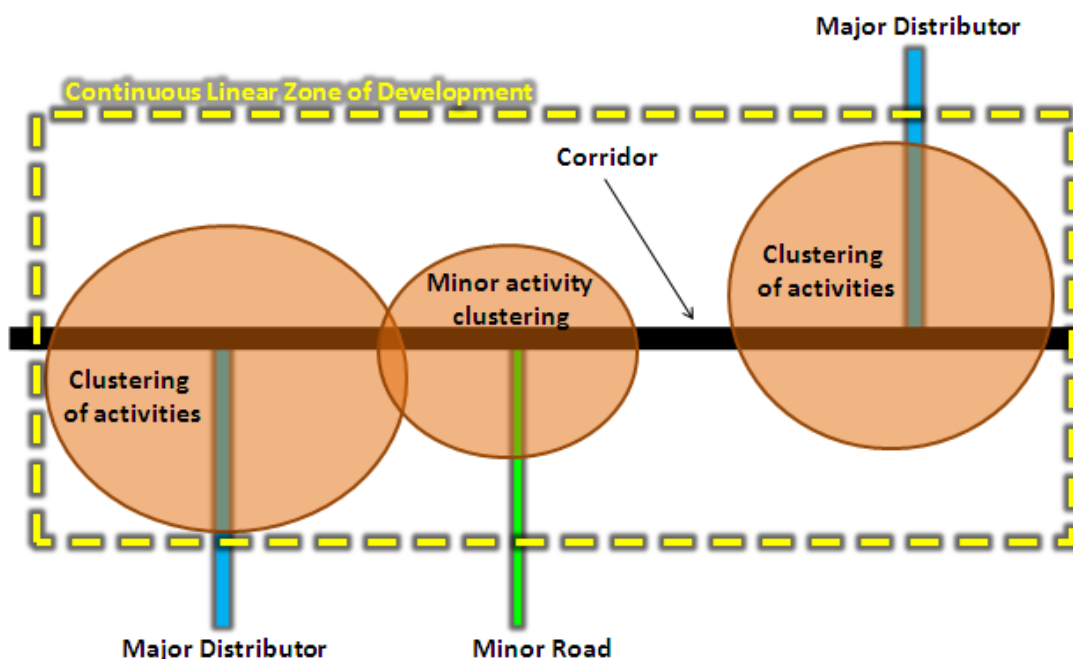
The principles as discussed above include all levels and detail of planning. These principles also apply to methodology of this research. The links between different nodes in a region is essential for the development of nodes. These links are created by corridors on different geographical levels. Corridors and nodes mutually support and rely upon each other. The corridors rely on nodes along its length to generate movement and activity. In turn, nodes form strategic points where economic and social investments are focussed in the methodology of this research. Corridors reinforce the economic efficiency and significance of nodes and vice versa.

## 6.4.2. The application of corridors

The planning, implementation and application of corridors in the spatial system is driven by a top-down planning process. As already explained, corridors have been successfully implemented and used in various levels of planning. In the general South African context, the application of corridors or development corridors in a region or regional plan mainly focusses on three elements. Aurecon (2014:201) concluded these three elements as follows:

- Major movement infrastructure such as railways, highways, major arterials that acts as a spine of development.
- Infrastructure that supports the movement of goods, services and people adjacent to main movement spines.
- Act as main attraction force along a corridor, such as major destination points or nodes that may ignite the process of development area or growth point and ultimately development of a linear zone of activity.

From this list, it is confirmed that the current application of a corridor as a regional planning instrument, is primarily focussed on the linkage and economic role. A corridor should consist of different uses that form a continuous linear zone of activity between nodes. Development along a corridor can be divided into lower and higher concentrated zones of development. These zones should link together and form a continuous zone of development. To illustrate how different development zones are identified and for the purposes of discussion the following figure of a development corridors and development zones should be studied.



**Figure 6-5: Impact of corridors on development zones**

Source: Own interpretation of the interaction between corridors and development zones.

By studying the figure above, one can conclude that the high intensity development zones on a corridor is often where nodes are formed and where higher order roads in the region links with the corridor. As development at these points, linkages or junctions continues, the geographical area surrounding that point spreads horizontally. These areas often meet or intersect with the points of lower intensity development along the corridor. Lower intensity development is often formed at linkages of lower order roads or with the corridor. All these points of development form a universal zone of development along the corridor.

Based on this section of corridors and the theory and application of corridors in the spatial system, it is clear that corridors are powerful regional planning instruments that have a major impact on the structure and development of the region. Corridors are focussed on the promotion of integration and contribution towards establishing prominent relationships between different areas. These corridors also play a significant role to enhance and promote the establishment and accessibility of economic and social opportunities in order to create a high quality urban or regional environment. The following section on planning regions focusses on the development of areas of opportunities or zones of development.

#### **6.4.3. The application of a planning region**

Planning regions can be implemented and used as part of a Spatial Development Framework. The Northern Cape Provincial Government requires that all local municipal spatial development frameworks include certain spatial structuring elements as it is referred to in the Northern Cape Provincial Spatial Development Framework. Planning regions often require a more focussed planning document and strategy which are specifically focussed on the planning, growth, development and management of a specific region. The focussed locations and desired development directions indicates a system of actions that is specifically planned to foster an environment enabling a specific growth nature.

By studying the current application of planning region in the planning environment (and discussed in Chapter Three), it is clear that these regions as spatial planning instrument is currently more applied on a larger regional scale. The same principles used on the smaller scale application still apply on the larger scales (sub-continental scale) of this research. A criterion for evaluation of the regional perspective's study area is influenced by taking into consideration the current applications and significance of existing planning instruments. In the following section, the criteria are discussed.

#### **6.5. Regional perspective criteria for evaluation**

As found in Chapter Four, the urban hierarchy is influenced by various aspects in the spatial system. Therefore, the criteria should embrace the characteristics of an urban hierarchy and the

spatial planning instruments. Spatial planning instruments are necessary to include in the evaluation as these instruments fulfil a specific role in a region and ultimately influence the urban hierarchy. Apart from the spatial planning instruments, the economic potential, dynamics and environment should also be included as part of the criteria. This process would therefore entail two different approaches to evaluate the study area and could be concluded as follows:

1. Spatial planning instruments
2. Spatial planning statistical measurement

Although the two approaches sound similar, it does differ significantly. By including both these approaches the role of an urban hierarchy as planning instrument could become clear based on the spatially balanced factor (spatial planning instruments) as well as the economic side (spatial planning statistical measurement) of the study area. The importance of both these approaches is clear based on strategic planning policies of South Africa in the twentieth century that would be discussed in Chapter Seven. Finding balance between the spatial and the economic side of a region proves to be a challenge in many policies. By utilising an urban hierarchy as a regional planning instrument, this problem could potentially be addressed in the strategic planning field. In the following sections each of the approaches and applicable role players are discussed.

### **6.5.1. Spatial planning instruments**

This approach specifically refers to actual existing regional planning instruments and aspects used in regional planning and discussed in Chapter Three of this research. Regional planning instruments play an integral role in regional planning policy, mostly due to the ease of implementation, the natural development due to growth and the way these instruments promote interaction between areas as an entity of instruments. The entity of regional planning instruments all impact the interaction between areas and has a direct impact on the establishment of an urban hierarchy (refer to Section 5.3). If these instruments are not considered, the role of the urban hierarchy as spatial planning instrument would be unclear. The spatial planning instrument approach would include the following regional planning instruments and their collaborative impact in the region.

#### **6.5.1.1. Nodes**

Nodes are the fundamental building blocks in strategic local, provincial and national planning policies and frameworks. The location and size of nodes in a spatial environment are directly linked to the interaction and ultimately the urban hierarchy in the region. In Chapter Three, importance and establishment of nodes in a region was discussed. Inputs and outputs in a region are linked to the nodal hierarchy of the region. These dynamics are in turn the result of economic activities and growth. As asserted by Glasson (1985:140) in Chapter Three, increased economic

growth can result in the establishment of nodes. It is due to this impact of nodes that this instrument should be included.

Nodes have always been a significant regional planning instrument and an important regional structuring element. The proximity of nodes in a spatial system promotes interaction between different regions or points over a geographical area. Nodes, as a regional planning instrument and spatial structuring element, have the potential of reshaping a region's dynamics through increased activity and interdependence between different areas in a region. It is due to this impact that nodes need to be included in the evaluating criteria, as these points in the spatial system are directly linked to the urban hierarchy. By recognising nodes and possible gaps between nodes in the study area, it can either promote increased investment, activity and relationship between areas or it could help to identify the major role players in the current hierarchy.

The "gaps" between the nodes or in the spatial system as mentioned in the previous paragraph, refer to a planning region that could be identified to promote the establishment of a more balanced urban hierarchy. The Northern Cape Province (as planning region), as mentioned, displays a vastly unbalanced spatial system with only a few major nodes and various small nodes. The distances between nodes and towns in the top order urban hierarchy are in many cases vast and interaction levels between these areas are limited. These gaps between the significant nodes of the urban hierarchy, can now be identified as a planning region for the establishment of new nodes or smaller nodes (lower in the urban hierarchy) and support the current nodes and urging these nodes to advance in the existing urban hierarchy.

#### **6.5.1.2. Corridors**

With nodes being the first and one of the most important factors included in the evaluation criteria, the inclusion of corridors as an equally important role player in the evaluation criteria is imperative. As explained in Chapter Three of this research, corridors and nodes in a spatial system are directly linked to each other. Corridors are the instruments used to promote interaction between nodes in the spatial system and equally important in the establishment of an urban hierarchy. In Chapter Five of this research it was clear that an urban hierarchy is also directly linked to corridors, as these regional planning instruments promotes interaction as focus various activities on major urban nodes, ultimately strengthening and aiding the establishment of an urban hierarchy.

Corridors guide development in a direction or act as a magnet for the establishment of different activities in a linear form. Each of these was also explained in Chapter Three of this research. The main differences between different corridors are the level of planning it is implemented on (different order corridors can be planned and implemented from different spheres of government such as specific areas, regions, provinces or from a national scale). The aspect that different

corridors have in common is ultimately linking different areas or nodes of activity with each other. It is due to the linkage and attraction of activities aspect of this regional planning instrument that it needs to form part of the evaluation criteria.

The manner in which corridors are utilised in the criteria was mainly focussed on the linkage network of the Northern Cape Province. National and provincial roads linking different nodes in the province were evaluated and weighed according to the type and role that they play. For example, national roads scored a higher weight than provincial roads linking different order nodes of the urban hierarchy. The combination of nodes and corridors therefore played an integral role in establishing the urban hierarchy and guided the process of utilising the urban hierarchy as a regional planning instrument.

By combining the role of nodes and corridors and the identification of gaps in the spatial system of the province, enabled the researcher to establish an existing urban hierarchy mainly based on the location of the spatial structuring elements. This process would later be used to identify the gaps and potential areas of investment along these corridors that would be refined by other aspects to be included in the criteria. Nodes and corridors were used to revise the urban hierarchy and illustrate the role of an urban hierarchy as a regional planning instrument. This would guide the implementation and recommendation part of the research to ultimately illustrate how an urban hierarchy could guide the promotion of a more balanced urban hierarchy and spatial system.

Nodes and corridors can be seen as the first phase of the evaluation of the study area's spatial system. This would now identify which nodes in the existing hierarchy could already be included in the process of creating a more balanced spatial system by implementing the role of an urban hierarchy as a spatial planning instrument. The second phase of the selection criteria that would be used to illustrate the role of an urban hierarchy would refer more to social and economic indicators. The reason for including the second phase and ultimately social and economic indicators is to evaluate if the chosen nodes in the first phase already consist of a basis of development or potential for further development.

## **6.5.2. Spatial planning statistical measurement**

### **6.5.2.1. Economic performance**

The first criterion used in the second phase relates economic output of the applicable area or region or node that was selected through the first phase. Economic output is chosen as a significant role player due to the fact that the output which a local economy contributes to the growth of a region is directly linked to the interaction between this node and other nodes in the immediate surroundings as well as the development of new nodes. Glasson (1985:140) asserts that economic growth and development can result in the establishment of growth poles/nodes in a

region. It can therefore be concluded that economic output is linked to the interaction between the nodes that in turn is directly linked to the establishment of an urban hierarchy for the region.

In Chapter Five of this research Friedmann (1986:70) also supports this conclusion by stating that: *“This new modern spin on the interaction between settlements result in a more network based hierarchy in which dominant, large cities are found at the top of the urban hierarchy and serve as the foundation of the region’s urban hierarchy from where most intercity relationships and interaction originate from.”*

A major problem and definite inhibiting factor of the economic output is that the smallest geographical level this kind of data is available, is based on local municipal level. For the purposes of this study, the local municipalities’ economic information was sourced from mainly Stats SA records and used as an indicator of that municipality’s economic performance. Economic performance (or output) does play a significant role in this study as this is directly linked to the nodal activities. The economic performance is measured in GVA (Gross Value Added).

According to Harari (2016:7), GVA is a measure of the total value of the goods and services produced in an economy after the inputs are already been deducted. The GVA then refers to the actual profit in terms of goods and services and is used to monitor economic performance and overall economic well-being. The economic performance of the applicable municipality’s economy was compared to the economic output of the Northern Cape Province as well. This was done to illustrate the significance of economic output of this particular economy in terms of the provincial economic output. With this comparison, it became clear how significant this specific economy is to the provincial growth and output.

#### **6.5.2.2. Economic concentration**

Economic performance might measure the outputs of that applicable municipality in terms of economic functions, but it does not consider the sources and distribution in sectors from which these outputs are derived from. Economic concentration is directly linked to the importance of the economic performance of the area. Economic concentration or “location quotient” in various fields of study refers to the level of concentration of each sector. The location quotient is often used as one of the main indicators to dissect a region’s economic state. Bear and Brown (2006:1) indicate that location quotients are used to compare an area’s economic composition to that of a larger area. By using location quotients, one can indicate how concentrated each economic sector is within the general economic environment.

A location quotient of, for example, 1.0 in mining (primary sector) means that the region specialises in mining, but is supported and backed by other economic sectors (secondary and

tertiary)<sup>9</sup>. On the other hand, a location quotient of 1.8 would indicate the specific region has a higher concentration in mining in comparison with the total economy. The following table indicates how the economy would be evaluated in terms of economic concentration by applying location quotient method.

**Table 6-1: Location quotient and economic concentration**

Source: Own compilation based on Bear and Brown (2006:1)

Location Quotient	Description
<1	Lowest concentration of activities in the sector
1	Balanced economic concentration
>1	Highly concentrated economy

In this research, the economic concentration might assist in either identifying a sound economic foundation and long-term sustainability or it might in turn identify the dependence on only a few economic sectors, which might indicate unsustainable future for external investment and growth. The dependence on one economic sector – especially in the case of mining – might indicate large economic growth, but with the fluctuations in the mining environment experienced, it could be a risky area to attract new investments and economic sectors.

The location quotient or economic concentration does not indicate the economic vulnerability of that specific region. It is important to understand the difference between the location index and economic vulnerability index. By first referring to economic vulnerability many may mistake this term with the definition and role of a location index as mentioned in the paragraphs above.

Bruguglio (2003:1) defines the concept economic vulnerability as: *“The exposure of an economy to exogenous shocks, arising out of economic openness.”*

Cordina (2004:1) clarifies this broad definition by adding that, *“...economic vulnerability indicates that the more vulnerable economic would tend to have a higher per capita capital stock and output but lower per capita consumption level, as resources are allocated to counteract vulnerability.”*

These views indicate that the concept of economic vulnerability rather refers to economic performance in a combination with the economic output and internal and external influences. This concept does not specifically refer to the output of one economic sector and the dependence on only one or two economic sectors. By studying the difference between these two concepts it

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<sup>9</sup> Primary economic sectors (extraction of raw materials): Mining and Agriculture  
 Secondary economic sectors (production of finished goods): Manufacturing, Services and Construction  
 Tertiary economic sectors (offering intangible goods and services): Retail, Transport and Storage, Business and Finance, Government and Community Services

becomes clear why the location quotient needs to be combined with economic performance of the applicable area. By combining the location quotient of an economy with the economic output, one can conclude that the more concentrated the economy is in certain sectors, the more dependent the total economy is on the overall output and contribution to economic growth.

Economic output, as explained in the previous section and the location quotient (economic concentration) statistics are both only available on the local municipal level as the smallest geographic representation. After these two variables are added in the second phase of evaluation, the next step would be to relate these statistics to smaller nodes (main nodes in municipalities) in the area and evaluate the human resource potential.

### **6.5.2.3. Population**

The population of the specific towns and nodes formed the last criterion that was included during the evaluation phase and application of the role of an urban hierarchy as regional planning instrument. Through the literature review and foundation of this research it was seen that the population of towns and cities does not play a significant role in determining the urban hierarchy of a region alone. However, population does play a distinct role in the urban hierarchy and may also serve as an indication of the potential these towns or cities have in terms of human resources.

In Chapter Five it was found that in some cases, urban hierarchy is nothing more than the urban population's size and distribution (Zipf, 1941:33). By including the urban population size, a more definite urban hierarchy can be formed. Population can also be linked to the potential in human resources of a particular area. If an urban node or town offers various employment opportunities, a large increase in population numbers can be noted. A wide range of employment opportunities may be the reason of increased urbanisation and present an increase quality of live for prospective and local residents. This increased rate of population growth and urbanisation is also linked to the physical size of the urban centre as well as economic activities. The combination of these activities all result in defining the local urban hierarchy.

The combination of population and economic indicators do result in a more complex and accurate urban hierarchy. Changes in these indicators are observed in the spatial system where access between these settlements is improved and economic growth is more widely spread. It is due to this combination of phase one and two that this research would show the role of an urban hierarchy as spatial planning instrument.

## **6.6. Evaluation**

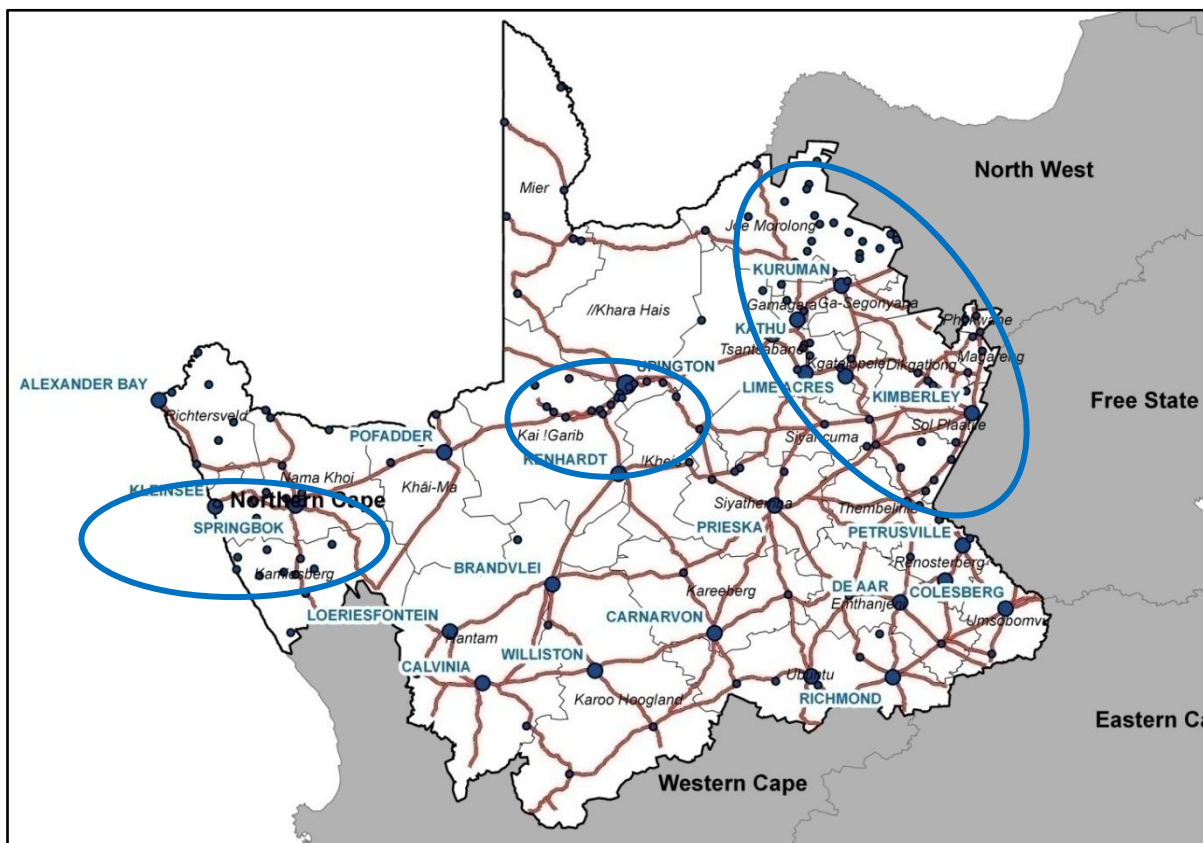
In this section, the demarcated study area (seen as a planning region) was evaluated based on the criteria discussed in the previous section. The first step in the evaluation process is to determine the status quo of the structuring elements or spatial planning instruments of the

Northern Cape. This evaluation should serve as an indication of the current spatial dynamics of the study area. The next step is to also link the latest available statistics to the study to illustrate the spatial significance of each area in the study area. Both evaluations serve as an indication of the current dynamics in the study area and would be used in the process to illustrate the role of an urban hierarchy as a spatial planning instrument.

### 6.6.1. Spatial planning instruments

#### 6.6.1.1. Nodes

The first step in the evaluation is to evaluate the current spread of nodes in the Northern Cape Province. As mentioned, this province is still classified as a “rural” province of South Africa with a limited set of nodes and a major unbalanced spatial system. This set of nodes is the potential link between South Africa with Namibia and Botswana. To evaluate and understand the dynamics in terms of nodes and to illustrate the unbalanced spatial system, the main nodes in each municipality in the study area is labelled.



**Figure 6-6: Urban nodes in the Northern Cape**

Source: Own compilation

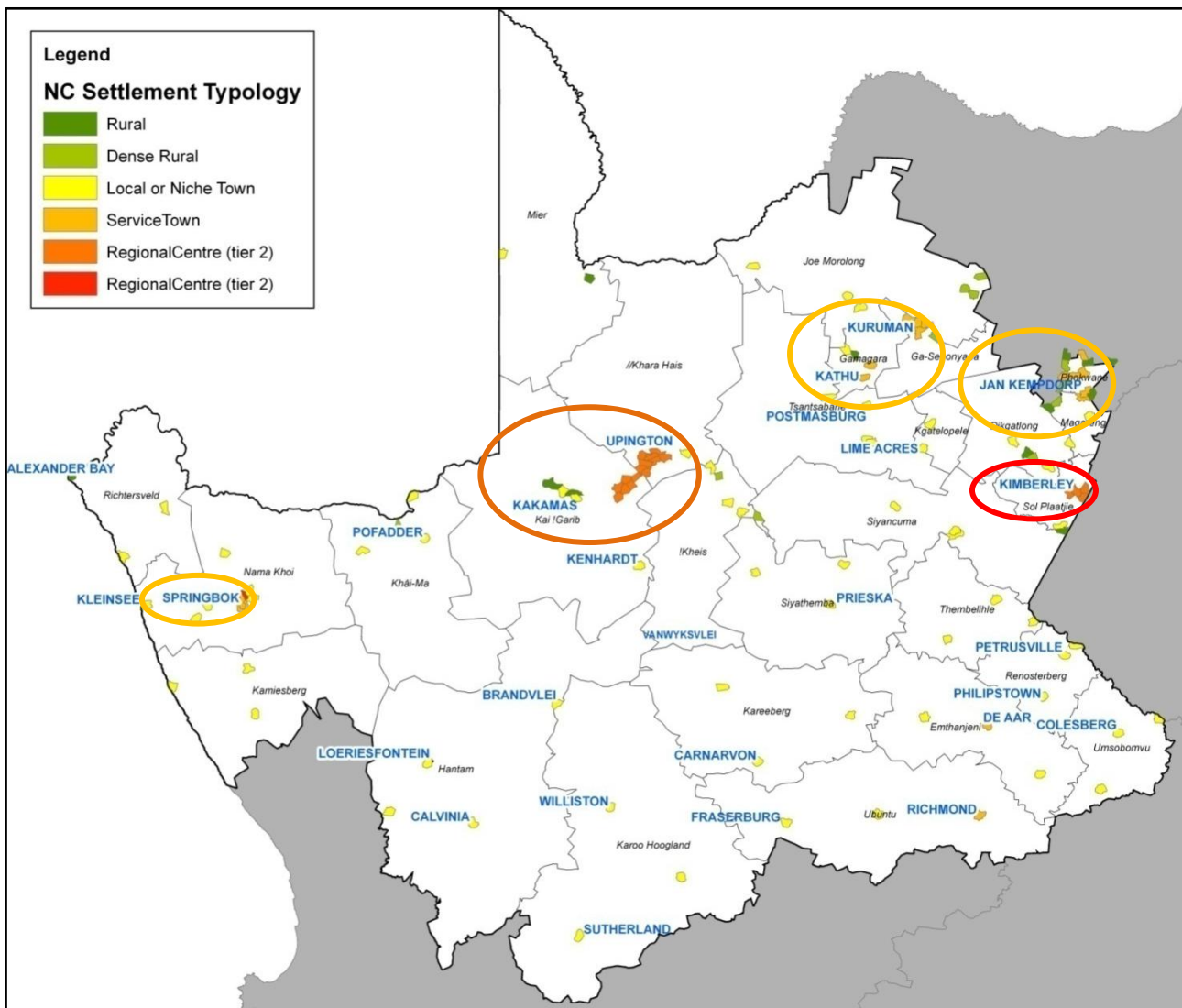
The figure above illustrates the spread and location of the current nodes. One of the first conclusions that could be made from the spread of nodes is that currently three main clusters of nodes could be differentiated in the study area. These clusters of nodes are not classified yet, but

merely grouped by location. Evident from the map is that the main concentration of nodes is found clustered in the north-western part of the province, close to the boundaries of the North West and Free State Provinces. The nodes in this first cluster have a strong relationship with the last-mentioned provinces and form a micro urban system. It is also noted that, if compared to the rest of the province, these nodes are located closer to each other.

The second cluster of nodes is found in the central northern parts of the province around Upington. The extent of this cluster of nodes differs from the main cluster mentioned in the previous paragraph. The general location of these nodes is mostly linked to the primary economic sectors (mainly agricultural uses) along the Orange River. The natural form of the Orange River and spread of the set of nodes relates to linear development, which could be linked to corridor development on a lower scale – referred to in this research as corridor.

The third cluster of nodes is located on the west coast and boundary of the province. The extent of this cluster of nodes could be compared to the second cluster in the previous paragraph. The function, role and dynamics of this cluster of nodes are also directly linked to activities in mainly the primary sectors, i.e. agricultural and mining sectors. The location of these nodes is also linked to linear development, but not through the impact of the natural topography as discussed previously. The spread and development of these nodes are more linked to the existing road infrastructure in the area, more comparable to the first cluster of nodes.

Apart from the discussed three clusters of nodes, it seems that the study area exhibits a fairly equal geographical distribution of nodes. If the figure is studied, it can be concluded that, based on a geographical location, the distribution of the main urban centres and smaller towns in the municipalities is rather regular. The geographical location of the nodes does not relate to the spatially unbalanced nature of the study area, but merely service as XY coordinate and convenient sustainable distances between the nodes in terms of early transportation procedures. If the functions and dynamics of these nodes are linked to the population size, relationship and dynamics between the nodes, the unbalanced nature of the nodes in the regional perspective study area becomes clear. If all these factors are considered, the following urban hierarchy exists according to the CSIR (2013).



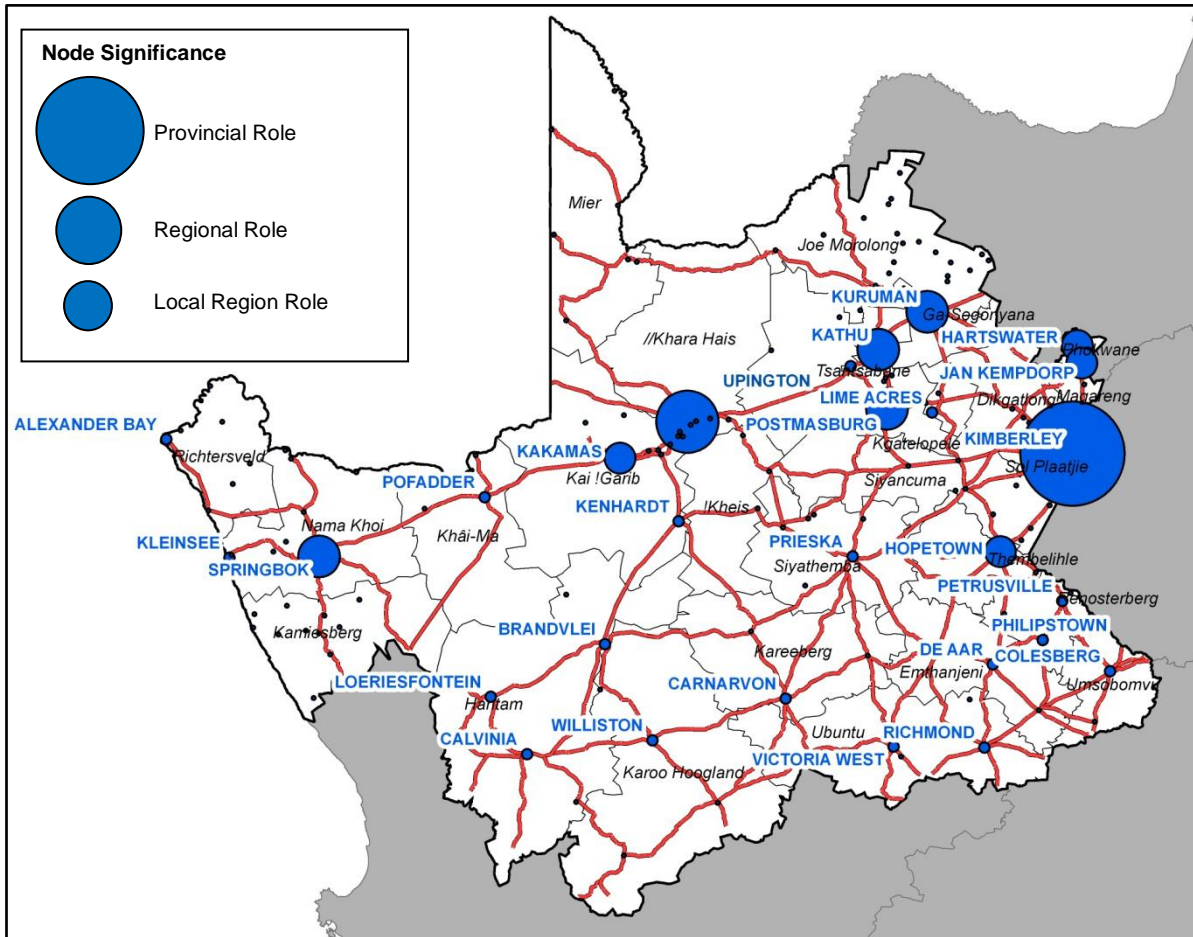
**Figure 6-7: Northern Cape settlement typology and hierarchy**

Source: CSIR (2013)

The hierarchy according to the CSIR (2013) in the figure above illustrates the spatial unbalanced system of nodes. If this figure is compared to the distribution of settlements as illustrated in before, it is clear that most of the settlements merely serve as local towns and seats of the rural municipalities. The difference of the distribution and the settlement typology is especially visible in the southern parts of the study area. Many of the local towns or niche towns (yellow areas) mostly serve as small central places and capitals in the rural municipalities.

In terms of the cluster of nodes, a clear difference is also noted in the figure. The clusters first illustrated, appeared to have a more balanced spatial system in the first figure. In the figure above, the conurbation of nodes serves as single entities around one central place in the cluster in many cases. Springbok, to the west of the province, fulfils a regional service centre function in the western parts of the province. This function of Springbok is noted in the size of the node compared to the other nodes in the east of the province. Apart from this example, it is still clear that

Kimberley and Upington forms the main nodes and top of the hierarchy in the spatial system in the study area. These top tier nodes serve smaller nodes in the direct proximity. To visually illustrate the impact of settlement classification in the hierarchy with the distribution of nodes, the discussed figures need to be combined in one illustration. The following figure combines the distribution of nodes and urban hierarchy of the study area.



**Figure 6-8: Northern Cape distribution of nodes and current urban hierarchy**

Source: Own compilation

If the hierarchy, functions, role, typology and distribution of the nodes in the study area are combined the spatial pattern in the figure above concludes the current status quo. From the figure above, limited balance in the urban hierarchy is noted. Largest nodes are concentrated in the north-eastern parts of the study area, while the rest of the province consist of limited significant higher order nodes apart from Upington, Kakamas and Springbok. In theory, it is expected that spatially a more gradual representation of higher, middle and lower order nodes should be seen spread evenly through the province.

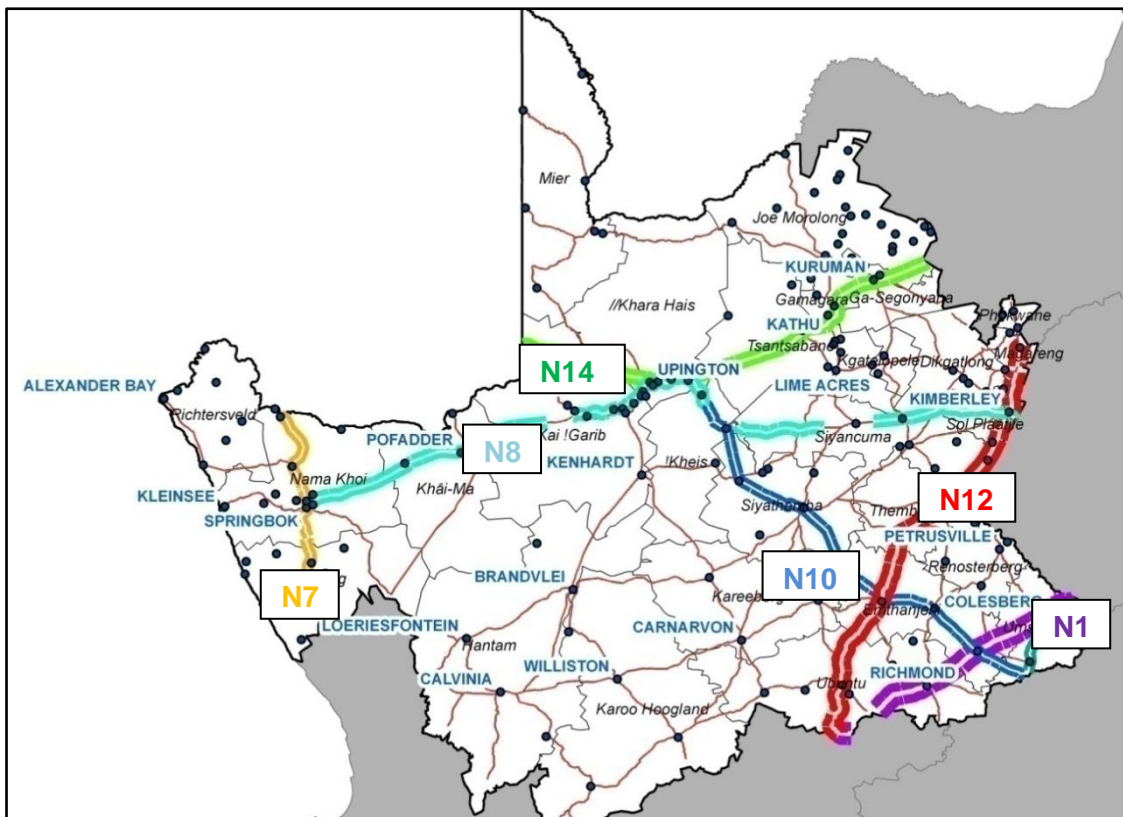
The impact of main transportation networks and corridors is not considered in the evaluation of the urban hierarchy and spatial pattern of the study area. As discussed in the literature foundation of this research, the impact of corridors plays a major role in hierarchy. Major corridors and corridors

of lower intensity are distinguished. In the following section, the transportation networks in the study area are evaluated.

### 6.6.1.2. Corridors

The evaluation of the current spatial distribution and nodes in the study area illustrated the unbalanced nature currently experienced in the Northern Cape Province. Although the physical spatial distribution of the nodes is linked to other factors (transport implications) the hierarchy and development scale of the nodes could be linked directly or indirectly to the current transport network. As seen in the discussion of the nodes (based on the distribution of nodes and types of nodes in the study area), a hierarchy of corridors could also be distinguished in study area.

The current network of transport roads to be evaluated focusses on the current road network itself. In South Africa, the primary and secondary roads are classified as mainly national roads (for example the N1, N12 etc.) as well as provincial roads (R512, R311 etc.). These roads are the roads linking the nodes in the previous section with each other. It is also these roads that are used for the transportation of goods between the different nodes. It can be concluded that this network of roads is responsible for the relationship between the nodes and ultimately the urban hierarchy. The following figure illustrates the current road network and primary and secondary corridors in the study area.



**Figure 6-9: Northern Cape road network and main corridors**

Source: Own compilation

From the figure above, the primary corridors are concentrated in the eastern parts of the study area. Clear east to west corridors are also visible, linking the opposite sides of the study area. Evident from the distribution, is the internal and external links and the direction of connection (east to west vs. north to south) of the corridors. The eastern corridors are focussed in connecting the northern parts of South Africa with the South. The central corridors are responsible for the connection between the west, central and eastern parts of the study area. The western corridors are mainly focussed on connecting Namibia in the north with Cape Town in the south.

Each of the displayed corridors fulfils a certain role and function nationally and provincially. The primary corridor (N1) responsibility is mainly to link Gauteng with the Western Cape in South Africa. This national road links Cape Town with Johannesburg via Bloemfontein and is a major distribution road nationally. The N1 does not have a significant impact on the nodes and connection and is in the south-eastern corner of the study area, linking Colesberg and Richmond, which is lower order nodes as seen in the previous section.

The N12, located in the eastern parts of the study area, also known as the Treasure Route, is responsible for a north and south linkage. In the study area the impact of the N12 is more significant on the nodes in the study area, compared to the N1. The N12 corridor connects intermediate cities in South Africa with the main metropolitan areas nationally. Emalahleni (former Witbank), Klerksdorp, Potchefstroom, Kimberley and George are included in the connection.

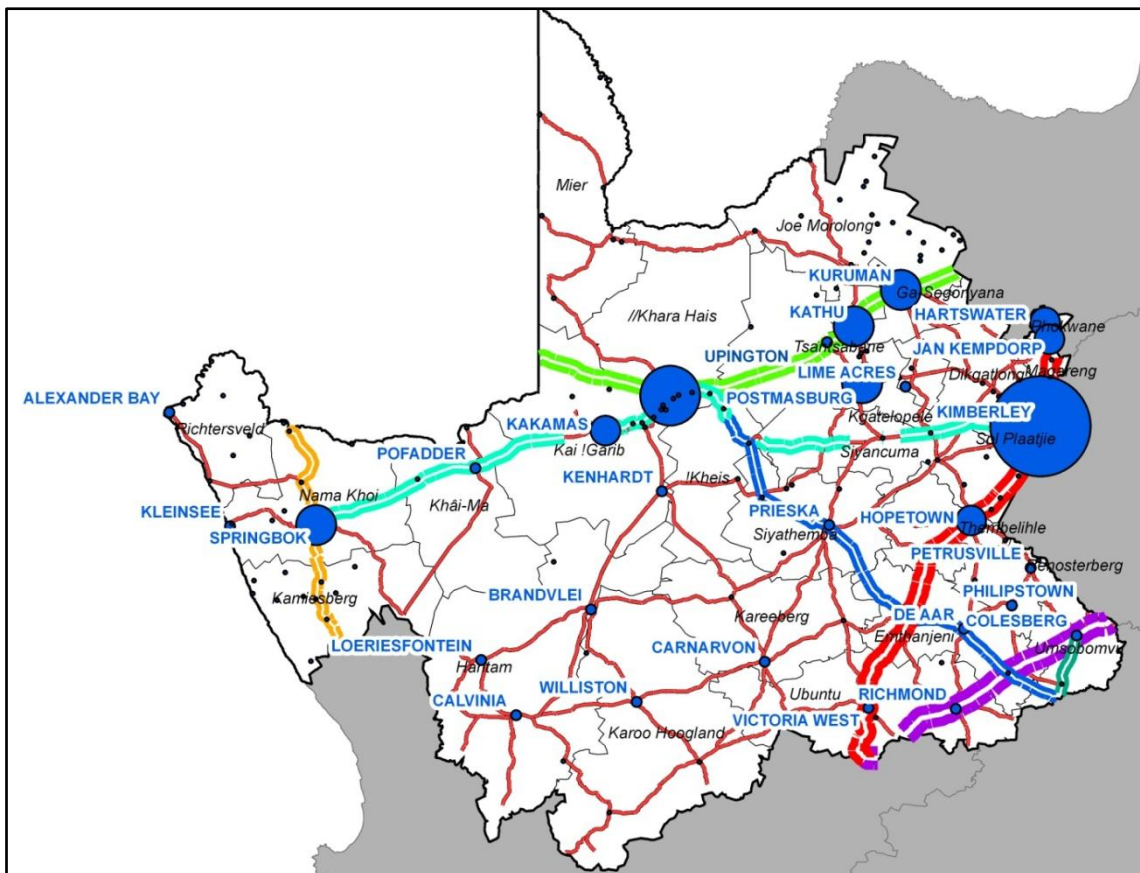
The N10 corridor connects the Northern Cape (also Namibia) with the Eastern Cape Province in South Africa. The N10 links the central parts of the study area with the Eastern Cape and Western Cape. Upington (a major node in the study area) is connected to Port Elizabeth via the N10. The N10 corridor is also seen as a major national significance and has a major impact on the urban hierarchy in the study area. The N10 corridor links up with the N8 corridor, which also plays a significant role in the study area. The N8 corridor is the link between Upington and Kimberley (the two tops of the hierarchy nodes in the study area) and connects the study area with the Free State and Lesotho. The link with the Free State Province is through Bloemfontein, which is also a national metropolitan area and important distribution link of products. The N8 also serves as an east west connector in the study area.

Another significant east west corridor in the study area is the N14 corridor. The N14 corridor is the direct link between the study area and the economic capital of South Africa, Gauteng. The N14 corridor is also an international significant corridor, with the link with Namibia. The N14 corridor also has a major impact on the urban hierarchy of the study area with the link between Upington, Kathu and Kuruman. Apart from Upington in the top tier hierarchy, the two last-mentioned nodes also serve as important nodes in the study area. This corridor is also related to mining activities in

the study area and is responsible for the relationship between the Kathu and Kuruman mining town conurbation.

The last of the corridors in the study area is the N7 corridor. The N7 corridor, located in the western parts of the study area, links the Western Cape with Namibia via Springbok. Traditionally, the western parts of the study area and the West Coast of South Africa is not commonly known for large scale urban nodes and developments and mainly serve as a national north to south connector in the west. Recently, the N7 corridor was nominated as a corridor that could be used to unlock economic potential in the western parts of the study area and South Africa. The potential in this area (west coast) can be seen in various initiatives such as the Phakisa implementation programme, focussed on the mining sector and ocean economy along the N7 (Zuma, 2015).

Through the discussion of the corridors in the study area (discussion based on distribution, location and relationship between different areas), these corridors are directly linked to the urban hierarchy of the study area, where goods and products are distributed from various parts of South Africa both into and out of the study area. The transportation and connection of goods between the nodes in the study area, has a direct impact on the current urban hierarchy in the study area. To illustrate the relationship between corridors and the urban hierarchy the spatial distribution of the nodes in the study area are combined with the corridors discussed in this section.



**Figure 6-10: Relationship between corridors and the urban hierarchy**

Source: Own compilation

From the figure above, it is clear that the relationship between corridors and the urban hierarchy is linked to the type, role and size of the node in the region. This relationship also reveals that higher order nodes are also connected via corridors. These corridors (and distances of the corridors between the higher order nodes) often require different strategic planning approach on a higher sphere of governance (provincial and national). The urban hierarchy planning and higher order corridors need to be addressed from a larger regional perspective. The significance of these high order nodes and corridors creates a framework for strategic planning from a national scale. As seen from the figure above, the concentration of higher hierarchy urban nodes is linked to where most of the corridors in the study area are found (in the eastern parts of the study area). This figure also shows that where various corridors intersect, a higher order and more significant urban node develop. Apart from this, the figure also confirms the unbalanced spatial pattern and urban hierarchy in the study area.

The combination of the nodes and the corridors in the study area is subsequently linked to the local municipalities within the study area. As discussed previously, the set of urban nodes that was evaluated is the urban seats of the various displayed municipalities. Considering the role of the seat of the municipality, most of the activities in the different municipalities are concentrated in these areas. With this conclusion, different statistics only available on municipal level could be linked to the set of nodes. The statistics that were linked to these nodes and municipalities served as the spatial planning statistical measurement and significance based on social and economic indicators.

## **6.6.2. Spatial planning statistical measurement**

### **6.6.2.1. Economic performance**

To start the evaluation process in terms of economic performance or output in GVA it is important to note that the GVA of each municipality is measured at 2015, as this is latest published economic data by Stats SA. Apart from the total GVA of the economy per municipality it is necessary to evaluate the GVA trends over the last 5 years of the published data. Due to the number of municipalities included in the evaluation, the first step would be to identify the main and most significant municipalities in terms of GVA output. This overall evaluation would then be used to measure the trends GVA trends between 2010 and 2015. The following table shows the GVA economic output per municipality in the study area.

**Table 6-2: Economic output (GVA) per local municipality**

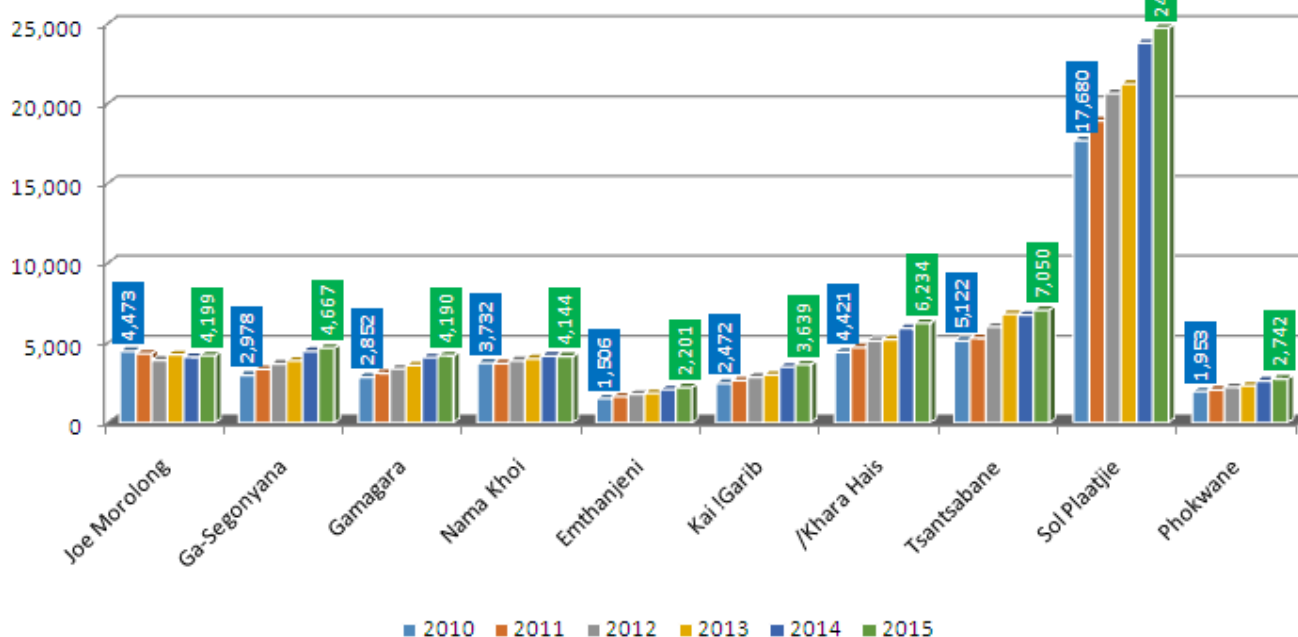
Source: Stats SA

Local Municipality	GVA (R in Millions)	Local Municipality	GVA (R in Millions)	Local Municipality	GVA (R in Millions)
Joe Morolong	4,199	Ubuntu	797	Kai !Garib	3,639
Ga-Segonyana	4,667	Umsobomvu	1,171	/Khara Hais	6,234
Gamagara	4,190	Emthanjeni	2,201	!Kheis	753
Richtersveld	1,352	Kareeberg	454	Tsantsabane	7,050
Nama Khoi	4,144	Renosterberg	429	Kgatelopele	1,680
Kamiesberg	404	Thembelihle	703	Sol Plaatjie	19,238
Hantam	1,219	Siyathemba	917	Dikgatlong	1,910
Karoo Hoogland	602	Siyancuma	1,628	Magareng	818
Khâi-Ma	1,075	Mier	180	Phokwane	2,742

The Sol Plaatjie Local Municipality (Kimberley) is the municipality contributing the most to the provincial economy in terms of output (GVA). The municipalities following on Sol Plaatjie LM is Tsantsabane LM, //Khara Heis LM, Ga-Segonyana LM, Joe Morolong LM and Gamagara LM. These municipalities all are strongly based on mining and agricultural sectors (primary economic sectors). This trend is expected to be seen in the economic concentration section.

To limit the evaluation in terms of trends in the GVA between 2010 and 2015 all the municipalities with a GVA output less than R2 billion will be excluded from the GVA trend evaluation. From the initial evaluation in the table above, one can start to already form an idea of an urban hierarchy linked to the seats of the municipalities. The GVA trend evaluation aims to illustrate which of the municipalities showed potential in terms of economic growth in terms of GVA over the latest published 5 years. The following figure shows the GVA output per municipality for the past 5 years.

**GVA Output (R in Millions) 2010 - 2015**



**Figure 6-11: GVA output historic growth per municipality**

Source: Stats SA

From the figure above, the majority of the local municipalities included in the GVA historic trend analysis shows a growth in terms of GVA output for the period between 2010 and 2015. The Joe Morolong LM is the only municipality with fluctuating growth rates during this period. The overall GVA trend for the last five years clearly shows the significance of these municipalities and the associated urban areas in terms of the Northern Cape economy. To further clarify this statement the annual growth rates for each of the municipalities is shown in the following table for the period between 2010 and 2015.

**Table 6-3: Economic output (GVA) annual growth rates per municipality**

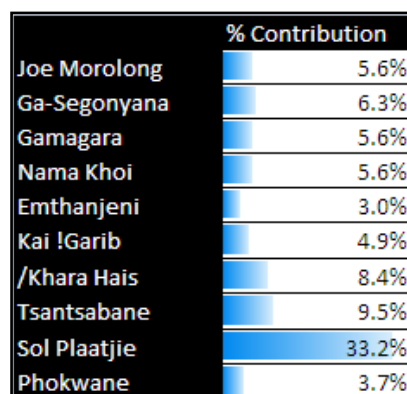
Source: Stats SA

	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015
Joe Morolong	↓ -3%	↓ -9%	↑ 9%	↓ -4%	→ 2%
Ga-Segonyana	↑ 12%	↑ 10%	→ 5%	↑ 15%	→ 4%
Gamagara	↑ 9%	↑ 9%	→ 6%	↑ 14%	→ 3%
Nama Khoi	↓ -1%	→ 5%	→ 3%	→ 5%	↓ -1%
Emthanjeni	↑ 8%	↑ 8%	→ 4%	↑ 13%	→ 6%
Kai !Garib	→ 6%	→ 8%	→ 5%	↑ 17%	→ 4%
/Khara Hais	→ 6%	↑ 9%	→ 2%	↑ 13%	→ 6%
Tsantsabane	→ 3%	↑ 13%	↑ 13%	↓ -1%	→ 5%
Sol Plaatjie	→ 7%	↑ 9%	→ 3%	↑ 12%	→ 4%
Phokwane	→ 6%	→ 7%	→ 4%	↑ 13%	→ 5%

The annual growth rates for the municipalities between 2010 and 2015 shows that the GVA output in most cases showed an increase. As discussed previously, the Joe Morolong LM is the municipality showing the most drastic and irregular growth rates. The other municipalities show either a significant growth or increase in the previous year or limited stagnating growth. Evident from the table is that the latest growth rate between 2014 and 2015 shows that the overall growth rates level down. This is mostly due to the economic impact in the mining sector experienced in this period. Lastly the contribution of each of the municipalities in terms of the Northern Cape provincial GVA output is shown.

**Table 6-4: GVA contribution to the Northern Cape per municipality**

Source: Stats SA



The Sol Plaatjie LM (Kimberley) contributes the most towards the Northern Cape total GVA output. This is expected as the Sol Plaatjie LM is the host of the capital of the province – Kimberley. Sol Plaatjie LM is also the municipality with the most stable and diversified economy. Apart from this, it is also significant that the ten evaluated municipalities contribute approximately 85.7% of the total Northern Cape GVA output. This confirms the significance and inclusion of the evaluation on these ten municipalities. It can be concluded that the survival and balanced growth in these municipalities is essential for the provincial and national economy. The following section evaluates the economic concentration of the municipalities in the province.

#### **6.6.2.2. Economic concentration**

The economic concentration evaluation of the municipalities is based on the 2006 local municipality demarcated boundaries. The evaluation of the economic concentration of each of the municipalities plays a significant role in the evaluation process. The economic concentration is measured by the location quotient as discussed earlier in this chapter in Section 6.3. After the economic output has been measured in the previous section, it is important to consider which sectors are mostly responsible for the economic performance and output. This can serve as an indication which of the municipalities are more diverse in terms of economic sectors and could also indicate where certain measures should be introduced to enhance sustainability.

In addition to this the economic concentration can also serve as an indication of the level of economic development and/or the potential to introduce external factors to further develop a local economy. For instance, if a municipality's economy is more concentrated in the primary sector, external investment focussed on the processing of products or raw materials in the secondary sector could be implemented. The economic concentration evaluation therefore serves as an indicator of potential investment in a local economy (recommendation phase of this research). The first step in the evaluation is to illustrate the economic concentration of each of the municipalities included in the study area based on the latest available data in 2013. The following table shows the concentration of the economy in the primary, secondary and tertiary economic sectors per municipality.

**Table 6-5: Economic concentration per municipality**

Source: Stats SA

	Primary	Secondary	Tertiary	Average		Primary	Secondary	Tertiary	Average
Moshaweng	0.48	2.84	1.54	1.62	Thembelihle	1.00	0.98	1.00	0.99
Ga-Segonyana	0.49	1.27	1.70	1.15	Siyathemba	1.18	1.09	0.95	1.07
Gamagara	1.38	0.59	0.50	0.82	Siyancuma	1.50	0.77	0.92	1.06
Kgalagadi	1.35	0.51	0.55	0.80	Pixley Ka Seme	5.26	0.08	0.18	1.84
Richtersveld	1.51	0.63	0.70	0.95	Mier	0.55	1.03	1.24	0.94
Nama Khoi	0.94	0.88	1.05	0.96	Kai !Garib	1.64	1.03	0.65	1.11
Kamiesberg	1.19	0.86	0.89	0.98	//Khara Hais	0.33	1.19	1.33	0.95
Hantam	0.31	1.91	1.36	1.20	!Kheis	0.97	0.86	1.04	0.96
Karoo Hoogland	0.35	1.29	1.40	1.01	Tsantsabane	1.35	0.48	0.91	0.91
Khâi-Ma	1.35	0.96	0.77	1.03	Kgatelopele	1.78	1.08	0.57	1.14
Namakwa	2.41	0.00	0.17	0.86	Siyanda	2.38	0.96	0.26	1.20
Ubuntu	0.95	1.67	0.93	1.18	Sol Plaatjie	0.54	0.81	1.09	0.81
Umsobumvu	0.68	1.32	1.03	1.01	Dikgatlong	4.07	1.47	0.48	2.01
Emthanjeni	0.59	0.79	1.12	0.83	Magareng	0.98	1.02	1.00	1.00
Kareeberg	0.24	0.45	1.23	0.64	Phokwane	1.65	2.40	0.77	1.61
Renosterberg	1.07	2.06	0.85	1.33	Frances Baard	4.72	0.76	0.45	1.97

As indicated in the table above, most of the economies of the municipalities are mostly concentrated in the primary economic sectors. The primary economic sectors include the agriculture and mining sector. In addition to this, it is also noted that the economic concentration of the municipalities in the tertiary sector is also common. The concentration of the economy in the tertiary sector is mostly linked to the government sector and the community services in especially the rural natured municipalities. The impact of other tertiary sector including business and finance, retail and wholesale and transport and storage is limited. The least concentrated economic sector is the secondary sector.

From these observations and conclusions, the municipal economies in general are mostly based on primary economic sectors. This can also be linked to the opportunity to invest or create new developments in the secondary sectors, which would have a positive spin-off in the tertiary sector. The conclusions made through this data are mainly to provide an overview of the entire Northern Cape Province and level of economic concentration. The economic concentration should be linked to the economic output of the municipalities. To present this data, the municipalities selected in the previous section were used.

To evaluate the level of economic concentration through the location quotient of the selected municipalities, it is necessary to evaluate how the level of concentration changed or developed over the last 5 years of available data. The trends of the latest 5 years can serve as an indication how municipalities diversified in the economy and therefore developed in a more sustainable economy. The location quotient should be more balanced towards 1 in a theoretically balanced

economy. The following table illustrates the trends in economic concentration of each of the selected municipalities.

**Table 6-6: Historic economic concentration trends per municipality**

Source: Stats SA

	2008			2009			2010			2011			2012			2013		
	Prim.	Sec.	Ter.	Prim.	Sec.	Ter.	Prim.	Sec.	Ter.	Prim.	Sec.	Ter.	Prim.	Sec.	Ter.	Prim.	Sec.	Ter.
Moshaweng	0.6	2.4	1.5	0.5	2.6	1.5	0.5	2.6	1.5	0.5	2.6	1.5	0.5	2.6	1.4	0.5	2.8	1.5
Ga-Segonyana	0.5	1.3	1.8	0.5	1.3	1.7	0.5	1.3	1.7	0.5	1.3	1.7	0.5	1.3	1.7	0.5	1.3	1.7
Gamagara	1.3	0.6	0.5	1.4	0.6	0.5	1.4	0.6	0.5	1.4	0.6	0.5	1.4	0.6	0.5	1.4	0.6	0.5
Nama Khoi	1.0	0.9	1.0	0.9	0.9	1.1	0.9	0.9	1.1	0.9	0.9	1.1	0.9	0.9	1.1	0.9	0.9	1.1
Emthanjeni	0.5	0.8	1.1	0.6	0.8	1.1	0.6	0.8	1.1	0.6	0.8	1.1	0.6	0.8	1.1	0.6	0.8	1.1
Siyancuma	1.5	0.8	0.9	1.5	0.7	0.9	1.5	0.8	0.9	1.5	0.8	0.9	1.5	0.8	0.9	1.5	0.8	0.9
Kai !Garib	1.6	0.9	0.7	1.6	0.9	0.7	1.6	1.0	0.7	1.6	1.0	0.7	1.6	1.0	0.7	1.6	1.0	0.7
//Khara Hais	0.3	1.2	1.4	0.3	1.2	1.3	0.3	1.2	1.3	0.3	1.2	1.3	0.3	1.2	1.3	0.3	1.2	1.3
Tsantsabane	1.3	0.5	0.9	1.2	0.5	1.0	1.3	0.5	0.9	1.3	0.5	0.9	1.3	0.5	1.0	1.4	0.5	0.9
Sol Plaatjie	0.6	0.8	1.1	0.6	0.8	1.1	0.6	0.8	1.1	0.5	0.8	1.1	0.6	0.8	1.1	0.5	0.8	1.1
Dikgatlong	3.7	1.3	0.5	3.9	1.3	0.5	3.9	1.4	0.5	4.0	1.4	0.5	4.0	1.5	0.5	4.1	1.5	0.5
Phokwane	1.4	2.2	0.8	1.5	2.3	0.8	1.5	2.3	0.8	1.6	2.4	0.8	1.6	2.4	0.8	1.6	2.4	0.8

The table above illustrates the same overall conclusion made in the overall situation of the Northern Cape regarding the economic concentration in mostly the primary and tertiary economic sectors. Noteworthy from this table is that the level of economic concentration in the primary sector is much higher. This is directly linked to the economic outputs in the primary sector. The level of concentration in the tertiary sector is linked to the government sector and impact of community services as concluded in the Northern Cape evaluation.

In terms of economic trends, only limited changes in the location quotient are observed in the selected municipalities. This suggests that as the economic performance (GVA output) of the municipalities increase, the level of economic concentration remains constant. Therefore, it can be concluded that the selected municipalities utilise the economic sectors more efficient to see a growth in economic performance. This however suggests that the municipalities depend mainly on the primary economic sectors, which have a negative impact in terms of sustainable and balanced economic growth. This data clearly illustrates the economically unbalanced state of the province.

The table also illustrates a more sustainable solution in terms of economic concentration in the Sol Plaatjie LM. If the Sol Plaatjie LM is studied, the levels of economic concentration in all three sectors are closer to 1. This suggests that the economy is more diversified and sustainable in the long-term. The location quotient could be used in a later stage of this research in recommendations and strategic planning. By combining the impact of economic balance with the urban hierarchy, a spatial approach can be formulated as the basis for illustrating the role of an urban hierarchy as spatial planning instrument.

### 6.6.2.3. Population

Population as a criterion remains an important indicator in terms of potential in human resources. Population is a constant factor that forms a central important indicator in the evaluation. As seen in Chapter Five, population is also used as an indicator that directly determines the urban hierarchy. The significance of population in the regard of this research is to indicate the potential municipalities with a large critical mass and high order nodes. The population statistics per municipality is available up to 2013. It should however be noted that the population statistics are only available in the 2006 municipal demarcation, different from the demarcation on which the Economic Performance was measured. All the municipalities are shown in the following table to determine the highest-ranking municipalities in terms of human resource.

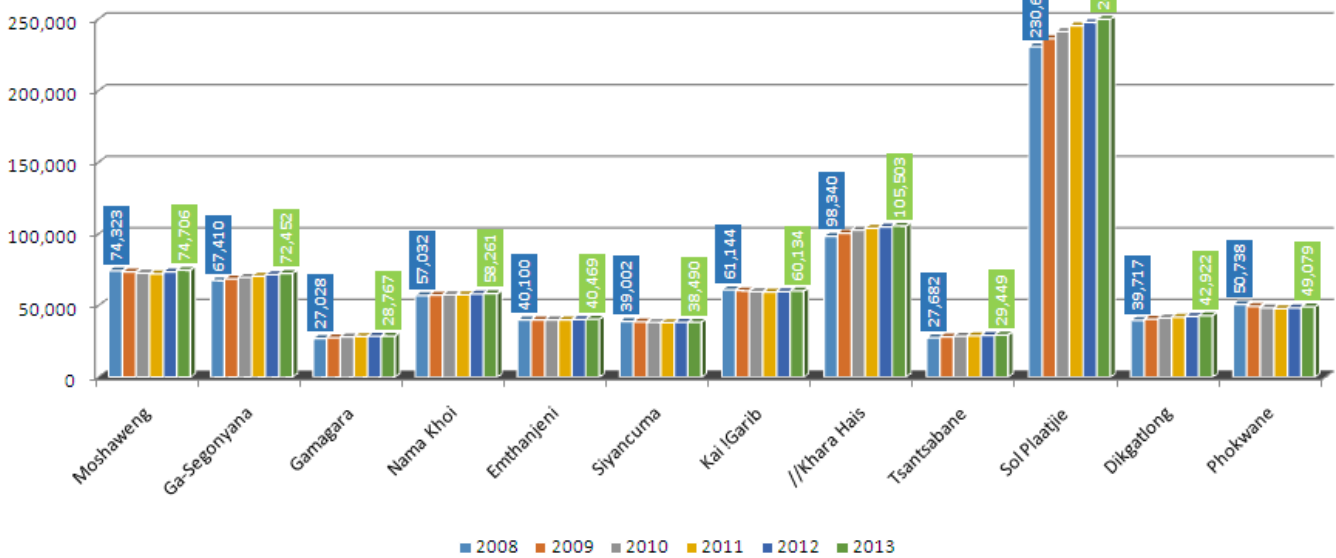
**Table 6-7: Highest ranking municipalities in human resources (Population)**

Source: Stats SA

Municipality	Population	Municipality	Population	Municipality	Population
Moshaweng	74,706	Ubuntu	17,502	//Khara Hais	105,503
Ga-Segonyana	72,452	Umsobumvu	23,310	!Kheis	20,603
Gamagara	28,767	Emthanjeni	40,469	Tsantsabane	29,449
Kgalagadi	5,858	Kareeberg	10,970	Kgatelopele	22,026
Richtersveld	15,474	Renosterberg	10,022	Siyanda	5,595
Nama Khoi	58,261	Thembelihle	14,298	Sol Plaatjie	249,788
Kamiesberg	13,354	Siyathemba	21,614	Dikgatlong	42,922
Hantam	22,866	Siyancuma	38,490	Magareng	21,663
Karoo Hoogland	11,419	Pixley Ka Seme	2,500	Phokwane	49,079
Khâi-Ma	13,480	Mier	8,085	Frances Baard	3,118
Namakwa	1,110	Kai !Garib	60,134		

The table above indicates that Sol Plaatjie Local Municipality is home to the largest population. The municipalities following Sol Plaatjie LM are //Khara Hais LM, Moshaweng LM and the Ga-Segonyana LM. A similar pattern compared to the economic performance is noted. To further evaluate the municipalities in terms of historic trends and population growth, all municipalities with a population less than 25,000 were excluded for further evaluation. Each of the remaining municipalities was then evaluated in terms of growth during the 2008 – 2013 periods (5 years).

## 2008 - 2013 Population per Municipality



**Figure 6-12: Population growth per municipality**

Source: Stats SA

From the selected municipalities, the same trends in terms of population are seen if compared to the economic performance selection. The only differences in the selected municipalities are the inclusion of Moshaweng LM, Siyancuma LM and Dikgatlong LM. The Moshaweng LM is the same municipality as demarcated in the 2011 municipalities as Joe Morolong LM. The municipality changed its name between the 2006 and 2011 municipal demarcations (Joe Morolong Local Municipality, 2016). The exclusion of the Dikgatlong LM and Siyancuma LM in the economic performance is mostly due to the small contribution towards economic output.

Although the latest population numbers in the selected municipalities can serve as an immediate indication of human resources in each municipality, the growth trends as illustrated in the last figure is equally important. By studying the growth patterns of the municipalities, one can start to form an idea which of the selected municipalities illustrates the largest growth rates in terms of population. The population growth in each municipality shows the movement of people towards a node in the municipality. This movement of population is likely initiated by either positive pull factors or negative push factors to a certain node or area. The positive pull factors may include the believe of better living conditions, employment opportunities or general improvement of services and facilities. The following table illustrates the annual growth rates of the selected municipalities with 2007 as base year.

**Table 6-8: Population annual growth rates per municipality**

Source: Stats SA

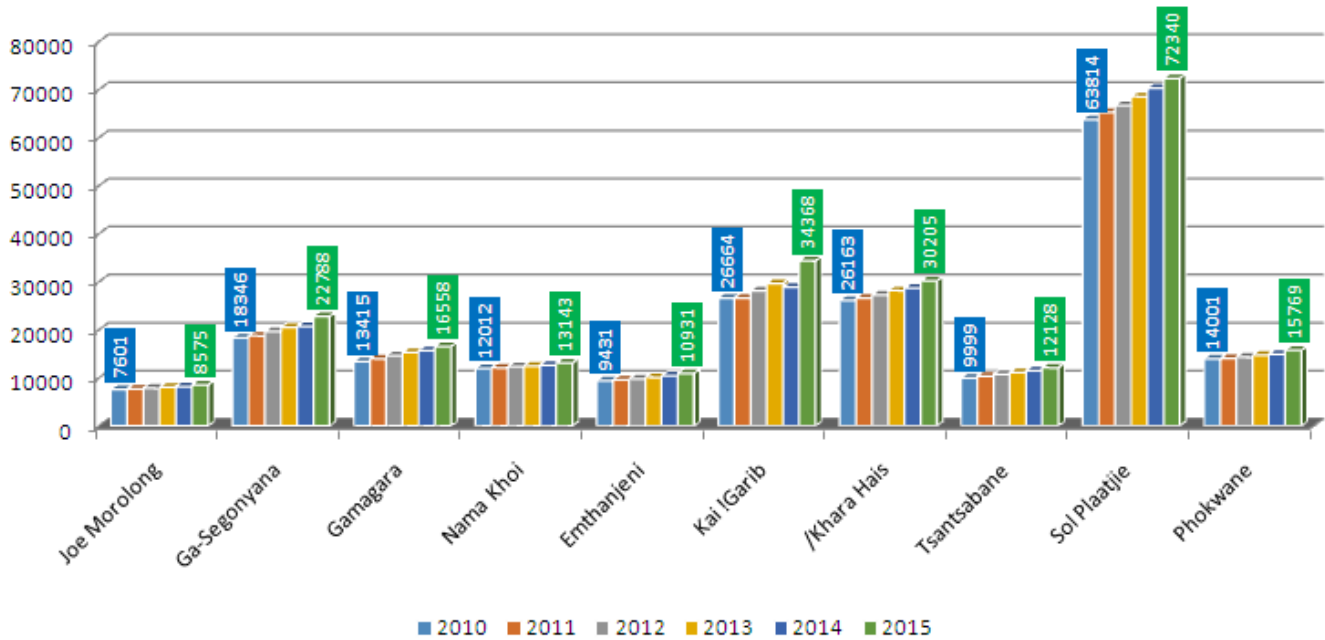
	2008	2009	2010	2011	2012	2013	Average
<b>Moshaweng</b>	↓ -1%	↓ -1%	↓ -1%	→ -1%	↑ 2%	↑ 2%	→ 0%
<b>Ga-Segonyana</b>	↑ 2%	↑ 2%	↑ 2%	↑ 1%	↑ 1%	↑ 1%	↑ 2%
<b>Gamagara</b>	↑ 2%	↑ 2%	↑ 2%	↑ 1%	→ 0%	→ 0%	↑ 1%
<b>Nama Khoi</b>	→ 0%	→ 0%	→ 0%	→ 0%	→ 1%	→ 0%	→ 0%
<b>Emthanjeni</b>	→ 0%	→ 0%	→ 0%	→ 0%	→ 1%	→ 1%	→ 0%
<b>Siyancuma</b>	↓ -1%	↓ -1%	↓ -1%	→ -1%	→ 1%	→ 1%	→ 0%
<b>Kai !Garib</b>	↓ -1%	↓ -1%	↓ -1%	→ -1%	→ 1%	→ 1%	→ 0%
<b>//Khara Hais</b>	↑ 2%	↑ 2%	↑ 2%	↑ 2%	→ 1%	→ 1%	↑ 2%
<b>Tsantsabane</b>	↑ 2%	↑ 2%	↑ 2%	↑ 1%	→ 1%	→ 1%	↑ 1%
<b>Sol Plaatjie</b>	↑ 3%	↑ 2%	↑ 2%	↑ 2%	↑ 1%	→ 1%	↑ 2%
<b>Dikgatlong</b>	↑ 2%	↑ 2%	↑ 2%	↑ 2%	↑ 1%	↑ 1%	↑ 2%
<b>Phokwane</b>	↓ -3%	↓ -2%	↓ -2%	↓ -1%	↑ 1%	↑ 1%	↓ -1%

In the growth summary above, one of the first conclusions made is the negative growth rates from 2008 to 2011 in the Moshaweng LM, Siyancuma LM, Kai !Garib LM and Phokwane LM. The negative growth rates experienced in these municipalities is mostly linked to urbanisation or people moving out of these rural nature municipalities to the surrounding municipalities. This movement is likely due to employment opportunities offered in the municipalities with a strong presence of mining activities. In addition to this, municipalities with a more urban nature often enjoy the benefit of the provision of subsidised housing and better service delivery. This data set serves as a clear sign of urbanisation in the Northern Cape Province. To justify this statement the growth trends of the Sol Plaatjie LM can be studied. These growth rates show a consistent growth rate over the entire period.

Municipalities with a consistent growth rate apart from Sol Plaatjie LM are Dikgatlong LM, Ga-Segonyana LM, Gamagara LM, //Khara Hais LM and the Tsantsabane LM. Most of these municipalities are host to large scale primary sector employment in either the agricultural sector or the mining sector. This is a clear indication of the migration towards employment opportunities, which is linked to improved and sustainable income, living conditions and ultimately a high quality of life. The circle of improvement in these municipalities is often linked directly to employment opportunities.

Better employment opportunities are linked to household income, while household income is directly linked to the affordability and qualification of increased housing opportunities and services. The combination of these factors contributes to the higher standards of living and general increased household confidence in the economy. The increased household confidence enables the population to actively take part in economic activity, resulting in economic growth and the

expansion of the networks between nodes and ultimately the urban systems and urban hierarchy. To confirm the conclusions made regarding employment, the employment statistics of the selected municipalities should be studied. Employment statistics are available on the same demarcation (2011 municipal demarcation) as found in the economic performance evaluation. For comparisons reasons, the same selected municipalities selected in the economic performance section (Section 6.4.2.1.) were used. The link and overlaps of the two different demarcations was already explained earlier in this section. The employment trends in this regard can be summarised in the following figure.



**Figure 6-13: Employment trends 2010 – 2015 per municipality**

Source: Stats SA

By studying the employment trends in each of the selected municipalities, some municipalities show more aggressive increase in terms of employment. The Sol Plaatjie LM has the largest representation in terms of employment numbers. This is mostly due to the diverse economic space (as seen in the economic concentration section) of the capital of the Northern Cape Province. From the growth in this municipality the phenomenon of urbanisation and positive pull factors can also be seen.

The Joe Morolong, Nama Khoi and Emthanjeni local municipalities experience a much more gradual growth in terms of employment. These municipalities consist of a more rural nature and are linked to employment opportunities in the primary economic sector. In terms of potential in human resources (linked to population), the annual increase of the past 5 years should be taken into account. This can serve as an indication where more people are employed annually which can potentially contribute in economic activities and interaction between different nodes or urban

centres. To clearly see how each of the municipalities showed an annual increase, the exact annual growth rate in employment need to be considered. The following table shows the annual increase in employment.

**Table 6-9: Annual employment increase per municipality**

Source: Stats SA

	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015
Joe Morolong	→ 1%	↓ 2%	↓ 3%	↑ 2%	↓ 5%
Ga-Segonyana	→ 2%	↑ 5%	↑ 4%	→ 1%	→ 10%
Gamagara	↑ 5%	↑ 5%	→ 4%	↑ 3%	↓ 5%
Nama Khoi	↓ 1%	↓ 2%	↓ 1%	↑ 1%	↓ 4%
Emthanjeni	→ 2%	↓ 2%	→ 3%	↑ 3%	↓ 5%
Kai !Garib	↓ 0%	↑ 6%	↑ 5%	↓ -2%	↑ 19%
/Khara Hais	→ 2%	↓ 3%	→ 3%	↑ 2%	↓ 5%
Tsantsabane	↑ 4%	→ 3%	→ 4%	↑ 3%	↓ 5%
Sol Plaatjie	→ 2%	↓ 2%	→ 3%	↑ 3%	↓ 3%
Phokwane	↓ 0%	↓ 2%	→ 3%	↑ 2%	↓ 5%

The table above shows the annual employment growth rates, while rating the growth experience for all the municipalities each year. For example, during 2010 and 2011 the Gamagara and Tsantsabane local municipalities experienced the largest growth in employment of all the selected municipalities. This evaluation is done for every year since 2010. The last recorded period between 2014 and 2015 seems negative, although it should be noted that the 19% growth in employment in the Kai !Garib LM is from a smaller base than the other municipalities. On the other hand, the 10% growth in employment in the Ga-Segonyana LM is significant if compared to the growth rates since 2010.

If the growth in employment is evaluated over the entire period as mentioned in Ga-Segonyana, a definite trend within the selected municipalities can be seen. The Ga-Segonyana, Gamagara and Tsantsabane local municipalities overall showed an annual growth in employment of between 4% and 5%. The growth in employment in these municipalities is linked to the economic situation and positive spin-offs from mainly the mining sector. In all three cases, the mining sector serves as a catalyst to create employment opportunities and ignite potential in other economic sectors.

The growth in these sectors can also be linked to more sustainable income that result in an increased ability of households to contribute and take part in local economy. The interaction between these three municipalities and related nodes are strong and has a significant impact on the urban hierarchy and urban system. Although the Sol Plaatjie LM experience lower growth compared to the three mentioned municipalities, it should be noted that the employment base is larger than the other municipalities (refer to the employment trends). If this is considered, the

growth rates experienced in the Sol Plaatjie LM is considered high and confirms the high rate of urbanisation to the capital of the Northern Cape Province.

## **6.7. Discussion of trends in the evaluation**

The discussion in this section aims to summarise the essence of the findings in the socio-economic evaluation in the sections above. The combination of economic potential, concentration, human potential and the impact of employment should be considered as an integrated entity, illustrating the current state of province in each of the included factors in the previous sections.

In terms of the GVA output of the municipalities in the study area, it was clear that the Sol Plaatjie LM (Kimberley) contributes the most to the economy. This was expected, as it is well-known that Kimberley is the capital of the province. More important was to consider the following major economic contributing municipalities and nodes in the province. One would expect that Upington (/Khara Hais LM) would be the next significant role player in the province, but from the data, it was found that Tsantsabane LM is responsible for a higher GVA output. After /Khara Hais the Ga-Segonyana, Joe Morolong, Gamagara and Nama Khoi municipalities all managed to provide a GVA output above the R4billion mark. The next municipality producing an output close to the last-mentioned mark was Kai !Garib, Phokwane and Emthanjeni municipalities, after which the remaining municipalities followed. From the GVA output data, it was clear that there exist a clear distinction of the municipalities producing more than R4 billion. With this being said, the “emerging” municipalities towards this mark also needed to be included.

Apart from the output in GVA, it is crucial to understand how these municipalities performed over the past few years to determine if the municipality is truly an “emerging municipality” in terms of GVA output. This was done by studying the GVA outputs per municipality for the past 5 years before the published data. This step revealed that all the “selected” municipalities included in the further evaluation showed a growth except for the Joe Morolong LM. This also revealed that the Emthanjeni, Kai !Garib and Phokwane municipalities had a low base of GVA output and therefore does not play such a significant role in further evaluation. Except for the Sol Plaatjie LM - which is seen as an anomaly in the province - the focus shifted towards the second-tier municipalities, with more or less an equal playing field in terms of the GVA output.

The actual annual growth rates in the municipalities were determined to measure growth specifically related to their own GVA base each year. This revealed that the Ga-Segonyana, Gamagara and Tsantsabane municipalities all achieved an annual growth close to 10%. Also noteworthy was the jump in GVA growth experienced in the Kai !Garib and /Khara Hais municipalities between 2013 and 2014.

With the emerging municipalities now clear, the next step was to determine the economic base of the municipalities. This would serve as an indication of how concentrated the economy is in the primary, secondary and tertiary sectors. The location quotient is used to clarify this step. An important difference to take into account in this step was that different municipal demarcation boundaries were used. The main objective was only to determine what the location quotient in the Ga-Segonyana, Gamagara and Tsantsabane municipalities is while evaluating the entire province. From the latest location quotient, it became clear that the Gamagara and Tsantsabane municipalities' economies were highly dependent on the primary economic sectors and more specifically the mining sectors. Ga-Segonyana LM were not that much dependent on the primary sector, with a larger concentration in the tertiary sectors, which in turn is linked to the government, community and administrative role of this municipality. If these were compared to the Sol Plaatjie LM, it was found that Sol Plaatjie is more evenly diversified in the economy, with a strong focus on the tertiary sector. From this, it can be concluded that the Gamagara and Tsantsabane municipalities had a high dependence on the primary economic sectors, while Ga-Segonyana were more advanced in progress in the tertiary sector.

As done in the GVA output, the growth or progress in terms of concentration in the municipalities were also studied to determine if progress were made in terms of attracting other economic sectors that would help the process of economic diversification. Given the role (mining) of the discussed municipalities, it is necessary to understand if considerable progress was made to ensure more sustainable investment or to be able to recommend remedies in terms of economic diversification to help uplift the node in the urban hierarchy. From this study, it was found that the economic concentration remained more or less the same for the previous 5 years. Some of the municipalities even showed an increased concentration of economic activity in the already undiversified economic situation as determined in Gamagara and Tsantsabane municipalities. From this, it can be concluded that if certain municipalities with the potential to advance in the urban hierarchy are identified for investment purposes, the strategy should be followed is to attract investment that is aimed at diversification of the economy.

With the economic situation in the regional perspective study area now clear, it was also necessary to study the social potential in terms of population and related employment levels. This serves as an indication of the potential in human resources as well as ability of people to take part in economic activities, which is linked to the employment levels. The first step was to evaluate the potential in human resources before the ability to take part in economic activities (employment). The same approach was followed by first studying the general population, then moving to the last 5 years growth and annual growth in population.

From the population study, it is concluded that the Sol Plaatjie LM acts as an anomaly in the province, with the largest population by far. The focus again was to evaluate the lower order municipalities and related nodes. From the population, it was found that the //Khara Hais LM is the clear second tier municipality, followed by Moshaweng, Ga-Segonyana, Kai !Garib and Nama Khoi municipalities. As expected, a different outcome in ranking in terms of population was found compared to the economic hierarchy. As seen in the previous chapters, although population numbers can be used as a single indicator of urban hierarchy, the economic side has a definite impact. The economic and social sides need to be combined in this process and was therefore included in the criteria.

The latest 5-year population growth of these municipalities as well as the municipalities of economic significance was studied. From the data, it was clear that low population growth rates occur across the municipalities, except for the Sol Plaatjie LM anomaly. Some municipalities in the selected evaluation showed increased growth rates. The next factor that was to be determined was to establish where growth occurs and relate it back to the economic evaluation through employment. While studying the population growth rates, it was noted that the rural municipalities such as Moshaweng, Siyancuma, Kai !Garib, Nama Khoi, Emthanjeni and Phokwane municipalities experienced low to negative growth annually, while the more urban municipalities and the municipalities of economic significance experience positive growth annually. From this, it can be concluded that firstly urbanisation is a main factor in the Northern Cape Province and that municipalities with economic significance and a strong mining background tends to pull people from the rural areas. The municipalities with a concentration (location quotient discussed earlier) in the primary sector enjoys a positive population growth. This suggests that people from the rural areas migrate to mining areas in search for employment opportunities which is related to improved living conditions and the increased ability to actively take part in economic activities.

This conclusion was confirmed while studying the employment growth rates in the municipalities that were included in the population evaluation. By studying the growth in employment over the previous 5 years, it became evident that the primary sector municipalities showed a constant increase in employment. Sol Plaatjie LM also showed increase in employment, but again remained the anomaly in the province. From the employment number, it was found that Ga-Segonyana, Tsantsabane and Gamagara municipalities experienced growth in employment which is directly related to the mining sector. The increase in employment in /Khara Hais and Kai !Garib is also related to the primary economic sector, but more specifically in the agricultural sector. If these two sectors' employment growth is compared, it was found that the agricultural sector's employment growth is more fluctuating compared to the constant growth in the mining sector up to 2014/2015 period, where the mining sector experienced issues such as strikes, commodity prices etc.

The employment trends can now be linked to the economic performance discussed earlier where it was found that economic output in especially mining municipalities continues to grow, despite the decline in employment. This supports the conclusion that these municipalities with a sound economic base, potential in population and employment needs to be targeted as investment nodes to create more balance in the region through unbalanced investment strategies. The unbalanced investment strategies are linked to the unbalanced spatial distribution as well as the economic unbalanced focus in the sectors.

## **6.8. Conclusion**

In this chapter, the regional perspective's study area was delineated on which the role of an urban hierarchy as spatial planning instrument is illustrated. With the delineation of the study area, it was necessary to establish a set of criteria that was used in the evaluation. The evaluation process of the study area focussed on two role players, i.e. spatial planning statistical measurement and spatial planning instruments. These role players were derived and based on the literature foundation and dynamics that has a direct impact on an urban hierarchy.

The spatial planning instruments included the evaluation of the current set of urban nodes and the current corridors in the study area. The evaluation of the current spatial planning instruments and structuring elements are done to determine the current existing spatial patterns. The spatial patterns and distributions were evaluated and discussed. The spatial planning statistical measurement focussed on the relationship between nodes, that are direct inputs to urban development and urban nodes. The factors assessed in this regard were the economic performance, economic concentration and population size and employment.

Through the inclusion of various statistics and trends over the past few years, a more detailed assessment of the study area is possible. The evaluation, combination of role players and assessment would be applied in the strategic planning chapter of this research where the role of an urban hierarchy as spatial planning instrument would be illustrated. To inform the strategic planning process of the study area, it is necessary to consider the principles in the existing regional development plans and strategies that needs to be applied in the study area.

## **CHAPTER 7: NATIONAL REGIONAL PLANNING POLICIES**

### **7.1. Introduction**

In the previous chapter, the regional perspective study area was evaluated based on the criteria that are aimed to illuminate the role of an urban hierarchy in a spatial system. This evaluation only focussed on the spatial system of the Northern Cape Province as a planning region. In regional and strategic planning, it is essential to understand the general spatial planning environment of that applicable area. In South Africa, the order of spatial planning documents is all aligned and link with one another. To effectively evaluate and plan from a regional perspective, it is necessary to consider the existing regional planning milieu and regional plans. Principles in the national regional plans need to be reflected on regional and sub-regional levels. The NCPSTDF (2012:3) confirms the significance to consider principles of national regional plans in provinces, regions and districts.

The existing regional planning milieu applicable to this study should incorporate general principles (from existing plans and policies) that need to be adhered to in the study area from a national planning point of view. By including these principles, the study area aligns with the strategic development vision and aims identified nationally. In this chapter, the focus would be to study the steps taken, lessons learned and progress made in the regional planning space in order to propose and link the theoretical background of this study with the evaluation criteria. This integrated approach and evaluation will assist in proposals in strategic planning in the final chapter. This chapter starts with the focus on the national regional plans and most recent and applicable regional plans that had a definite impact on the existing urban hierarchy.

### **7.2. National spatial planning legislation**

Before each of the applicable national regional plans is discussed in this chapter, it is necessary to consider the national spatial planning system in which the essence and principles of these plans are founded in. For the purposes of this chapter, the focus is only on the current spatial planning legislation applicable in South Africa. Although the plans discussed in this chapter were all published and implemented before the latest legislative framework, it is necessary to understand the norms and needs regional planning (national or provincial) focus on. The latest released act is the Spatial Planning and Land Use Management Act (Act 16 of 2013).

According to SPLUMA (2013:14), the spatial planning system of South Africa consists of:

- Spatial Development Framework on national, provincial and municipal level;
- development principles, norms and standards to be implemented;

- management and facilitation of land use; and
- procedures and processes for the preparation, submission and consideration of land development applications or related issues.

From the elements set out above, it can be concluded that, for the purposes of this research and discussion of this chapter the focus on spatial planning component falls into the Spatial Development Framework on national, provincial and municipal levels. This spatial planning focus refers to the term regional planning used in this research. The Act allows and specifically discusses spatial planning principles within the similar context in terms of elements that should be included such as the compilation, review and approval of plans and the monitoring of the implementation of spatial planning plans and policies. The Act specifies the need and significance of spatial planning by stipulating that the principles in the Act apply to all organs of state and other authorities responsible for the implementation of the legislation and guide the preparation, adoption and implementation of and spatial development framework (SPLUMA, 2013:16).

The Act continues by further stipulating exactly how these spatial development frameworks should be prepared. According to SPLUMA (2013:24), national and provincial spheres of governance and each municipality need to prepare spatial development frameworks that:

- Interpret and present the spatial development vision of the responsible sphere,
- Informed by a long-term spatial vision,
- Represent the integration and trade-off of all relevant plans and policies,
- Guide planning and development decisions,
- Contribute to a coherent and planned approach to spatial development,
- Provide clear and accessible information,
- Include previously disadvantaged areas, areas under traditional leadership, rural areas, informal settlements, slums and land holdings of state-owned enterprises and government agencies,
- Address historical spatial imbalances in development,
- Identify the long-term risks of particular spatial patterns of growth and development and the policies and strategies necessary to mitigate those risks,
- Provide direction of strategic developments and investments,
- Promote a rational and predictable land development environment,
- Take cognisance of any environmental aspects,
- Give effect to national legislation, policies and plans, and
- Consider and incorporate the outcomes of public engagement.

By studying the needs and requirements set out in SPLUMA regarding the spatial development, it can be concluded that this research directly impacts the various of the requirements, such as long-

term particular spatial patterns and development and how to mitigate the risks associated therewith, guide development decisions, provide strategic development and investments, address historical spatial imbalances while giving effect to national legislation. The legislative framework clearly provides the need for effective spatial development planning on all geographic levels. Spatial planning legislation in South Africa was considered as fragmented and disconnected prior to the adaption of SPLUMA (Joscelyn, 2015:22). SPLUMA aims to create a more general structure for spatial planning legislation.

The spatial planning process (including all the requirements, principles and needs) need to enable spatial justice. According to SPLUMA (2013:18), spatial justice is pursued whereby, "*Past spatial and other development imbalances must be redressed through improved access to and use of land*". Considering the spatial justice factor and historic plans and policies, it is necessary to study the previous and current national plans applicable to this research. The study of these plans and programmes will provide clear insight on spatial imbalances, urban hierarchy development and approaches followed in the plans. These insights are a valuable contribution to this research and the illustration of the role of an urban hierarchy as spatial planning instrument.

### **7.3. National regional planning policies**

As explained in the introduction of this chapter, the importance and significance of the national regional planning milieu is considered as an important platform in this research. Regional planning policies and the progress made in these documents is important to understand to align proposals in the recommendations part of the research. Regional planning in South Africa has seen some significant changes and aims throughout the years. The result of the history of the regional planning documents on regional perspective is a large variety of plans all with different outcomes. To focus the efforts in this research, only the national regional planning documents that had a definite impact on regional planning in general and the existing urban hierarchy were studied. These plans were grouped in national industrial planning policies and spatial landscape and integration planning. The inclusion of the national industrial planning policies is directly linked to the region's specific development phase. South Africa and the regional perspective study area is generally aligned with the pre-conditions to take-off development phase (Section 4.4), where some development obstacles and slower economic growth prevents South Africa and the study area to advance into the take-off phase. Additionally, the spatial landscape and integration are included to focus on the latest regional plans in South Africa and to promote integration and regional balance. The most recent and current national regional planning documents were also included to guide the recommendation and implementation phase of this research.

### **7.3.1. National industrial planning**

The first group of regional planning policies mainly focus in strategic planning with specific reference to industrial planning nationally. As seen in Chapter Six, industrial and mining play a significant role in the development of the Northern Cape province. Due to the economic composition, many employment opportunities and economic growth originates around industrial related nodes in province. The plans discussed in this section illustrate industrial development planning nationally as well as the impact on the province. From the plans discussed below, certain regional planning instruments and initiatives were used to promote development in these areas. In these plans, the use of growth poles, corridors and incentive support is applied on a national scale as well on the Northern Cape province. Additionally, the province was also part of the previous delineated homelands. From a national perspective, it is important to note that these spatial planning principles and instruments used on a national scale also applies on smaller geographic scales and regions.

#### **7.3.1.1. National Physical Development Plan**

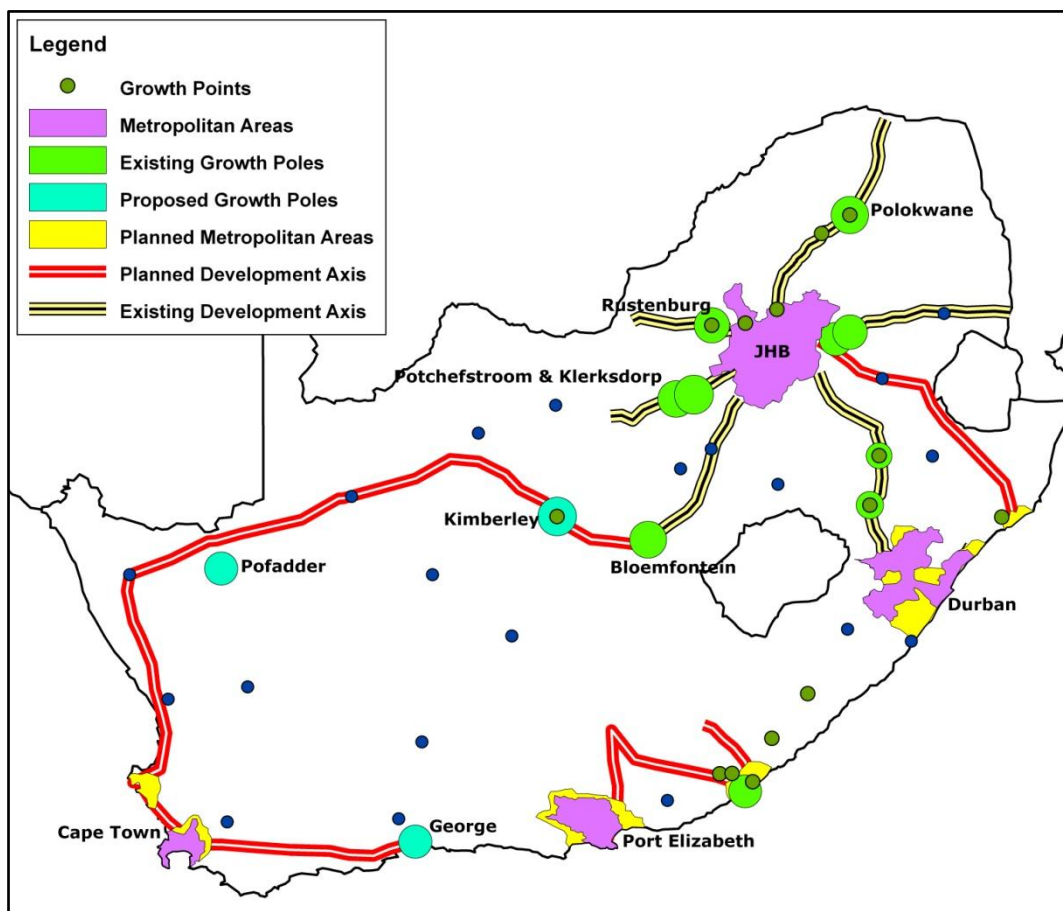
The National Physical Development Plan (NPDP) was the first national regional plan that seen the light. This was the first plan that focussed on the national spatial system as a whole. During the 1960s decentralisation formed the basis of regional planning. Through decentralisation forming the basis of regional planning, most plans aimed to restructure the national economy in order to promote economic independence. With the background of decentralisation and establishment of economic autonomy, it became evident that balance amongst regions in the national spatial system should be created (DPE, 1975:12). The main idea of the NPDP was to create balance amongst the South African regions.

Due to the lack of national regional plans in South Africa it was clear that some drastic changes were to be made in the existing spatial system. To promote the aim of the NPDP, 38 planning regions were identified for development. The planning regions referred to in the NPDP exhibits the same characteristics and aims as the planning regions that were discussed in Chapter Three. The 38 planning regions were earmarked for specific development and use and also to focus most development efforts on the applicable area.

To further support the aim of the NPDP and the already identified planning regions, additional growth nodes were identified. The nodes identified mainly included metropolitan areas. The identification of the growth nodes in the NPDP is the second regional planning instrument which was applied. As discussed in Chapter Three, nodes are considered as a significant regional planning instrument to promote growth at a specific point. It was mentioned that the nodes often consist of the necessary prerequisites to promote and initialise economic growth. The

metropolitan areas in 1975 also displayed these characteristics and were therefore identified for growth nodes. According to the DPE (1975:12), the growth nodes enjoyed the support of development by means of large financial incentives on offer to support development initiatives.

The identified planning regions and nodes had the focus on creating balance in the national spatial system, but the problem was that both these regional planning instruments are focussed on a single geographical component. The third regional planning instrument was introduced in the NPDP. This regional planning instrument role was to link the growth nodes and planning instruments by implementing growth axis. The growth axis (as it was seen in the NPDP) had the same characteristics of the corridor as discussed in Chapter Three. The growth axis (or corridors) was not only aimed to link the growth nodes but also encourage development along these routes.



**Figure 7-1: National Physical Development Plan**

Source: DPE (1975:14)

According to the DPE (1975:13), separate development in different regions supported ultimate aim of the NPDP. Industrial development in these separate areas was the source of the creation of new employment opportunities in different locations spread through the national space. Geyer (1989:260) concludes that the combination of separate development, growth nodes, growth axis

and planned regions were all implemented in the NPDP to create more balance through the national spatial system.

As the NPDP was the first regional plan focussed on a regional perspective, the plan had high expectations and aimed to improve the national spatial system on a large scale. In the NPDP a major issue was that the identified planning regions had no regard for population density. This shortcoming can also be related back to why population is also included in the regional perspective evaluation criteria. The industrial development that occurred due to the growth nodes that were chosen was identified in areas with no industrial potential (Geyer, 1989b:262). The growth nodes were chosen with the idea of driving industrial development into a certain planned direction. The NPDP had no regard to competitive advantages. This meant that sectors and businesses had no edge or strategic plan to place itself above another competing facility. The positive gains and negative growth pains all resulted in the duplication of urban areas.

The metropolitan areas especially showed great progress to shape the spatial system and support the national urban hierarchy, but other areas on the periphery and smaller nodes showed no progress (Geyer, 1989b:262). This meant that the unbalanced nature between regions in the national space became more unbalanced and the gap between high and low order nodes in the urban hierarchy only enlarged.

The NPDP was ideologically founded, but the aim to create balanced between regions in the national spatial system and the way that regional planning instruments were used was a large step in the right direction in terms of national regional planning. According to Geyer (1989:257), the problem was not specifically with the aim and plan of the NPDP, but rather the timing of the plan. In the NPDP a clear effort was seen to use nodes and corridors as the two main spatial planning instruments in this plan. The application of these instruments was successful and unsuccessful in various cases, proof that nodes and corridors alone cannot be identified without a clear vision of balanced development.

#### **7.3.1.2. The Good Hope Plan**

The Good Hope Plan (GHP) was the plan that followed on the National Physical Development Plan in 1980. This plan was the next step in national spatial development planning and aimed to improve on the imperfections experienced in the NPDP. In this plan the relationship and deliberation of both the public and private sectors were seen as a significant contribution and fact taken into account in strategic national planning. Both the public and private sectors were the source of development projects in the national space, therefore the changes and behaviour of these sectors were closely followed and monitored.

According to Oranje and Merrifield (2010:34), in the GHP the 38 planning regions that were identified in the NPDP were scaled down to eight new development regions. This dramatic decrease in planning regions was a result of lessons learned in the previous plan. It was found that if too many planning regions are identified and enjoy the support of incentives, the external impact is minimal and no real momentum in term of development in these regions can be seen. The planning regions identified in the GHP were strategically chosen to include the impact on the former homelands. During the 1980s the apartheid regime was focussed on keeping the national space mostly for the white population.

The next regional planning instrument that had a clear change was the development axis, as referred to in the NPDP and also known as corridors. According to Oranje and Merrifield (2010:38), there was no clear indication or referral to development axis in the GHP. This suggests that the GHP had an entirely different focus if compared to the NPDP regarding the national spatial system.

According to Oranje and Merrifield (2010:38), 8 de-concentration points in metropolitan areas and 20 decentralised industrial development points were identified instead of proposing clear development axes. Although the GHP and NPDP had different approaches regarding the national spatial system, the industrial focus in both plans remained significant. As a result of the NPDP industrial demarcation, certain limits were being created by the demarcated areas (Geyer, 1989a:381). The GHP attempted to minimise the limitations by offering additional support.

The areas that were targeted for additional support, first needed to qualify for support through the following criteria (DFA, 1982:48):

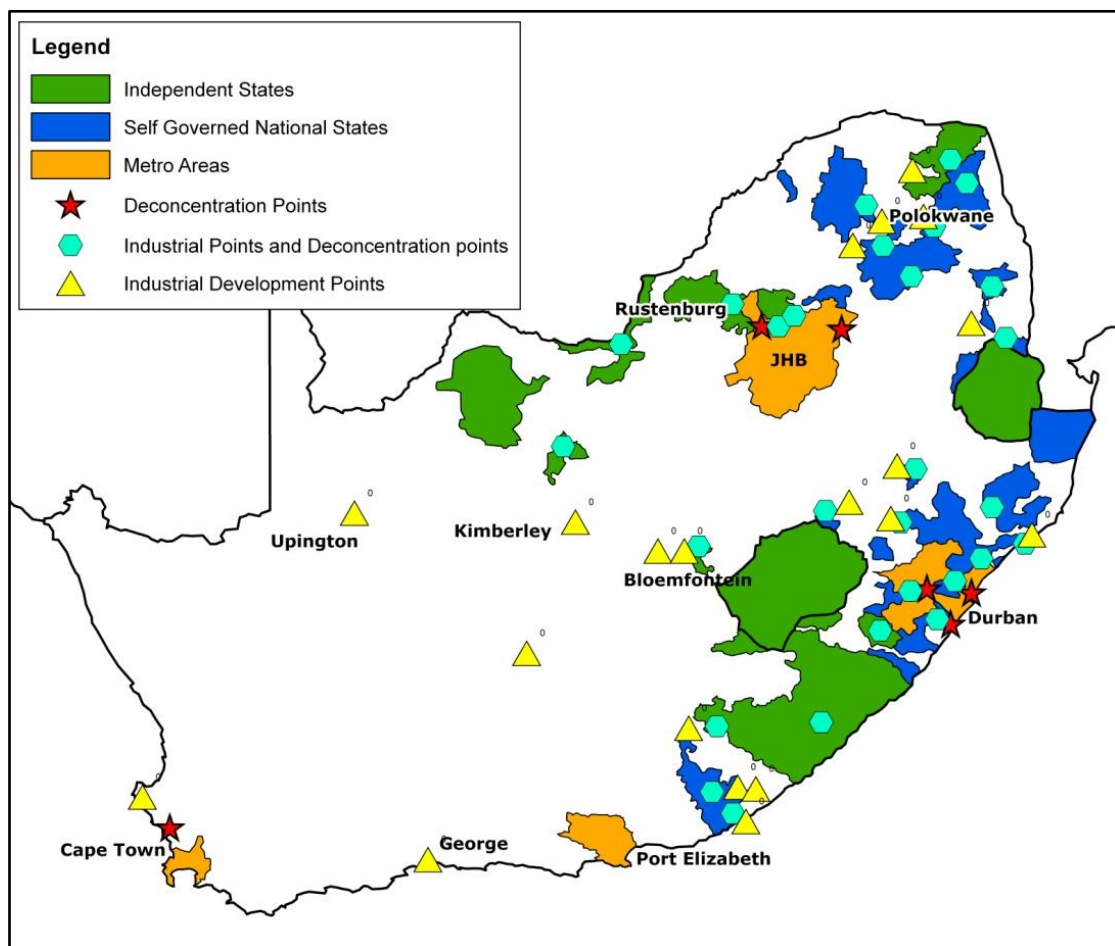
- The area should not be affected by the economic influences of the metropolises
- The area should be located between two or more economic nodes and on an existing development corridor,
- Consist of a sound basis of existing infrastructure,
- An already established developed core needs to exist in the region to create a critical mass to attract people and investment opportunities. and
- Employment opportunities should be available for homeland residents.

The abovementioned criteria illustrated that balance between regions were also a focus by implementing and developing new upcoming economic development nodes. Areas that showed potential for economic growth would probably already consist of sound infrastructure and an existing economic core. An important factor was that these areas should also show potential to create sustainable employment opportunities which are outside the influence of the metropolitan areas of South Africa. Noteworthy to the listed criteria is the specific reference to the location

between two economic nodes and on a development corridor or axis. This suggests that the GHP supported corridors that were both proposed and implemented by the NPDP or corridors that developed naturally over time.

It is safe to conclude that the GHP supported the phenomenon and importance of the urban system through this specific criterion. A clear shift from the metropolitan areas and existing economic nodes suggests that the middle and lower urban hierarchy enjoyed support from the GHP if these areas qualified based on the other mentioned criteria.

If the criteria are further studied, one can see that specific reference was also given to the homelands and the employment opportunities these areas held. According to the DFA (1982:52), the previous homelands offered a substantial support in terms of employees in various economic sectors. The previous restriction of movement required that residents in the homelands should show a valid pass to travel between their points of employment and the places they were allowed to live. By moving employment opportunities closer to the homelands, this major difficulty and barriers were improved to promote a freer flow of employment factors. By removing this barrier, the result was that development closer to the homelands showed a rapid incline.



**Figure 7-2: National Physical Development Plan**

Source: DFA, (1982:34)

Although the GHP had a different focus than the NPDP and showed success in terms of promoting employment flow, it still had some issues that were not planned for. The criteria used to offer additional support did limit the possibilities, but allowed too many growth points to be identified. Incentives were not concentrated and spread too thin over a large geographic area. Urbanisation to urban centres continued, despite new nodes being identified and rural areas further degraded gradually. According to Geyer (1989:386), equalisation centres were later introduced in the spatial system as an effort to counter this process. The only real successes that were achieved in the GHP were the development of secondary centres and the further support and development of corridors between these urban centres.

In the same time the GHP were implemented the first Regional Industrial Development Programme (RIDP) was initiated and implemented. This programme was specifically aimed to support industrial development as introduced and proposed in the GHP (Geyer, 1989a:390). This programme proposed industrial development in more than 50 locations spread through the national space and aligned to the homelands.

In the case of the first RIDP, it is observed that the use of nodes as regional planning instruments was implemented. Important in this approach was that development was not only proposed at certain strategic points but also supported by implementing external forces, i.e. incentives. Through the incentives at these locations, development increased, but not as initially envisioned. The large incentives offered at these locations were unsustainable. The incentives offered in this case were to attract investment as an effort to create development in certain areas.

### **7.3.1.3. Regional Industrial Development Plan**

Although the GHP aimed to improve on the mistakes made in the NPDP, the industrial development programme still showed room for improvement. As a result of the issues in the RIDP and lessons learned, a new RIDP was implemented in 1991. The focus in the new RIDP was not to establish new industrial development nodes in certain locations, but to develop an integrated South African economy. According to Drewes and Bos (1995:250), the development of each individual region was considered as a high priority. The reason for behind this approach was simply that the level of development of each region contributed to the development of the entire national space. The theory of the interaction and interrelationship of urban systems as discussed in Chapter Five could be seen as the basis of this plan.

The dynamics of the regions and the national urban system had a significant impact on the development of the national spatial system. In order to create a balanced and integrated regional space, the planning according to the urban hierarchy needs to be considered as a regional planning instrument. National regional planning cannot be proposed without considering the urban hierarchy and dynamics of the national urban system. The key in unlocking regional balance potentially lies in the role of an urban hierarchy as spatial planning instrument.

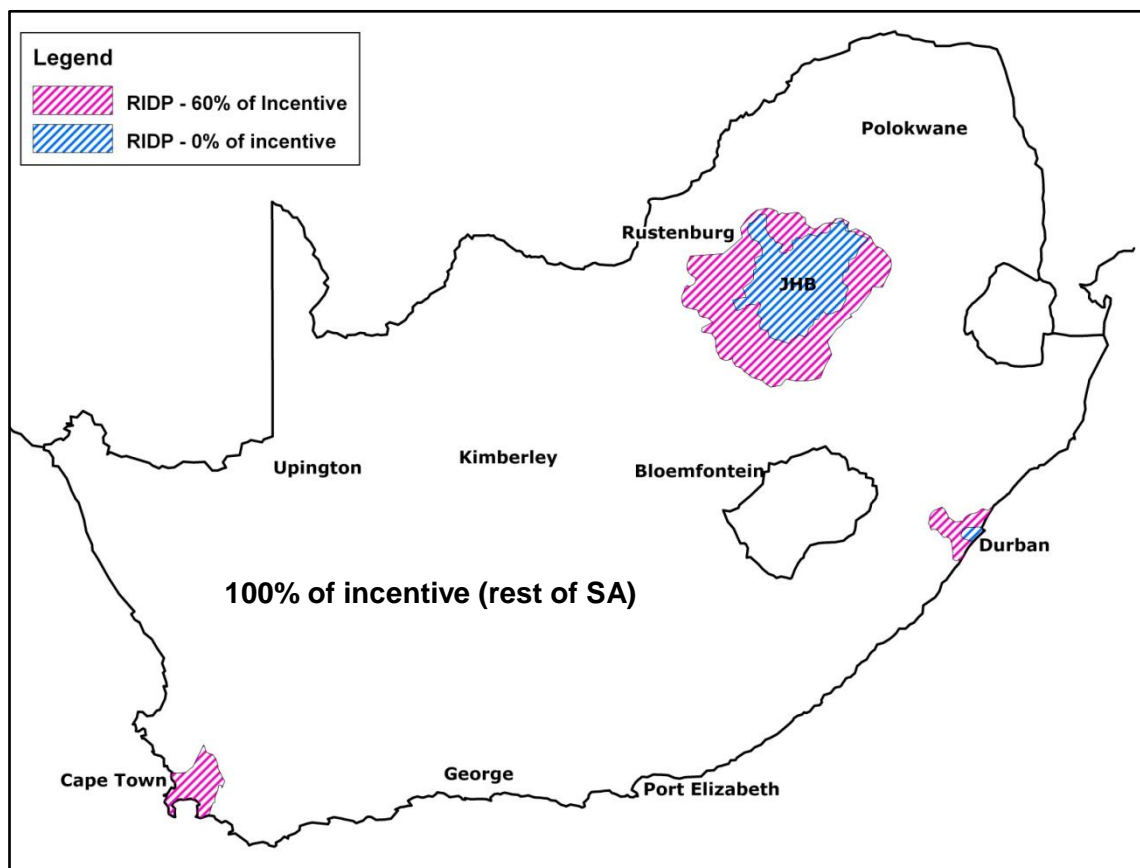
In the 1991 RIDP regional development were approached to create universal integration between the regions in the nation space. All the previous plans only focussed on promoting development and attracting investment in certain chosen locations and regions (referred to planning regions discussed in Chapter Five). During the planning and implementation of the 1991 the gap between the under-developed and undeveloped regions became clear. No development in undeveloped regions was mostly due to development not being supported in these areas or the lack of infrastructure.

The national economic market and performance had a significant impact on the RIDP. Production factors were allowed to spread and freely influence interaction between nodes and regions. The result of the free-flowing production factors resulted in the spontaneous development in areas where previously no development occurred. More economic sectors started to increase in development, leading to a more diversified economic base. Together with the free-flowing

production factors, location freedom was also provided in contrast with the GHP. As mentioned, the RIDP had a stronger relation to economic principles than the previous plans and introduced a new profit / turnover-based scheme in terms of incentive support. The incentive offered in development projects were also based on short-term support.

By following this approach, a risk account for industrial development was established and incentive support was based on the growth and general performance of the business. The way the performance of the business was measured was not necessarily based on economic growth but was more biased to the management of the business (Drewes and Bos, 1995:251). The more effective a business was managed, the more incentives were on offer for support. Development projects should be effectively managed and driven to promote economic growth to help achieve the greater aims of the RIDP.

In contrast with the NPDP the focus shifted from the support in mainly the metropolitan areas. Gauteng and Durban areas did, for example, not qualify for any incentive support. Cape Town enjoyed partial support and qualified for 60% of the incentive support with Pietermaritzburg and the intermediate regions of Gauteng (Drewes and Bos, 1995:259). In the current national space, the effects and support can easily be seen in the intermediate regions of Gauteng, Cape Town and the Pietermaritzburg in terms of the N3 corridor. Drewes and Bos (1995:259) also confirmed that the rest of the country qualified for full support of the incentive scheme. By studying the areas that qualified for incentive support, one can conclude that the RIDP aimed to uplift the areas of lower development to a more balanced state in the national space. The figure below illustrates the general idea of the areas that qualified for incentive support and the general plan of the RIDP.



**Figure 7-3: National Physical Development Plan**

Source: Drewes and Bos (1995:260)

As seen from the map above, it is clear that the geographic spread of the incentives was great. This suggested that incentive support was widely spread and also unsustainable to maintain on such a great regional (almost national) coverage. The result of this large geographic coverage was that many areas received support with no potential and the envisioned effect of the RIDP did not realise. Incentive support in some areas could have rather be focussed on the areas that really showed potential.

The other failure the RIDP had was to entirely ignore the metropolitan areas in terms of support. The metropolitan areas showed potential in terms of employment and employment investment opportunity, having large populations already living in the metropolitan areas. This supports the population criteria of population on the regional perspective as seen in Chapter Six. Due to the available infrastructure foundation in the metropolitan areas and intermediate cities, these areas showed the most potential for investment and development as most development projects were already located in these areas. The political correctness of the RIDP quickly turned into politically driven investment projects. The political influence on the RIDP was biased in aiding the home countries and previous growth centres which were more actively promoted (Drewes and Bos,

1995:264). This effect skewed the approach of creating balance between regions in the national space.

#### **7.3.1.4. Industrial Policy Action Plan**

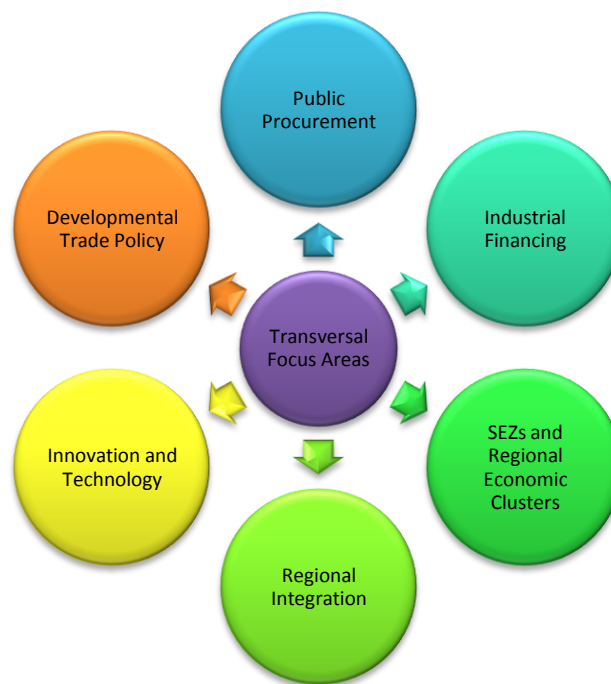
The Industrial Policy Action Plan (IPAP) was developed from the Economic Sectors, Employment and Infrastructure Development Cluster of South Africa. According to IPAP (2016:13), South Africa's history of industrial development and economic growth serves as proof that no short-term solutions exist to promote industrial development and economic growth. Problems associated with the mentioned aspects are normally associated with long-term solutions. The IPAP identifies these problems in South Africa and proposed a collective effort to address these problems and secure long-term inclusive growth required to alleviate unemployment and inequality in South Africa (IPAP, 2016:13).

The South African economy has experienced continuous negative impacts and aftershocks since the global recession (Madubeko, 2010:22). Apart from these aftershocks from the global recession, high levels of uncertainty and several local challenges further impact the general growth of the economy (Madubeko, 2010:22). According to IPAP (2016:17), the economy has experienced an even lower growth rate of 1.3% in 2015 with the poor economic performance at sector level. The IPAP proposed key action programmes with both a transversal focus and sectoral focus. The key programmes related to this research are mainly focussed on the transversal focus action programmes.

The IPAP is an action plan that specifically focus on the constraints in the industrial sector in South Africa and the impact on the economic growth. IPAP propose collaborative approaches and possible solutions in the identified constraints in South Africa. Reiterations of this plan considers the need to support the range of policy instrument that government can apply in an effort to alleviate the mentioned problems. The core objectives of the IPAP remains constant and includes the following (IPAP, 2016:37):

- Diversification of the economy;
- promotion of labour absorbing industries;
- industrialisation model focussed on inclusive growth;
- contribution towards industrial development in Africa; and
- movement towards a knowledge economy.

The transversal focus areas identified in the IPAP is specifically proposed to address the core objectives of the IPAP. Six main transversal focus areas are proposed that is aimed to focus on the industrial sector and promote economic growth in South Africa. The following figure illustrates the six main transversal focus areas as set out in the IPAP:



**Figure 7-4: IPAP transversal focus areas**

Source: IPAP (2016:44)

In terms of public procurement, the compliance with sector designation and localisation requirements in state procurement needs to be monitored and ensured (IPAP, 2016:45). Public procurement can potentially be applied as an effective instrument to help in the promotion of economic growth, industrial development and innovation. According to IPAP (2016:53), a strategically and coordinated industrial financing system needs to be developed that combines the efforts of state and development finance institutions. Among these efforts, priority is also given for dynamic firms, which consist of greater strengthened conditions for development.

According to IPAP (2016:60), the Special Economic Zones Programme (SEZ) is aimed to accelerate growth and development in designated regions in South Africa to promote decentralisation of industrial development. Incentives are offered in the SEZs to help attract industrial development in these regions. The same approach in terms of incentives is also noted in other industrial development plans of South Africa in the past (refer to Sections 7.3.1.1 – 7.3.1.3). These SEZs are proposed to be expanded in the existing areas as well as developing new SEZs in other regions. IPAP (2016:60) develops SEZs as dynamic platforms to promote foreign investment and to increase export capacity in the existing SEZs and other industrial clusters.

In line with the NDP (discussed in Section 7.3.2.3), the IPAP promotes regional integration through coordinated development of African regional infrastructure. The IPAP (2016:64) supports industrial development along African infrastructure in an effort to promote an integrated industrial

environment and expand the ability for trade between African countries and South Africa. An integrated African industrial development platform should also be supported through a specific development trade policy that could ensure effective integration through flexible/strategic tariffs amongst the impacted countries (IPAP, 2016 50).

Regional integration is further supported through innovation and technology, which is seen as a key transversal focus area in the IPAP. The focus on innovation and technology also allows for ongoing reconsiderations of existing incentive schemes of the SEZs. The promotion of this focus area also has an impact on the industrial financing system (IPAP, 2016:48). It can be concluded that this focus area can be used to promote and support the other focus areas. As discussed in Chapter Four, innovation and technology interventions take a longer time to promote growth in regions. Innovation and Technology improvements are supported through the IPAP to formalise research and development projects that is specifically aimed at increasing industrial growth.

The IPAP was specifically developed and implemented to focus on economic growth that could be enhanced through the industrial sector in South Africa. Compared to other industrial development policies, the IPAP only identifies specific focus areas that could be focus in. The SEZs, the infrastructure development and regional integration are the focus areas that have a specific spatial impact. Similar approaches in terms of incentives offered in clusters and SEZs are seen in previous plans including the RIDP and the GHP.

### **7.3.2. Spatial landscape and integration planning**

In the second group of spatial planning policies, the focus is on the physical spatial landscape and integration of areas. These plans are mostly studied from a national perspective. The national perspective approach to spatial planning also applies on the Northern Cape Province as a planning region. The integration and planning for areas that was previously left behind in terms of development also applied to the province. Due to the unbalanced urban hierarchy, various small nodes exist in the Northern Cape. These nodes often experience unbalanced development, associated with the own unique challenges in planning. From these plans, the role and significance of industrial development and mining is still evident in the Northern Cape Province. These facilities are identified as strategic investment areas are used in nodal development strategies. These nodes are linked with other major nodes in the national landscape with corridors. The impact of the large nodes on a national scale is still significant apart from the distance between the nodes. Lastly, although the Northern Cape Province is considered fairly rural, both the urban and rural areas need to be addressed to rectify and address previous disadvantages and imbalances. Many of the approaches proposed in these policies on a national level, also needs to be applied on a provincial, district and local level. These principles should be supported from a bottom-up approach to spatial planning as discussed in this research.

### **7.3.2.1. Spatial Development Initiatives**

The Spatial Development Initiatives (SDIs) were developed in order to help create balance between regions by specifically identifying strategic areas for investment. These SDIs were focussed in regions that were considered as underdeveloped but showed potential to develop into larger nodes (Sandberg and Martin, 2001:69). The SDIs were applied as an effort to draw external investment into these underdeveloped areas to promote balance between regions. The SDIs had a planning region approach (see Section 3.7) that includes different, corridors and nodes. This regional planning strategy integrated the three regional planning instruments in an effort to promote regional balance in the national spatial system.

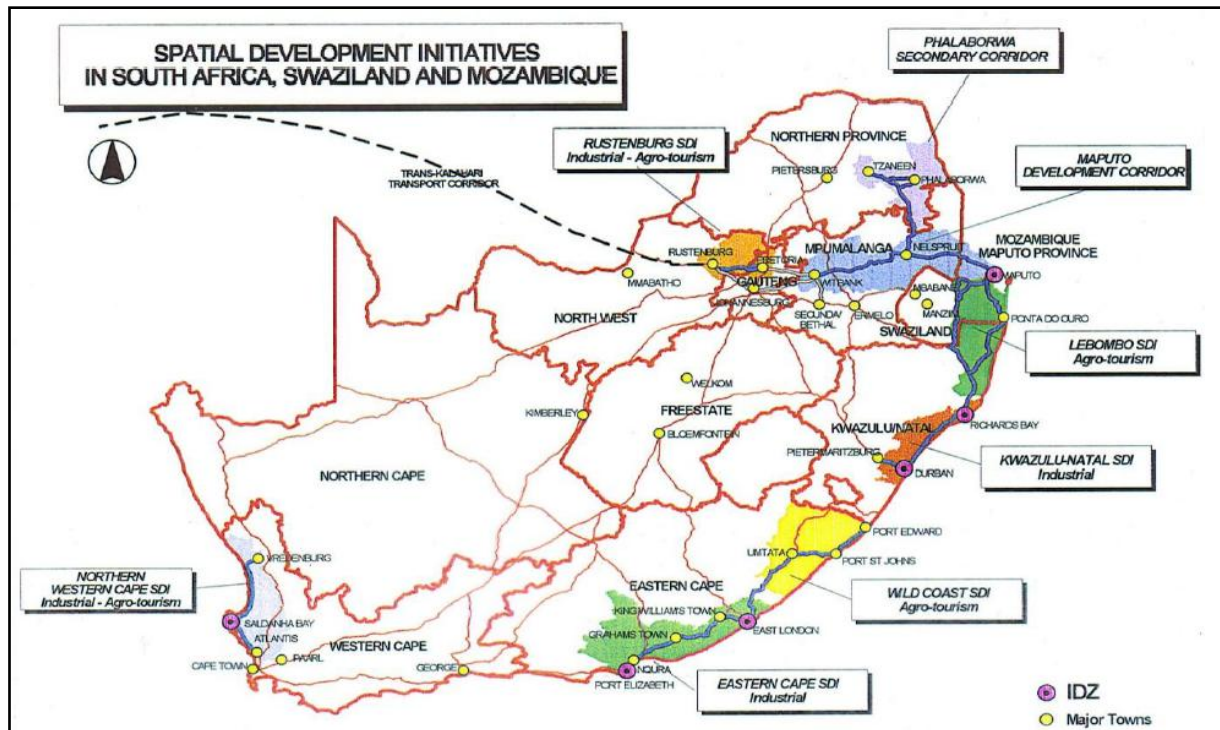
The main criteria that had an impact on where the SDIs were implemented was that the location for investment needed to show sufficient potential in terms of growth but a lack of factors that enabled significant growth. In support of the external investment, the socio-economic and political cohesion facilitated the cooperation from the government. The interventions and steps taken in the SDI were focussed on short and effective that was aimed to facilitate growth and attract external investment. Investors were invited to create business opportunities that had been identified in certain strategic locations. This meant that focussed economic investments were identified through a top-down approach (identified from high hierarchy of government) and supported by external investors. Additional supplementary projects that contributed to the greater plan of creating balance between regions were identified within the SDI locations.

According to Jourdan (1998:718), SDIs can be seen as targeted interventions by central government that assist in unlocking economic potential while also facilitating new investments and job creation in a specified area. These initiatives were also supported through government that were based on the promotion of black economic empowerment that ensured that local and small business could enjoy maximum benefit from these initiatives. Miller (2011:3) also supports the significant role of the government by adding that the programme was conceived by the Cabinet in 1995 as an attempt to improve the functioning of government in targeted regions of the country, particularly in those areas where the greatest potential of growth existed.

In South Africa 11 SDIs were identified (Miller, 2011:3):

- The Maputo Development Corridor
- The Phalaborwa SDI
- The Platinum SDI
- The West Coast Investment Initiative
- The Fish River SDI
- The Wild Coast SDI

- The Richards Bay SDI
- The Durban and Pietermaritzburg Nodes
- The Lubombo SDI
- The Gauteng Special Economic Zones



**Figure 7-5: Spatial Development Initiatives in South Africa**

Source: Adapted from Jourdan (1998:718)

The SDI programme consisted of a two-phased process that involved government in different levels. The first phase (identification of the SDIs) was the responsibility of the national government. After the first phase was completed the actual project implementation phase followed, which formed the responsibility of the provincial and local governing bodies. Oranje *et al.* (2009:2) confirm this by stating that the local or provincial investment agencies were responsible to facilitate new growth and investment in the identified region. During the implementation of the SDI programme it was found that local and regional clusters were established in the identified areas. These clusters consisted of various firms across the economic sector that focussed on strategies that aimed to improve effectiveness of investment projects.

The local and regional clusters aided the outcome of the SDI programme by offering support that was aimed to create a more attractive investment environment in the chosen areas. The success of the programme, according to Jourdan (1998:725), rested on the ability to identify regions with the potential attract investment sustainably and to respond to investment injections effectively and rapidly in a creative manner.

Miller (2011:3) states that: *“Successful investment strategies are thus the premise of the SDIs and informs government’s conception of regional development. A pro-investment strategy, the SDI perspective (as enunciated by its leading proponents), also emphasizes the importance of economic governance and local development that is cognizant of the environmental and socio-economic impact.”*

Through the SDI programme the importance of investment and capital in an area with the potential to develop became clear. External capital needs to be attracted and utilised during the implementation of development projects. According to Miller (2011:3), the collaborative investment strategies of public-private partnerships were the principal source of funding anchor projects and development corridors of the SDI programme. Miller (2011:3) continues by stating that the success of SDI projects was also based on the implementation of packages of measures that identified potential growth areas that support the financial and industrial capacity of parastatals and to target potential public-private investment combinations.

Through the identified regions in the SDI and the important component regarding investment to anchor projects, it can be concluded that the SDI programme were spatially unbalanced and economically balanced. The programme excelled in utilising unidentified growth potential in chosen different geographical locations. By following this approach economic balance between regions in the national space could be achieved through a spatially unbalanced methodology.

The SDI programme showed that external investment in identified locations could be sustainable if the correct implementation framework is followed. A similar approach of the SDI programme is linked to this research. The main difference is that the urban hierarchy and the criteria used in Chapter Six identify areas that show potential to create regional balance and to promote economic growth in these chosen areas.

#### **7.3.2.2. National Spatial Development Perspective**

The National Spatial Development Perspective (NSDP) was first issued in 2003 and updated again in 2006. For the purposes of this section, the combination of the 2003 and 2006 NSDPs was studied collectively. The 2006 NSDP provided a framework for a more focussed intervention by government regarding equitable and sustainable development. The NSDP was seen as a key instrument in the government’s drive to ensure greater economic growth, sustained job creation and the eradication of poverty.

The NSDP coordinated policies that had an impact on spatial implications of infrastructure programmes on national, provincial and local government levels. The NSDP identifies strategic locations through the national space where growth and development performance are key in the attainment of national objectives (NSDP, 2006:i). The NSDP also provided a platform where

intergovernmental collaboration in conjunction with technical support through a range of specialist and academia could be achieved.

The NSDP provided the following three different key issues regarding regional development in South Africa (NSDP, 2003:9 and NSDP, 2006:ii):

- A set of principles and mechanisms for guiding infrastructure investment and development decisions;
- A description of the spatial manifestations of the main social, economic and environmental trends that should form the basis for an understanding of the national space economy; and
- An interpretation of the spatial realities and implications for government intervention.

In the NSDP five principles were also put in place to support the key issues listed above and to contribute to the broader growth and development policy objectives of government. These principles include the following (NSDP, 2006:iii):

**Principle 1:** Sustained rapid economic growth as a pre-requisite for the achievement of other policy objectives, among which poverty alleviation is key.

**Principle 2:** Provision of basic services to all citizens (e.g. water, energy, health and educational facilities) wherever they reside.

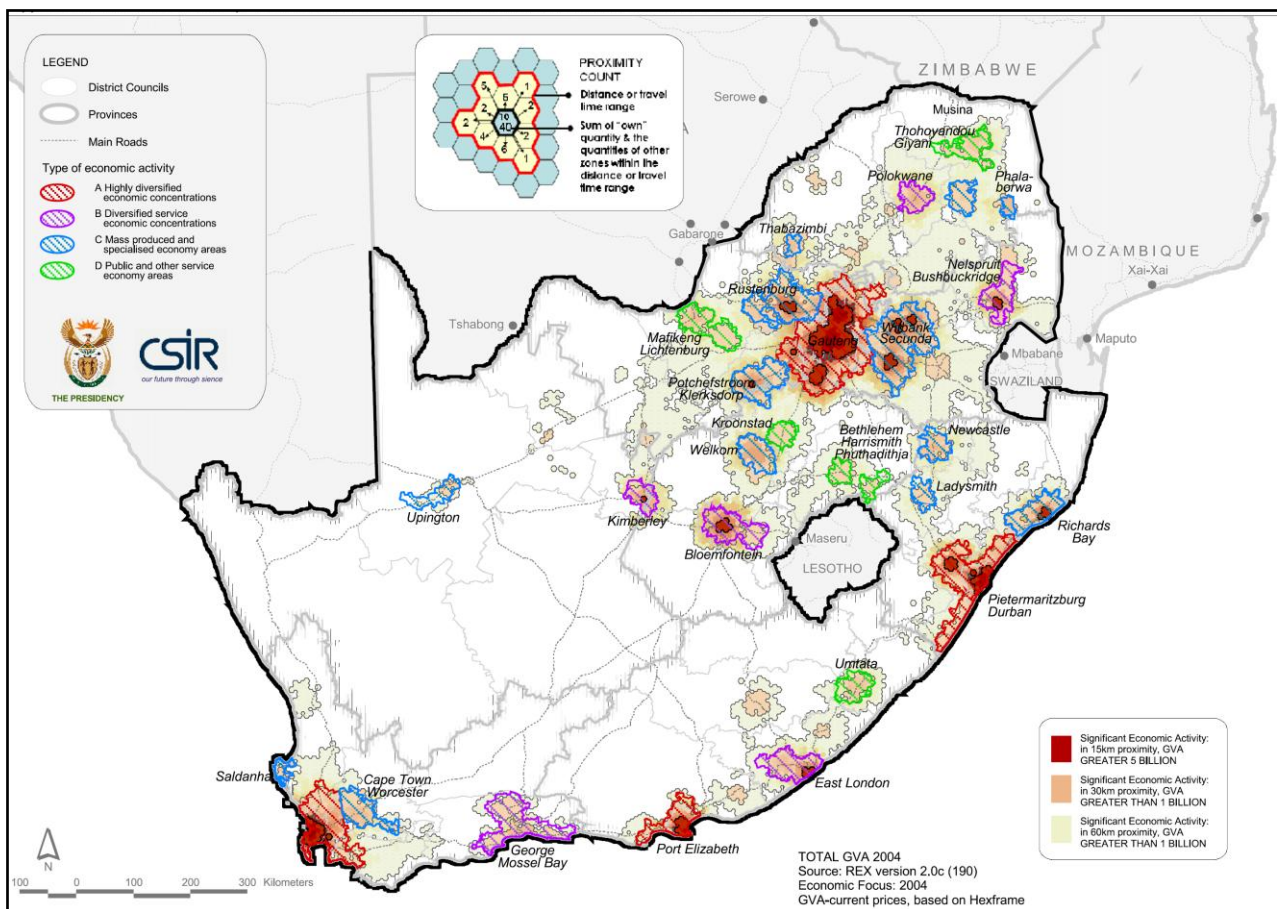
**Principle 3:** Government investment should be focussed on localities of economic growth and/or economic potential in order to gear up private-sector investment, to stimulate sustainable economic activities and to create long-term employment opportunities.

**Principle 4:** Efforts to address past and current social inequalities should focus on people, not places. Areas with high levels of poverty and demonstrated economic potential should include investment beyond basic services to exploit the potential of those localities. In localities with low demonstrated economic potential, government should concentrate on the provision of education and training, social transfers and poverty-relief programmes.

**Principle 5:** In order to overcome the spatial distortions of apartheid, future settlement and economic development opportunities should be channelled into activity corridors and nodes that are adjacent to or that link the main growth centres. Infrastructure investment should primarily support localities that will become major growth nodes in South Africa and the SADC region to create regional gateways to the global economy.

It is clear that in the NSDP a strong focus was on the economic side of national regional development. Most of the development and investment priorities in the NSDP were either focussed to sustain economic growth in strategic locations or develop proper infrastructure aimed to reduce social inequalities. A clear reference was also given to the two regional planning instruments i.e. nodes and corridors. In the NSDP, the role nodes and corridors were seen not just to attract development but also to prevent further spatial distortion and to facilitate a future settlement development pattern.

With government spending focussing on strategic locations, private sector economic investment was also prone to follow and stimulate further economic activities and local employment opportunities. These economic investments and projects were aimed to enable growth centres to be linked through the mentioned nodes and corridors (Oranje *et al.*, 2009:6). The NSDP classified the national space in terms of national economic significance. National economic significance was based on the type of economic activity, economic output and the relation of these two factors with economic concentrations. The following figure illustrates the classified and identified areas of economic significance.



**Figure 7-6: National Spatial Development Perspective economic significant areas**

Source: NSDP (2006:32) combined with 2004 GVA data

By studying this figure, it is clear that the NSDP focussed more on metropolitan and intermediate cities. The NSDP classified these areas as:

- Highly diversified economic concentrations (Red)
- Diversified service economic concentration (Purple)
- Mass produced and specialised economic area (Blue)
- Public and other service economic areas (Green)

Infrastructure support programmes and investment support was channelled to these areas and developing nodes to support growth in these regions. To promote effective implementation of the main ideas and outcomes, the NSDP assisted various levels of government in the spatial planning process by creating Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs). According to the NSPD (2003:32), additional support was provided in low capacitated government levels to aid the decision-making process. Orange *et al.* (2009:6) confirm this by adding that the NSDP created certain guidelines to help organise spatial planning on a regional perspective.

The NSDP made significant progress in creating a framework that steered regional policies. By doing this it was ensured that all the regions adapted the approach to development based on the guidelines and principles as set out in the NSDP. The NSDP created the opportunity on all government levels to develop their own strategies and plans based on the guidelines. If these areas did not have the capacity, the NSDP provided guidance and assistance in the planning of these areas.

With the increased investment possibilities, competition between projects increased that resulted in an increase in development levels and ultimately economic growth (NSDP, 2003:32). Economic growth and employment possibilities were focussed in these areas where most potential were identified. Effective provision of basic needs and services aimed to decrease the gap of social inequities. Identified districts and the metropolitan areas served as basis to build and distribute potential and demographic patterns (Oranje *et al.*, 2009:11).

The NSDPs were the first national development perspectives that showed a combination of top-down approaches that is driven and supported from the bottom-up. The high government level identified the aim and principles and enforced it onto lower government levels that adapted these principles in order to help achieve the aims as set out nationally. By following this approach to national spatial planning, it enables lower governing levels to adapt and apply the development principles according to their own needs and problems experienced at provincial and local levels. With the implementation of the NSDPs, a clear transition was made from a rigid top-down

approach to an approach that allowed for inputs from local levels based on the national common goals set.

The approach adapted in the NSDP could potentially be applied on the different levels on which the empirical study focussed on. The regional perspective study area's (see Chapter Six) development strategies aim to create regional balance. If balance between regions in the Northern Cape Province could be achieved with the assistance of district and local municipalities, the success could translate into more balanced regional development. A similar approach can potentially be applied on different geographic scales such as the sub-continental scale (SADC) to be discussed in Chapter Eight.

### **7.3.2.3. National Development Plan**

The National Development Plan (NDP) is the general national plan driving development in South Africa currently. The National Planning Commission was appointed by President Jacob Zuma and tasked to draft a vision and national development plan in May 2010 (NDP, 2011:25). The Commission issued a Diagnostic Report in June 2011 that stipulated the nation's achievement and shortcomings since 1994 (NDP, 2011:25). This report identified a failure to implement policies as well as a lack of partnerships that promoted growth and progress of South Africa. The challenges South Africa faces related to the theme of this research includes (NDP, 2011:25):

1. Inadequate and under-maintained infrastructure to effectively support development;
2. inclusive development is restricted by ongoing spatial divides;
3. unsustainable resource intensive economy primarily focussed on the primary economic sectors; and
4. inadequate and poor quality public services.

The NDP aims to eliminate poverty and reduce inequality in South Africa by 2030. According to the NDP (2011:24), the nation can realise these goals by drawing on the energies of the residents of the country, growing an inclusive economy, building capabilities, enhancing the capacity of the state and promoting leadership and partnerships throughout society. The NDP is a general document focussing on various regional issues.

The NDP covers various issues and sectors, all playing a crucial role in the vision of South Africa by 2030. For the purposes of this research, preference was given to the chapters on South Africa in the region and the world as well as on transforming human settlements. The chapter on South Africa in the region and the world relates to and supports the need for the sub-continental level empirical study, which will be discussed in Chapter Eight. The chapter on the transformation of human settlements is more applicable to the regional perspective as evaluated in Chapter Six.

As seen from the national regional plans (NPDP and GHP) it is clear that the apartheid regime had a significant impact in forming the human settlements and urban systems of South Africa. From the GHP it became evident that places of employment and living areas in a region matters. The apartheid regime and its planning policies resulted in the development of large distances where people live and work, where services could not be sustained and where the dynamics of a society were influenced by the economic environment (NDP, 2011:260).

In the NDP (2011:260), the Commission concluded that despite reforms in the spatial planning environment and systems, colonial and apartheid legacies still have an impact on the spatial system of the nation. In reaction to this, the Commission proposed a strategy that addresses the apartheid geography that creates suitable conditions for humane and sustainable living and working conditions. The strategy that was proposed focused on the following aspects (NDP, 2011:260):

- Respond systematically to entrenched spatial patterns that illustrates social inequality and economic inefficiency;
- implement strategic catalytic interventions aimed to promote spatial transformation;
- create balance between equity, economic competitiveness and environmental sustainability; and
- offer support to communities, individuals and the private sector in engaging with the state on the future of settlements.

To implement the strategy and pursue the aims of the NDP it is proposed that a national spatial framework should be developed as an instrument to drive the transformation of human settlements and the spatial system of South Africa. According to the NDP (2011:278), a spatial policy aims to coordinate and connect decisions that drives and shapes places efficiently. The spatial policy proposed here cannot transform the spatial system on its own and should be supported with plans that attract the support from both the public and private sectors. By promoting and implementing effective spatial planning, communities could be build that supports social cohesion.

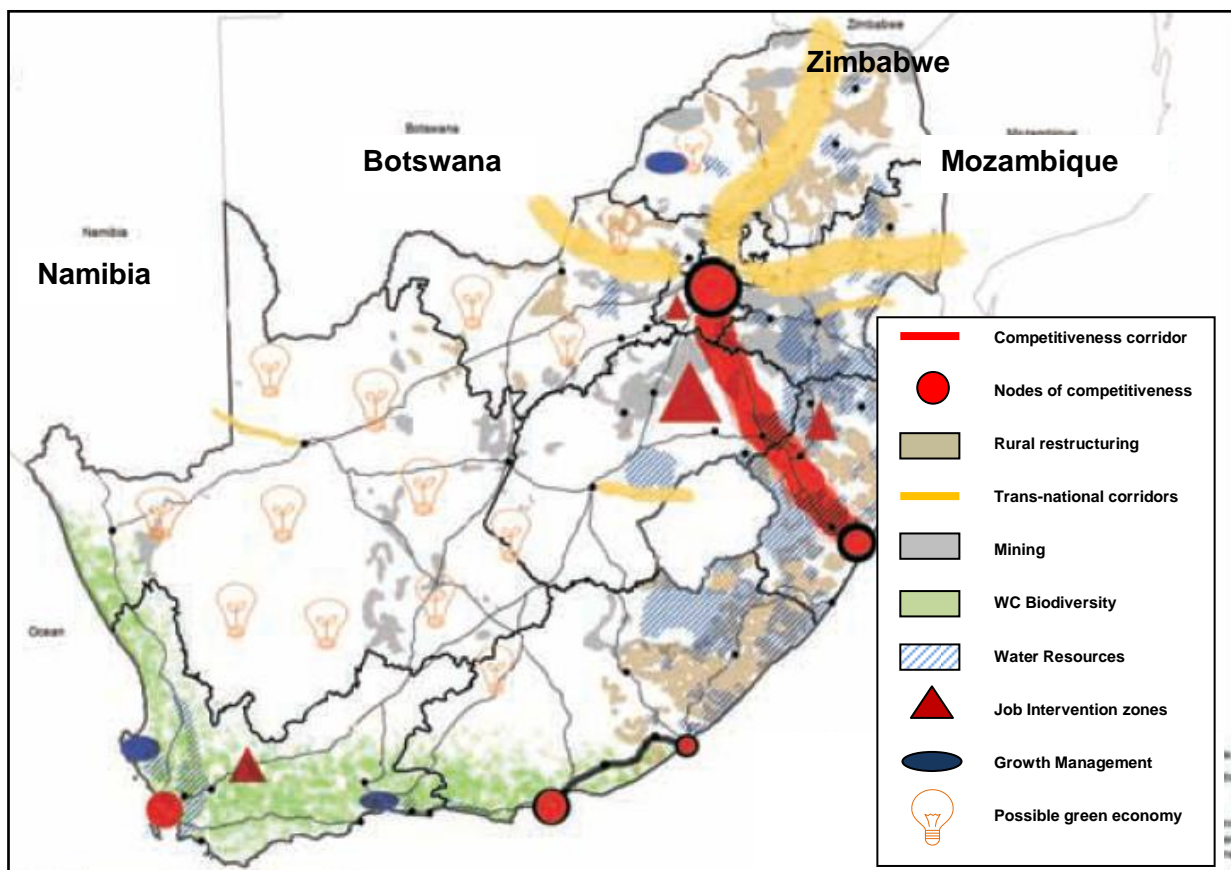
The spatial framework could also be used to promote the relationship and interdependence between South Africa and the neighbouring countries. The relationships can be strengthened by guiding measures to improve cross border infrastructure connections that would ensure efficient integration between the countries. This would in turn support the management of a wider network (urban hierarchy) of human settlements and supports the sharing of economic assets (NDP, 2011:278).

The development of this proposed framework should involve the government, business and civil society to identify accurate issues; and propose effective approaches to development. It can

therefore be concluded that the NDP follows a combination of a top-down and bottom-up approach by involving the mentioned three role players. This approach is similar to the NSDP which was discussed in Section 7.3.2.2. It is crucial that the private and public sector should understand the challenges and potential each area has and responds to this with a location-specific approach.

The Commission recognised that cities and towns are interconnected into an urban system that spreads beyond regional boundaries. It was also found that economic activity is becoming more consolidated in the largest cities (NDP, 2011:278). This confirms that currently the national spatial system and regions are becoming increasingly unbalanced. The Commission found that highly skilled activities requiring professional skills are decentralising as a result of technological development (NDP, 2011:278). This creates opportunities in smaller urban centres lower in the urban hierarchy but still connected in the urban system. The aims of this research could potentially be applied to these mentioned opportunities to identify smaller urban centres to develop and advance in the urban hierarchy in order to create balance in regions.

The national spatial framework deal with areas of national importance and aim to develop specifically identified locations and programmes to support growth in these areas. These identified areas and implementation of the programmes aimed to support growth are purely identified from a top-down approach. The Commission states that these areas (planning regions) would work best if external support, a fund or investment could be used to direct growth and achieve the specific spatial objectives (NDP, 2011:279). The establishment of such a fund would require fiscal arrangements in the economic policy of South Africa.



**Figure 7-7: Identified areas for growth in the NDP**

Source: NDP (2011:279)

The national spatial framework or scheme identified the following spatial targeting areas:

- *National competitiveness corridor*  
According to the NDP (2011:279) the corridor of logistic hubs, road, rail, fuel and other infrastructure including and connecting Gauteng and Durban is a crucial factor that impacts and determines the future growth of the national economy. This corridor should also be integrated in a Durban to Dares Salaam corridor.
- *Nodes of competitiveness*  
These identified nodes are clusters of urban zones that accounts for at least 5% of the national GDP or employment opportunities. These clusters show the potential for future growth and development and special attention should be given to these areas to ensure effective and sustainable growth and development.
- *Rural restructuring zones*  
The Commission noted that some rural areas consist of large populations and experience change in terms of urban form and settlement formation. These areas

need to be managed, developed institutionally, develop infrastructure and the economy needs to be stimulated.

- *Transnational development corridors*

The corridors that are classified as transnational corridors play an integral role in creating an integrated southern Africa economy. Specific interventions and policies are required to stimulate economic growth along these corridors to promote a sound relationship between the neighbouring countries.

- *Resource-critical regions*

Areas that have been identified in this classification consist of natural resources (mineral resources, important biodiversity and critical water production areas) that provide lifelines of economic and eco-system growth of South Africa. Specific policies are required to manage these areas and to ensure the sustainable development of these areas and responsible use of the natural resources.

- *Special intervention areas*

Special intervention areas are identified areas that require support from the government for specific periods. Job intervention zones are zones that illustrate more than 20% of job losses over the past decade. Job intervention zones require the stimulation of new economic sectors to diversify the economy and draw new employment opportunities. Growth management zones are areas that consist of potential rapid growth that requires management and planning in order to ensure sustainable growth. Green economy zones refer to areas that have the potential in the creation of “green jobs”. Intervention in these areas may result in significant private sector development and the creation of employment opportunities.

The NDP focusses on the transformation of human settlements by realising the impact of urban systems and relationships between urban areas. The NDP also proposes a national spatial framework that utilises the interrelationship of urban centres, but has a strong focus on top-down identified strategic areas that require special attention and planning. These areas are identified through a top-down approach. The NDP consist of a combination of both top-down and bottom-up approaches in the other planning approaches. Throughout the NDP it is clear that South Africa’s position in the world and the region is of major importance.

In order for South Africa to achieve the goals and objectives as set out in the NDP and to support the transformation of human settlements, the country needs the relationships between other countries to be developed through the local economy, political and social demands. According to

the NDP (2011:236), South Africa needs to set the following goals to position itself strategically in terms of the present and emergent global context:

- *Define national priorities*

The factors that are needed to establish a basis for foreign relations should include the promotion of sustainability of the natural environment, the global economy, international flow of migrants, human freedom and international cooperation. The revision of geopolitics of the country is necessary especially with the growing pressure on African countries as well as economic and institutional obstacles. This revision may eliminate the prevention of regional integration amongst the African countries with South Africa.

- *Aggressively expand trade and investment*

The expansion of trade and investment in the Africa region is important to build relationships and promote further integration with African countries. The expansion of trade would require the development and upgrading of infrastructure that links these countries such as development corridors and railways. The infrastructure should also be supported by effective trade facilitation systems and supply-chain management across the borders. This would eliminate administration issues that hinder potential trading routes.

- *Harmonise border policies*

Border policies between South Africa and the neighbouring countries should be harmonised in an effort to promote and support regional trading. Consultation is required to develop greater financial integration.

- *Integrate national institutions responsible for foreign policy, international negotiations and monitoring*

The support from South Africa's business community and research institutions are required to develop and enhance South Africa's negotiation skills to develop a high level of national competitiveness in southern Africa. Typical steps to support this would be to empower the Development Bank of Southern Africa (DBSA) by strengthening facilities like these institutionally in terms of capacity. South Africa is also critically underrepresented in these organisations, especially in the DBSA where South Africa is the major funder of the group.

- *Improve human security through effective transnational natural-resource management*

Human security could be achieved by managing vital issues such as the sustainability of natural resources (minerals, water and energy) as well as vital issues such as HIV/AIDS, malaria, tuberculosis and transnational crime. Interventions should be focussed on the improvement of livelihoods in countries that are mainly dependent on the agricultural sector and agro-processing. Support should be provided by improving productivity and to include a large portion of African producers in value and supply chains.

By pursuing the steps discussed above, South Africa would be able to position itself strategically to promote regional integration and help achieve the aims and goals of the NDP. As mentioned, for the purposes of this research South Africa's position in terms of continental integration is considered in an effort to align the sub-continental level study area with the NDP and to link the regional perspective and sub-continental study areas. In the following section the cooperation and integration in Africa is discussed.

### **Cooperation and integration in Africa**

In the investigation of the Commission, it was found that South Africa is perceived to be a regional "bully" in the African context and that the responsible policy-makers in this framework tend to not have a sound understanding of the geo-politics in Africa (NDP, 2011:239). This issue inhibits continental relations and integration with other African countries. The focus is merely on the issues experienced in the different countries rather than the promotion of relationships and integration between the countries.

Africa is often seen as the next upcoming growth region due to the slow but moderate economic growth experienced in many sub-Saharan countries. If growth continues gradually as it did over the past ten years in Africa, South Africa's effort in building African relationships will have a positive impact. Many economies are expected to emerge in the African continent, resulting in various significant growth nodes. The challenge now is to align South Africa strategically and develop into one of the powerhouse economies that takes the lead in development and influences globally.

According to the NDP (2011:239), other African countries like Nigeria and Kenya are likely to expand their economic influences, putting the South African economic influence in Africa at risk. The two mentioned African countries, with Egypt and Angola is likely to emerge as economic nodes in the continent. South Africa needs to establish relationships between these countries and position itself as a major node within this network of countries. South African policy makers need to urgently address this issue and to plan a way forward on how to promote integration in this network. This research illustrates on sub-continental level how a network could be planned

through balanced regional development by using the urban hierarchy as a regional planning instrument.

A major role-player in South Africa's role in the continent is the presence of a diversified economic base, which many of the African countries do not have. The continental links between South Africa, Kenya and Nigeria needs to be supported through a network of smaller emerging economies such as Angola and Egypt. This network could potentially attract foreign investment and promote further development in these countries. This need in the NDP illustrates and confirms the need for the sub-continental approach that follows in Chapter Eight. Due to the geographical location, external investment is most likely to come from the emerging Asian powers. The way forward would be to take cognisance of the emerging African economies and join forces to help shape the political economy of Africa and its global relations.

### **The SADC and SACU**

In South Africa's effort to position it strategically within the African continent and amongst growing economies it is needed to shift from the traditional way of thinking from regionalisation to regionalism. This paradigm shift would entail effective and careful political planning and possibly the establishment of formal institutions that takes responsibility of regionalism and integration. These institutions would probably take time to develop, therefore, the aims should be to first focus on the existing institutions i.e. Southern African Development Community (SADC) and the Southern African Customer Union (SACU).

For effective and strategic positioning, South Africa need to align its policy-making process to guide the following (NDP, 2011:243):

- Focus on what is practically achievable without over-committing to regional and continental integration.
- Remain an influential member of the international community.
- Stabilise the regional political economy through increased integration and cooperation.

In order to ensure effective implementation and progress in policy-making regarding continental integration, it is necessary to continuously review the effectiveness of the SADC policies and relationships. The main priority of these relationships and policies should be to ultimately expand the country's economy and influence. South Africa should also aid in terms of further development and support to the neighbouring countries in order to promote a good and sound relationship between the countries.

International and continental relationships need to be reinforced and reviewed in order to align the country's approach to promote national economy growth. According to the NDP (2011:256), South

Africa has a rich history in terms establishing cooperation between countries of the global south. The key in establishing relationships between these countries is to establish multiple transnational affiliations to support the growth, development and investment of South Africa and to position the country strategically to promote its influence in the African continent.

#### **7.3.2.4. Comprehensive Rural Development Programme**

The Comprehensive Rural Development Programme (CRDP) in essence deals with the meeting of basic human needs, the establishment of rural business initiatives, agro-industries, co-operatives, cultural initiatives, vibrant rural markets and the empowerment of rural people and rural communities (CRDP, 2013:10). All these elements are specifically focussed on to uplift the under developed rural areas in South Africa. These elements can be grouped in the social upliftment and human development of the rural population and providing economic growth and activity in the rural areas. The principle is to first focus on the rural population basic needs and to empower the people through education and skills development followed by initiatives to stimulate economic growth.

The CRDP envisions the development of equal and sustainable rural communities by promoting the following (CRDP, 2013:10):

- Effective spatial integration, land use planning and regulatory systems which promote optimal land utilisation and production as well as effective land administration;
- successful land reform that promotes agricultural development, increase production and food security;
- infrastructure development to support access to quality services and economic opportunities;
- enterprise development to stimulate the rural economy and creation of jobs;
- agro industries sustained by rural markets and credit facilities;
- human development through increasing and diversification of the rural population's skills;
- good governance and democratisation – emphasising accountability and shared benefits in the transformation of rural areas; and
- human well-being and sustainable environment – taking cognisance of the rural conditions and the interaction between people's well-being and the place in which they live for sustainability.

The progress and success of the aspects listed above needs to be measured and monitored. The CRDP built rural development measures into the programme to ensure that the proposal in the CRDP is implemented and the success is tracked. The rural development measures are grouped into three phases, including the meeting of basic human needs (Phase I), rural enterprise

development and rural industries (Phase II), markets and credit facilities (Phase III) (CRDP, 2013:12). Phase I specifically focus on uplifting the rural people and communities by primarily dealing with basic human needs. This phase consists of a detailed analysis of rural communities and the conditions they live in (CRDP, 2013:12). Phase II is regarded as the phase that focus on the entrepreneurial development including the establishment of enterprises and businesses by offering development support and initiatives in rural areas. This phase is aimed to revitalise and the revamping of socio, economic and information in local rural markets (CRDP, 2013:13). The CRDP (2013:13) anticipates that phases I and II would succeed in stimulating economic growth in rural areas. Phase III is specifically aimed at the development of different sized rural industries.

The CRDP recognises that homogenous development strategies are not suitable to address the challenges in the rural space. According to the CRDP (2013:25), challenges are raised for “blanket policies” that fail to consider the differentiated nature of the rural space in South Africa. In the CRDP, the necessity to build capacity in local government is realised as this is a vital step to ensure the monitoring process of the measure progress made in rural areas. In terms of the incentives offered for the establishment of firms and industries in rural areas, a well-coordinated multi-sectoral approach is required to ensure that communities are central to their own development.

#### **7.3.2.5. Integrated Urban Development Framework**

According to the UN (2010:1), 71.3% of South Africa’s population will be residing in urban areas by 2030 and nearly 80% by 2050. As a result of this future projection, the UN (2009:1) advised African governments to act accordingly and development plans or frameworks to position the countries strategically to be able to handle the pressures of a mostly urban population in the future. The Integrated Urban Development Framework (IUDF) is the framework developed to assist South Africa in the preparation of a mostly urban based population in the future. The South African landscape has not yet successfully created an inclusive and sustainable urban growth model, preventing transition to a resource -efficient growth path as envisioned by the NDP (IUDF, 2016:11).

According to the IUDF (2016:11), the framework investigates possibilities for a more effective and efficient management of urban spaces approach. The IUDF aligns with the NDP’s aim to develop cities as the country’s economic drivers through improved spatial efficiency (NDP, 2011:25). Based on the aims identified in the NDP and the issue raised from the UN, the IUDF reinforces South Africa’s need to (IUDF, 2016:12):

- Create more compact and connected cities and towns;
- increase inclusive economic growth and thereby create jobs;

- improve the employability of the unemployed (and those at risk of losing their jobs in a volatile global economy) by investing in healthcare, education, skills training and social protection;
- anticipate the changing nature of global economic competitiveness, as international measures come into force to deal with climate change; and
- change the governance social compact in South Africa, by giving citizens more scope to shape their own lives and improving public services and the accountability of public institutions.

The needs listed above helped guiding the general outcome of the IUDF to promote and drive spatial transformation in towns and cities by steering urban growth towards a more compact nature and improving connection between coordinated towns and cities. This framework guides the development of inclusive, resilient and liveable urban settlements, while also focussing on the unique set of challenges in South Africa (IUDF, 2016:7). The needs, aims and outcomes guided the proposal of the nine policy levers that aims to collectively address the structural drives that maintain the urban landscape of South Africa.

The nine policy levers identified in the IUDF includes (IUDF, 2016:8):

- Integrated urban planning and management
- Integrated transport and mobility
- Integrated sustainable human settlements
- Integrated urban infrastructure
- Effective land governance and management
- Inclusive economic development
- Empowered active communities
- Effective urban governance
- Sustainable finances

In terms of the integrated urban planning and management, the changing of spatial development will only occur over an extended period of sustained steps being prioritised. The aim in this element is to establish compact, integrated and connected cities and regions which are collective more productive (IUDF, 2016:46). Spatial, sectoral and strategic plans need to be aligned to guide development and manage growth. Municipalities are required to develop long-term plans aligned to the NDP and provincial strategies. The qualities of the municipal spatial plans need to be improved to ensure effective implementation of these plans (IUDF, 2016:47). As part of the spatial plans, municipalities should also ensure that land-use and human settlement planning are aligned to transport planning. According to the IUDF (2016:47), development needs to be focussed around main corridors and existing or emerging economic nodes.

Integrated transport and mobility could potentially be supported by empowering cities or local governments to support various public transport modes. Cities or local governments can be empowered or guided by a devolution strategy that helps to manage and integrate public transport (IUDF, 2016:55). The IUDF (2016:56) urges investment along core public transport nodes and corridors. This will only be enabled if these nodes and corridors are identified by cities or local governments. Once these regional planning instruments have been identified, the strategic planning documentation of the municipality should reflect that development are supported at these locations.

The IUDF (2016:63) proposed that integrated sustainable human settlements can be supported by accelerating and focussing on upgrading informal settlements. Areas of informal settlements, in the South African context, is often decentralised with limited access to economic activities and in environments not usually suited for settlement development. The IUDF (2016:64) also prioritises the regeneration of inner cities in an effort to provide additional urban opportunities other than informal settlements. The development of a national policy on inclusionary housing is also proposed as a potential short-term step that needs to be prioritised that can result in increased integration in cities and towns (IUDF, 2016:64).

Integrated urban infrastructure can potential be achieved by consolidating and coordinating infrastructure funding in cities and towns. As part of this, the strategic planning of municipalities need to include an overarching framework for infrastructure planning (IUDF, 2016:72). Infrastructure development and planning are directly linked to finance implications and capacity. The IUDF (2016:73) focusses on potential steps to secure and develop funding and increase capacity of infrastructure in the towns and cities. Infrastructure need to be developed to potential link rural and urban areas to promote efficient integration. Good infrastructure should enhance the socio-economic development in both urban and rural areas.

The IUDF (2016:75) also identified efficient land governance and management as a policy lever. This policy lever includes the growth of cities and towns through investments that provides income for municipalities that could allow further investment in infrastructure and services promoting an inclusive urban environment. Inclusive economic development is associated with the inclusive urban environment. The South African urban landscape needs to be transformed in a dynamic and efficient area which foster innovation, sustain livelihoods and enable economic growth that could be used to sustain and expand public services and amenities (IUDF, 2016:82)

Communities in towns and cities should also be empowered through a stable and safe landscape that promotes respect, embrace diversity and equality of all races and people of different backgrounds (IUDF, 2016:91). To support empowered and active communities, an effective urban governance system should also be created. Effective urban governance would have the

necessary institutional, fiscal and planning capabilities to manage multiple urban stakeholders (IUDF, 2016:98). The last policy lever proposed by the IUDF (2016:105) is by implementing sustainable finances. Sustainable finances entail efficient support through a fiscal framework that acknowledge development potential as well as pressures of urban spaces.

In conclusion, the IUDF's foundation is that employment, housing and transport systems are the key to effectively transform South Africa's urban landscape. Aligned with the NDP (2010:25) the IUDF promotes the restructuring of urban areas by reducing travel costs and distances, preventing further development of housing in marginal places, increasing urban densities to reduce sprawl, improving public transport and shifting employment opportunities and investment towards dense peripheral township areas. The nine policy levers that were identified are specifically proposed to form the basis for achieving an integrated urban development platform.

#### **7.4. Conclusion**

In this chapter, the regional plans and the history of the development of national industrial plans and spatial landscape and integration planning were studied. The study on these regional plans was focussed with specific reference to balanced regional development and includes the latest applicable national regional development plan. The regional planning milieu of South Africa is important to understand which historic approaches were successful and how some of these plans introduced and implemented regional planning instruments in the national spatial system. Common issues, identified in these plans, regarding the unbalanced spatial system and gaps between the urban hierarchies have a significant impact on forward regional planning. The combination of the role of an urban hierarchy and level of regional balance has a strong correlation on the national spatial system.

In the following chapter, the sub-continental study area is studied and evaluated to illustrate the role of an urban hierarchy on a larger scale. In this chapter, a set of criteria, aligned with the criteria used to evaluate the regional perspective study area, is identified in order to do strategic planning by incorporating urban hierarchy as a regional planning instrument. The focus of the sub-continental study area is important, as elaborated in the National Development Plan (Section 7.3.2.3), to position South Africa strategically in the continent and to promote regional relationships between the countries. By utilising the role of an urban hierarchy on a sub-continental scale, the aim is to promote the strategic position of South Africa by focussing on the relationship between important nodes in this spatial system.

## **CHAPTER 8: SUB-CONTINENTAL PERSPECTIVE**

### **8.1. Introduction**

In the previous two chapters, the focus of the study area was based on a regional perspective (regional perspective study area) to illustrate how an urban hierarchy could be utilised as a spatial planning instrument. However, it is important to evaluate the role of the urban hierarchy as strategic planning instrument in line with the national regional plans. In the study of the NDP (Section 7.3.2.3), a clear focus of South Africa in the continental context emerged.

The significance of positioning South Africa strategically in the continent explains the importance of this chapter. To take the correct steps in an effort to position South Africa to benefit from continental development, it is important to focus on the relationship and linkages between South Africa, other sub-continental countries and the SADC. Linkages and relationships between nodes were studied in Chapter Three of this research. The link between the urban hierarchy, urban system, linkages and relationships between different regions is undeniably important in any spatial development scale.

This chapter focusses on a study area on a greater sub-continental scale. The general approach followed in this chapter, aligns with the approach adapted in the regional perspective's study area. The difference in this approach is that the evaluation on a sub-continental scale utilises more general published data for specific areas and relates it back to specific nodal points in the study area. The implementation and role of an urban hierarchy as a spatial planning instrument is illustrated in this chapter.

### **8.2. Sub-continental research approach and methodology**

In Chapter Six of this research, the evaluation of the regional perspective study area was conducted to illustrate the role of an urban hierarchy as spatial planning instrument. After the evaluation of this regional perspective study area had been completed, the applicable regional plans and the development thereof were studied. During this study, the National Development Plan (Section 7.3.2.3) revealed that South Africa needs to align itself strategically in Africa through the strengthening of links and relationships with large economies in Africa. Apart from the need identified in the NDP, it is also well-known that South Africa is the gateway into Africa for foreign investors and developers. Through the combination of the last-mentioned factors, the need became evident to also illustrate the role of an urban hierarchy as spatial planning instrument on this much larger geographic extent.

With this large geographic extent kept in mind, it was important to establish a clear approach as to how the study and concept should be applied on this level. Two main points of departure included the general approach compared to the regional perspective study area and to focus the study on the promotion of regional balance and integration in the SADC. With a prominent corridor between the countries, a more direct link between these economies and South Africa exists. The links between South Africa and the SADC countries need to be supported and developed through corridor development to ensure effective integration and relationship building.

Secondly, it was important to illustrate the role of an urban hierarchy as spatial planning instrument through a general integrative approach. The principles in this approach should remain constant to ensure effective implementation. These principles included the study and evaluation of the region based on structuring elements and on socio-economic significance. This approach was also applied on the region between Angola and South Africa and also South Africa and Kenya. Being located on the east and west of the African continent, it was evident that two links needed to be created.

By following the same generic approach as in the regional perspective study area, the countries between South Africa, Kenya and Angola were subjected to a preliminary evaluation process. These countries all form part of the SADC, which creates a common ground of general statistics used for the preliminary evaluation. The SADC statistics yearbook formed the basis of the published data (latest published in 2014) used in the preliminary evaluation of the sub-continental study area (sub-continental study area). The aim of this preliminary evaluation was to establish which countries should be included in the in-depth evaluation of the sub-continental study area. The identification of the countries should form a continuous eastern and western link respectively between South Africa, Angola and Kenya.

After the preliminary evaluation process had identified and isolated the countries for an in-depth and focussed evaluation process, each of these countries was evaluated through a similar generic evaluation approach as followed in Chapter Six, on the regional perspective study area. The evaluation of each country was focussed on national level to identify the possible corridors that could be supported or established. These corridors should form a link from node to node and country to country, with the ultimate aim to promote corridor development between the countries of concern. The evaluation was first focussed on the structuring elements (nodes and corridors) and was then backed up with the socio-economic significance. The structuring elements' evaluation was focussed on the current hierarchy and national corridors of each country, while the socio-economic significance was evaluated based on published census and economic data of each of the included countries.

In general, the census economic and -employment data were combined with older published census datasets in to determine trends and correlate current data findings with previous published statistics. The status quo (current statistics) and historic trends formed a clear picture of the dynamics at play in each of the countries on a national as well as on a regional view. In all these cases, the smallest geographic level possible was used to source data from.

Each country was evaluated individually, but linked to the neighbouring country to form an eastern and western linking corridor. This approach was different from the conventional approaches followed in each of the included countries. The aim was to create and form a hierarchy of nodes, linked with corridors to ensure effective integration and promote the relationships between different countries with a common objective of linking large economies in the continent. In regional planning, each of the countries is seen as a planning region within the study area. The result is the lack of continuity in strategic planning and limiting economic potential to national boundaries.

### **8.3. Defining the sub-continental study area**

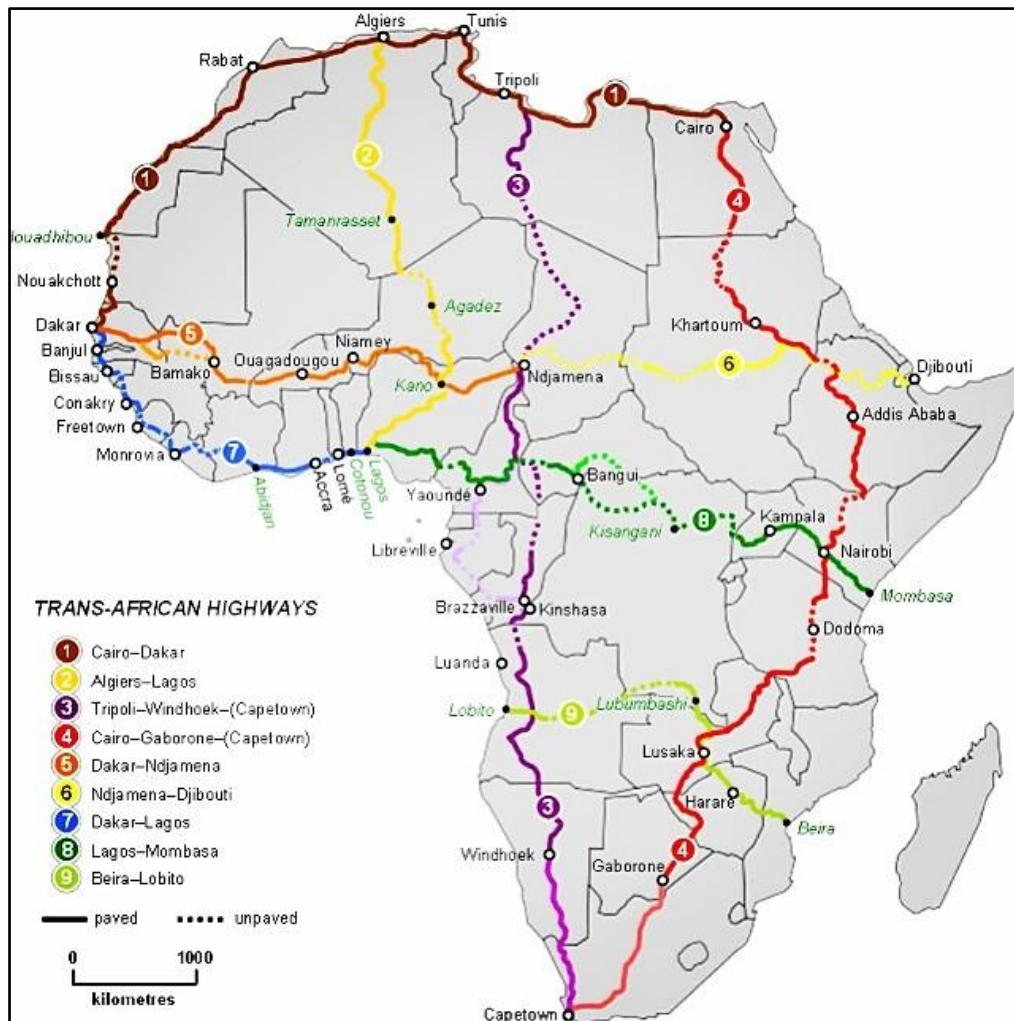
To illustrate the valuable role of an urban hierarchy on a sub-continental scale it was important to first delineate a study area on which these efforts would be focussed on. Due to the sheer scale of the African continent and the various challenges (political, lack of information, language barriers etc.), it was necessary to carefully consider where the study should focus on a sub-continental study area.

South Africa has been the main gateway to access the rest of Africa for many decades. According to Games (2012:1), the country offers various attractive features for businesses and companies globally looking to invest in Africa. Bosman (2016:4) continues by confirming that South Africa has the most diversified and sophisticated economy in Africa, which increases the ability to attract foreign investors looking to enter Africa. In many cases, the country then becomes the head office in Africa, where business and project in the rest of Africa could be run from.

To link the sub-continental study area with the regional perspective study area it was important to also consider the strategic outcome that the NDP had identified, namely that South Africa needed to establish itself strategically in the world (NDP, 2011:239). By starting to position South Africa optimally in Africa, the relationships between the immediate countries in Southern Africa needed to be built. By actively working on trans-border policies and trade negotiations in the SADC, sub-continental study area as a planning region could lay the foundation for many foreign investors looking to invest in Africa through a well-established network of relationships.

The relationships built or seen as “under construction” could be the groundwork for and support the development of significant growth nodes as the economies become more integrated. Many of these potential growth nodes already exist and just need to be offered proper support networks

through relationships. Increased activity could support a cross border, sub-continental urban system network that is spread through Southern Africa. The potential in this could also support the reason for delineating the sub-continental study area especially through the SADC countries. The NDP (2011:239) identifies the potential anchor economies likely to be involved. Nigeria and Kenya are actively looking to expand their economic influences through the continent followed by Egypt and Angola. This strategy could be developed with the aims to build continental relationships between other SADC countries and South Africa.



**Figure 8-1: South Africa as gateway into Africa**

Source: AFD (2003:52)

By studying the figure above, it is clear that two different routes or corridors need to be investigated to link South Africa with the SADC countries discussed in the previous paragraphs. The relationships between South Africa and the rising economies should be linked through the network of the countries between them. A network of relationships, or urban system, should be supported along the corridor to form continuous links into Africa. Smaller nodes need to be identified as strategic links that support the network and promote flow of products and services.

The NDP (2011:239) states that policy makers need to urgently address the issue of promoting integration in Africa. It is at this point that this research could be of value, by illustrating the role of an urban hierarchy as a spatial planning instrument. The role of the urban hierarchy as spatial planning instrument could be used to identify strategic nodes supporting the links between South Africa and the named economies.

Africa is often chosen for foreign investment due to its rich natural resources (Angola, South Africa, Democratic Republic of the Congo, Zambia etc.) and oil reserves (Angola). However, investment in South Africa is multi-sectoral, indicating the level of diversification and ease of doing business. According to Games (2012:2), South Africa has been one of the largest non-oil producing countries chosen for foreign investment. The SAIRR (2012) states that the countries' foreign direct investment (FDI) into the rest of Africa has increased four times the rate of its global FDI, from R3.8 billion in 1994 to R115.7 billion in 2009. Despite this significant increase in FDI, only a mere 8% of South Africa's total foreign investment is in the rest of Africa.

South Africa has provided multi-national companies with the platform from which businesses could be run in the rest of Africa. The foundation laid by these companies result in a significant number of business mergers and an increase in acquisitions by foreign investment companies. According to Games (2012:2), South Africa also has an established number of capitalised banks that help in attracting investors searching for access to the loans, trade finance and other products offered in the African continent.

The level of infrastructure in South Africa is also another attraction for foreign investors. Many foreign investors may also feel that they could aid in the development of new infrastructure in Africa. The infrastructure networks are directly linked to the transportation hub that is formed in South Africa. Games (2012:2) states that South Africa has been known for decades as the preferred transportation and logistics hub serving Southern Africa.

The location of South Africa in the global space puts the country in a strategic central location. South Africa's location is ideal for international airlines, shipping and logistic facilities. By studying the following figure, it is clear that South Africa is centrally located and in the ideal position in terms of fulfilling an international distribution hub, attracting external investment from various economic giants.



**Figure 8-2: South Africa as international distribution hub.**

Source: SAA (2016)

Due to the country's location globally and in the African continent, policymakers and investors are continuously looking for opportunities in which the country could become the hub in the African continent. (Legwaila 2010:2). South Africa also plays a pivotal role in the trans-shipment of products to other African countries by utilising the country's deep-water ports. Games (2012:3) also confirms that South Africa is already known to be the lead distribution centre for goods and services including equipment, car parts and other various food products.

### **8.3.1. Factors influencing South Africa as the gateway to Africa**

The potential in South Africa to link the country with other SADC countries on various levels (economic growth, investment, food security and trade relations) are enormous. As stated by Legwaila (2010:2), South Africa has always been one of the major role-players to form a basis to enter the rest of Africa. Given all these historic developments in terms of growth and being the preferred platform to launch global companies into Africa one tends to ask why South Africa has not yet fully developed in its role as the gateway to Africa.

The NDP (2011:239) also reflected on this underlying issue and lack of development as the true gateway to Africa by stating that there is an immense need to promote the cooperation and integration into Africa. The NDP (2011:239) continues by stating that South Africa needs to take desperate steps to align its policies strategically in terms of integration and the establishment of relationships into Africa. Umezurike *et al.* (2016:362) confirms that the factors preventing South

Africa to develop as the main gateway into Africa mostly are due to “in-house” difficulties and obstacles.

These obstacles are presenting unresolved issues that impact the decision of foreign and international companies to use South Africa as basis to enter Africa. Minerva (2011:1) confirms that international companies are using other countries to enter Africa by stating that it is Mauritius growing stature as the international centre serving various countries in Africa. Minerva (2011:3) states that Mauritius has developed as a rival to South Africa to fulfil the role as gateway to Africa due to internal and external factors. The factors preventing the development of South Africa and integrating it into Africa can be divided into two different factors namely external and internal factors.

#### **8.3.1.1. Internal factors**

High political demands limit South Africa’s potential to develop into the gateway of Africa. The country is struggling to find balance between the needs of potential investors and the needs of the political electorate (Games, 2011:3). To attract potential foreign investment the country needs to offer a stable labour union and relations environment, a constant work wage, high levels of technical and management skills and a capable state. The NDP (2011:25) touches on many of these aspects and identifies the need to build a capable state and eradicate corruption.

South Africa also lacks a transparent policy environment and the level of intervention of government driven economic decisions and policies. These factors are mostly influenced by the increasing popularity in the political environment. Many government decisions and interventions in South Africa are often driven by the demands of the nation and the willingness of the political parties to adapt to these demands in order to gain popularity amongst the residents.

The unstable labour environment is also of great concern where strikes occur on a regular basis that often has direct impacts on the economic growth of the country. Games (2012:3) confirms this by stating that in the first half of 2011 more than 30 million man days were lost due to strikes, which increase by 23% over 2010. Games (2012:3) also compares this statistic with the state in Nigeria where 4,75 million man days were lost due to strikes between 2004 and 2009. The significant gap between these statistics also confirms that there is a problem regarding labour productivity, which has a direct impact on economic growth of South Africa.

The government is also not as allowing and open to foreign investors, which drives away various economic growth and development opportunities. According to Games (2012:3), this negative attitude was recently highlighted in the treatment of government regarding Walmart in its bid for local retail giant, Massmart. Games (2012:3-4) also lists other internal challenges that have an impact which include the following:

- Exchange controls (hardly present in other African countries),
- Declining industrialisation (exporters struggle with high business costs),
- Decline in key investment sectors, especially in mining,
- High costs at Durban port making it a less attractive entry/exit point to the region,
- Congestion at the Beit Bridge border post, which remains a major bottleneck of Africa,
- Increasing competition from other African banks, particularly from West Africa,
- Hikes in the cost of power because of resources mismanagement and a lack of proper maintenance, and
- High, albeit declining, crime rates and the rapid increase of corruption.

It is clear that there are various internal factors that keep South Africa to form the important link between international countries and the rest of Africa. These factors all need to be addressed either from a policy and/or a political basis in order to strategically align South Africa to integrate into Africa as stated in the NDP. Apart from the internal factors, various external factors also exist that has the same impact as the internal factors.

#### **8.3.1.2. External factors**

Many international businesses have a great regard to where businesses could be launched geographically and managed in Africa. The role the geographic location plays in this decision-making process becomes clear when realising that various other smaller gateways are currently being used to launch businesses of different natures into Africa. Examples of these smaller gateways can be seen in the case of Mauritius where different international banks enter Africa as well as in other mining companies specifically located near the natural resources.

Luanda is also often the preferred location by various Brazilian companies to enter Africa (Games, 2012:3). The relationship and influence of China is another perfect example. The China – Africa development fund was established in South Africa (Qiaowen, 2015:1). Games (2012:3) confirms that China nowadays prefer to rather deal directly with other African countries and politics rather to use South Africa as a gateway. Many Chinese companies are now based in countries such as Ghana, Kenya, Zambia, Botswana and Ethiopia.

Relationships between companies globally are also being supported by the rapid expansion of the network of airlines. Large economies in Africa has utilised this option with the investment in their national airlines. According to Games (2012:3), examples of this rapid expanding network of airlines are seen in Kenya (Kenyan Airways) as well as Ethiopia (Ethiopian Airlines). Emirates Airlines are also supporting this notion of development from Dubai. The establishment of these new routes and support from these airlines means that business men no longer travel via South Africa to the business destination in Africa, but can now opt for direct flights.

With the increasingly high import and other transport costs, many international companies now opt to ship the products directly to the coastal bound countries and choose the shortest route to the other destinations. Kenya is a good example where Mombasa is considered as a major port in Africa from where various countries import their goods. The linkages and infrastructure that starts to develop in Africa is taking the focus off South Africa as becoming the main gateway to Africa. The challenge lies in aligning South Africa's efforts to contend for the status by ensuring effective linkages and networks of relationships in the rest of Africa, starting at the SADC.



**Figure 8-3: South Africa in context of the SADC**

Source: Ngwawi (2016)

Umezurike *et al.* (2016:363) states that South Africa is continuously being seen as the main gateway to rather enter Southern Africa rather than the sub-Saharan Africa. Strategically this makes sense in gradually entering the rest of Africa through Southern Africa. The main focus should be to first establish sound relationships and integration between the countries in Southern Africa in order to effectively enter market in the rest of Africa. This also confirms and supports the sub-continental study area with the focus on the SADC. By focussing on the SADC, the sub-continental study area aligns with the outcomes identified in the NDP and fits in the strategic vision of other international companies.

## **8.4. Evaluation criteria for sub-continental study area**

### **8.4.1. Introduction**

To evaluate and illustrate the role of an urban hierarchy on a much larger geographic scale than the regional perspective study area, an applicable criterion for evaluation should be determined. The size and contents of the sub-continental study area pose certain threats and limitations that need to be considered in the criteria for selection. The first limitation the sub-continental study area includes is the large geographical coverage of the SADC. This coverage and different countries included makes it difficult to consolidate into one common study area.

The second limitation in the sub-continental study area is focussed more from a statistical point of view. The one aspect is the lack of a regular and updated statistical basis on smaller levels than from a national point of view. In Africa the availability of regularly updated statistics is a major issue in terms of research. The available statistics are often based on a high level with limited detail in terms of smaller geographical levels. The second aspect refers to the structure and statistic reports.

The way in which statistics is published in Africa differs from country to country. The last-mentioned aspect in particular is of concern as the types outputs consist of different reports and structures. The challenge lies in creating a criterion that could be applied on a large geographical scale that is not based on assumptions and is supported from a statistical point of view. The criteria proposed should be backed by the current state and physical elements (structural elements) and supported by statistics.

Although the ideal would have been to evaluate the regional perspective and sub-continental study areas both with the exact same set of criteria, it simply is not possible without common standardised data. The regional perspective study area includes statistical datasets of a common standard and structure, which help to promote effective evaluation. The sub-continental study area does not consist of a standardised data that could be applied in uniform over the entire study area. An example of the impact of the regional perspective criteria is the element which takes into account the "Economic Concentration" of the area. This specific statistic is not measured in detail on a small geographical level.

As mentioned before, it is necessary to propose a unique criterion for the sub-continental study area evaluation. This criterion should aim to effectively illustrate the role of an urban hierarchy on a sub-continental study area and prevent the lack of statistical information to influence the outcomes. The idea is to create a common criterion, which is still focussed on the entire study area and build on the foundation of common statistics and existing elements that could be implemented as a blue print over the study area. By following this approach, different countries

could be evaluated on a common statistical background and existing elements. The following sections discuss each of the applicable elements that are included in the criteria.

#### **8.4.2. Structuring elements**

In Chapter Three, the importance of structuring elements was discussed. As mentioned, the role structuring elements play in the regional and strategic planning is vital due to the significant impact these elements have on a geographical context. These structuring elements can be identified as the regional planning instruments. These elements help with the formation and development of any region on different geographical levels. In this case the regional planning instruments would be applied on the sub-continental level study area. The instruments that would be used as guidance to illustrate the role of an urban hierarchy on a larger scale would be through the use of nodes and corridors.

On this sub-continental scale, different nodes and corridors are used to structure the interaction and movement of people, goods and services through Africa. Nodes and corridors in Africa and in the identified sub-continental study area have a strong relationship with each other. With the combination of these two regional planning instruments, this much larger geographic scale serves areas with various goods and services on different levels. Nodes and corridors, as discussed in Chapter Five are also directly linked to the establishment of an urban hierarchy and ultimately an urban system.

In the case with nodes in the geographical level of the identified study area are easily identified through aerial photography as well as primary research in available data. In the study area, an existing hierarchy of towns and cities could easily be identified. This hierarchy would be illustrated and evaluated in terms of its proximity to other nodes (urban hierarchy) and the possible position in terms of major transportation routes. By combining the identification of the current hierarchy of nodes in the study area, the current linkages to surrounding areas would also be evaluated.

From the existing linkages, road networks and distribution routes between different nodes in the spatial system would be directly linked with existing corridors and evaluated accordingly. In the absence of existing development corridors, major routes and important national roads would be used to guide the evaluation process of corridors and distribution patterns, which ultimately has an impact on the establishment of the urban hierarchy. The existing hierarchy would then be evaluated according to the combination of the nodes and corridors.

It is important to remember that the identified study area do include various countries of the SADC. The political or administration boundaries should not have a direct impact in the evaluation process of the study area in terms of nodes and corridors as discussed in the previous

paragraphs. The reason behind ignoring national and administrative boundaries is to evaluate the study area as one entity and not evaluate the different countries as separate entities.

The reason why the study area should be evaluated as one entity is to illustrate what the role of the urban hierarchy over the entire area can play as a spatial planning instrument irrespective of national boundaries. The ultimate aim after the evaluation process in this research is to recommend an urban hierarchy that would enable effective flow of goods and services to promote national growth and to establish more sound relationships between the included countries. This would then align with the outcomes and issues raised in the NDP and discussed in Section 8.2. From this section, it can be concluded that, in terms of the structuring elements or spatial planning instruments, the same approach in terms of nodes and corridors on the regional perspective study area is tried to be aligned with the sub-continental study area. From a statistical point of view, the limitations mentioned earlier result in a slight difference in the criteria followed in Chapter Six.

### **8.4.3. Statistical focus**

To substantiate the findings and evaluation from the structuring elements as discussed in the section above, it is necessary to support the evaluation through statistical information. In terms of the approach, the statistical focus aligns with the approach followed in the regional perspective study area in Chapter Six. The major inhibiting factor in African countries is the lack of accurate and up to date census information and other related economic stats. Although many countries do publish some statistics, these statistics are often based on a large geographical level such as national and occasionally provincial. The other problem is that some of these statistics are also published in different languages as in the case with Angola with Portuguese as the main language.

The most common statistics that is often published are focussed on the population and consist of a pure demographic approach such as sex, race and age. To substantiate all the countries on an equal base, the most prominent and standard statistic published is focussed on population. The size of the population will be used as a standard statistical evaluation criterion. As found in Chapter Five, population is often directly used to determine an urban hierarchy on various occasions. By combining the statistical approach with the structural approach, a more accurate evaluation could be completed in the identified study area.

Regarding this issue the level of geography that population statistics are sometimes based only on larger district or provinces, these statistics will be used as guidance to confirm the current hierarchy by comparing the identified nodes as identified in the structural elements section. Due to the level of development in African countries, the correlation between population size in a province is more directly linked provincial statistics than in South Africa for instance. Urbanisation in African

countries is also common phenomenon. This would aid in confirming the local nodes and inform recommendations by combining it with the structural elements.

It should also be noted that not all African countries exhibits the same lack of published statistical information. Some countries in the identified study area do consist of a larger base of statistical information and smaller geographical levels. In these cases, all available statistics would be utilised such as levels of employment, occupations and Gross Value Added at basic prices (GVA) per economic sector. This is to present a most accurate evaluation of the sub-continental study area.

By combining the structural elements and the statistical focus in the evaluation of the study area a current hierarchy could be identified and confirmed using statistical information. This criterion will also be used to recommend invest opportunities at certain strategically place nodes that consist of the potential in enhancing the relationships between different nodes in the region to ultimately move up in the urban hierarchy. By following this approach, the role of an urban hierarchy would be to illustrate where to invest sustainably and propose interventions in regional and strategic plans of the study area. In the following section the study area will be evaluated based on the discussed criteria.

## **8.5. Evaluating the sub-continental study area**

### **8.5.1. Preliminary Evaluation**

To start the evaluation of the sub-continental study area, it is necessary to first study the SADC and all the member countries. By focussing on the SADC from a country point of view, it could aid in the identification process of which member countries should form part of the sub-continental study area. The integration between the countries in this regard should be promoted through regional balance and link with South Africa. In Chapter Seven it was found that the connection between South Africa with other African countries is important.

In Section 7.3.2.3 it was mentioned that a few African countries can be seen as the main economic role-players and showing economic growth with potential in terms of trade and investment. Specific reference in this section was given to Kenya, Nigeria, Egypt and Angola in the following paragraph:

*“The continental links between South Africa, Kenya and Nigeria needs to be supported through a network of smaller emerging economies such as Angola and Egypt. This network could potentially attract foreign investment and promote further development in these countries.”*

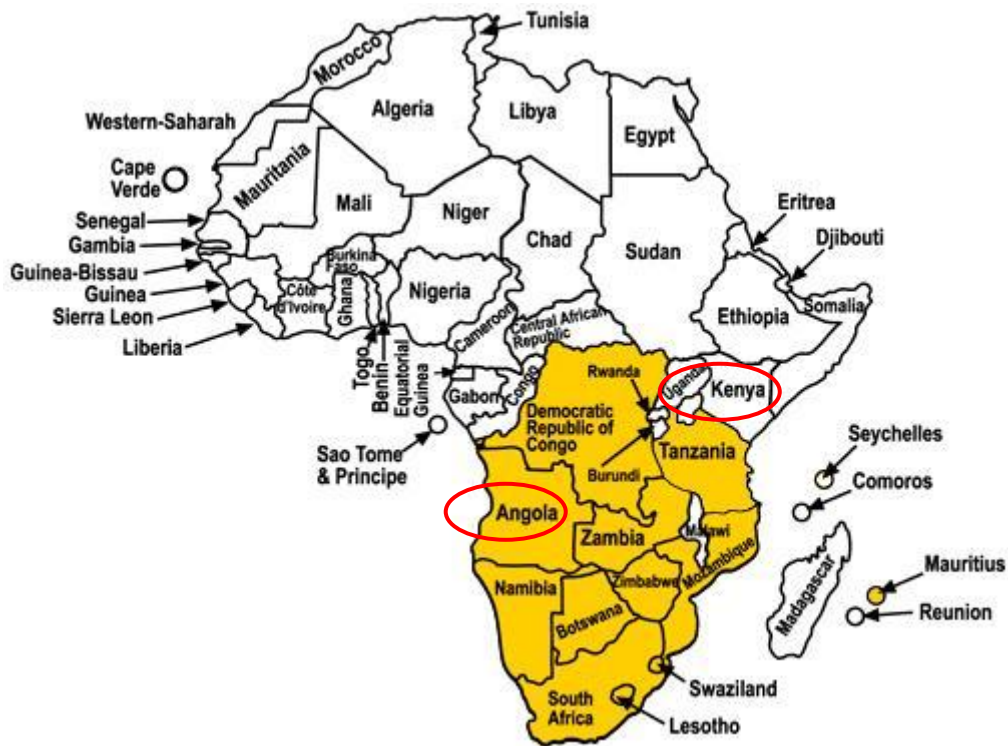
With this outcome and need already identified in strategic regional planning documentation of South Africa, the challenge lies in confirming the viability and linkages between these countries. The role of an urban hierarchy as a spatial planning instrument refers to the development of a network of nodes in a linear form between the applicable countries. This network should exhibit strong linkages between the nodes in the countries to promote regional balance and integration. By evaluating the SADC on country level and as an entity, a preliminary evaluation on the potential link from a country basis need to be investigated. Prior to the investigation, it is necessary to define which countries and capital cities exist in the SADC. The member countries and their capital cities are summarised in the following table:

**Table 8-1: SADC Member Countries and Capitals**

Source: BSA (2015)

<b>COUNTRY</b>	<b>CAPITAL CITY</b>
<b>Angola</b>	<b>Luanda</b>
<b>Botswana</b>	<b>Gaborone</b>
<b>Democratic Republic of the Congo</b>	<b>Kinshasa</b>
<b>Lesotho</b>	<b>Maseru</b>
<b>Madagascar</b>	<b>Antananarivo</b>
<b>Malawi</b>	<b>Lilongwe</b>
<b>Mauritius</b>	<b>Port Louis</b>
<b>Mozambique</b>	<b>Maputo</b>
<b>Namibia</b>	<b>Windhoek</b>
<b>Seychelles</b>	<b>Victoria</b>
<b>South Africa</b>	<b>Pretoria</b>
<b>Swaziland</b>	<b>Mbabane</b>
<b>Tanzania</b>	<b>Dar es Salaam</b>
<b>Zambia</b>	<b>Lusaka</b>
<b>Zimbabwe</b>	<b>Harare</b>

By studying the geographic spread of the SADC and its capital cities (Figure 8-4), it is clear that Kenya and Angola (as mentioned as possible nodes and major economic role-players) are located on the western and eastern coasts of Africa. This implicates two different potential links (Eastern and Western linkages) that needs to be investigated in the sub-continental study area.



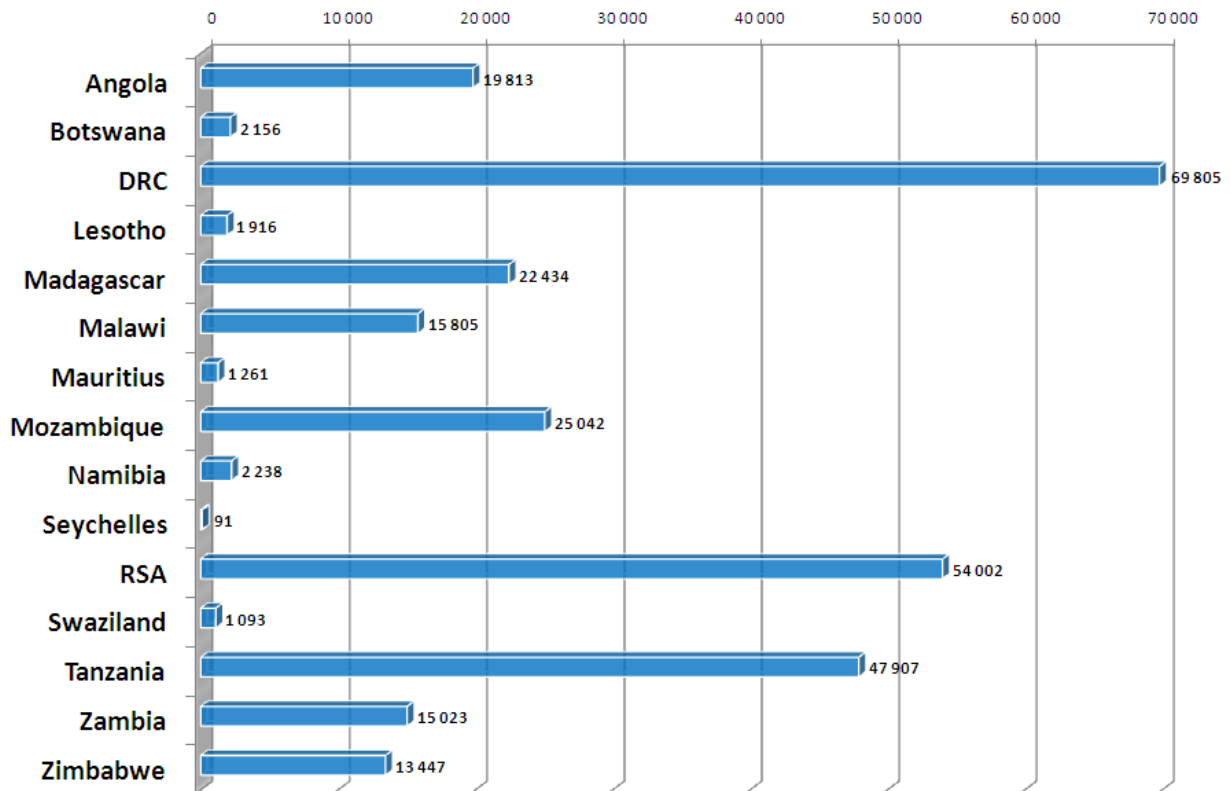
**Figure 8-4: SADC Member countries in Africa**

Source: BSA (2015)

In the evaluation of the SADC from a country perspective the population size, sub-continental economic growth (GDP), Human Development Index (HDI), risk (in terms of political and economic stability), labour and employment, and ease of doing business will be included. These factors cover the demographic and economic potential of the countries as well as the possibilities in terms of development and employment that could create a more sustainable environment for external investment. Member countries showing potential with regard to these factors would then be further investigated on a national overview in terms of urban hierarchy and internal linkages. The identified countries in the SADC will then be seen as a planning region as explained in section 3.7. The approach of utilising these countries in the study area aligns with the approach on the region perspective study area (Section 6.2).

#### **8.5.1.1. Population**

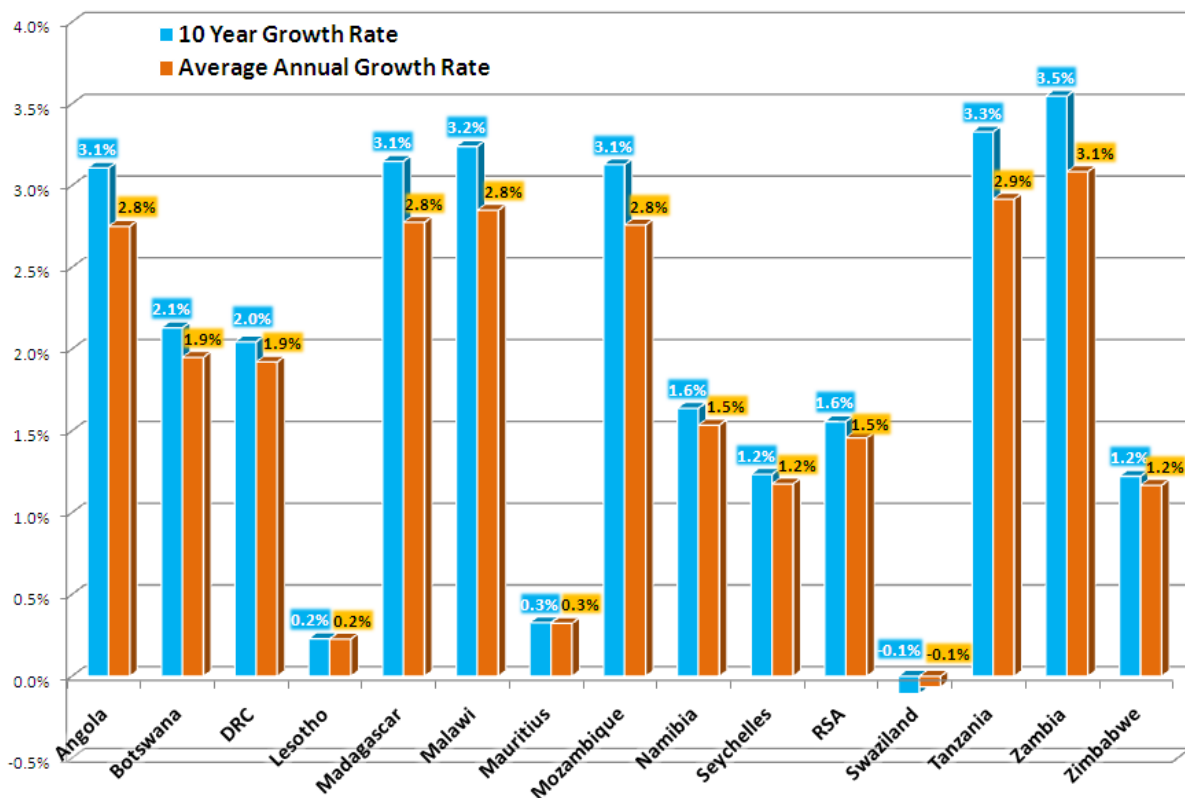
The population evaluation specifically refers to the total population per country for both sexes for the period between 2004 and 2014. The population per country for this period (past decade) is important to evaluate as this might be an indicator in terms of potential in human resources. Additionally, Zipf (1941:33) confirmed that the urban population size is directly linked to the urban hierarchy. From a country point of view, the total population is linked to the population in urban centres. The following figure illustrates the total population for each of the member countries as recorded mid-year in the SADC Statistical Yearbook 2014.



**Figure 8-5: Population by country**

Source: SADC 2014 Yearbook

From the chart above it is clear that the five countries with the highest population number are the Democratic Republic of the Congo, South Africa, Tanzania, Mozambique and Madagascar. Although the population number is important, the focus from a country point of view may somewhat have an impact on the potential and could be linked to the geographic coverage and other social factors. For this reason, the population statistic from a country point of view could not be considered as a potential indicator on its own. The total population of each country indicates the size of the population, but does not indicate the growth in this section. In the following figure the population growth per country will be evaluated.



**Figure 8-6: Population growth rates by country**

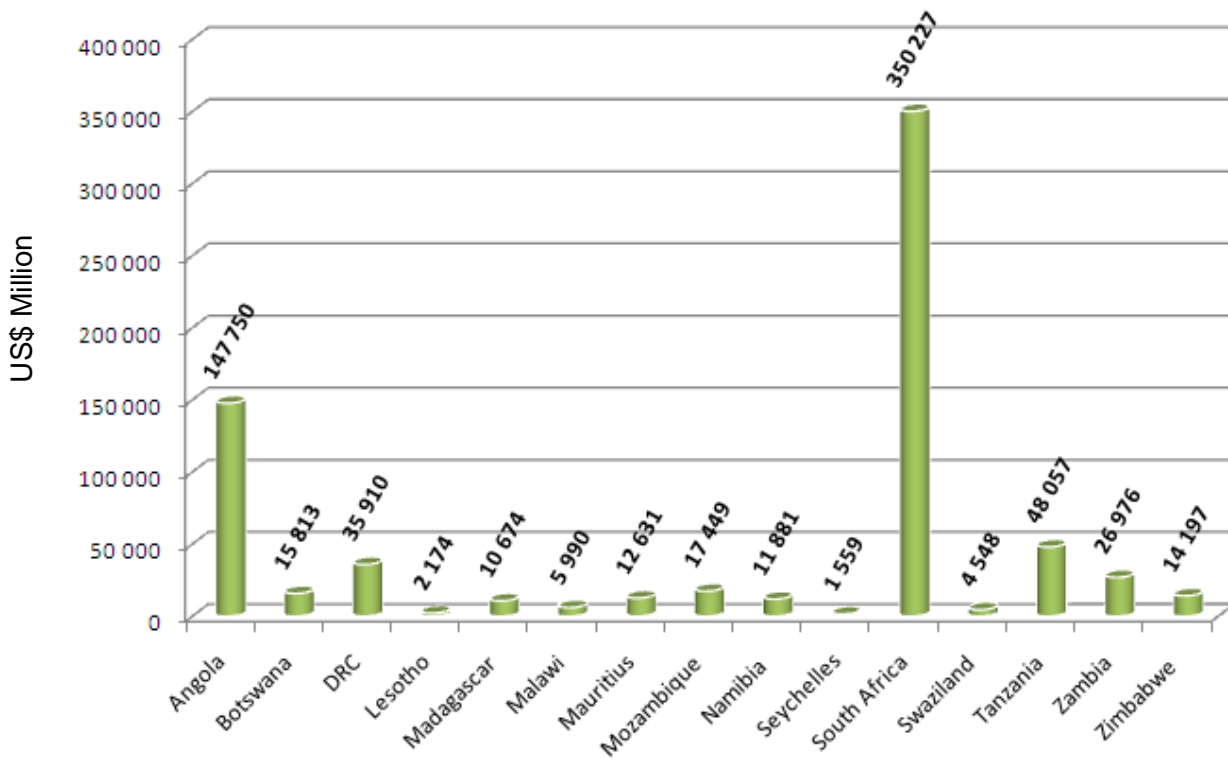
Source: SADC 2014 Yearbook

When the population growth rates of each country are considered, it is clear that on average the 10-year population growth rate are higher than the average annual growth rate per country. Further to this it can be concluded that Angola, Madagascar, Malawi, Mozambique, Tanzania and Zambia are the countries showing the most significant annual growth rates for the past decade. If the population growth rates are combined with the total population, a much more accurate evaluation in terms of population could be completed. If these statistics are combined, it can be concluded that in terms of population and population growth Angola, Tanzania, Zambia and Mozambique are the main role players in the SADC.

### 8.5.1.2. Economic growth

The next step in the evaluation process of the SADC is focussed more on an economic perspective. The previous factor focussed mainly on the demographic potential of the countries. In this step an indication is the Gross Domestic Product (GDP) is used as an indication of the sub-continental economic growth and potential for increased economic activity in the member countries. The GDP indicates the total value of goods produced and services provided in each of the member countries. This can also serve as an indication of a possible main node that should be used to link South Africa and potentially expand the network of services provided amongst other member countries of the SADC. This could ultimately promote interconnectivity in the region. The

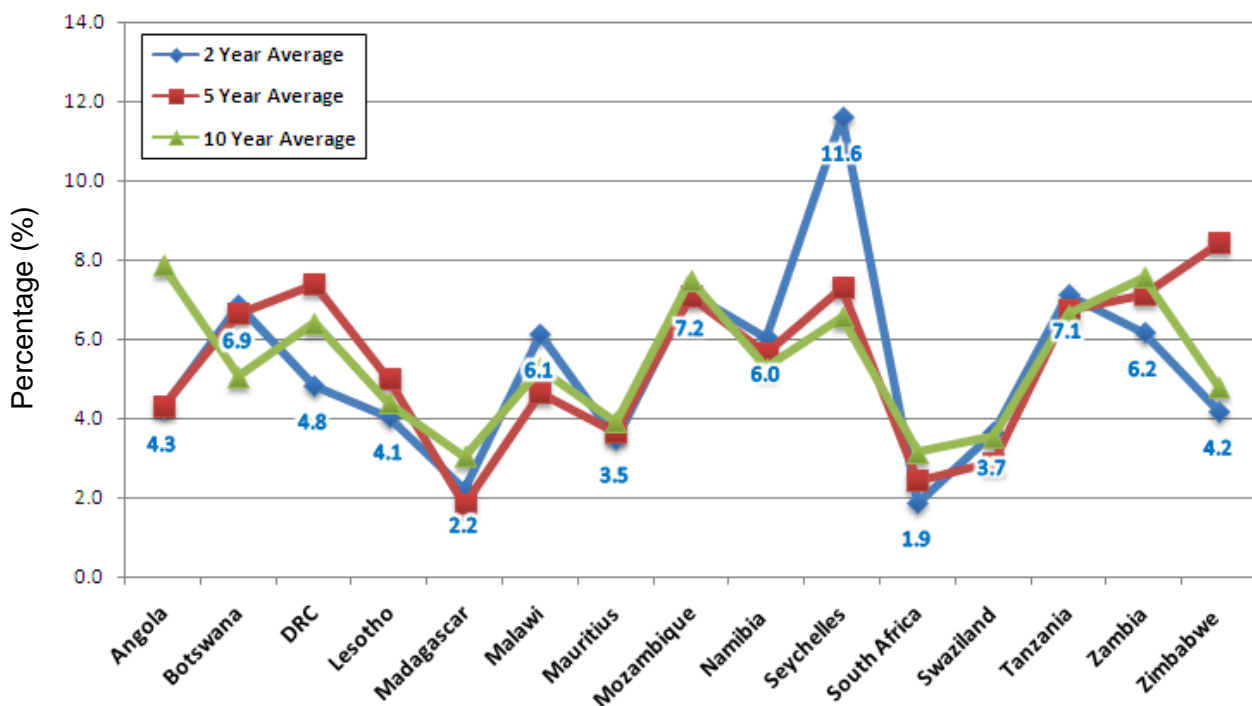
following figure illustrates the total GDP in each of the countries as recorded by the SADC (2014 Statistical Yearbook).



**Figure 8-7: GDP by country**

Source: SADC 2014 Yearbook

From the total GDP per member country, it is clear that the five regions showing the highest total GDP's are South Africa, Angola, Tanzania, DRC and Zambia. The total GDPs as shown in this figure illustrates the "triangle of potential between South Africa, Angola and Tanzania. Tanzania in this regard could be seen as the link to Kenya. The link with Kenya is important as stipulated in the NDP (2011:239). The total GDP however refers to the latest released GDP and form an idea of potential linkages with countries that has a sounder economic basis and potential to expand. In order to see how sustainable the GDP output is in these countries, the GDP growth rates need to be used. The GDP growth rates show the economic stability from a two, five and ten-year perspective. The following figure illustrates these growth rates.



**Figure 8-8: GDP growth rates by country**

Source: SADC 2014 Yearbook

If the different GDP growth rates over the three different timeframes are used, it can be concluded that in general, all the member countries show positive growth rates with the lowest growth rate registered over the past two years by South Africa at 1.9%. In the evaluation of this second factor the trends in growth rates needs to show increases gradually or the growth rates need to be stable at a certain rate. Fluctuations in growth rates as experienced in Seychelles over the past 2 years could only be sensitive to certain events or a once-off growth spike.

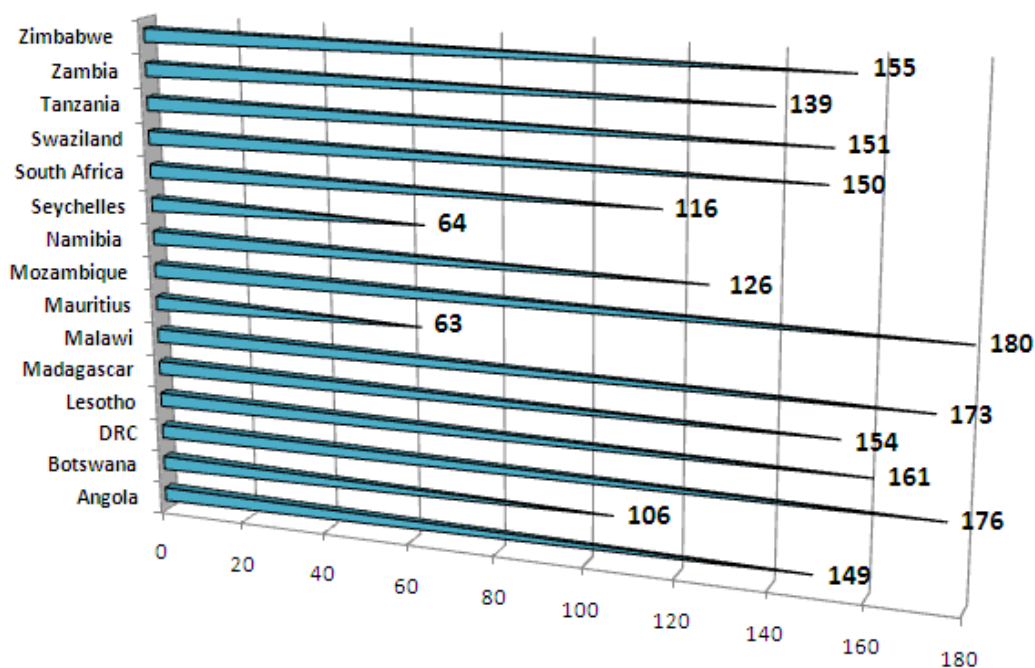
From this information, it can be concluded that Tanzania showed a gradual increase in GDP from the 10-year to the 2-year average. Zimbabwe, on the other hand showed a big decline in the GDP growth rates. Constant GDP growth rates are seen in Botswana, Mozambique, Mauritius, Namibia and Swaziland. While in the short-term Angola also showed a more constant GDP growth rate. The impact on the aim of the study on the western side of the continent is that Namibia could be used as a link between South Africa and Angola, which aligns with strategy and need to link Angola and South Africa.

The eastern side of the African continent is a rather complicated situation with the need to link with Kenya in the east. With a decreasing economic growth rate in Zimbabwe, different options can also be considered as links through either Botswana or Mozambique with a much more stable sub-continental economic environment. Botswana and Mozambique both have low total GDPs

compared to other member countries in the SADC. Possible further links could then be considered through Zambia and Tanzania towards Kenya.

### 8.5.1.3. Human Development

The HDI statistic, or the Human Development Index, is an index that ranks countries according to the level of human development. According to the DBSA (2001:11), the HDI uses the combined impacts of life expectancy, literacy, education and standards of living to determine the rank. The HDI is specifically focussed on the well-being of the particular country's residents. This index does not include the impact of economic performance and growth as already been evaluated in the previous section. The HDI can be seen as an additional factor that is directly linked to the total population of the countries as discussed in Section 8.4.1.1 as well as the general well-being and level of education of the population. The lower the rank achieved by countries, the higher the level of human development of that country. The HDI ranking of the member countries in 2014 will be used as an indication for the evaluation.



**Figure 8-9: Human Development Index ranking by country**

Source: SADC 2014 Yearbook

From the 2014 (latest) HDI rankings, it can be concluded that most of the member countries in SADC do not have high levels of human development. This also confirms the need for external help and investment and the overall improvement of human development in the African continent. The HDI rankings show that the lowest rankings are achieved by Seychelles and Mauritius, which are both island countries. The concern and focus should also be more on the countries that could potential improve integration and connectivity within the SADC. The lowest rankings (apart from

the two island countries) are Botswana, South Africa, Namibia, Zambia and Angola. Mozambique's (which was considered as an alternative to bypass Zimbabwe due to the impact of the sub-continental economic stability) does not show a good ranking and level of human development. Based on the HDI factor, Botswana can be viewed as an alternative link to Zambia, Tanzania and ultimately Kenya.

#### 8.5.1.4. Risk analysis

Apart from existing factors and indicators such as population, economy, labour and employment and the HDI certain research papers and external companies have also used other indicators that are linked to investment and development. Dave *et al.* (2016:1) have indicated in the Business Monitor International's (BMI) Southern Africa outlook that an index could be used to illustrate the risk rating in the short and medium term pertaining the stability of countries. The BMI's country risk index scores countries on a 0-10 scale. This index evaluates the short and long-term political stability, economic outlook, potential and operational barriers to doing business. The risk analysis statistic is based on a larger geographic scale and only published per country. The short-term outlook refers to a current 3 to 6 months period while the long-term outlook refers to 6 to 24 months. The following table indicates the BMI's Country Risk Index for Southern African countries:

**Table 8-2: Country risk indicator**

Source: Dave *et al.* (2016:1)

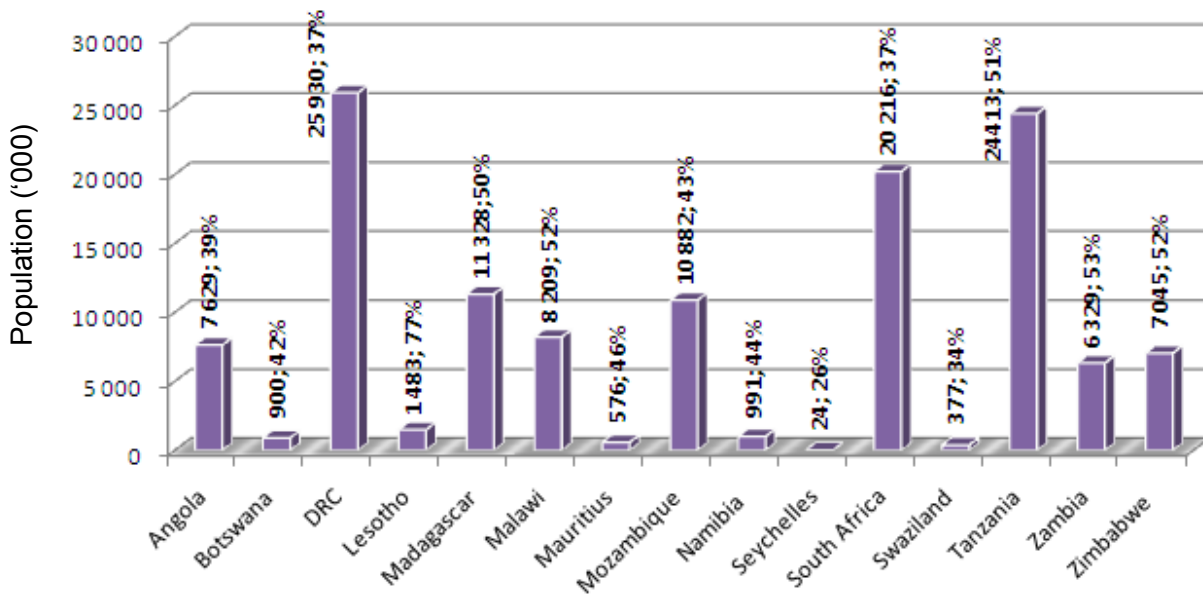
Country	Short Term		Long Term			Country Risk
	Political	Economic	Political	Economic	Operational Risk	
Mauritius	82.7	57.9	81.5	59.8	62.4	67.7
Botswana	72.9	65.8	69.0	59.7	48.5	60.3
South Africa	62.7	49.4	63.4	60.4	54.3	57.5
Namibia	69.6	36.5	62.7	45.6	48.5	51.7
Zambia	61.2	41.7	54.2	47.6	44.4	49.0
Mozambique	46.7	33.3	55.3	37.9	34.4	40.4
Angola	66.0	32.5	51.7	40.2	31.8	42.5
Madagascar	49.8	31.0	41.4	39.0	36.9	39.3
Zimbabwe	41.5	18.1	39.2	27.0	34.4	32.4
<b>Regional Average</b>	<b>61.5</b>	<b>40.7</b>	<b>57.6</b>	<b>46.4</b>	<b>44.0</b>	<b>49.0</b>
<b>Global Average</b>	<b>64.3</b>	<b>50.1</b>	<b>61.3</b>	<b>52.8</b>	<b>49.9</b>	<b>54.7</b>

From the Country Risk Index of Southern Africa Countries there is a clear distinction between countries of lower and higher risks. In the table it can be concluded that Botswana, South Africa, Namibia and Zambia are the countries that are considered of a lower risk in the short and long-term compared to Mozambique, Angola, Madagascar and Zimbabwe. From the country risk index above, it is clear that Zimbabwe is considered a major risk showing an unstable and unclear future in terms of development and doing business. This factor suggests that Botswana can rather be

used as an alternative route to link with Zambia and Tanzania opposed to Mozambique, which is also considered as a higher risk country.

### 8.5.1.5. Labour and Employment

The Labour and Employment factor further expands on the population and HDI of the SADC member countries. This factor also considers the size of the labour force of each country compared to the percentage the labour force form of the total population. By combining these two, conclusions could be made about the ability to provide labour of each country if compared to the total population. The following figure displays the combination of these two statistics.



**Figure 8-10: Labour Force and Portion of Population by country**

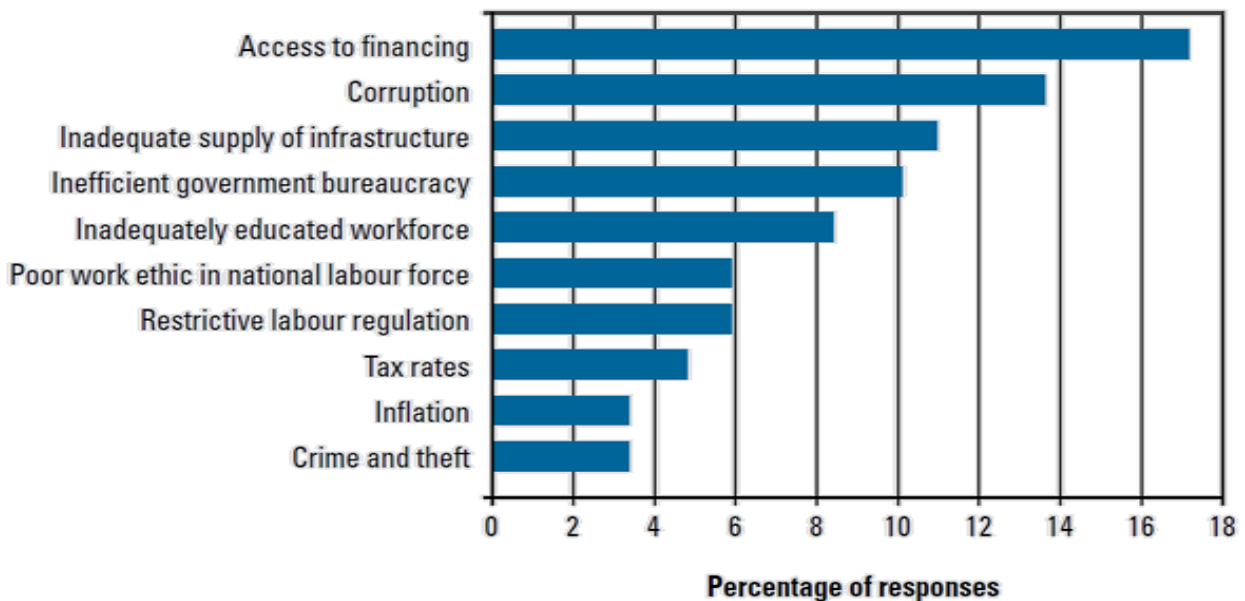
Source: SADC 2014 Yearbook

From these statistics it is clear that the DRC, South Africa and Tanzania show the largest labour forces in the SADC. In terms of percentage of labour force compared to total population a rather balanced profile could be seen in the SADC with percentages varying between 26% - 77%. If these statistics are combined, the countries with the largest population size and portion of labour force of the population shows the highest potential in terms of providing employment opportunities for their residents. In this regard Tanzania and Zambia shows the most potential.

### 8.5.1.6. Ease of Doing Business

According to the WEF (2015), access to finance, corruption, lack of human resources and development infrastructure are considered as the factors that inhibits the level of doing business and ultimately external investment in the SADC. This finding from the WEF is a wide

generalisation of the status quo in terms of doing business in the SADC. These factors differ drastically depending on each specific country. According to the SAIIA (2015:18), Mauritius could be used as an example where inefficient government bureaucracy prevails as the number one factor inhibiting level of doing business. The impact of crime and theft is hardly mentioned in this analysis. The SAIIA (2015:19) continues by stating that corruption is seen as the main inhibiting factor in Lesotho while restrictive labour regulation is the main role-player in South Africa. In the SADC overall access to finance for development is a major problem. The following figure illustrates the top 10 factors inhibiting the ease of doing business in the SADC.



**Figure 8-11: Factors inhibiting the Ease of Doing Business**

Source: WEF (2015)

From this figure it is clear that various factors impact the ease of doing business in the SADC. These factors can also be seen as areas where improvement could be recommended in order to start to address the problem. The *Ease of Doing Business* factor focusses on the general rating in terms of this index. The Ease of Doing Business Index ranks 189 economies ranging from 1 (best performing) to 189 (worst performing). Countries with high ratings in this index are seen as countries where it is difficult to enter and start a company with limited support and negative factors, as seen in this section. The following table illustrates the rankings of the SADC from 2006 to 2015.

**Table 8-3: Ease of Doing Business trends per country**

Source: WEF (2015)

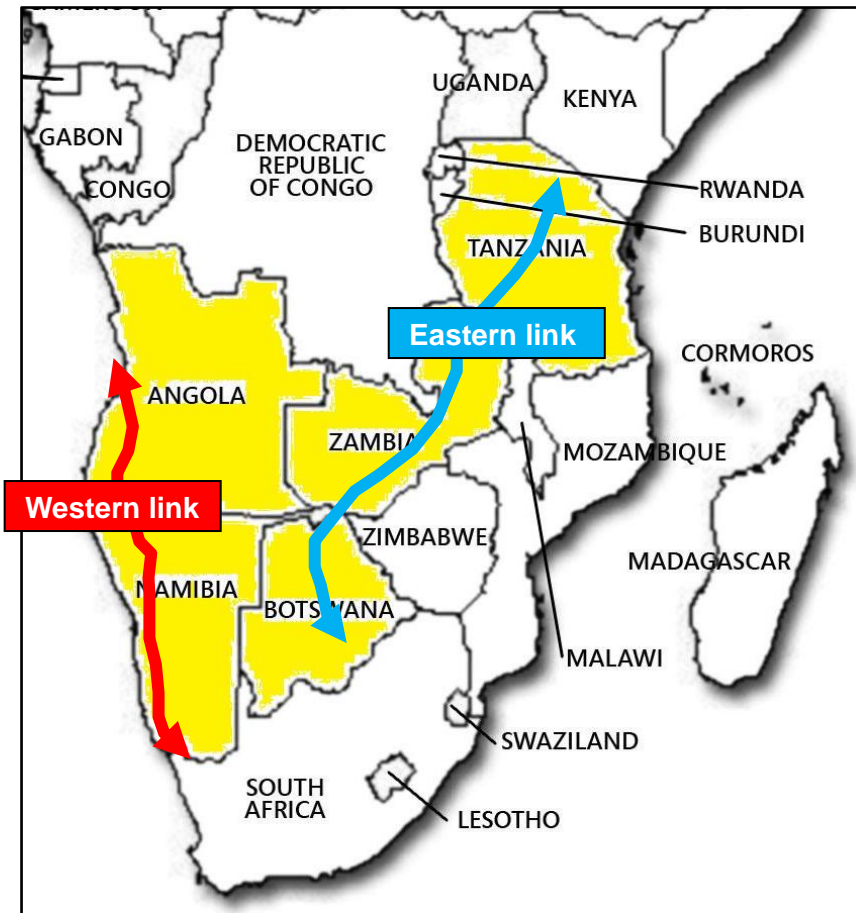
Country	2006 (155 countries)	2010 (183 countries)	2014 (188 countries)	2015 (189 countries)	Change in rank 2006 to 2015
Angola	135	171	179	181	-46
Botswana	40	52	56	74	-34
DRC	155	176	183	184	-29
Lesotho	97	142	136	128	-31
Madagascar	131	144	148	163	-32
Malawi	96	141	171	164	-68
Mauritius	23	21	20	28	-5
Mozambique	110	132	139	127	-17
Namibia	33	74	98	88	-55
Seychelles	N/A	109	80	85	N/A
South Africa	28	36	41	43	-15
Swaziland	N/A	123	123	110	N/A
Tanzania	140	125	145	131	+9
Zambia	67	80	83	111	-44
Zimbabwe	126	168	170	171	-45

The statistics in this table serves as the final factor for choosing countries to focus on as a way to connect South Africa with Kenya and South Africa with Angola. From this table it is clear that most of the countries in the SADC show negative progress in terms of ease of doing business. This confirms the need for urgent strategies and programmes to help integrate the SADC member countries and unlock potential for integration by addressing the ease of doing business problem. This can be seen as a restraining factor for external investment. Different alternatives are rather used to limit risk and keep the negative impact of ease of doing business from the integration network. This table shows that the countries with the best ratings in the SADC are Mauritius (island country), South Africa, Botswana, Namibia, Zambia and Tanzania.

#### 8.5.1.7. Discussion of preliminary evaluation

The aim of the preliminary SADC evaluation was to determine specific routes to link South Africa with Kenya and Angola while developing relationships and links between the SADC members. A western and eastern corridor or link is envisaged towards these countries. The preliminary SADC evaluation focussed on demographic potential, economic potential, human development and resource potential as well as potential risks and barriers. After each of the factors in the

preliminary evaluation were considered, certain countries were identified to be included in further research as shown in the following figure.



**Figure 8-12: Countries forming the Western and Eastern links**

Source: Own Compilation

The countries that are illustrated in this figure will be included for further investigation. These countries show the most sustainable potential network of countries that could be focused on to evaluate integration in the SADC and connect South Africa with east and west Africa major economic role-players. The role of an urban hierarchy as a spatial planning instrument in this regard would be applied in these countries in order to promote connectivity and integration. The following sections will focus on each of the identified countries (excluding South Africa). South Africa is excluded from this evaluation, as the country consists of more detailed statistics and seen as a planning region in its own capacity.

### 8.5.2. Western link countries

The western link countries in the study area consist of Namibia and Angola, which are evaluated by population statistics, employment statistics and current nodal and corridor structure.

### **8.5.2.1. Namibia**

Namibia is situated between South Africa and Angola and therefore is the only country linking South Africa with Angola on the western link as discussed earlier. It can therefore be concluded that the Namibia, as a country, plays a vital role in terms of connectivity and linkages between South Africa and Angola. To evaluate Namibia from a statistical point of view the Namibia 2011 Population and Housing census will be used for population purposes. According to the NPC (2012:11), this census was completed in September 2011. The 2011 census is the third census that was completed after Namibian independence.

In addition to the 2011 census report, additional statistics were also used to source other important statistics that were not included in the official census documentation. The Namibian Labour Force Survey 2014 Report was used to determine the employment statistics of Namibia. The employment statistics is important to indicate where potential in terms of different employment opportunities and other activities are focussed.

Population is the first statistic that needs to be evaluated in Namibia. Population statistics are the first indicator of where potential lies in human capital. In African countries in general it is well-known that people move towards areas with the most opportunities in terms of available services, goods and employment opportunities. Unlike other African countries' census, the 2011 census survey focussed on both regions and constituencies in Namibia. In order to provide a more accurate evaluation in terms of population, the smallest geographical level is chosen for representation of population statistics. In the following table the population per constituency are illustrated as found in the latest Namibian census.

**Table 8-4: Namibia population per constituency**

Source: NPC (2012:42)

Constituency	2011	Constituency	2011	Constituency	2011	Constituency	2011
Kabbe	14,500	Mpungu	20,700	Ondobe	24,000	Ondangwa	36,800
Katima Mulilo Rural	16,300	Mukwe	27,600	Ongenga	21,900	Ongwediva	33,700
Katima Mulilo Urban	28,200	Ndiyona	20,500	Oshikango	28,700	Oshakati	46,900
Kongola	5,600	Rundu Rural	60,700	Omulonga	32,500	Uukwiyu	12,100
Linyanti	15,300	Rundu Urban	20,700	Aminius	12,300	Uuvudhiya	4,000
Sibbinda	10,200	Tobias Haiyeko	45,800	Gobabis	21,000	Eengodi	21,800
Arandis	10,200	Katutura Central	24,600	Kalahari	7,500	Guinas	10,400
Daures	11,300	Katutura East	18,600	Otjinene	7,400	Okankolo	15,900
Karibib	13,300	Khomasdal	43,400	Otjombinde	6,900	Olukonda	9,600
Omaruru	8,500	Soweto	15,100	Steinhausen	9,700	Omuntele	17,100
Swakopmund	44,700	Samora Machel	49,700	Epukiro	6,000	Omuthiya Gwiipundi	26,100
Walvis Bay Rural	26,900	Windhoek Rural	22,200	Anamulenge	13,300	Onayena	15,400
Walvis Bay Urban	35,500	Windhoek Urban	76,000	Elim	11,200	Oniipa	24,800
Gibeon	12,100	Moses //Garob	45,500	Etyai	34,900	Onyaanya	20,800
Mariental Rural	15,100	Epupa	18,000	Ogongo	19,600	Tsumeb	19,700
Mariental Urban	15,300	Kamanjab	8,700	Okahao	17,500	Grootfontein	24,600
Rehoboth Rural	7,300	Khorixas	12,900	Okalongo	30,500	Okahandja	24,300
Rehoboth Urban	29,200	Opuwo	27,900	Onesi	13,100	Okakarara	22,500
Berseba	10,500	Outjo	12,400	Oshikuku	8,900	Omatako	17,300
Karasburg	16,200	Sesfontein	8,400	Outapi	37,200	Otavi	12,500
Keetmanshoop Rural	7,100	Eenhana	21,100	Ruacana	15,200	Otjiwarongo	31,300
Keetmanshoop Urban	18,900	Endola	25,500	Tsandi	28,000	Tsumkwe	9,900
Luderitz	13,700	Engela	24,300	Otamanzi	13,500		
Oranjemund	9,600	Epembe	16,200	Okaku	18,900		
Kahenge	29,700	Ohangwena	17,500	Okatana	14,700		
Kapako	27,000	Okongo	25,600	Okatjali	3,200		
Mashare	15,600	Omundaungilo	7,800	Ompundja	4,600		

From the table above, it is clear that the areas with the highest population numbers are Windhoek, Rundu, Samora Machel and Oshakati. Windhoek and Rundu are the areas with the highest population by far compared to the other constituencies. The existing population can serve as an indication where the latest potential lies in terms of human capital in Namibia. Apart from these statistics, it is important to understand how the areas grew since previous census was done. In the following table the population numbers, growth rates and percentage of population in terms of the total population are illustrated. These numbers however were not recorded on constituency level throughout the different census surveys and only the main areas could be used.

**Table 8-5: 2011 Namibia population trends**

Source: NPC (2012:50)

Area	2011			2001			1991	
	Population	Growth Rate	% of Total Pop	Population	Growth Rate	% of Total Pop	Population	% of Total Pop
Caprivi	90,100	1.3%	4.3%	79,826	-1.2%	4.4%	90,422	6.4%
Erongo	150,400	4.0%	7.1%	107,656	9.4%	5.9%	55,470	3.9%
Hardap	79,000	1.6%	3.8%	68,244	0.3%	3.7%	66,495	4.7%
Karas	76,000	1.0%	3.6%	69,322	1.3%	3.8%	61,162	4.3%
Kavango	222,500	1.0%	10.6%	202,691	7.3%	11.1%	116,830	8.3%
Khomas	340,900	3.6%	16.2%	250,261	5.0%	13.7%	167,071	11.8%
Kunene	88,300	2.8%	4.2%	68,724	0.7%	3.8%	64,017	4.5%
Ohangwena	245,100	0.7%	11.6%	228,384	2.7%	12.5%	179,634	12.7%
Omaheke	70,800	0.4%	3.4%	68,038	2.9%	3.7%	52,735	3.7%
Omusati	242,900	0.6%	11.5%	228,841	2.0%	12.5%	189,919	13.5%
Oshana	174,900	0.8%	8.3%	161,915	2.0%	8.8%	134,884	9.6%
Oshikoto	181,600	1.3%	8.6%	161,007	2.5%	8.8%	128,745	9.1%
Otjozondjupa	142,400	0.5%	6.8%	135,384	3.2%	7.4%	102,536	7.3%

The table above illustrates the patterns of population number and percentage of total population per area in Namibia since 1991 to 2011. More important is the latest growth rates between 2011 and 2001. According to the statistics published by the NPC (2012:50), the Erongo, Khomas and Kunene areas are the areas with the highest growth rates by far. These areas include the Walvis Bay/Swakopmund node, Windhoek and Opuwo respectively. The high growth rate calculated in the Kunene area's growth rate is large due to the low population base. By considering the population base of the area, it is noted that Oshikoto also see one of the higher population growth rates. The Oshikoto area is where Tsumeb is located apart from other towns.

General employment statistics in Namibia is scarce and mostly based on regional perspective and focussed on the entire labour force. In order to provide accurate statistics, the 2014 Namibia Labour Force Survey was used as an indication to illustrate the concentration of employment per sector in each region aligned to the census regions discussed previously in the population section. Although the 2014 Namibia Labour Force Survey is only a survey, it is seen as the most accurate source of employment statistics with the largest coverage of small geographical areas (NSA, 2014:20). According to the NSA (2014:20), limited sampling errors were found due to improved statistical measures and methods applied in the survey. The small geographical level focus, small sample errors and the largest coverage in terms of employment statistics in Namibia were all reasons to use this survey as a clear indication of employment.

The employment statistics in this survey provides an indication where high levels of employment in each industry are concentrated in Namibia. Apart from just referring to where the highest levels of formal employment are concentrated in each region, these statistics also refer to where more tertiary sector employment is concentrated in Namibia. Larger numbers of specialised employment and tertiary sector employment serves as an indication of a more diverse economy.

A diversified economy in terms of employment can be related to larger urban areas with a more sustainable employment base and skill level. The following table illustrates the employment per industry for each region.

**Table 8-6: Namibia employment per industry**

Source: NSA (2014:8)

Area	Caprivi	Erongo	Hardap	Karas	Kavango	Khomas	Kunene	Ohangwena	Omaheke	Omusati	Oshana	Oshikoto	Otjozondjupa
Agriculture	11,357	5,730	8,684	12,414	30,283	4,286	10,736	34,020	11,729	42,238	7,968	18,662	17,204
Mining & Quarrying	0	5,004	81	2,263	54	1,368	314	0	27	128	178	1,832	2,310
Manufacturing	221	8,122	728	3,349	413	10,371	1,342	633	1,020	751	2,814	1,139	1,867
Electricity	76	259	0	0	0	1,085	0	0	175	0	266	165	358
Water	106	211	52	49	163	748	84	216	397	0	194	0	139
Construction	1,900	7,444	3,105	2,599	2,216	15,544	1,067	1,876	1,343	2,005	2,509	2,896	3,358
Retail	3,189	10,401	1,878	2,592	5,098	20,991	1,912	7,118	2,901	6,354	7,971	5,129	3,857
Transport & Storage	823	5,003	482	1,275	1,340	9,735	253	1,136	442	285	2,024	1,591	1,271
Accommodation	887	2,886	1,020	1,262	4,176	11,198	1,729	1,395	464	1,121	4,716	2,937	2,976
Communication	47	378	271	35	54	4,143	44	72	59	0	0	330	158
Financial	52	936	537	387	770	9,043	163	262	421	312	646	355	725
Real Estate	0	57	39	0	69	269	132	0	0	0	0	0	52
Professional Activities	105	926	299	124	300	4,297	139	0	184	345	140	106	198
Administrative	1,408	3,276	1,314	1,160	1,328	11,572	1,212	1,825	2,707	886	5,771	1,192	1,510
Public Services	705	3,166	562	1,579	1,540	12,251	553	1,207	1,111	1,285	2,172	2,501	3,310
Education	3,110	3,788	1,009	1,234	3,512	5,454	1,664	4,371	2,840	3,443	4,782	2,381	4,208
Health & Social	638	1,347	616	506	1,771	4,792	313	512	135	749	1,845	2,313	1,042
Arts & Recreation	82	758	300	435	0	1,286	90	0	179	152	358	60	233
Other	511	1,256	683	534	1,405	4,984	1,010	517	280	1,065	735	431	608
Private Households	1,607	4,860	3,772	1,622	1,610	11,162	2,217	2,161	2,238	3,761	10,562	5,503	6,593
External Organisations	41	61	126	0	0	201	0	0	0	0	81	0	0
<b>Total</b>	<b>26,866</b>	<b>65,869</b>	<b>25,557</b>	<b>33,419</b>	<b>56,102</b>	<b>144,780</b>	<b>24,973</b>	<b>57,321</b>	<b>28,652</b>	<b>64,882</b>	<b>55,730</b>	<b>49,522</b>	<b>51,977</b>

From the table above, it is clear that the Khomas region (Windhoek) is where most of the employment is focussed in. The Khomas region is therefore classified as the employment hub in Namibia and could be seen as the source of various pull factors, ultimately resulting in increased levels of urbanisation. The Erongo, Omusati, Ohangwena and Kavango regions are all comparable in terms of employment levels and also the next largest employment regions in Namibia. In the table it can also be included that the regions in the yellow shading are the regions which also play a role in the provision of employment.

In terms of employment per sector the Khomas region reveals the same characteristics in terms of total employment as discussed in the previous paragraph. The agricultural sector remains the sector with the highest number of employment throughout Namibia. The same approximate order of employment can also be seen in terms of the employment per sector in each region. The levels of higher order employment need to be considered in the urban hierarchy as well as the recommendations in Namibia. These statistics should also be aligned with the structuring elements.







2014 Census were sourced from the National Institute of Statistics of Angola. The published data in the latest census statistics were used in the evaluation process of Angola.

Luanda, as the capital of Angola, is considered as the main and most important node in the country. This legacy is directly linked to the civil war experienced in Angola between 1975 and 2002 (Guimaraes, 1992:37). Ultimately the aim would be to see Luanda as the main destination node within Angola. The population will be used to identify the provinces with the most potential according to the latest published 2014 census data.

As seen in the section above, the latest 2014 census data is used to show the population numbers per province. The smallest geographic level at which the data is released is on provincial level. In addition to this the NIS (2014:15) indicated that 62.3% of the total population throughout Angola is urbanised. Therefore, a strong relationship between the province and the capitals of the province could be used to identify where the most potential lies in terms of human capital. This approach will be illustrated in the structural elements section of the evaluation. The following table illustrates the 2014 population per province.

**Table 8-7: Angola 2014 population by province**

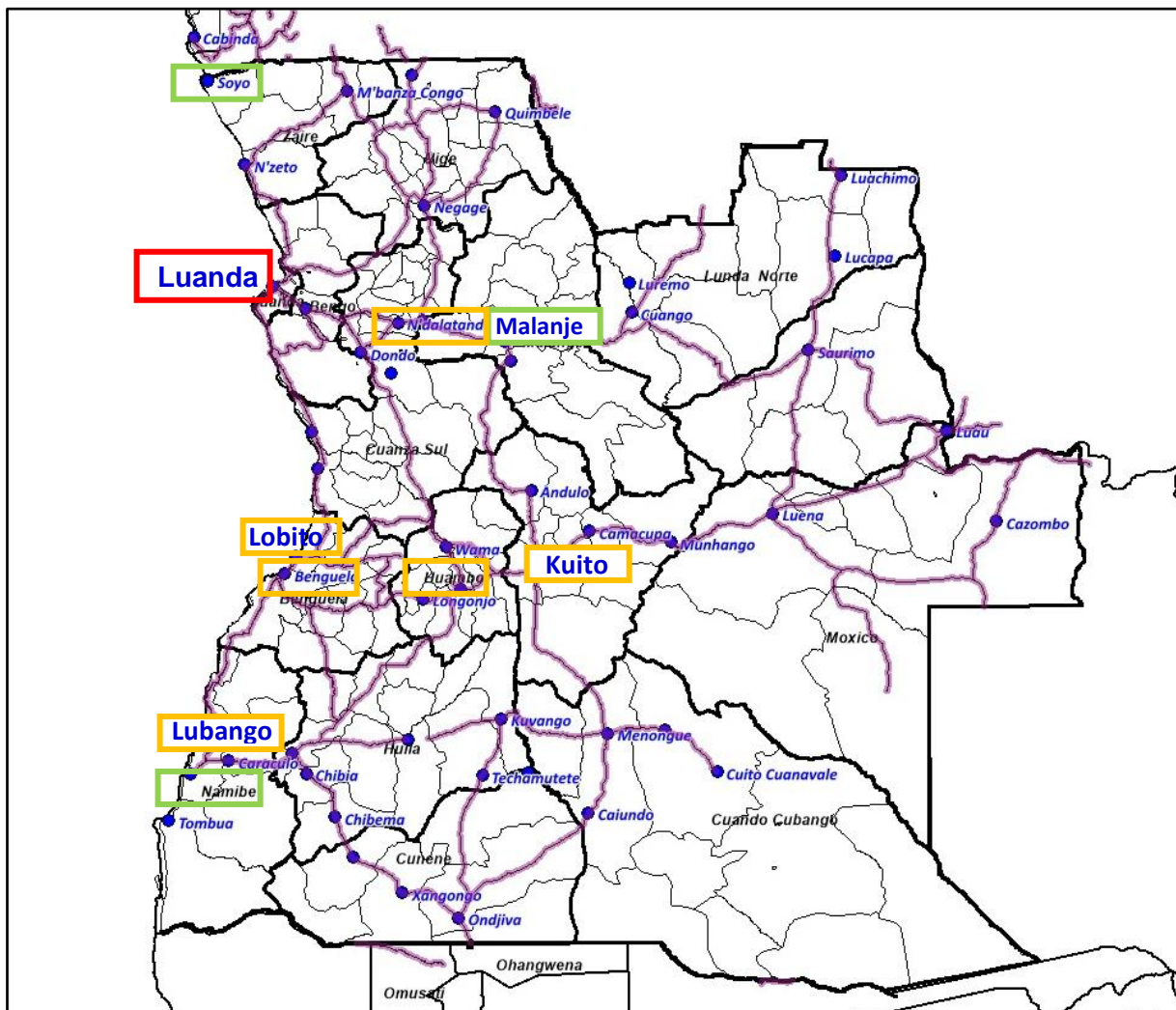
Source: NIS (2014:15)

Province	2014 Population	Province	2014 Population
Cabinda	688,285	Huambo	1,896,147
Zaire	567,225	Bie	1,338,923
Uige	1,426,354	Moxico	727,594
Luanda	6,542,944	Cuando Cubango	510,369
Kwanza Norte	427,971	Namibe	471,613
Kwanza Sul	1,793,787	Huila	2,354,398
Malanje	968,135	Cunene	965,288
Lunda Norte	799,950	Lunda Sul	516,077
Benguela	2,036,662	Bengo	351,579

As seen from the table above, Luanda province is the province outweighing the other provinces in terms of population by far. The statement of Guimaraes (1992:37) is also confirmed that most of the activity in Angola is focussed in Luanda. Huila, Benguela, Huambo and Kwanza Sul are the provinces showing the following highest potential after Luanda province. These statistics will be linked to structural elements evaluation of Angola.

In order to determine the main urban hierarchy in Angola, the main towns and urban nodes, according to the NIS (2014:15), were extracted from the entire list of urban and rural towns of Angola. As mentioned before and seen in the population statistics, it should be noted that apart from Luanda, limited larger order nodes exists in Angola. Although an urban hierarchy is determined and illustrated in the figure below, it should be remembered that most of the activities

are focussed in Luanda. Luanda as capital and critical mass of all activity should be seen as the ultimate destination node to be linked with South Africa. The following figure illustrates the main towns and urban nodes in Angola as well as the urban hierarchy as discussed after the figure.



**Figure 8-16: Main urban nodes and urban hierarchy of Angola**

Source: Own compilation

From the figure above it is clear that, in terms of the existing nodes in Angola, the majority of the nodes are concentrated in the west of Angola. Many of the main “nodes” as extracted from the census data are still very small and would be considered as rural nodes compared to other countries. To identify the largest nodes a conclusion is made from the census data to identify the main urban nodes based on the census. These top hierarchy nodes, extracted from the entire set of main towns of Angola, are then classified in terms of top, middle and lower order urban centres in the hierarchy.

Luanda is considered as the top of the hierarchy urban centre given its status as the nation’s capital as well as the high population compared to all the other centres and also the high

concentration of activities in Luanda. Luanda is also the only node in which international businesses invest in and form their base from where Angolan activities are run from. The middle order urban hierarchy consist of nodes with a population larger than 100,000 people. To put this in South African context, these towns are a roughly the size of a quarter of the Khayelitsha suburb in Cape Town. This helps to illustrate the major unbalanced spatial system of Angola in terms of nodes.

Finally, the lower order nodes are the nodes with a population between 65,000 to 100,000. These nodes can also be earmarked as potential growth areas in Angola, as these nodes succeeded in differentiating themselves from the main urban nodes provided by the census data. In order to understand the links and relationship between the nodes and identified urban hierarchy, the corridors and main transportation networks need to be assessed.

The main roads and movement system in Angola are directly responsible for the interaction between the different nodes. With Luanda as the capital of the nation and creating a critical mass attracting various activities it is expected that most of the roads lead to Luanda as main destination. It is also expected that a prominent north to south form in the existing infrastructure exist in Angola due to the fact that Luanda is situated in the northern parts of Angola. The east to west networks only serve as linkages with the smaller nodes in the east with Luanda. The following figure illustrates the main roads as well as the main and secondary corridors in Luanda.



**Figure 8-17: Main Angola corridors and road network**

Source: Own compilation

The figure above shows the main and secondary corridors in relation to the main roads in of Angola. It can be concluded from this figure that these corridors fulfil a connecting road between the northern and southern parts of Angola as well as connecting the east with the west. Based on the unbalanced urban hierarchy (discussed in the section above) it is clear that these corridors merely fulfil a connecting role in Angola. These corridors need to be implemented as a structuring element that could attempt to create a more balanced spatial distribution in terms of nodes in Angola.

The main corridor (red) is a prominent corridor linking Namibia with Angola and ultimately Luanda. Parallel to the main corridor, a secondary north to south corridor can also be identified linking major nodes (such as Cuito and Malanje) in central Angola with Luanda. These nodes (middle and lower order hierarchy) serve a connecting role between the east and west of Angola. The location of these nodes and the main east to west nodes naturally also forms a secondary corridor. These secondary (east to west) corridors connect Angola with the DRC (Democratic Republic of

the Congo) and Zambia. Potential in terms of trade and exports along these corridors exists that could also potentially development the current unbalanced spatial system towards a more balanced nature. The different roles of the corridors would be taken into account during the strategic planning phase of this research that illustrates the role of an urban hierarchy as spatial planning instrument.

### **8.5.3. Eastern link countries**

The eastern link countries in the study area consist of Botswana, Zambia and Tanzania, which are evaluated by population statistics, employment statistics and current nodal and corridor structure. Botswana in this case fulfils a dual role of providing north to south linkages and also connecting the eastern and western links.

#### **8.5.3.1. Botswana**

The latest census survey completed in Botswana was in 2011. Statistics Botswana (2014) released the Population and Housing Census 2011 Analytical Report in 2014. According to Statistics Botswana (2014:4), this report focussed on the major themes linked to the housing and population demographic data in Botswana. In this report the smallest geographic level remains on district level. Some level of reference to urban centre and settlements are also referred to in certain chapters. The statistics in this report also included the findings and statistics of the 2001 census that were published in the Population and Housing Census 2001 Analytical Report also published by Statistics Botswana in 2003. The evaluation of Botswana will be based on these sources from a statistical point of view.

The population factor refers to the national distribution of population through Botswana over the entire national geographic space. According to Statistics Botswana (2014:7), the correct understanding of the current population statistics and the dynamics of population in Botswana is crucial for national strategic planning. The need and importance of the population factor in Botswana becomes clear in this report. In terms of population in Botswana, the focus was on the historic population growth as well as the current population number. The following table indicates the combination of the current and historic population per census district.

**Table 8-8: Botswana population and growth rates by province**

Source: Statistics Botswana (2014:9)

Province	2001	2011	Growth Rate
Gaborone	186,007	231,592	24.5%
Francistown	83,023	98,961	19.2%
Lobatse	29,689	29,007	-2.3%
Selibe-Phikwe	49,849	49,411	-0.9%
Orapa	9,151	9,531	4.2%
Jwaneng	15,179	18,008	18.6%
Sowa	2,879	3,598	25.0%
Southern	113,704	129,247	13.7%
Barolong	47,477	54,831	15.5%
Ngwaketse West	10,471	13,689	30.7%
South East	60,623	85,014	40.2%
Kweneng East	189,773	256,752	35.3%
Kweneng West	40,562	47,797	17.8%
Kgatleng	73,507	91,660	24.7%
Central Serowe/Palapye	153,035	180,500	17.9%
Central Mahalapye	109,811	118,875	8.3%
Central Bobonong	66,964	71,936	7.4%
Central Boteti	48,057	57,376	19.4%
Central Tutume	123,514	147,377	19.3%
North East	49,399	60,264	22.0%
Ngamiland East	72,382	90,334	24.8%
Ngamiland West	49,642	59,421	19.7%
Chobe	18,258	23,347	27.9%
Delta	2,688	2,529	-5.9%
Ghanzi	32,481	43,095	32.7%
CKGR	689	260	-62.3%
Kgalagadi South	25,938	30,016	15.7%
Kgalagadi North	16,111	20,476	27.1%

From the table above, it can be concluded that the two districts with the largest population is Gaborone and Kweneng East. Apart from these two districts the following districts regarding population size is the Central Serowe/Palapye and Central Tutume districts. The population numbers per district show that apart from the few districts with large populations, Botswana is not densely populated in most of the districts. It can also be concluded from this statistics that Botswana shows growth rates varying between high growth rates to negative growth rates.

These growth rates refer to the increase of population since 2001. These rates should not be viewed in isolation, but should also refer to the population base of each district. The districts with high growth rates and a large population base are the districts showing the highest potential in terms of population. It is also expected that these districts are the home to the top order hierarchy, which will be discussed in the later sections. These districts should also be home to large employment opportunities or various pull-factors.

In addition to the population statistics per district, the Botswana Census (2014:196) also included statistics on the migration patterns between the districts. Migration numbers and statistics can be added as supporting statistics to either see as an addition to the natural population growth or could also serve as an indication of where people are moving to. The migration patterns are likely linked to the process of urbanisation or counter-urbanisation. Both of these processes have an impact on the urban hierarchy of a region. In the following table the In-migration and Out-migration numbers are illustrated with the latest population statistics of each district.

**Table 8-9: Botswana population migration by province**

Source: Statistics Botswana (2014:196)

Province	Population	Inmigration	Outmigration
Gaborone	231,592	31,564	38,720
Francistown	98,961	13,108	16,855
Lobatse	29,007	4,114	5,090
Selibe-Phikwe	49,411	6,274	7,001
Orapa	9,531	1,834	2,398
Jwaneng	18,008	4,035	3,615
Sowa	3,598	1,028	684
Southern	129,247	10,730	9,965
Barolong	54,831	5,202	4,010
Ngwaketse West	13,689	1,255	1,050
South East	85,014	12,275	7,266
Kweneng East	256,752	25,786	15,041
Kweneng West	47,797	2,918	653
Kgatleng	91,660	7,849	6,092
Central Serowe/Palapye	180,500	16,151	13,295
Central Mahalapye	118,875	8,600	9,408
Central Bobonong	71,936	7,145	5,195
Central Boteti	57,376	4,923	3,553
Central Tutume	147,377	12,640	11,363
North East	60,264	6,923	4,801
Ngamiland East	90,334	6,131	8,573
Ngamiland West	59,421	2,339	2,999
Chobe	23,347	415	2,131
Delta	2,529	3,177	141
Ghanzi	43,095	3,177	2,239
CKGR	260	135	104
Kgalagadi South	30,016	1,822	1,955
Kgalagadi North	20,476	2,018	1,524

Based on the numbers regarding migration in the table above, migration destination areas should be noted in the districts of Botswana. According to the migration statistics, it is clear that Gaborone, Kweneng East, Central Serowe, Francistown and Central Tutume are the districts experiencing the highest number of in-migration. This data should be deemed relevant in the strategic planning chapter and recommendations of this research. In-migration statistics can be used in this case as an indication where people are drawn to as a result of potential.

The next factor that is taken into account in the evaluation of Botswana is employment. Employment levels can serve as an indication where the potential lies in terms of job creation and also where existing knowledge and services are focussed in the particular area. Employment numbers for Botswana were included in the latest census (Statistics Botswana, 2014:196) per district. Although the smallest geographical level of the statistics is focussed in the district, the same principle in terms of employment potential in the district applies. The following tables indicate total employment numbers per district as well as occupations in Botswana per district.

**Table 8-10: Botswana occupation by district**

Source: Statistics Botswana (2014:512)

District	Managers / Administrators	Professionals	Technicians	Clerks	Service / Sales Workers	Skilled Agri. Workers	Craft Workers	Plant & Machine Opd.	Elementary Occupations	Not Stated	Total
Gaborone	10,494	14,188	11,554	11,358	18,143	745	15,133	8,401	19,078	457	109,551
Francistown	1,919	2,761	3,457	3,860	8,271	330	6,026	5,073	8,538	110	40,345
Lobatse	594	903	1,292	1,037	2,282	76	1,431	1,035	2,740	41	11,431
Selibe-Phikwe	723	1,221	1,637	1,510	3,235	134	3,924	3,825	4,371	42	20,622
Orapa	226	410	576	268	512	25	844	686	904	20	4,471
Jwaneng	460	540	865	709	1,162	114	1,973	1,225	2,244	2	9,294
Sowa	72	109	176	193	263	1	286	299	326	1	1,726
Southern	873	1,700	2,533	1,730	4,306	4,752	3,440	1,954	9,008	36	30,332
Barolong	290	678	882	635	1,588	1,598	1,074	729	4,965	59	12,498
Ngwaketse West	77	102	219	128	342	1,019	199	146	1,197	1	3,430
South East	1,504	2,819	3,007	3,314	5,609	767	4,407	2,432	7,784	232	31,875
Kweneng East	1,504	2,819	3,007	3,314	5,609	767	4,407	2,432	7,784	232	31,875
Kweneng West	2,379	4,312	5,805	6,617	13,803	4,894	14,731	8,680	20,049	320	81,590
Kgatleng	1,056	1,596	2,316	2,447	4,179	2,815	4,618	2,012	9,201	352	30,592
Central Serowe/Palapye	1,697	2,784	3,427	2,710	6,714	5,293	7,968	3,078	16,439	42	50,152
Central Mahalapye	805	1,314	2,004	1,532	4,303	4,417	3,366	1,315	9,823	299	29,178
Central Bobonong	442	824	1,081	847	2,190	2,563	1,995	1,126	6,102	99	17,269
Central Boteti	386	541	850	733	1,995	1,982	1,651	1,035	4,722	173	14,068
Central Tutume	738	1,687	2,163	1,717	4,960	3,294	4,534	2,250	13,318	190	34,851
North East	502	820	1,238	916	2,363	929	2,119	1,087	5,571	24	15,569
Ngamiland East	1,059	1,151	1,868	1,933	5,116	3,497	3,168	1,695	5,857	144	25,488
Ngamiland West	315	419	808	490	1,737	4,879	1,667	586	3,183	29	14,113
Chobe	399	339	688	877	2,442	389	1,130	1,565	2,696	185	10,710
Delta	133	2	5	18	790	173	130	76	299	2	1,628
Ghanzi	419	538	869	784	1,763	1,778	1,151	724	5,071	32	13,129
CKGR	8	4	2	10	41	3	36	15	62	0	181
Kgalagadi South	269	335	660	546	1,223	1,294	691	469	2,947	28	8,462
Kgalagadi North	222	379	481	348	841	876	591	396	2,315	7	6,456

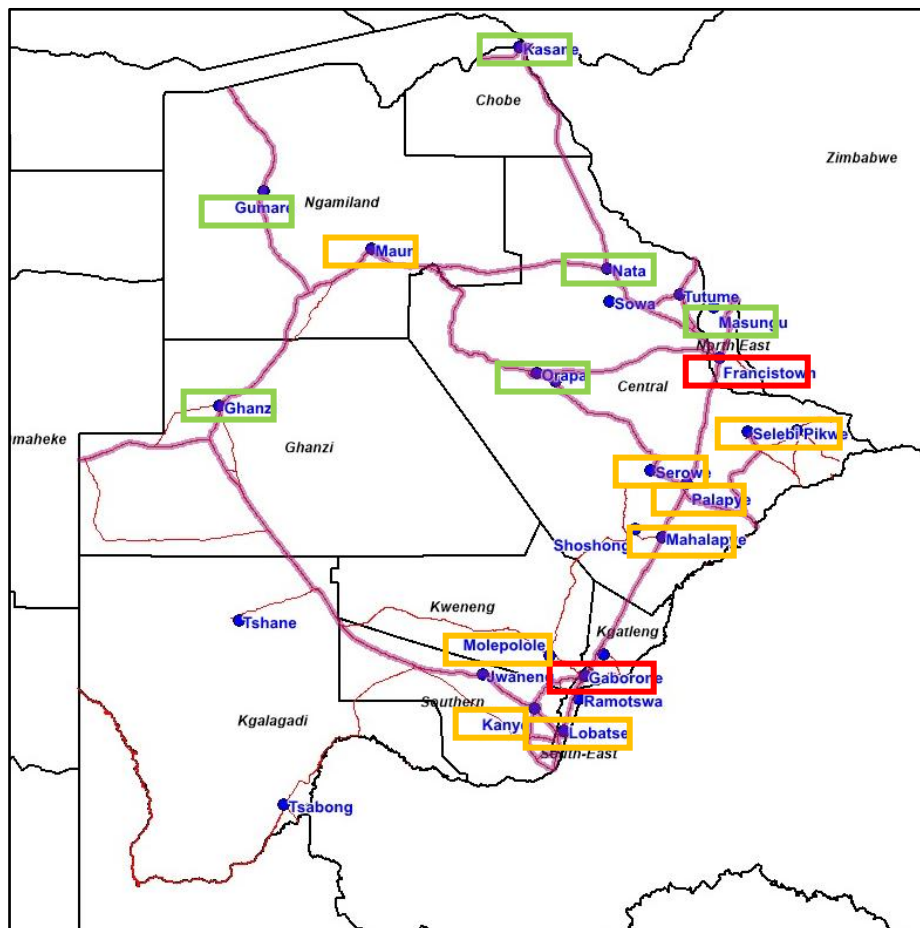
The table above indicates not only the total employment number, but also combines these numbers with the numbers of occupations per district. As mentioned, the employment numbers can merely indicate the potential in terms of employment and human capital in the applicable district. From the total employment numbers, it is clear that Gaborone, Kweneng and Central Serowe forms the largest nodes in terms of potential in human capital. More important to these statistics is the occupations and numbers thereof in each of the districts.

The occupations and occupation number in each of the listed categories can serve as an indication of the number of elementary, specialised and professional services in the districts. The number of services as well as the diversity of occupations can therefore be directly linked to an urban hierarchy and central places in Botswana. From these numbers, the same trends are seen

as the total employment numbers. This is expected, as occupations are directly linked to employment in the districts. It is however important to take note of the level of diversification and also the more services and professionals numbers in the table. In this context Gaborone, Francistown, Kweneng and Serowe are the districts showing higher diverse numbers in the listed occupancies. This indicates that these towns are likely to fulfil a central place role and should also be important in the urban network and hierarchy.

The evaluation of Botswana's nodes and current urban hierarchy is based primarily on the surveyed urban settlements included in the Botswana census. Although the findings and surveys of census in this case had a strong focus on population counts, it serves as a clear indication of the existing urban hierarchy of Botswana. According to Statistics Botswana (2014:170), settlements in the census can broadly be divided into towns, cities and urban villages. This indicates a clear urban hierarchy.

In addition to this, Statistics Botswana (2014:170) further states that only two cities are classified namely Gaborone (capital of Botswana) and Francistown. Lobatse and other mining centres in Botswana forms the larger towns, while urban villages are classified as settlements with a population of at least 5 000 with a minimum of 75% of the employees engaged in the agricultural sector (Statistics Botswana, 2014:170). The following figure illustrates the current urban hierarchy and the geographic spread of the identified nodes.

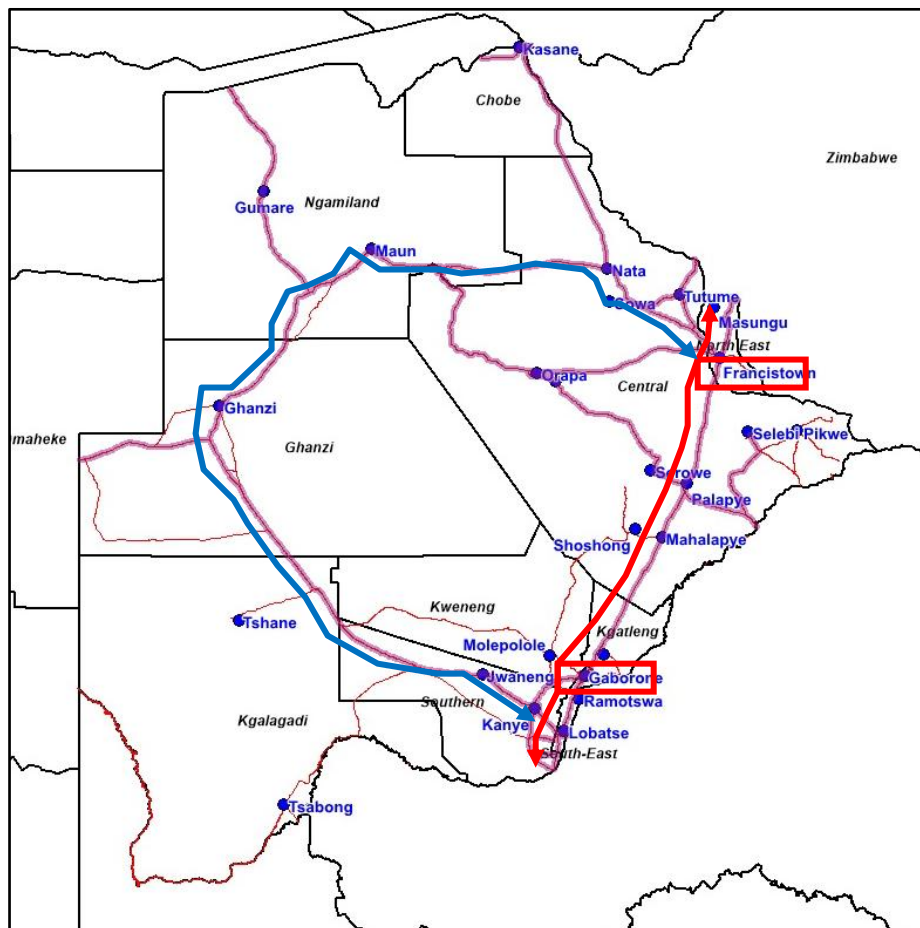


**Figure 8-18: Botswana main urban nodes and urban hierarchy**

Source: Own compilation based on Statistics Botswana (2014:170)

From the figure above, it is clear that Botswana consists of a clear unbalanced spatial development pattern. The spatial pattern and hierarchy is mainly linked to the natural phenomena occurring in the west of Botswana such as the Okavango Delta as well as the Kalahari Desert. Most of the nodes are concentrated around the two largest nodes and top of the hierarchy in Gaborone and Francistown. The middle order nodes (orange) are clustered around in between these nodes. The third-tier hierarchy nodes and some of the second-tier nodes are decentralised from the current clusters, but along existing road networks.

In terms of corridors or linkage system it is expected that due to the natural barriers (Okavango Delta and Kalahari Desert) mentioned in the previous section limited infrastructure exist in this regard. The linkage network or corridors between nodes promote the efficient flow of products and services that help to maintain and develop an urban system in Botswana. The following figure illustrates the main road network in red and the secondary in blue.



**Figure 8-19: Botswana main road network and corridors**

Source: Own Compilation

As seen from the figure above it is clear that limited infrastructure exist in terms of road network. Evident from the figure is that existing infrastructure in terms of roads are focussed in the eastern parts of Botswana around the two highest order nodes. The primary corridor and most significant road in Botswana link the two major cities in the urban hierarchy. The primary corridor does not only link the two largest nodes, but also serves a connection between the lower order smaller nodes in the Botswana spatial system.

The secondary road network (blue) forms a circular form connecting Maun and Ghanzi with the two the two main nodes in the hierarchy. This circular network mainly fulfils an internal connecting role in Botswana. Other roads branching out from this network is mainly used as links between Namibia, Zimbabwe and Zambia. These roads have limited supporting nodes that creates a clear linear development and definite corridor development. Other than the primary and secondary road network it is evident that a clear polycentric development pattern exists amongst the main nodes and corridors.

### 8.5.3.2. Zambia

The Central Statistics Office (2012:13) published the National Analytical Report on the 2010 Population and Housing census in Zambia. The census covered the entire areas both urban and rural and published the data on provincial level. From the report information and statistics and trends will be used to evaluate the potential in the provinces and link it back to large urban areas. The statistics that are included in this evaluation focussed on population and labour force, which would be directly linked to the large existing urban nodes in Zambia and in the provinces.

From a statistical point of view, the first factor that is included in the evaluation of Zambia is the population. The population statistics for Zambia are only based on provincial level as smallest geographical level. These provincial statistics can be used to be linked to the large urban centres in Zambia in order to present the existing urban hierarchy in Zambia. According to the National Statistics Offices (2012:24), the following table indicates the population in Zambia at provincial level and shows how the population grew in these provinces.

**Table 8-11: Zambia population and growth rates by province**

Source: National Statistics Office (2012:24)

Province	2000	2010	Growth Rate
Central	1,012,257	1,307,111	2.6%
Copperbelt	1,581,221	1,972,317	2.2%
Eastern	1,231,283	1,592,661	2.6%
Luapula	775,353	991,927	2.5%
Lusaka	1,391,329	2,191,225	4.6%
Muchinga	524,186	711,657	3.1%
Northern	809,400	1,105,824	3.2%
North Western	583,350	727,044	2.2%
Southern	1,212,124	1,589,926	2.8%
Western	765,088	902,974	1.7%

From the table above, it is clear that Lusaka is the province with the largest population in Zambia. This aligns with the role of Lusaka being the capital of the Lusaka province as well as the national capital. Apart from being host to the largest population in Zambia, Lusaka province also showed the largest population growth compared to the other provinces in Zambia. This might also be an indication that urbanisation in Zambia and more specifically towards Lusaka are increasing due to certain pull factors such as employment, better living conditions and education.

The second largest populated province in Zambia is the Copperbelt province. The Copperbelt province is well-known for the mining activities, which serves as a pull factor to draw people towards employment opportunities. The Copperbelt province is followed by the Eastern, Southern and Central provinces of Zambia. The population table above will be linked to the largest urban

centres and current hierarchy in Zambia in order to identify the geographic spread of the urban hierarchy on a national basis.

The population in the provinces and the urban hierarchy could also be linked to the labour force in each of the provinces as indicated in the previous sections. The labour force in the provinces may be an indication of potential that could be utilised if external investment and creation of employment opportunities are considered in each of the provinces. Opportunities created in the nodes aligning to the population and labour force may result in the establishment of pull factors and uplifting the local urban areas through the provision of employment and ultimately better living conditions and human development. The following table indicates the labour force between 2001 and 2010 (National Statistics Office, 2012:93).

**Table 8-12: Zambia labour force and growth rate by province**

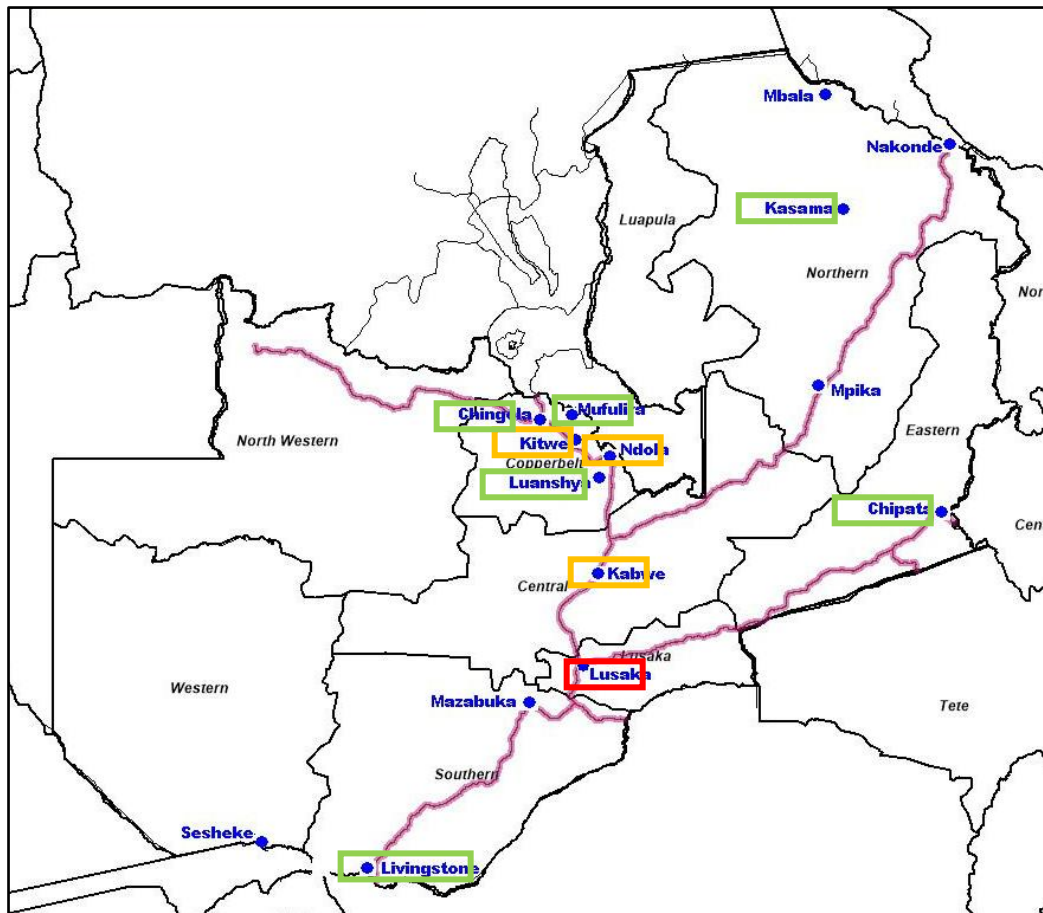
Source: National Statistics Office (2012:93)

Province	2000	2010	Growth Rate
Central	317676	394281	2.2%
Copperbelt	492644	643903	2.7%
Eastern	447763	533661	1.8%
Luapula	267726	322203	1.9%
Lusaka	404672	720884	5.8%
Muchinga	169314	243787	3.6%
Northern	258029	362923	3.4%
North Western	182761	219767	1.8%
Southern	319198	497059	4.4%
Western	305368	320702	0.5%

From the table above the labour force according to province indicate that the labour force statistics show the same trends as the population statistics. Lusaka province is home to the largest labour force in Zambia, which is followed by Copperbelt, Eastern, Southern and Central provinces. Noteworthy to this table is that, apart from Lusaka province showing the largest growth rate in the labour force, the Southern, Muchinga and Northern provinces show the following largest growth rates in terms of labour force.

The previous paragraphs focussed more on the evaluation of Lusaka from a statistical point of view. As already been discussed in the earlier chapters of this research, the structuring elements play an equal important node in strengthening the urban hierarchy and promoting interaction between nodes. The structuring elements include the existing urban hierarchy and the infrastructure in terms of linkages and corridors between different nodes in the Zambian spatial system. By linking the statistical data with the current hierarchy, the geographic spread of the

urban hierarchy could be seen. The following figure indicates the largest urban centres and current urban hierarchy according to the population size and latest census (NSO, 2012:93).



**Figure 8-20: Zambia main urban nodes and urban hierarchy**

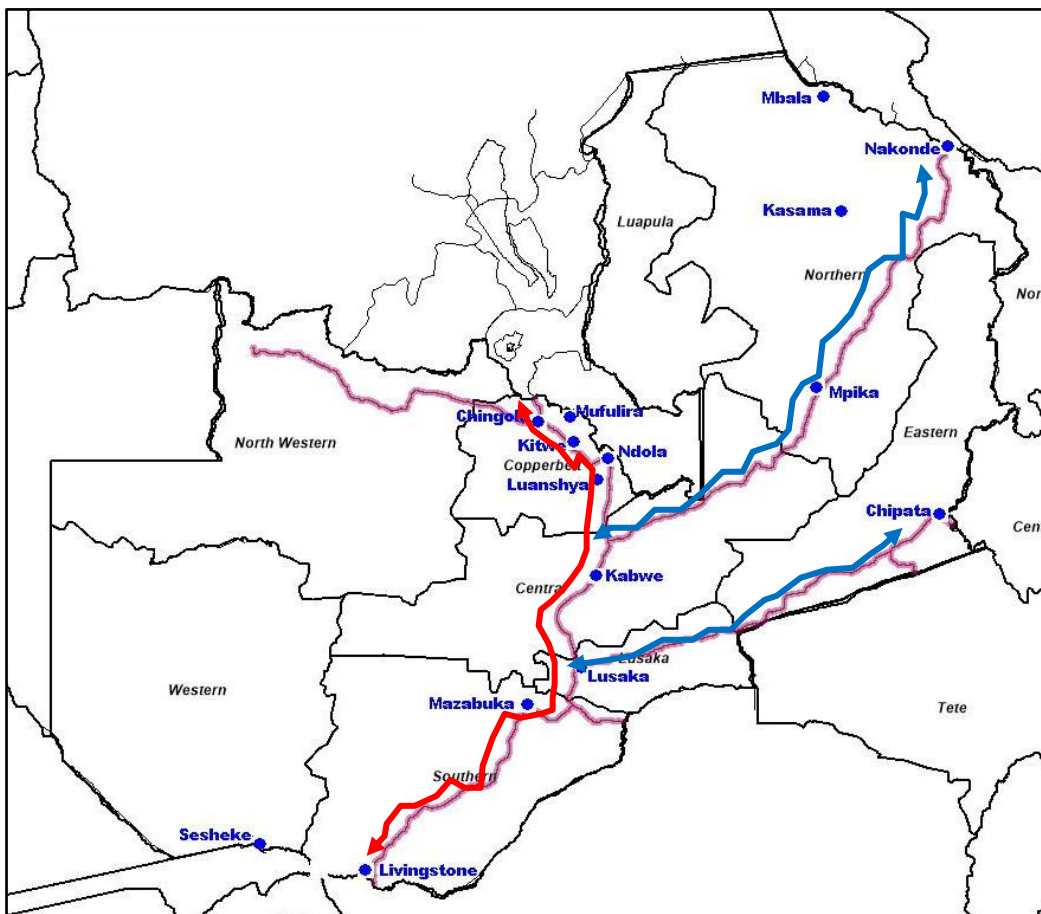
Source: Own compilation based on National Statistics Office (2012:93)

Similar as Angola, the urban hierarchy of Zambia is not complex with only a few large urban nodes. The urban hierarchy as indicated is dominated by Lusaka as the capital of the nation (same principle applied in Angola). The population size, extent, economic dynamics and overall function of Lusaka outweighs the rest of the urban nodes by far. The difference in terms of urban hierarchy of Zambia compared to Angola is the cluster of middle and lower order urban nodes located in the Copperbelt region of Zambia.

The development of these towns is primarily linked to the economic and employment activities in the mining sector. This confirms the value and employment opportunities and levels as an important role player in an urban hierarchy. This mixed cluster of towns is all linked to Ndola (forming the capital of the area) due to the external linkages with the international airport with direct flights to South Africa. The cluster, existing level of development and hierarchy of these towns serve as a clear indicator of the significance of interaction between different nodes which leads to a major and contribution to the urban hierarchy and spatial balanced system. The

challenge in Zambia is to promote this principle throughout the country in an effort to develop a more balanced urban hierarchy.

Although Figure 8-20 does not include the entire urban hierarchy consisting of all the towns and villages in Zambia, it shows the most prominent urban nodes that could be seen as potential national Zambia nodes and areas that could be considered in determine the route of the eastern link between South Africa and Kenya. By taking the statistical factors into account the route through Zambia needs to be considered by linking nodes with existing infrastructure. The following figure shows the location and geographical spread of these centres and combines it with the existing main infrastructure network linking Namibia, Botswana, Zimbabwe and Tanzania with Zambia.



**Figure 8-21: Zambia main roads and corridors**

Source: Own compilation

The existing main road infrastructure in Zambia can be classified as fairly simple. If the role of this network is compared to Angola again, it is clear that this network's main purpose is to connect the surrounding countries with Zambia. This network connects Zambia with Namibia, Botswana, Zimbabwe, Tanzania, Malawi, Angola and the Democratic Republic of the Congo (DRC). The

administrative boundaries of Zambia contribute to the large east to west spread, where the east and west is clearly divided by the boundaries of the DRC.

The main corridor in Zambia connects Zimbabwe with Lusaka and Lusaka with the Copperbelt region where the cluster of significant urban nodes is located. The link between Lusaka and the Copperbelt region fulfils an important economic role where various goods and products are transported on this primary corridor. The secondary corridors can be split in two, where Lusaka is linked Chipata and leads into Malawi. The second secondary corridor links Lusaka with Tanzania in the north via Nakonde. The role of the corridors discussed and the urban hierarchy will be combined with the statistical factors and used in the strategic planning phase of this research, which aims to illustrate the role of an urban hierarchy as spatial planning instrument.

### **8.5.3.3. Tanzania**

In the evaluation process of Tanzania different sources were used as a result of a lack of data included in the latest census survey. The latest national census in Tanzania were completed in 2012 and known as the 2012 Population and housing census. According to the NBS (2014:2), the objective of the latest census was to determine the population size, distribution, composition and other socio-economic information as well as the status and quality of housing in the country. This census was specifically aimed to provide a status quo and progress of the country's development plan and programmes (NBS, 2014:2). The statistics published in the census survey is used to evaluate the potential in terms of population.

As with the case of the other countries used in the evaluation, the first factor to be included in the evaluation process of Tanzania is the population numbers. In the latest census survey, the smallest geographical level of the statistics is based on a regional scale. As with the case of the other evaluated countries, this level of focus will be used and should be efficient enough to determine where most of the human resources are concentrated in Tanzania. The region's population will then be related back to the structuring elements of Tanzania. In the following table the latest population count is shown.

**Table 8-13: Tanzania population by region**

Source: NBS (2014:7)

Region	2012 Population	Region	2012 Population
Dodoma	2,083,588	Tabora	2,291,623
Arusha	1,694,310	Rukwa	1,004,539
Kilimanjaro	1,640,087	Kigoma	2,127,930
Tanga	2,045,205	Shinyanga	1,534,808
Morogoro	2,218,492	Kagera	2,458,023
Pwani	1,098,668	Mwanza	2,772,509
Dar es Salaam	4,364,541	Mara	1,743,830
Lindi	864,652	Manyara	1,425,131
Mtwara	1,270,854	Njombe	702,097
Ruvuma	1,376,891	Katavi	564,604
Iringa	941,238	Simiyu	1,584,157
Mbeya	2,707,410	Geita	1,739,530
Singida	1,370,637		

As seen from the table above, it is clear that Dar es Salaam is the region with the highest population numbers by far. Apart from Dar es Salaam the Mbeya, Mwanza and Kagera regions are the following largest regions in terms of population size. Tanzania is the only country in this evaluation where the national capital is not the largest node in terms of population size. From the table above, it can be seen that Dodoma (the national capital) is the eighth largest province in terms of population. This illustrates the skewed hierarchy that could be formed when population size alone is used to determine the urban hierarchy in a region. It is also important to note that urban households increase by 33% in 2012 from 26% in 2002 (NBS, 2014:9). This also confirms that urbanisation in Tanzania, as with the case of other African countries, is on the increase.

The second factor taken into account in the evaluation process of Tanzania is the employment distribution as done in the other predecessor countries. The NBS (2014:2) also published statistics and current status in terms of employment in the latest 2012 census survey. The NBS (2014:3) deems employment as another important factor that measures general socio-economic status of the country. Employment in this instance will be used to identify the areas where most employed people are concentrated in the country.

A higher concentration of employment is linked to increase economic activity and living standards, which is in turn linked to more services and a sound and sustainable base of living. Higher employment levels could also indicate various economic activities in each region. From an investment and strategic planning perspective higher level of employment and economic activity contributes in creating an economic node that interacts with other nodes, which in turn has an impact on the urban hierarchy. The following table illustrates the employment numbers per region according to the latest 2012 census.

**Table 8-14: Tanzania employment per region**

Source: NBS (2014:97)

Region	2012 Employment	Region	2012 Employment
Dodoma	853,986	Tabora	851,963
Arusha	664,427	Rukwa	411,165
Kilimanjaro	729,528	Kigoma	863,004
Tanga	882,213	Shinyanga	566,072
Morogoro	1,002,049	Kagera	1,095,971
Pwani	460,518	Mwanza	982,154
Dar es Salaam	1,719,467	Mara	655,803
Lindi	422,236	Manyara	558,162
Mtwara	629,119	Njombe	331,298
Ruvuma	636,824	Katavi	219,277
Iringa	419,147	Simiyu	596,409
Mbeya	1,123,966	Geita	687,212
Singida	554,188		

From the table above, it is clear that the Dar es Salaam region is the region with the most potential in terms of total employment numbers. This region is then followed by the Mbeya, Kagera and Morogoro regions. Theoretically these regions offer the higher levels of employment and therefore economic activity. However, if the employment and population numbers are combined, one can determine the percentage of employed people in the region. This can also serve as an indication of the general living standards linked to the employment numbers and could potentially identify regions that do not have a large population base as potential areas for strategic and sustainable planning. In the following table the percentage of employed people in the region are determined.

**Table 8-15: Percentage of employed Tanzanians by region**

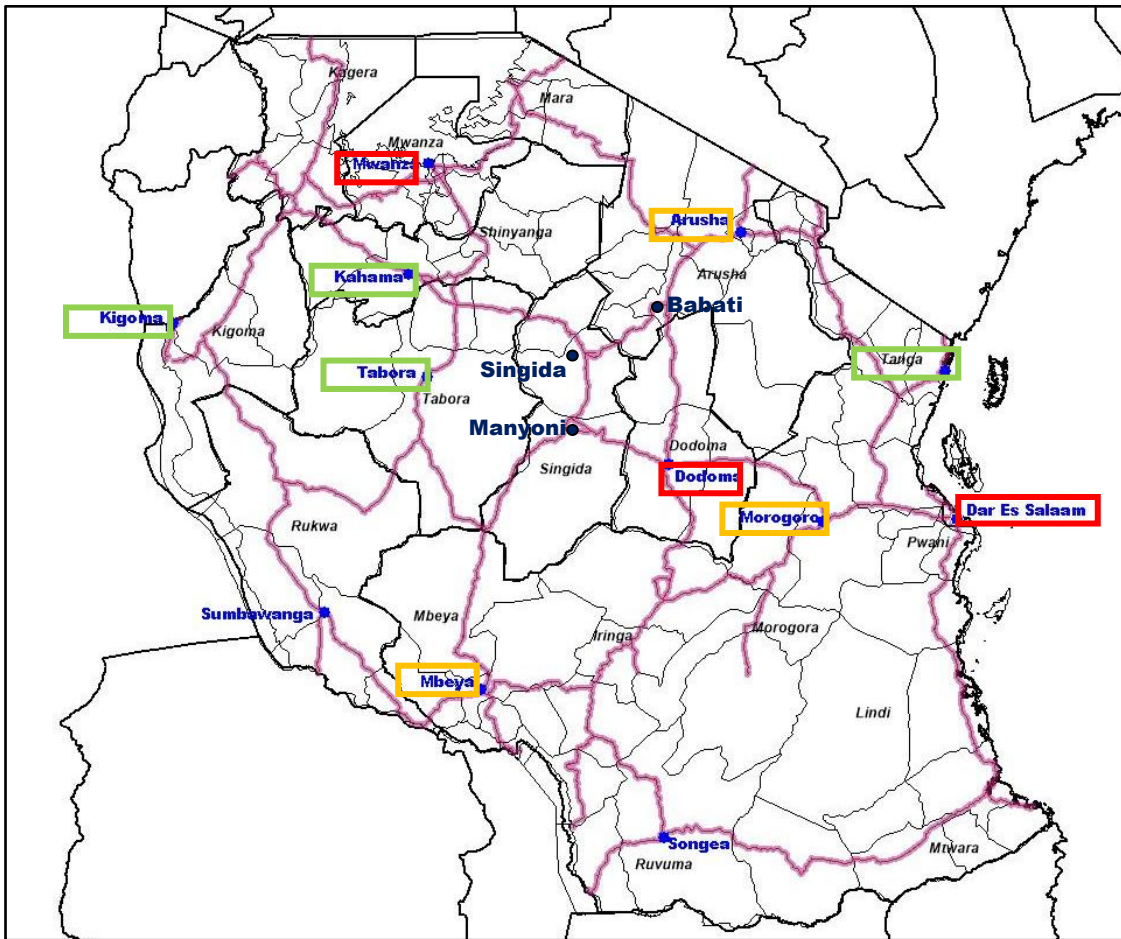
Source: Own calculation from NBS (2014:7 and 97)

Region	% Employed per Region	Region	% Employed per Region
Dodoma	41%	Tabora	37%
Arusha	39%	Rukwa	41%
Kilimanjaro	44%	Kigoma	41%
Tanga	43%	Shinyanga	37%
Morogoro	45%	Kagera	45%
Pwani	42%	Mwanza	35%
Dar es Salaam	39%	Mara	38%
Lindi	49%	Manyara	39%
Mtwara	50%	Njombe	47%
Ruvuma	46%	Katavi	39%
Iringa	45%	Simiyu	38%
Mbeya	42%	Geita	40%
Singida	40%		

The table above illustrates the percentage of employed people of the total population per region. This can serve as an indicator of where employment is concentrated in Tanzania and where potential lies in creating new employment opportunities or also which areas is expected to be home to Tanzanians earning sustainable income to more effectively take part in economic activities. The potential of economic activity participation is also linked to the urban hierarchy and economic development per region. The effects of employment, economic activities and population can be seen in the current urban hierarchy of Tanzania.

As seen in the case of all the evaluated countries in this chapter, the main urban nodes in Tanzania also need to be evaluated. Apart from the role and function of each of the nodes in Tanzania in the general hierarchy and relationship in the Tanzanian urban system, this urban hierarchy is also the last set of nodes connecting Kenya with South Africa. With this being said, it should also be noted that the urban hierarchy should not only be seen as “passing through” nodes. These nodes should be evaluated on the same basis as the previous countries. The role, location and statistical significance of each node needs to be included on a combination of connecting roles, possible external investment and potential for development to ultimately attempt to create a more balanced spatial system in Tanzania.

The statistical significance combination will be included in the final strategic planning chapter where the role of an urban hierarchy as a spatial planning instrument will be illustrated. The current set of main urban nodes and centres first need to be evaluated to understand the geographic spread and current dynamics. The following figure illustrates the location of all the major urban nodes in Tanzania and the current urban hierarchy based on population size according to the latest census data. For the purposes of this exercise the Zanzibar islands are excluded from the current nodes as these nodes do not have an impact on the purpose of the evaluation.



**Figure 8-22: Tanzania main urban nodes and urban hierarchy**

Source: Own compilation based on NBS (2014:7)

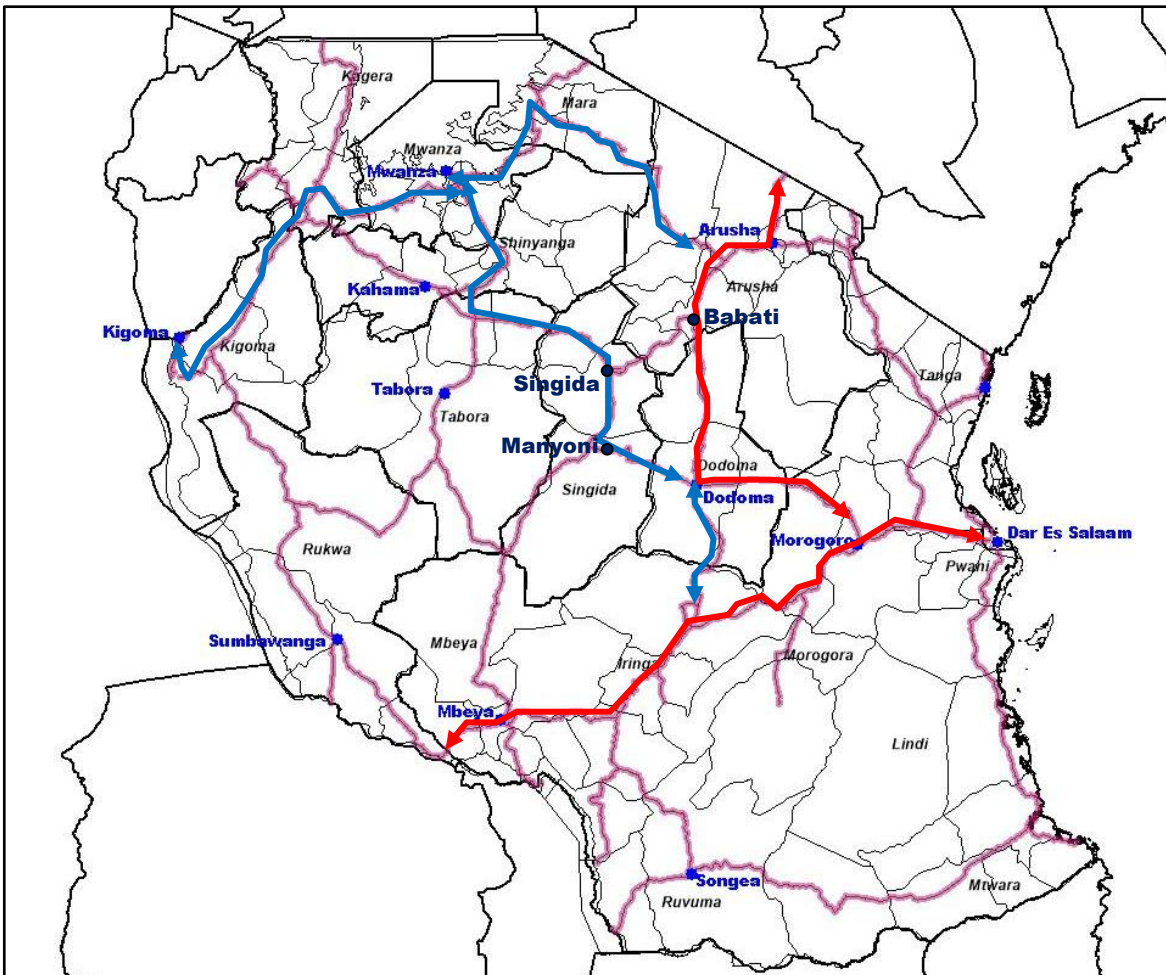
From the figure above, it is seen that Dar es Salaam, Dodoma and Mwanza is the three nodes in the top of the urban hierarchy. Dar es Salaam is a much larger and more significant node than Mwanza, but Mwanza is far more significant from the other large urban centres. The role and size of Mwanza compared to the other nodes justifies the inclusion of Mwanza in the top urban hierarchy alongside Dar es Salaam. This principle and phenomenon was also noted in Botswana with the case of Gaborone and Francistown. In this case Francistown could be compared to Mwanza in terms of the function and role the node plays in the country. Both Da es Salaam and Mwanzas support the role and function of the national capital of Dodoma, which is located more central in Tanzania.

The middle order hierarchy are more concentrated in the east central parts of Tanzania towards Dar es Salaam. Apart from Tanga, a cluster of lower order urban nodes are noted in the north-western parts of Tanzania. This cluster of nodes is found in close proximity of Mwanza. Considering the proximity of Mwanza, it is clear that Mwanza place a far more central place role and is interconnected to the smaller urban nodes in the cluster. The relationship and connection

between these nodes result in a slightly more balanced spatial system if compared to the rest of the country.

The divide between the lower and middle order urban hierarchy in Tanzania is clearly linked to the top urban hierarchy nodes' location in the country. The middle order nodes' role and functions are directly linked to the transport network leading through the country as well as towards Dar es Salaam, which is considered as an important employment node in the urban hierarchy. The road transport network will be assessed in the following section.

The evaluation of the urban hierarchy and spread of nodes in the previous section stressed the significance of the presence of main transport networks in Tanzania. This principle is also discussed in the theoretical chapters of this research. In order to understand and clearly indicate the impact of corridors on the existing hierarchy the existing road networks of Tanzania needs to be evaluated. The following figure illustrates the network of road infrastructure in Tanzania.



**Figure 8-23: Tanzania main roads and corridors**

Source: Own compilation

The figure above shows the main corridor (red) and movement networks in relation to the existing road network infrastructure of Tanzania. The main corridors of Tanzania are focussed more towards Dar es Salaam and Dodoma, both top order nodes in the hierarchy. Apart from connecting and linking other nodes with Dar es Salaam and Dodoma the main corridors also link Zambia with Kenya. These main corridors are linked to Dar es Salaam due to the function and role of this node in Tanzania. Various goods are also imported and distributed from Dar es Salaam.

Goods distributed from Dar es Salaam are moved along the secondary corridors in Tanzania. The secondary corridors (blue) link other large nodes with the top order urban hierarchy. The linkages between different lower and middle order urban nodes result in the natural development of a more balanced urban system through effective connectivity and relationships between these nodes. The role of the different corridor system in Tanzania will also be included in the final chapter of strategic planning of this research. In conclusion to the corridor evaluation, it is also clear that the different corridors serve the entire Tanzania country effectively with the support of other lower order roads.

## **8.6. Discussion sub-continental study area evaluation**

### **8.6.1. Introduction**

The discussion of the significant trends in the evaluation of the sub-continental study area is more focussed on the evaluated statistics per country that were included in the study area. The countries that were included in the study area is arranged to connect Angola with South Africa through a western linking corridor and also South Africa with Kenya through an eastern linking corridor. With Namibia being the only country between South Africa and Angola, it can automatically be concluded that Namibia is seen as the linking country for the western corridor. The eastern corridor however had different options in terms of creating a link. The countries between Kenya and South Africa all formed part (including the SADC members) of the preliminary evaluation of the study area.

The evaluation of these countries was based on mostly the SADC statistics yearbook as well as from the World Bank. The evaluation was based on population, sub-continental economic growth, Human Development Index, SADC Country Risk Indicator and Ease of doing business. The African Continent and its countries are seen as a developing area with great potential in terms of population and economic growth. Most of the countries consist of a large population, which is backed up by economic growth, in most cases from a lower base. These two factors create the opportunity for external investment globally. The factors that clearly defined the actual eastern link

were the Human Development Index, Country Risk Indicator and Ease of doing business. These three factors explain the actual dynamic of living, doing business and investing in Africa.

The Human Development Index was led by the SADC island-based countries, which are not seen as a possible link. The countries that followed were South Africa, Namibia, Botswana and Zambia. From this, it could be concluded that Botswana was the in this case the more suitable country to develop the eastern linking corridor. With this being said, the possibility was also tested by the last two factors. The Country Risk Indicator confirmed that Botswana is a lower risk country for investment, where Zimbabwe rated the lowest in the evaluation. Lastly, the Ease of doing business factor again confirmed that Botswana is the most stable, safe and constant route to link South Africa with Zambia, Tanzania and Kenya. The countries that were therefore included for further evaluation were Namibia and Angola in the western link and Botswana, Zambia and Tanzania on the eastern link.

### **8.6.2. Western and eastern link countries evaluation**

The more detailed evaluation focussed on factors such as population, employment and the structuring elements through nodes (hierarchy) and corridors. The general approach that was kept in mind was that a continuous corridor should link different countries with the significant nodes of potential that is supported by the population and employment levels as far as possible. In terms of the western linking corridor, an already existing corridor and urban hierarchy in Namibia aligned with the approach. The main difference in the corridor was the link between Namibia and Angola. Primary and secondary linking corridors in Angola were identified, which was mostly backed up by the population size of the nodes in the provinces due to a lack of employment statistics. The primary corridor is focussed on Lubango and Huambo as main nodes that link with Luanda, while the secondary corridor is more focussed on Cuito, Malanje and N'dalatando. All these nodes show significant potential in terms of population and align with main national roads.

The western corridor first started in Botswana, where the current urban hierarchy and national road network is more focussed in the western parts of the country. The eastern and central parts of the country are limited by natural physical barriers such as the Kalahari Desert and vast untamed natural areas. The main link is between Gaborone (capital) and Francistown (capital of the north). These nodes also formed the top order urban hierarchy. The links between these areas first needed to be strengthened before the link from Francistown into Zambia is proposed. The population and employment statistics revealed to focus on Mahalapye and Palapye between the capitals. Palapye outweighed Mahalapye in terms of population, but being located in close proximity to each other, it is expected that both these nodes could benefit from investment and strengthen the current links. Nata and Kasane were identified as third tier nodes, along the main national roads which linked with Zambia.

In Zambia the main hierarchy and activity is focussed between Lusaka and the Copperbelt conurbation of towns, which was also supported by population and employment statistics for these regions. From this point, the current road infrastructure and urban hierarchy linked to population and employment were used. From Lusaka, it was seen that Kabwe can be seen as an important node, which also links with the Copperbelt region. After Kabwe, the national road split into a north-eastern direction towards Tanzania, with no significant town nodes in terms of employment and population. Some lower order or third tier towns were located off the national main road to Tanzania. From this, it can be concluded that new nodes new to be considered for development to strengthen the link and relationship between Zambia and Tanzania.

From Tanzania's point of view a corridor in the northern direction towards Kenya is needed. From the population and employment statistics, it was found that most of the population and employment is concentrated in Dar Es Salaam, which is not the nation's capital. Dodoma, the official capital of Tanzania, ranks lower in terms of population and employment. Strong internal links between these nodes exist. Based on population, it was found that potential exists in the north and south of the country. The main challenge in this case will be to connect these areas between each other and ultimately Kenya. The national link between Kenya and Tanzania should be used as guideline for recommendations. The employment statistics and current hierarchy revealed that Mwanza, Mbeya and Arusha should have an impact on recommending a linking corridor. Morogoro and Kagera also showed potential in terms of employment statistics, but are not located on the existing national infrastructure network. Essential in this case would be to link with top order nodes on the national route, which is Dodoma in this case. This would also enhance the role and function of the nation's capital city.

## **8.7. Conclusion**

In this chapter, the sub-continental level study area was delineated to illustrate the role of an urban hierarchy as spatial planning instrument in Africa. The study area was delineated to align with the National Development Plan of South Africa's goals and outcomes. These goals and outcomes include the positioning of South Africa on continental scale. In order to position South Africa strategically in Africa, the country needs to be linked to economic "giants" of Africa, namely Angola and Kenya. In order to start the linkage process, certain countries of the SADC in this area was selected based on a preliminary evaluation with the focus on population, economic growth, human development level, risk analysis, labour market and ease of doing business.

The preliminary evaluation indicated certain countries that could be considered to be linked South Africa with Kenya and Angola. These countries were then evaluated individually based on a statistical significance and structuring elements (nodes and corridors), aligning the general approach with the approach followed on the regional perspective study area. The evaluation of

these countries discussed the current status quo and disclosed the important areas to focus on in strategic planning. This evaluation will be used in the final chapter of this research where the role of an urban hierarchy as spatial planning instrument will be illustrated.

The evaluation and findings in this chapter will therefore inform the strategic planning process. In the following chapter the existing policies and plans will be studied in order to understand how the final chapter's recommendation would fit into the already existing set of policies and plans applicable to the sub-continental study area of this research.

## **CHAPTER 9: SUB-CONTINENTAL REGIONAL PLANS AND STRATEGIC PLANNING**

### **9.1. Introduction**

In the previous chapter, the sub-continental study area was evaluated to illustrate the role of an urban hierarchy as spatial planning instrument. The approach in the evaluation of the sub-continental study area aligns with the approach followed in the regional perspective's study area by including the combination of spatial structuring elements as well as statistical factors. The statistical factors utilise published data on a more general scale in each of the countries. This evaluation formed the basis of the potential of the study area to be considered for recommendations in this research. However, recommendations could not only be based on the evaluation process and should also be aligned with existing strategic documentation or should propose a strategic way forward, based on existing plans and strategies.

In this chapter documentation, plans and strategies of the SADC are studied to understand the vision, relationships and current structures within the sub-continental study area. The existing plans and strategies need to be taken into account as part of this research to either assist these plans to achieve the outcomes or to propose new strategic inputs by focussing on the role of an urban hierarchy and implementing it as a spatial planning instrument on a larger geographic scale.

### **9.2. Spatial planning policy framework**

Due to the number of countries that are included in the sub-continental focus, a general overview of the spatial planning policy framework needs to be included. This general overview of the framework should just aim to illustrate the framework of the planning system in the sub-continent. The overview created interprets spatial plans and policies that are applied in this context. In general, the SADC does not consist of a specific spatial planning legislative framework.

According to UN-HABITAT (2010:12), most of the developing countries' original spatial and strategic plans proved to be rigid, ineffective and failed to interpret the needs of all the stakeholders. Failure to address the needs and interest of stakeholders results in a difficult and complicated implementation strategy that requires highly capable human resources. The reality in most of these countries is that limited institutional capacity exists to effective role out these kinds of plans.

The UN-HABITAT proposed an intervention in the strategic spatial planning process that (UN-HABITAT, 2010:12):

- is more process oriented and contains broader spatial ideas;
- prioritises plans according to participation and consensus building among stakeholders,
- aims to provide a spatial dimension to sectoral interventions as a means of integrating them; and
- is implemented through the empowerment of different actors, as opposed to regulation and enforcement.

The intervention and support offered by the UN-HABITAT not only included an approach to strategic spatial planning but also the development of approaches and tools to support consultation, identify priorities and to implement plans more effectively (UN-HABITAT, 2010:12). Direct assistance is provided in this context to help authorities formulate and implement strategic plans. This intervention shows how strategic planning enhances decision making, participation and spatial articulation of existing plans and policies. It also proves that these plans are products of various stakeholders and the role of policy makers shifts more towards a facilitator responsible to translate these plans into official planning documents, maps and planning instruments.

According to Davidson (1996:446), strategic planning on this level is a combination of structure planning and action planning. These two concepts directly refer to the development vision in terms of growth and development as well as the implementation side of spatial planning. This aligns with the spatial focus of the UN-HABITAT in terms of structuring elements (UN-HABITAT, 2009:35). The last-mentioned spatial focus is more biased on the spatial vision, while Watson (2009:161) feels that a successful strategic plan should create an integrated framework for planning and critical infrastructure issues articulated in different regional hierarchies.

From the UN-HABITAT intervention, it has become clear that spatial planning comes with various challenges of which the integration of sector plans with the regional plan is one of the major role players (UN-HABITAT, 2009:38). In terms of a future development vision, it is necessary to integrate all these types of plans into one framework. According to Todes (2010:417), South Africa's approach to integrated planning is most successful with the Spatial Development Frameworks guiding the development vision with specific reference to both the public and private sector (see Chapter Seven). These strategic planning documents become an important instrument to promote integrated development planning in South Africa. Considering the sub-continental study area, it is necessary to understand the development vision, approaches and plans within the guidance framework of the UN-HABITAT. The next sections specifically focus on Africa integration and the SADC's approach to spatial planning.

### **9.3. SADC policy framework**

#### **9.3.1. Introduction**

The integration of different countries in Africa has been promoted by various governing bodies, institutions and strategies. Amongst others, the African Union (AU), Regional Economic Communities and specifically the SADC strive to promote effective integration in the African continent (DFID, 2011:5). Through the continuous push for integration, the primary aim is to develop the African continent as a thriving and independent continent, which engages fully and freely in the global space. This continuous push for integration within the SADC and the continent serves as a vital platform for the evaluation of the sub-continental study area. The role of an urban hierarchy as spatial planning instrument in this regard would be to potentially promote integration in the SADC to achieve regional balance. Increased integration will support external investment and position the countries for sustainable development.

#### **9.3.2. Africa integration**

The AU provides a platform from which African countries can express themselves freely in the global space and represent the citizens of Africa when important international decisions are made (DFID, 2011:5). The Pan-African Agenda supports the efforts and visions that are promoted by the AU. Pan-Africa Agenda is a movement that acknowledges the need for cooperation of different African countries with the main objective set on economic and social development throughout the continent. If cooperation and integration between different African countries could be achieved, development, upliftment and investment projects are more likely to be sustainable and could ultimately lift the poverty burden hanging over Africa.

In efforts to promote social and economic development through integration between countries, the AU has identified different regional economic blocks (DFID, 2011:5). The regional blocks specifically aim to negotiate free trade areas that could roll out on a much larger geographic scale. The SADC functions as one of the pillars of these identified regional economic blocks. This organisation is headquartered in Gaborone in Botswana. The aims and ultimate goal of the SADC are to further socio-economic integration and to secure the political environment and cooperation. Therefore, it is important to support the role the SADC plays in achieving integration between the countries.

#### **9.3.3. SADC framework for integration**

The main purpose of the SADC is considered to promote deeper economic cooperation and integration to help address many of the factors that make it difficult to sustain economic growth and socio-economic development, such as continued dependence on the exports of few primary

commodities (SADC, 2011:20). Continuous emphasis is placed on a global scale and particularly countries relying on the exports of primary commodities, to transform their economies and diversify the economic sectors by exploring new possibilities to attract other sector and activities.

In the SADC, the small economic markets, inadequate economic infrastructure, social problems and the low-income base have put severe pressure on the countries to attract investment and maintain these projects without external assistance. In an effort to help address these problems, the SADC has proposed and implemented a development integrated approach with specific focus on the political and economic diversities of regional integrating countries (SADC, 2011:20).

This strategy is sensitive to the different ways of productions in the countries, trade patterns, general business, unique labour market, natural resources and sharing of it, development priorities, institutional arrangements and resource allocations. The strategy of integration specifically focusses on barriers and restraints that are mainly created on production level, infrastructure supply and overall efficiency of processes (SADC, 2011:20). From this strategy and its focus, it is clear that the SADC aims to provide assistance in economic growth and development by effectively integrating the SADC member countries in an effort to offer support within this institution.

#### **9.3.3.1. The SADC vision, mission and agenda**

The SADC's vision is focussed mainly on the development direction and integration of Southern Africa as one region. The SADC urges residents of Southern Africa and membership countries to form a collective and shared vision of the development of Southern Africa as a sole community. According to the SADC (2011:21), the vision of the SADC is as follows:

*“The SADC vision is one of a common future, a future in a regional community that will ensure economic wellbeing, improvement of the standards of living and quality of life, freedom and social justice and peace and security for the peoples of Southern Africa. This shared vision is anchored on the common values and principles and the historical and cultural affinities that exist between the peoples of Southern Africa.”*

The development of this region should be sensitive to each member countries' heritage and region, but should aim to socially and economically integrate the SADC region to uplift the development level of the region and promote sustainability in external investment and other projects.

The mission is ultimately to promote and sustain equal economic growth and a socio-economic landscape that is supported through effective and productive systems, cooperation and integration,

sound governance and maintenance of a constant level of peace and security of the regions, the countries and the neighbouring countries (SADC, 2011:21). These principles should enable the region to develop into an effective player in international relations and the world economy. According to the SADC (2011:21), the mission is clearly underpinned by the following principles:

- sovereign equality of all member states
- solidarity, peace and security
- human rights, democracy, and rule of law
- equity, balance and mutual benefit
- peaceful settlement of disputes

These principles are clearly focussed on the integration of the SADC as one region. The SADC agenda is more concentrated on providing guidelines and foundations from where the SADC's institutions, policies and strategies should be built upon. The following paragraphs explain which principles should be adhered to in strategic planning documents, strategies or projects.

The promotion of equal and sustainable socio-economic and economic development should be aimed to ensure the eradication of poverty and to improve the quality of life of all the residents of the SADC through regional integration (SADC, 2011:22). Development should be guided to be self-sustained and maintained by depending on the support and interaction from member countries of the SADC. The reliance, interaction and support offered between countries result in a complementary role between the national and regional strategies. These strategies aim to promote and maximise employment opportunities, protection of the natural environment and the utilisation of resources in the SADC region (SADC, 2011:22).

After considering the vision, mission and agenda of the SADC it is clear that existing regional integration plans and strategic plans should be studied. The general vision and principles of the SADC needs to be integrated with the role of an urban hierarchy in the sub-continental study area.

#### **9.4. Regional integration**

Regional integration in the SADC has become increasingly significant with the economic changes and rhythms in both the continental and global scale. The movement and intensified focus on regional integration are supported by the NEPAD programme. The SADC (2011:22) explain that the NEPAD is a strategic vision and framework with a holistic focus that is aimed to promote multidimensional development in the African continent.

NEPAD covers various aspects concerning the development of Africa that includes economic growth, integration, political issues, social relations, security of the residents and various cultural developments. Although the intention of NEPAD is supported by the SADC, the SADC is actually

used as a platform to promote integration and outcomes of the NEPAD programme. The development and well-being of the Africa continent is clearly visible in the outcomes of NEPAD.

The outcomes of NEPAD can be summarised as follows (DIRC, 2004):

- to eradicate poverty;
- to place African countries, both individually and collectively, on a path of sustainable growth and development;
- to halt the marginalisation of Africa in the globalisation process and enhance its full and beneficial integration into the global economy; and
- to accelerate the empowerment of women.

These outcomes support the role and linkages between the SADC and the NEPAD programme. This is a typical example of how a top-down approach to strategic planning is implemented into the lower order framework and institutions. By aligning the lower order frameworks, the common objective or goal could be enhanced and supported from the bottom structures upwards. This also aligns with the strategic and regional planning as discussed in Chapter Seven. This could be used as a guideline and approach as to how to influence spatial and regional planning in the sub-continental study area.

The cooperation between different countries enhances the possibility to establish regional and continental integration and an interrelated urban system. With the establishment of an urban system, Africa could start to engage in new international relationships, which in turn could aid in the economic growth of the countries in Africa. NEPAD has identified certain priorities that need immediate attention to start pursuing the picture formed in NEPAD and underlined in the different institutions and specifically the SADC. According to DIRC (2004), the priority areas for NEPAD are listed as follows:

- a) Establishing the conditions for sustainable development by ensuring:
  - ✓ Peace and security
  - ✓ Democracy and good political economic and corporate governance
  - ✓ Regional co-operation and integration
  - ✓ Capacity building
  
- b) Policy reforms and increased investment in the following priority sectors:
  - ✓ Agriculture
  - ✓ Human development with a focus on health, education, science and technology and skills development
  - ✓ Building and improving infrastructure, including Information and Communication Technology, Energy, Transport, Water and Sanitation

- ✓ Promoting diversification of production and exports, particularly with respect to agro-industries, manufacturing, mining, mineral beneficiation and tourism
- ✓ Accelerating intra-African trade and improving access to markets of developed countries
- ✓ The environment

c) Mobilising resources by:

- ✓ Increasing domestic savings and investments
- ✓ Improving management of public revenue and expenditure
- ✓ Improving Africa's share in global trade
- ✓ Attracting foreign direct investment
- ✓ Increasing capital flows through further debt reduction

By studying the priority areas above, it is clear that the three main issues involve the sustainable development, policy frameworks and aspects aimed to accelerate economic growth in the international space. These areas could be supported by implementing an effective urban hierarchy in the spatial system that could be used as an instrument to drive and promote the achievement of these three areas. The role of an urban hierarchy would become clear when effectively implemented in the sub-continental study area. In short, this approach could help to strategically identify most viable areas for economic growth and development to promote sustainable development and regional balance.

The urban hierarchy should also advise or recommend certain strategies to be pursued in spatial planning initiatives. With the implementation of an effective urban hierarchy, integration and connectivity between different nodes and countries develop the basis for resource mobilisation between different urban areas and countries. In order to recommend an approach to implement and illustrate the role of an urban hierarchy on the sub-continental study area, the existing initiatives should be studied to understand the manner in which the SADC aims to achieve the outcomes and goals as set out by NEPAD.

## **9.5. Spatial planning initiatives**

### **9.5.1. Regional Indicative Strategic Development Plan**

The Regional Indicative Strategic Development Plan (RISDP) strives to align the principles of the NEPAD programme and the SADC with the current existing regional development plans and policies of applicable to the SADC. In the past, the regional plans, strategic planning documents and policies always focussed on a broad spectrum of sectors with clear principles but no definite

way to approach spatial planning in the SADC. Strategic development plans should have a clear and definite implementation strategy in order to ensure that goals and objectives are reached.

In regional planning in South Africa, the same approach and issue could be seen. Since the RIDP (Regional Industrial Development Plan) in 1991, no clear regional development plan was implemented until the NDP (National Development Plan) in 2010. Although various frameworks (Urban Development Framework, Rural Development Framework in 1997), programmes (Reconstruction and Development Programme in 1994), initiatives (Spatial Development Initiatives in 1997) and perspectives (National Spatial Development Perspective in 2002 and 2006) were seen as the national regional development plan, no real national spatial development plan with specific reference to spatial development and clear outcomes and goals were implemented.

Although these “plans” all had a specific focus and success, no clear definite spatially linked plan to develop the national space was seen as with the NPDP, GHP and RIDP. Together with the success, these plans all had some issues that had been experienced during the time it was implemented. The NDP (latest plan in South Africa – see Chapter Seven) aimed to give a clear vision, goal and strategy as to how the nation should be developed by 2030. The NDP provides different approaches to and ways of how the outcomes and priority needs should be achieved in the various sectors as seen in Chapter Nine.

The RISDP fulfils the same role on the sub-continental study area in the SADC as the NDP on the South African spatial system. The role of providing clear direction and for development with specific reference to existing programmes, projects and activities in the SADC are key to the success of this strategic spatial planning document. According to the SADC (2011:23), the RISDP outlines certain conditions that should be adhered to in order to achieve regional integration within the SADC member countries and also the sub-continental study area. To better describe the role of the RISDP, one could conclude that the RISDP is not a commanding type of spatial plan, but rather a plan that gives direction and identifies certain milestones that first need to be achieved before moving forward in regional development and integration.

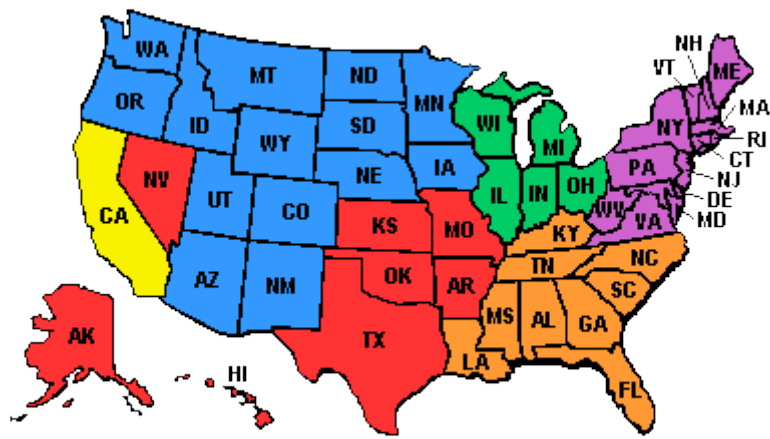
The role of the NDP could also be seen in a similar light of the RISDP with the clear milestones and goals that need to be achieved in order to make progress in regional planning. Although both these plans outline and identify the milestones to be achieved, they could also advise on ways and methods how to reach certain milestones. An example can be that unemployment should be decreased by first improving education and training skills in order to equip individuals with the necessary skills to be able to be considered for more permanent employment opportunities. The milestone in this case is the decrease in unemployment nationally, while the plan may simultaneously give advice how to achieve this milestone i.e. through improving education levels and uplifting individual skills of individuals.

The benefit of this approach in spatial planning is that it could serve as a plan (with clear outcomes), suggesting approaches and ways to address issues and also to easily monitor the progress made in the region. The monitoring process helps to keep track of the progress made in the plan by referring to specific milestones. Logical and effective implementation of the regional development plan can thus be enforced and also backed up by project management principles. By taking smaller steps and targeting different milestones progressively, this strategy seems more likely to achieve success and to be reasonable about the set goals and ultimate outcomes that were identified in the top hierarchy of spatial planning.

According to the SADC (2011:24), the RISDP recognises the need for a more flexible approach toward spatial planning and regional integration between member countries. Bordering countries and members of the SADC might have different ways of approaching a common milestone as set out by the SADC, therefore it is important to be flexible and open for various approaches towards regional integration in order to effectively promote and develop integration between the different countries. With this flexible and open approach of the RISDP, progress in regional integration is easier and more effective than enforcing a dedicated approach. One can also link this approach to a larger scale bottom-up approach where individual countries can implement different programmes and strategies towards the final achievement of the common milestone.

Most of the existing plans, policies and strategies of the RISDP were individually designed and structured by various sectors. The implementation and design of these plans are driven by Sector Coordinating Units, before it is escalated for final approval and grouped into clusters by different Directorates (SADC, 2011:24). This methodology in implementing the different strategies has the benefit of building from the bottom levels upwards. The major negative factor in this method is that the strategies and plans seem to be rather disconnected or in other cases weak links were experienced in a few areas.

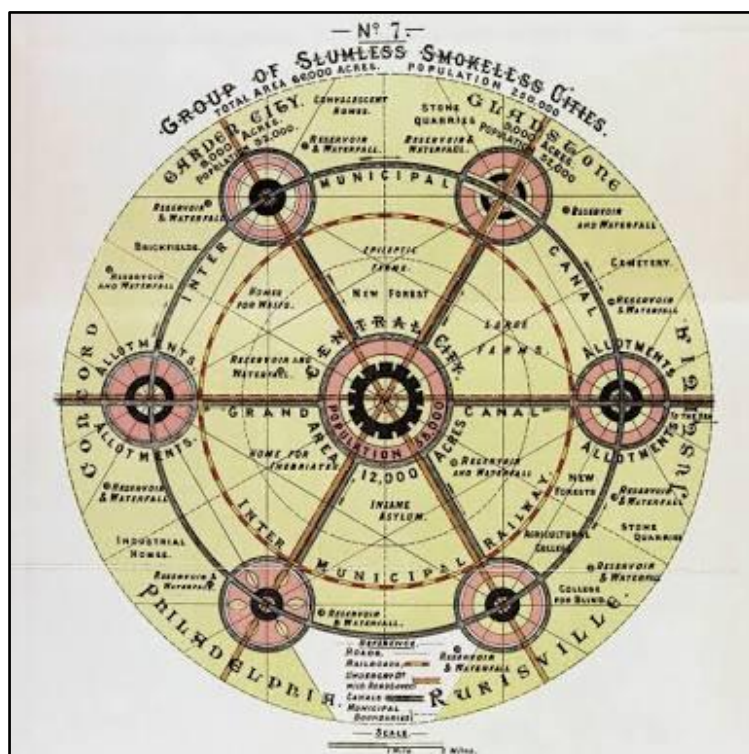
As mentioned, this approach has both positive and negative aspects in the implementation. The problem as raised in the previous paragraph regarding the weak links and disconnected nature of the plans lies within the building blocks of the strategies and how this particular plan is created. In most cases, and as it can be concluded from the sectors, it is clear that the region or plan is only built and focussed on a small, regional perspective geographical area. The plan is structured around what should be achieved and how it should be implemented within the jurisdiction of that specific Sector Coordinating Unit. The following figure illustrates the principle of this bottom-up approach in regional planning.



**Figure 9-1: Visual illustration of bottom-up approach**

Source: Llarull (2004)

Different small regions are puzzled together to form a larger regional plan that is implemented between countries (or states in terms of the figure) and within the SADC. If this larger regional plan is then viewed and implemented through a top-down hierarchy, the different weaknesses become clear. Although regional plans can share the same visions, missions, agendas and principles, the manner of dissecting the regions is different. The blueprint of a successful plan cannot be implemented blindly on other areas. When strategic regional planning is done, it is necessary to first start dissecting the larger geographical area or specific planning region. This approach can be visually illustrated in the following figure.



**Figure 9-2: Visual illustration of top-down approach**

Source: Bass Studio Architects (2016)

This approach identifies larger and main spatial and strategic issues and could aid in designing an effective implementation process in order to achieve the main objectives of the SADC. The role of an urban hierarchy as a spatial planning instrument could be of great value. By utilising the urban hierarchy over a large geographic scale, a more sustainable approach could be followed in the identification of priority areas and could also indicate different relationships and the interconnection between areas. The interconnection and relationships could help achieve further smaller geographic scale problems as currently being identified by the various Coordinating Sector Units.

According to the RISDP (2011:24), this plan identifies and strengthens these weak linkages, programmes, plans and strategies. The manner in which the RISDP currently addresses this problem is to promote efficiency in the plans and driving the specific outcomes identified. This means that, instead of actually providing different approaches and strategies, the RISDP is actually fast tracking the process of exposing the weak links in the current sector driven plans. The RISDP provides clear guidelines in terms of social and economic principles, but no clear regional strategic development plan is given. The RISDP rather plays a facilitating and coordinating role in this case. The RISDP (2011:24) confirms this approach with the following phrase.

*“It also provides the Secretariat and other SADC institutions with clear guidelines on SADC's approved social and economic priorities and policies, and, therefore, enhances their effectiveness in discharging their facilitating and coordinating role.”*

With the clear role and approach of the RISDP, it should be remembered that this plan enforces the vision of a common future within the regional community. This desired regional development is approached through the promotion of sustainable and equitable economic growth and socio-economic development. The ultimate objective of the RISDP remains to deepen the integration agenda of SADC with a view to accelerate poverty alleviation and achieving other economic and non-economic development goals. From this objective alone, it is clear that integration, social and economic values are driven to help uplift the current state of the SADC member countries. This objective is not clearly linked to a strategic regional plan that identifies areas that could be targeted to give immediate attention to. A clear strategic regional plan for the SADC could aid in identifying these areas and to gain momentum in progress through interrelated networks between different areas. An urban hierarchy could serve as a key spatial planning instrument informing where to focus on.

### **9.5.2. DFID Southern Africa Development Plan**

Apart from the RISDP discussed in the previous section, various external planning initiatives exist. These external initiatives all include similar approaches to development in Southern African. The

DFID serves as an example of a specific external initiative. The Department for International Development has introduced the Southern Africa Development Plan. This plan was first published in February 2011 and stipulates the rationale for regional integration (DFID, 2011:1). This regional plan is also applicable to the sub-continental study area as demarcated in Chapter Eight. The plan is mostly based on three central themes (stipulated below) that are targeted for improvement and on which the strategies are based (DFID, 2011:1):

1. Overall growth and the creation of jobs and promotion of equity
2. Resilient livelihoods
3. Peace and security

If the three central themes are compared to the focus areas of the RISDP, it can be seen that the two plans are very much aligned. Other external initiatives also align with the RISDP. The alignment of the two plans is mostly due to the dire need experienced in Southern Africa in these main areas. These themes are understandably common due to the history of Sub-Saharan Africa and the general level of development. The major difference between the Department for International Development Southern Africa Development Plan (DFIDSADP) and the RISDP is the specific focus on resilient livelihoods. Although the RISDP also addresses this theme through sustainable and habitable urban areas under an overall theme of sustainable development, the DFIDSADP specifically focusses on resilient livelihoods as a separate theme in the plan. In this section, the plan is summarised and discussed to understand the difference, alignment to the RISDP and approaches of the DFIDSADP.

To sustainably build and help growth in Africa, the UK has decided to increase funding aimed for development and regional development programmes to £1 billion pounds from 2011 to 2015 (DFID, 2011:3). This increase and vision of the UK are of great importance for the development of Africa. The DFID, based in London, also works closely with African Institutions such as NEPAD and the African Union (AU) to ensure cooperation and implementation. Cooperation with these institutions and bodies is the only approach as to how external strategic regional planning could be implemented successfully in Africa (top-down approach). Through this regional plan, the DFID has started a process of learning how development in Africa is approached and how to build on current successes already achieved in Africa (DFID, 2011:3).

The AU is used as a platform where common issues and needs could be raised and represented on a global platform, making the partnership between the DFID and AU of great importance. Further to this, the AU as platform is used to promote cooperation between different countries in Africa with the main aim to achieve sustainable growth across the African continent. This ensures that the cooperation and foundation already exist through the AU to promote effective implementation and success of DFIDSADP. The AU has established regional blocks to effectively

manage the process of integration between these countries. Regional blocks such as the SADC align with the demarcated sub-continental study area and create a hierarchy of structures that could be targeted for specific reasons. The DFID aims to target these blocks and existing structures and hierarchy to successfully implement this regional plan.

The SADC and the sub-continental study area are known to cover various countries in the African continent. The boundaries of many of these countries and the exact area and extent of each have only been finalised recently (DFID, 2011:9). According to the DFID (2011:9), individual countries in Southern Africa often do not have the capacity or expertise to deal with trans-border regional solutions. The integration and effective planning of these areas require the help and input of a network of countries to work towards an integrated regional approach. The network of countries needs to collectively implement a regional approach in such a manner that all the concerned countries are placed in a position to benefit from the regional approach.

The DFID (2011:9) states that, due to the small and scattered populations in African countries, these countries often lack the potential and the existence of significant nodes and markets that could result in the successful attraction of external investment. The lack of this potential is negative in terms of sustainable development of these areas. Regional integration between these countries could result in the establishment of a more defined spatial pattern and hierarchy of nodes that can attract different levels of external investment.

Apart from the limited relationship between countries, proper infrastructure and the development of cross-border infrastructure are other inhibiting factors that limit growth and integration between African countries. Cross-border infrastructure is vital in the effective promotion of integration and trade routes between countries, which in turn leads to economic growth and development. The DFID (2011:9) states that roads, railways, ports and energy infrastructure also need to be developed through integration as individual countries often do not have the means to provide these trade corridors and nodes. This has been identified as one of the most significant issues regarding the development of countries in Southern Africa. Regional integration could only be achieved through the collaboration of a network of countries that is driven by a common goal and agenda. The DFID (2009:11) has realised the need for integration and has started to address these problems by specifically focussing on the target areas to start to address regional integration in Southern Africa.

As mentioned previously, the DFID should target certain particular areas of engagement that would ensure the external investment plan and strategy could be more sustainable. For this reason, the DFID has identified specific areas of priority that need to be engaged with the three central themes as mentioned that form the basis of the plan. According to the DFID (2006:16), the

following areas were identified that form part of the common themes or work together amongst these themes:

- Growth, jobs and equity
- Regional transport infrastructure
- Resilient livelihoods
- Food security
- Water
- Climate change
- Infectious diseases
- Peace and security

These areas should show the potential of adding value to country and regional led approaches where the UK could contribute with its experience and expertise in the different fields. These areas should also have the backing of different institutions that could be used as background to help monitor and implement strategies in these areas. From the list discussed above, a clear infrastructure master plan also exists with a clear vision in the SADC and ultimately the sub-continental study area. The plan referred to is the SADC Regional Infrastructure Development Master Plan that is discussed later in this chapter.

The implementation of the SADP (Southern Africa Development Plan) and the establishment of regional integration and collaborative working between countries are approached through different methods of integration. The two extreme approaches referred to include “soft integration” and “hard integration”. According to the DFID (2011:9), soft integration may include a form of a consensus in a framework of intergovernmental arrangements and hard integration may include the process where member countries actually give up a certain amount of sovereignty to supranational institutions. The SADP has managed to successfully implement different levels of integration ranging from coordination and harmonisation to full integration.

*“The African Peer Review Mechanism, a voluntary programme among AU member states to increase accountability, is an example of soft integration based on countries opting into a peer review system (DFID, 2011:9).”*

According to the DFID (2009:11), functional integration may also lead to more holistic approaches in mending new relationships and integration between different countries. Such an example may include benefits and cooperation between countries to collectively address social implications of regional economic integration. This principle and approach should only be linked to smaller geographic areas to promote effective management and prevent higher order duplication. In other words, if functional integration can be achieved through straightforward measures and approaches

that are commonly agreed on, it should be implemented directly without escalating it to higher governing institutions or bodies.

Effective and sustainable integration needs the cooperation of all development partners in the region including member countries, international agencies and Regional Economic Communities (RECs) that work together to establish a synergy between the countries. The geographic coverage of the SADC and its broad mandate automatically partners with the DFID. It is clear that different organisations at different institutional levels have the same common goal – to promote integration in Africa.

Although the combined effort of these two organisations has succeeded in securing funds for regional infrastructure, the accumulation of public finance remains a challenge (DFID, 2011:15). Large scale infrastructure development is necessary to promote effective integration between the member countries. Public and private partnerships and funding programmes need to be introduced to help securing funds and develop a region wide infrastructure network. Securing private sector collaboration falls under the duties and roles of the RECs.

The emphasis on the private sector should not take away the responsibility and pivotal role of national governments. Regional integration can only be achieved through the cooperation of national governments. Integration decisions and steps need the approval from different government levels from various levels, depending on the scale. According to the DFID (2011:16), it also engages with international agencies in efforts to attract external investment. Certain international groups with a central cooperation and harmonisation theme provide frameworks for discussion of integration at regional level. These platforms should be operationalised more effectively in terms of regularity of discussions and involvement.

### **9.5.3. Regional Infrastructure Development Master Plan (RIDMP)**

#### **9.5.3.1. Framework and foundation**

The vision in providing a region-wide infrastructure network was first conceived in 2007 in Lusaka, Zambia (SADC, 2012:6). The objective was set to establish documents and frameworks aimed at guiding the development of cost-effective trans-boundary infrastructure. The vision of providing an integrated infrastructure network in the SADC is based on six pillars, which form the basis of the RIDMP. These pillars include Energy, Transport, Information and Communication Technologies (ICT), Meteorology, Water and Trans-Frontier Conservation Areas (TFCA).

The foundation of these six pillars is formed from harmonised policies and regulations supported by human resource capacity development programmes as well as an increasing public awareness and common goals. The success and competitiveness of the SADC depend on a joint effort and

cooperation of all resources to achieve this common comprehensive development infrastructure network of the SADC. The framework and foundation of the RIDMP is illustrated by the following figure.



**Figure 9-3: RIDMP framework for infrastructure network of the SADC**

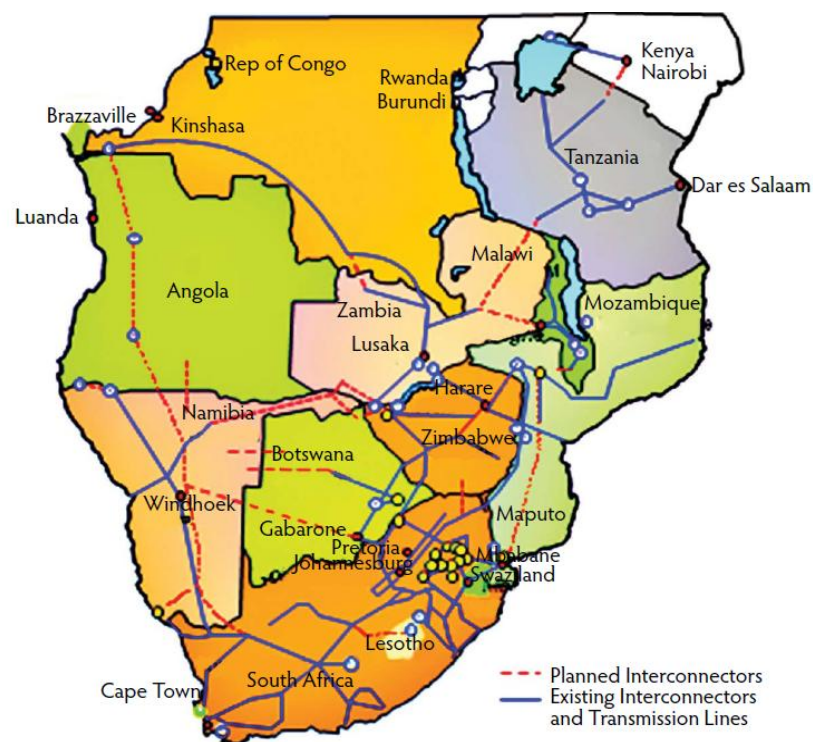
Source: SADC, (2012:6)

For the purpose of this research, four of the six pillars are discussed, namely Energy, Transport, ICT and Water. These four pillars can be directly linked to integration and connection between nodes and countries, which are of great concern to this research.

#### **9.5.3.2. Energy**

In terms of energy, the SADC has already developed a network of infrastructure of electricity between 9 of the member countries of the SADC (SADC, 2012:8). This existing network has already optimised interconnection and trade between the concerned countries. The short-term need of the expansion of this network is to include three more member countries. By expanding the network, production and trade in the SADC could become more integrated in terms of the energy sector.

Apart from the existing energy network and the short-term need to expand this network, the SADC has also identified issues in the energy provision amongst these countries. According to the SADC (2012:8), these challenges are focussed more on the energy, delivery, price and access to services. Some of these challenges include the lack of access to electricity in rural areas, lack of project planning and funds in the expansion of the electricity network. Coal has also been the main source of power generation with limited projects and research into renewable energy methods. The following figure illustrates the existing network as well as planned projects in the SADC.



	Name of Project	Member States	Estimated Year of Completion
1	Central Transmission Corridor (CTC)	Botswana, Namibia, Zambia and Zimbabwe	2014
2	ZIZABONA Interconnector Project	Botswana, Namibia, Zambia and Zimbabwe	2015
3	Zambia–Tanzania–Kenya (Z-T-K) Power Interconnector Project	Zambia, Tanzania, Kenya	2016
4	Namibia – Angola Interconnector Project	Namibia, Angola	2016
5	Democratic Republic of the Congo (DRC) – Angola Interconnector	DRC and Angola	2016
6	Mozambique – Malawi Interconnector	Mozambique and Malawi	2016
7	2nd South Africa – Zimbabwe Interconnector	South Africa and Zimbabwe	2017
8	2nd DRC – Zambia Interconnector	DRC and Zambia	2017
9	Mozambique Backbone Project	Mozambique	2020

**Figure 9-4: SADC regional power and energy projects**

Source: SADC, (2012:21)

In terms of energy, identified projects are mostly focussed on electricity generation and transmission projects, refineries, storage facilities and pipelines for petroleum, gas and transport and distribution facilities of coal in terms of demand and exports (SADC, 2012:8). Most of these projects are already included in the master plan. Apart from the identified projects, softer issues such as electricity management, funding, institutional support and policy frameworks also inhibit the effective delivery of energy. Although the master plan only refers to the provision of energy and the expansion of the current infrastructure, the softer issues are also important for effective network expansion.

### 9.5.3.3. Transport

The transport sector refers to road transport, rail transport, ports, air transport and water transport. The overall transport sector is directly linked to the level of integration and also the support to improve integration between countries and nodes. The role of transport and the management and expansion of this network are vital in promoting integration between SADC members and nodes. This sector is also directly linked to evaluation criteria and the role of an urban hierarchy in study area and SADC.

The research and drafting process of the RIDMP revealed that a lack of surface transport was experienced and continuously widening (SADC, 2012:10). This finding confirms one of the reasons why countries and nodes in the SADC experience isolation and a general lack of integration and communication. The RIDMP aims to address the lack of integration and general disconnected existing transport networks by implementing and planning various multimodal transport projects all over the region, as illustrated with the following figure:

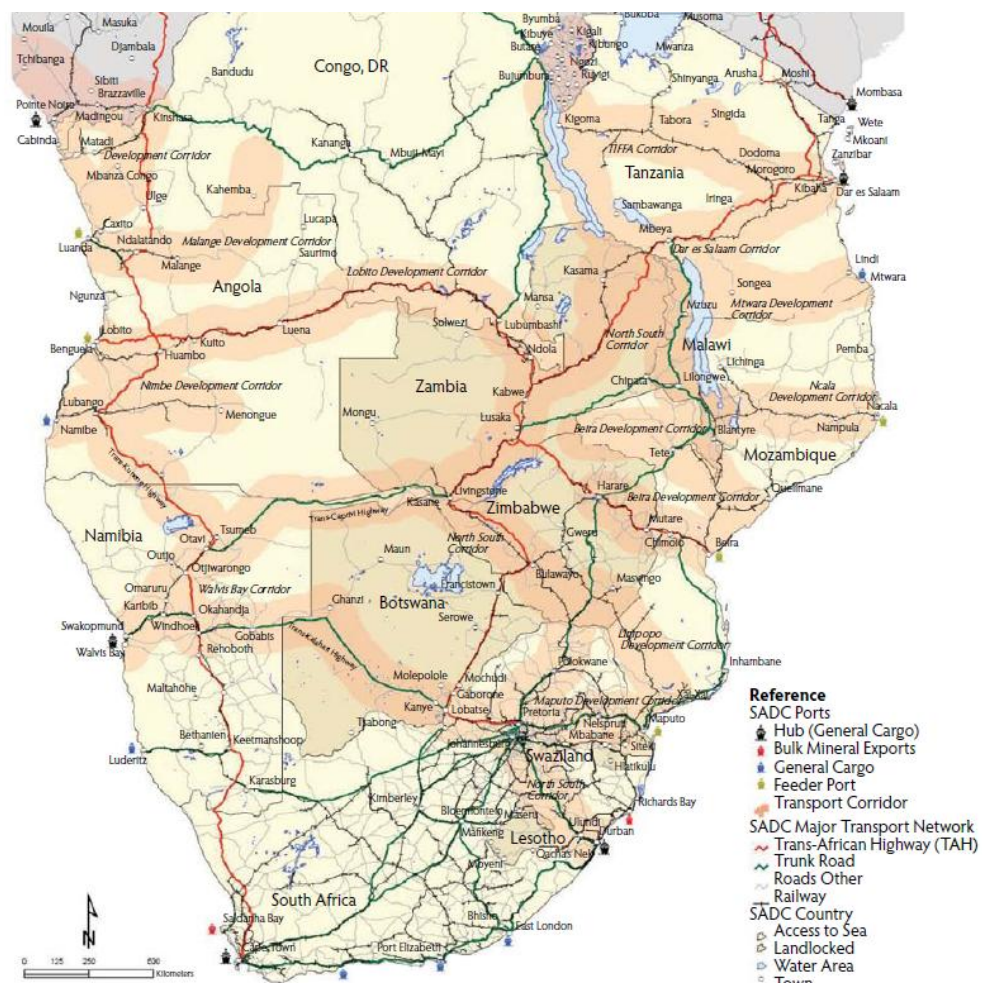


Figure 9-5: SADC Regional transport corridors

Source: SADC, (2012:23)

From the figure above and existing infrastructure, it is clear that the SADC follows a corridor approach by aligning and concentrating transport routes where possible. This approach is also directly linked to the urban hierarchy in the region as well as the sub-continental study area and had to be taken into account in later stages of this research. With the planned projects and location of expanding networks, it can be concluded that management of these networks are focussed on central corridors. It is expected that the expanding network should integrate countries and nodes more and also unlock trade opportunities. These opportunities could only be unlocked with the cooperation of the logistics sector.

The productivity and level of integration are directly linked to the efficient performance of the road infrastructure. The quality and efficiency of movements on these networks are also addressed to a lesser extent around major nodes. This is mostly due to the fact that the RIDMP focusses more on the provision and expansion of region-wide transport network. Efficiency of movement on roads in large nodes is addressed on lower and more detailed levels such as bypasses, widening of roads and traffic calming steps. Funding in the provision and expansion of the transport network is also a major challenge in the region (SADC, 2012:10).

In terms of the railway network in the SADC, it is also found that the railway network is operated on a national basis in the SADC. This is a major problem and is directly linked to isolation of areas and prevents effective integration. Common technical and operational standards and measures need to be implemented in the SADC to rectify and address this major issue. Approaches such as the last-mentioned need to be concluded in one document that provides a general framework of operation of the entire railway network (SADC, 2012:10). The existing network operates well, but is limited in capacity due to a lack of maintenance and operating capacity. In order to effectively utilise this network, major upgrades should be implemented on the network.

In terms of water transport, the planning and management of ports are done on a national basis in the SADC. The SADC does play a role in proposing development of new ports, as existing ports are operating currently over capacity (SADC, 2012:10). The SADC lacks an institutional body and capacity that continuously drive the maintenance and development of ports in the region. The RIDMP suggests that private sector companies need to be attracted in this process in order to build capacity and ensuring ongoing upgrading of current facilities. The delay of and high costs at ports have a critical impact on ease of trade and ultimately local economies. By building capacity and managing existing ports more effectively, this issue could be addressed.

According to the SADC (2012:10), air transport is considered a global enterprise based on commercial considerations. Air transport is also guided by international conventions and standards that maintain good overall quality in the region. The RIDMP has identified the need for the establishment of a body that could manage the overall safety in order to facilitate

harmonisation of operating systems and procedures. The SADC countries consist of many airports that are upgraded on a continuous basis due to the involvement of private sector and international bodies. OR Tambo International Airport serves as a regional hub in terms of air transport of the SADC.

#### **9.5.3.4. Information and Communication Technologies**

Information and Communication Technologies (ICT) have become increasingly important in the twentieth century. Through this vital resource, citizens can enable themselves to gain vital knowledge in order to excel in various sectors. The SADC (2012:12) states that the ICT are seen as the knowledge economy and in some cases the electricity of the twenty-first century. As this vital resource continues to be more and more valuable, the SADC's goal is to provide each citizen in the region with access to this resource.

The SADC has already commenced with programmes and frameworks to effectively provide access to this resource. These efforts are constrained due to the lack of other supporting infrastructure and in particular the energy sector. In order to provide full capacity and efficiency in this sector, steps need to be taken to first address the issue regarding complementary infrastructure. The existing infrastructure that is provided is also not used to its full capacity in order to gain maximum benefit from this sector.

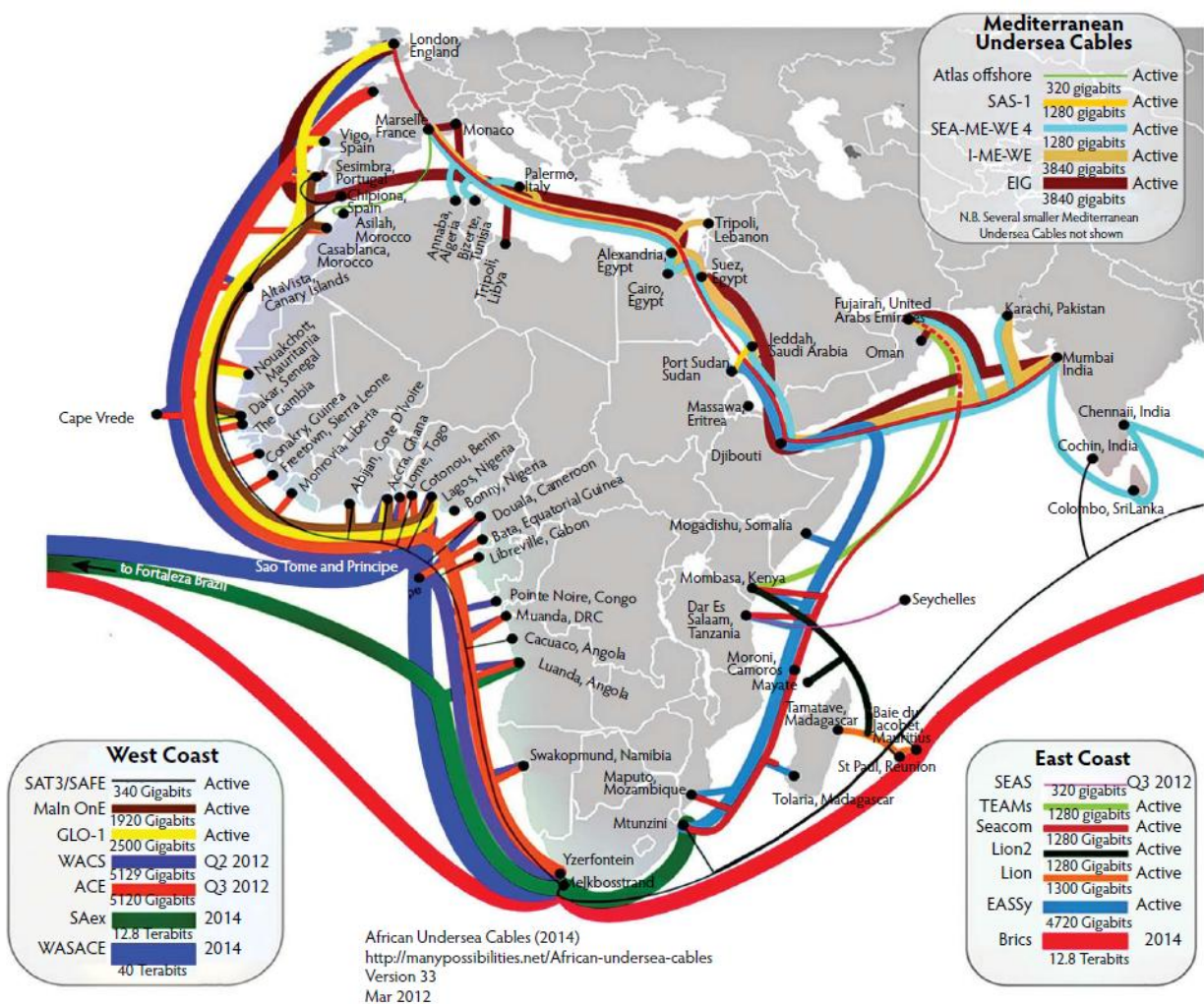
The national fibre optic networks need to be managed more effectively and should also be extended in order to provide this resource to a much larger portion of the population at affordable costs. The lack of effective coverage in terms of optic fibre drives countries to link up with regional international links which has a direct impact on costs. This also has a direct impact on the general public in particular as the public uses broadband services directly linked to the external and international exchange rates.

The effect on costs for the general public limits the actual development of applications and services, directly linked to effective management in various sectors. The SADC (2012:12) states that SADC members show the same international trends regarding an increase in mobile networks users, internet access, online shopping, decline in postal services and incline in the provision of internet trade and exports. This confirms the need for effectively providing and expanding the infrastructure network directly linked to ICT.

The RIDMP aims to provide always-on, affordable connectivity, rich content and useful applications with easy to use mobile networks and postal services. Effective postal services could also be outsourced to various other role-players including the private sector. Private sector companies therefore play an integral role in completing the ICT circle. According to the SADC (2012:12), 2011 showed a 4% per capita internet user base. The SADC assumes that by 2027,

this portion is likely to increase to 20% and reaching between 80-90% of businesses and households in the SADC region.

To achieve this expansion and goal, collective efforts from governments and all other stakeholders need to work together to expand the infrastructure networks. National governments need to allocate specific roles and responsibilities through a systematic approach in order to ensure effective delivery and prevent any potential bottlenecks and identify the best way forward by studying the international trends and methods. This framework should be based on infrastructure, capacity building, e-services and applications as well as research and innovation in the ICT sector. The RIDMP has identified projects aimed to improving the current situation regarding ICT, as can be seen in the following figure.



**Figure 9-6: SADC ICT projects**

Source: SADC, (2012:23)

Most of these projects illustrated above focus on attracting investment from the private sector in the ICT infrastructure of the region in an effort to bridge the existing gaps in the SADC member countries and full integration amongst the members. The ICT infrastructure network will provide a

reliable, region wide, resilient, modern, fully integrated and connected network that is supported by undersea cables on the eastern and western sea-boards of the continent as illustrated in the above figure (SADC, 2012:23).

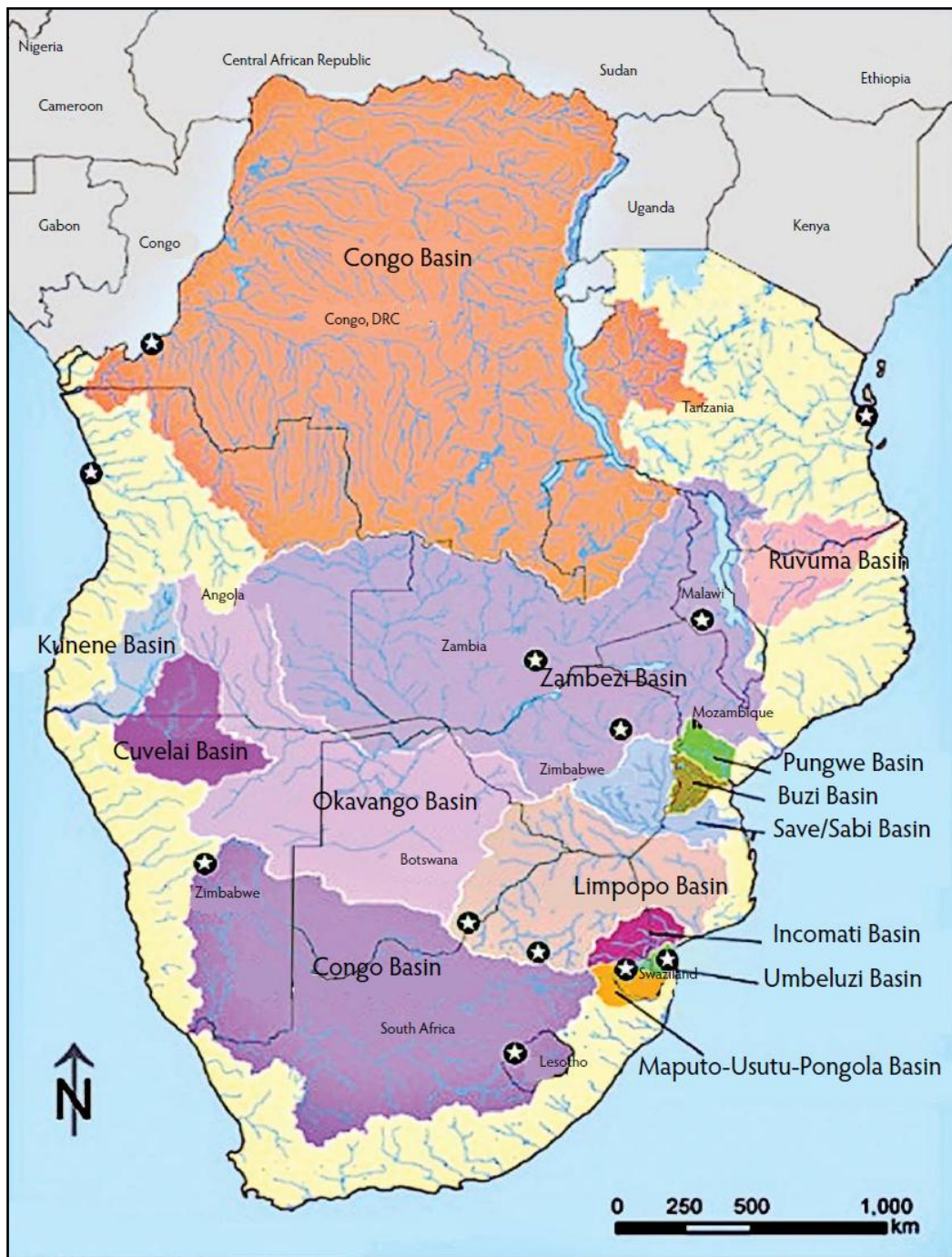
#### **9.5.3.5. Natural resources**

Water, probably one of the scarcest resources, has become an international concern over the past few years. The impact of climate change and other factors such as pollution has emphasised the importance and management of this resource even more globally. The diagnostic study of the SADC has indicated that the SADC member countries only retain 14% of available renewable water resources of which the Kariba and Cahora lakes retain about 10% respectively (SADC, 2012:1). The rest of the retainable water all flows back to the oceans through river networks in the region.

Water and rainfall statistics and calculations have showed that there is adequate water for each SADC citizen (SADC, 2012:15). With this being said and proved, the challenge in the SADC is to retain the water through an inadequate and poorly managed water infrastructure network in the region. The provision of water in the SADC is directly linked to socio-economic and economic functions of the region. In the African continent (and the SADC) it is known that the provision and management of water differs vastly from north to south and east to west of the continent.

The challenges in the region therefore require a joint effort in terms of planning, management and development of additional water infrastructure programmes in the region. The SADC (2012:15) stated that approximately 40% of the region's citizens have no access to clean and safe to drink water resources, which is considered as a worryingly dangerous statistic. Apart from this, over 61% of the population have no access to adequate sanitation and personal hygiene water sources (SADC, 2012:15). Statistics such as these are directly linked to the overall problems experienced in terms of health and also other economic activities particularly linked to food processing industries.

The SADC took note of the issues experienced in terms of the water sector infrastructure. Infrastructure linked to the water sector needs to be improved in order for countries to develop economically and provide better livelihoods to the region's citizens. This is directly linked to the goals and aims of the Department for International Developments' Southern Africa Development Plan 2011 and beyond (discussed earlier in this chapter). The RIDMP focussed and proposed on 34 water infrastructure projects, as illustrated in the following figure.



**Figure 9-7: SADC Transboundary basins**

Source: SADC (2012:26)

These identified projects started to be implemented in 2013 and are expected to continue up to 2021. The immediate action and implementation of water infrastructure projects were implemented this fast due to the fact that the necessary preparation and cooperation of all stakeholders including the private sector was already done. With these projects annual renewable water resource storage is expected to increase from 14% to 25% (SADC, 2012:15). Areas under irrigation could therefore be expanded, minimising the effect of climate change and droughts, directly linked to economic activities, growing of crops and further integration between member

countries. Water resource projects can also be used in the generation of green energy and improving access to water and sanitation to the residents in the SADC countries.

#### **9.5.3.6. Critical factors for implementation**

One of the purposes of the RIDMP was to critically evaluate the SADC region in terms of regional infrastructure and to highlight the need for improvement and action in the current plans. According to the SADC (2012:18), the RIDMP should serve as a platform of implementation of various regional infrastructure development programmes and projects. This strategic planning document also provides a common ground for cooperation of development patterns focussing specifically on collaboration between all stakeholders in the implementation of expanding networks. Certain critical factors however need to be implemented to ensure the effective working of the RIDMP and includes (SADC, 2012:18):

- **Commitment of member countries and related agencies**

It is essential that the cooperation between member states be ensured by the mutual signing of Memorandums of Understanding (MoUs). By signing MoUs, the applicable countries ensure their cooperation, realise the development goals and respect the national development plans.

- **Creation and strengthening of oversight and implementing institutions**

The RIDMP has recommended that certain institutions are appointed to oversee and monitor development projects launched within the region. Existing institutions need to be strengthened or new institutions need to be created in order to provide assistance and guidance on a more technical level as requested by the RIDMP.

- **Appropriate policy, institutional and regulatory framework**

Infrastructure projects and programmes need to be guided by mutual policies and regulatory frameworks within the member countries. These policies and frameworks would provide an enabling environment, ultimately ensuring effective implementation of projects. The SADC has been of great assistance in the provision of model policies and frameworks that are adapted by various member countries. This ensures transparency and standardisation of policies regarding infrastructural development.

- **Provision of a robust monitoring and evaluation system**

The RIDMP also provides guidance in terms of monitoring and evaluation processes that ensure effective and accurate reporting systems. Accurate reporting systems are essential

to ensure that agreed targets are met and quality is guaranteed in the projects at operational level.

- **Availability of a pipeline of bankable projects**

The RIDMP has developed a general GIS database that is available to utilise in infrastructural development programmes. This GIS database includes pipeline projects that could be applied or used to guide development projects. The SADC has also developed a fund (SADC Project Preparation and Development Fund) that is specifically aimed to support project preparation and development in the region.

- **Financial sustainability of projects funding**

Funding and financial sustainability are of the common problems that were identified by the RIDMP during the diagnostic report on the region. In order to ensure sufficient funding of projects, projects need to be detailed in terms of realistic and accurate costs.

- **Partnership with private sector in infrastructure development**

As with the case with funding, the cooperation of the private sector is also a common and essential issue raised by the RIDMP. The public-sector experiences funding problems of these projects, particularly due to fiscal limitations or competition of socio-economic issues. In order to address this challenge, the RIDMP has created a platform based on public private partnership participation in infrastructure projects. In some cases, the SADC members have invited certain private sector role-players to form the sole partner members in various projects. The elimination of monopolies should be eliminated and open access to project participation should be institutionalised.

- **Adoption of the user pays principle**

Another major challenge in infrastructure projects in the region is the lack of cost-effective tariffs in terms of infrastructure access and usage. This challenge has resulted in limited resources available during maintenance of existing infrastructure in the region. A balance should be created in terms of access and usage of infrastructure and cost-effective payment options. Payment to access and usage of infrastructure is directly linked to building up the ability to maintain existing infrastructure.

By studying these factors, it is clear that the SADC has used the RIDMP as an important framework and guiding document to expand the existing region wide infrastructure. These factors are proposed and recommended through a top-down approach with the option of member countries to adapt the SADC factors and examples. The countries can also choose to use this

framework to guide member countries that have the capacity to expand in infrastructure in the region ensuring effective integration between the countries.

## **9.6. Conclusion**

In this chapter, existing strategies and plans applicable to the sub-continental study area were discussed. These are mostly focussed on the SADC as an entire geographic area. The main concern and central theme in these documents are directly linked to the central theme of promoting integration between member countries of the SADC. The central theme of integration can be effectively aligned with the role of an urban hierarchy as spatial planning instrument. For this reason, it is important to illustrate the role of an urban hierarchy by promoting integration between member countries through nodes and corridors.

The urban hierarchy, nodes and corridors need to form the foundation for recommendations on the sub-continental study area. In the following chapter, the strategic planning for the regional perspective and sub-continental scale is done by illustrating how an urban hierarchy can be used as a spatial planning instrument on different geographic levels. Different models for implementation are proposed for the different geographic levels that take the evaluation of the study areas (based on theoretical principles) into account. These models also align with the existing strategic vision and planning documentation as discussed in Chapters Eight and Nine.

## **CHAPTER 10: STRATEGIC PLANNING**

### **10.1. Introduction**

In this chapter, the different sections of the thesis will be discussed collectively. By combining the research methodology, literature and empirical investigation sections, a new collective reasoning is discussed that is specifically focussed on the aims and objectives of this research. From Chapter One, the primary aim of this thesis was identified to specifically consider the role of an urban hierarchy as spatial planning instrument. The primary aim is linked to the following objectives that were identified to help achieve the aim:

5. To potentially combine spatial planning instruments and urban hierarchies in an integrative approach and illustrate what unique insights can be deduced and how these insights might achieve progress towards a higher level of spatial balance in a region.
6. To determine appropriate urban hierarchies in a region relevant to its unique development phase.
7. To interpret an urban hierarchy through nodes with similar characteristics, based on social and economic indicators, relevant to the region's development.
8. To determine and potentially propose unique policy approaches for a planning region in different phases of development.

The chapter starts with the synthesis that serves as a point of departure of actual recommendations in the different geographical study areas which are discussed and tested. The chapter will then be concluded by referring back to the aim, objectives and stated hypotheses in Chapter One.

### **10.2. Synthesis**

The literature foundation of this research consists of three main themes. These three themes can be concluded as, i.e. Spatial planning instruments, Regional delineation and Urban hierarchy (Chapters Three, Four and Five). The role of an urban hierarchy as spatial planning instrument is the core subject linking the three themes mentioned above. These themes are not directly linked to each other, but have indirect effects on the spatial dynamics of a region. The different links and relationships between each of the individual themes and the core subject of this thesis are illustrated in Figure 10-1.

Spatial planning instruments (Chapter Three) are significant in this thesis for the elements used as instruments all play an integral part in the region's development. The spatial planning instruments studied were nodes, corridors and planning regions (see Sections 3.5 – 3.7). Each of the instruments is responsible to create and guide structure and development in a region towards a

specific vision. The main theory, the development, impact and dynamics of each of the spatial planning instruments were studied to understand how planning instruments are applied in a region to promote a certain structure or development direction.

The first spatial planning instrument studied was a node (Section 3.5). Nodes are the points in a region where activities are concentrated in and from where development and growth occurs (Weber, 1909:34). Different authors had different views and inputs of the functioning and development of nodes. The manner in which a node develops was studied in order to determine how the concentration of activities is attracted and which dynamics promote growth (Sections 3.5.1 – 3.5.2). Apart from understanding where nodes are typically found spatially, it was found that activities of different economic sectors and functions cluster together due to increased synergy levels between the different uses (Boudeville, 1972; Glasson, 1985). These uses help to create positive spinoffs into the surrounding activities and uses, which in turn create employment opportunities that attract people from the surrounding region (positive pull factor) (Ainamo, 2002; Roberts and Fisher, 2006). Over time, these nodes grow naturally and attract more activities and people.

The development of nodes is directly linked to economic growth and economic sectors functioning within the node (Section 3.5.2). Economic growth and the attraction of economic sectors are mostly linked to the geographic location and dominant economic sector activity, which creates the agglomeration benefits for additional and complementary facilities as discussed (Section 3.5.2.3). The application of nodes as spatial planning instruments is linked to the development and role of a node. Nodes are identified in a certain environment to attract the establishment of activities to gain momentum for natural growth and development of a particular area.

The second spatial planning instrument studied was a corridor. Of all the instruments studied, the most important and are nodes and corridors which cannot be separated from each other (Hauptfleisch *et al.*, 2010; Andersen Burnett, 1998; Roeseler and Von Dosky, 1991; Boudeville, 1972; Michaelson *et al.*, 2008). The interaction and combination of nodes and corridors are an integral part and concept of this research. The development and dynamics of a corridor are important and could play an essential role in regional development. As with the case of nodes, different views and opinions exist of corridors. The local South African views and international views on the development of corridors were studied (Sections 3.6.2). From these different opinions and views, a conclusion was made that corridors fulfil mainly a linking role, combined with linear development of different intensities.

The linking role of a corridor is primarily responsible to establish interaction between different order nodes and areas within a region (Geyer, 1988:123). Corridors are responsible for internal and external regional growth and to guide development and growth towards newly identified nodes in a

spatial system. For this reason, nodes and corridors cannot be separated from each other in spatial planning. Apart from linkages corridors are also responsible and linked to the development of infrastructure networks, growth in population, structural form and communication developments (Harrison and Todes, 1996; Priemus and Zonneveld, 2003:167) . In terms of how corridors are applied as a spatial planning instrument, it is the role above that can be seen as the main application of corridors. Corridors are planned to promote and uplift the development within a region in the aforementioned factors, supported by different activities strengthening the interaction between nodes along corridors (Michealson *et al.* 2008; Harrison and Todes, 1996 and Curtis, 2012). Corridors are therefore significant in determining the structure and guiding the growth of a region and nodes and ultimately the urban hierarchy of a region.

The third spatial planning instrument discussed was planning regions (Section 3.7). In terms of planning regions this thesis mainly focussed on how it develops and how it is applied on a regional scale. From the study, it was found that planned regions can be seen as areas identified and planned for to guide development of that specific region into a desired direction (James, 1952 and Glasson, 1985). An entire region was therefore identified as a spatial system to drive development into a certain direction. Planned regions are areas reserved for the use of a specific significance and role (James, 1952; Glasson, 1985 and Friedmann, 1966).

The different spatial planning instruments that were studied are currently applied on specific delineated regions to promote spatial balance in a region, from an unbalanced spatial form. In this chapter the process of regional delineation was discussed and the impact and role of corridors became evident (see Chapter Four). The different methodologies studied in regional delineation also guided the process of how the different areas were delineated. The remainder of the chapter focussed on the actual growth of regions as well as the specific growth phases of different region (Sections 4.4 and 4.5).

In terms of unbalanced and balanced growth within a region, it was necessary to understand the dynamics at play in both these ways of growth. From both ways of growth, the different spatial and economic development states of a region were discussed (Rosenstein-Rodan, 1943; Lewis, 1956; Ohlin, 1959; Danino-Pastore, 1963; Temple, 2008 and Gardiner *et al.*, 2012). The study clearly revealed that spatial development of a region refers to the distribution of nodes while, economic development refers to economic contribution and investment of nodes. The current regional planning plans and visions applicable on this thesis all strive to create a more balanced spatial and economic state in a region.

The external investment forces and reaction of people living in the region create an unbalanced momentum from a theoretical balanced region. The unbalanced growth and development nature of a region and the dynamics studied in Section 4.5.2 are directly linked to the urban hierarchy and

system of a region. Unbalanced economic and spatial state of region can also be seen in the distribution and functioning of different nodes in a region. A higher and lower order node of a region develops due to external investment and policy implication, to name a few. The interaction between these nodes is responsible for the establishment of an urban hierarchy in the region.

From the development and growth of a region, the urban hierarchy formed the final theme and also significant contributor to the thesis. The discussion of urban systems and urban hierarchy were combined in one chapter, as these two concepts are closely related to each other (see Chapter Five). The functioning and dynamics of an urban system in a region are primarily dependent on the urban hierarchy; therefore, the literature of urban systems was discussed first.

In terms of urban systems different authors found that, apart from the urban hierarchy in a region, the urban system is also linked to an established network and systems of spatial human behaviour and preferences over time (Pumain, 2006). As urban systems develop and evolve over time, it can be expected that different urban systems and dynamics are found in the national, international and global spatial system. In order to align the literature and functioning of urban system with the focus of this thesis, the urban system in developing countries were discussed first. (see Section 5.2).

Urban systems, in especially sub-Saharan Africa and developing countries, experience major problems in terms of urbanisation and the inability to manage the urban space as a result from foreign investment. These two problems are linked to each other, for example, if external investment and development occur in a city, people from the general surrounding region migrate to this node in hope for improved living conditions and employment (Friedman, 1978; El-Shanks, 1984). The impact and rate of urbanisation in the African urban systems were confirmed in the evaluation in Chapter Eight, where these countries were evaluated in terms of population in large nodes. This effect is also directly related to the unbalanced spatial nature of African countries and confirms the need to utilise an urban hierarchy in an integrative approach.

The unbalanced spatial and urban systems in these countries result in the inability of the country to adapt and benefit from the globalisation and foreign investment, which could provide more sustainable employment opportunities and economic growth (Renaud, 1981 and Belsky 1983). From the research it was also found that the population growth, industrial development, transportation facilities and communication technologies all have an impact on the development and dynamics of an urban system in Africa (see Section 9.7). These factors are linked to the population in the regions and nodes, employment and labour force, corridors and linkages between different nodes in the urban hierarchy (Friedman, 1978; Renaud, 1981; Belsky 1983; El-Shanks, 1984). The last mentioned were included in the evaluation of the sub-continental scale study area.

In Section 5.3, it was found that differentiation in urban systems exists. This differentiation in urban systems is used to discuss and express different levels of urban systems spatially. These three topics include the hierarchical organisation, hierarchical differentiation and the indecisiveness of urban systems (Sections 5.3.2 – 5.3.4). The hierarchical concentration concept is linked to the level of study and recognises three main levels of more or less separate and independent entities following a possible similarity with the hierarchical organisation of living organisms.

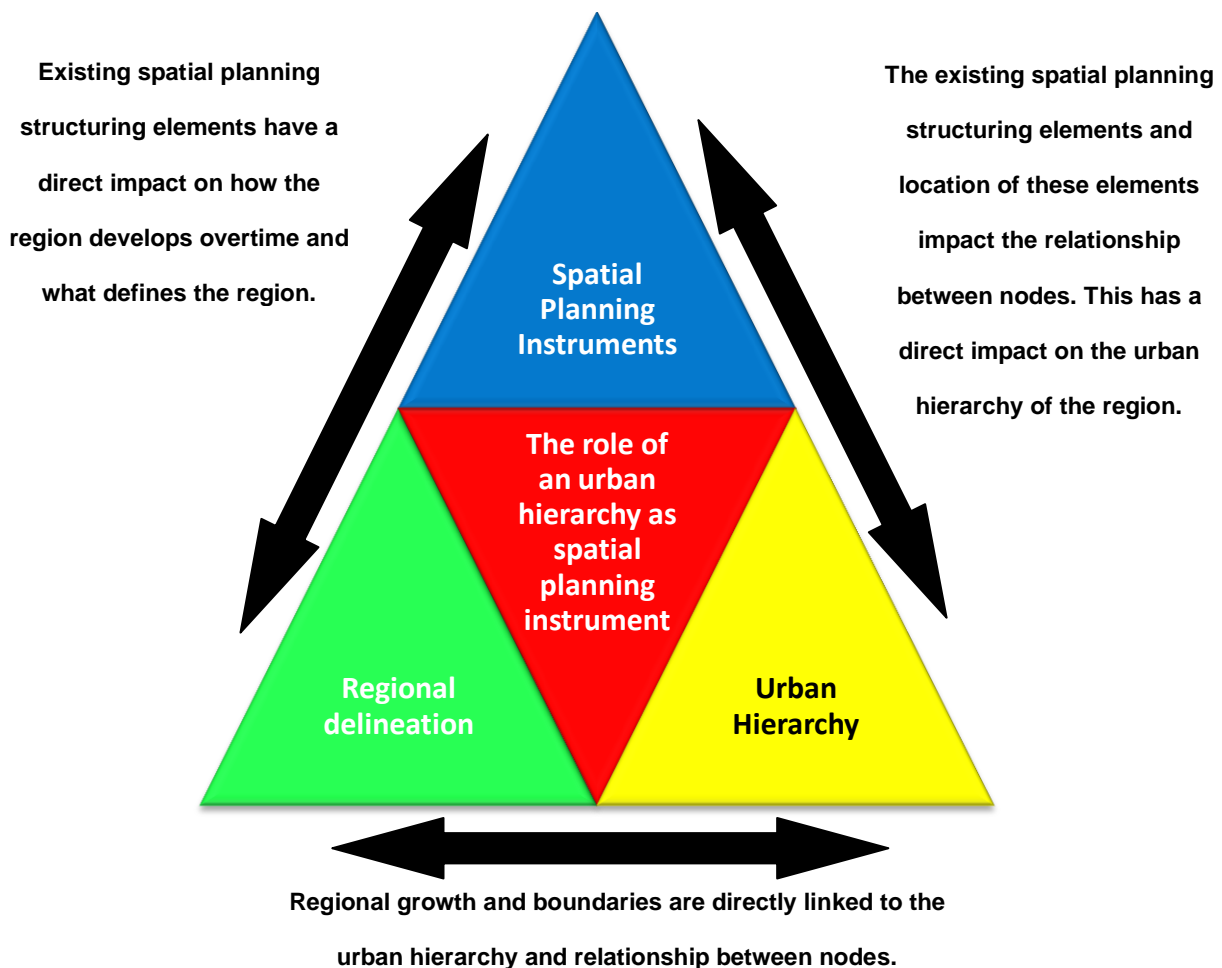
Hierarchical differentiation term refers to the different urban systems that could exist, depending on the urban hierarchy and types of places existing in the spatial pattern (Pumain, 2006:169). The different lifespan and dynamics between central and non-central places in spatial system result in the direct economical and structural impact of a region. The indecisiveness of urban systems specifically referred to the different roles of different sized nodes in a region within an urban system (Pumain, 2006:172).

Although the hierarchical order of these nodes differs, each node fulfils a specific role that adds to the development and functioning of the urban system (Lane *et al.*, 2009). The three most basic levels of organisation are the individual role players responsible for activities in an area, the city or node itself and lastly the system of cities where different nodes have an impact on the development of the other (Beckmann, 1958). These individual role players, different sized nodes and hierarchical distribution are directly linked to the urban hierarchy of a region.

As found in the urban systems literature (Section 5.2), the urban hierarchy refers to the hierarchical distribution and interaction between nodes of a specific size. In the hierarchical differentiation, each of these nodes consists of its own unique role and dynamics. The interaction and relationship between the different nodes in a region determines the urban hierarchy apart from the socio-economic factors such as number of products sold (GVA) and population size.

In the hierarchical differentiation in urban systems, it was found that each node, central or non-central place fulfils a unique role in the region, which has an impact on the urban hierarchy. In the light of these conclusions and to better understand the dynamics of the different types of places, the central and non-central places were discussed. Central places (Section 5.5) in a region can be studied as emerging and growing places as a result of the scale of economies and the supply of products and services (Christaller, 1966; Pacione, 2009, Meijers, 2007). The development and functioning of these places can serve as an indication of how the urban hierarchy is established and why different nodes and places are ranked higher in a region than other (Krugman, 1996; Preston, 1971). The relationship between an urban hierarchy, central and non-central places were studied in Section 5.6, to understand the impact these has on the topic of the thesis.

In the relationship between these instruments, it was concluded that one of the main issues in terms of strategic planning, was that the methods and models currently being applied, tend to oversimplify the functioning and dynamics of the urban hierarchy within a region. The dynamic and function of different types of nodes (types of places and order nodes) result in a complex and interconnected system in reality. An urban hierarchy can be determined on different geographical scales, i.e. nationally, provincially, and locally. For the purpose of this research the urban hierarchy from a regional perspective and sub-continental scale are referred to and studied. It was found that the level of relationships or interaction between nodes (urban hierarchy) was largely linked to the variety of products and services at offer in the nodes or in specific neighbourhoods with a unique offer of services. It is also common use to develop an urban hierarchy purely based on the population size (see Section 5.4). These opinions, methods and the dynamics of an urban hierarchy should all be taken into account and applied as a major spatial planning instrument that could be applied to create regional balance. The figure below aims to illustrate the relationship and tension between the different themes in context of this research.



**Figure 10-1: Relationship between the literature themes and the role of an urban hierarchy as spatial planning instrument**

Source: Own compilation

The figure above illustrates the role and links between the different literature themes in this research. From the figure, it can be concluded that regional balance can potentially be promoted in combining these three instruments. An integrative approach combining the spatial planning instruments, urban hierarchy and regional delineation should be collectively applied in a region to promote regional balance. This application refers to the role of an urban hierarchy as a spatial planning instrument. In the combination of these elements, a new integrative approach is proposed to illustrate the role of an urban hierarchy as spatial planning instrument. In the following section the role of an urban hierarchy as spatial planning instrument to promote regional balance is explained by referring back to the literature principles.

### **10.3. Integration of research components**

The section above concluded and illustrated the literature principles on which the foundation of this research was built. The links and relationships between the themes were discussed and illustrated in this section. From this discussion, it is clear that the main theoretical themes in this research are interconnected and linked to each other (see Figure 10.1). These themes are not new in terms of literature background, but the application and general approach is applied in a new integrative approach in this research. The result is that the current application of the literature principles is slightly altered in terms of this research. To illustrate the core difference in these themes, the following table illustrates the principle, the current application and the proposed alterations in the new integrative approach to urban hierarchy as a spatial planning instrument.

**Table 10-1: Literature, methodology, objectives, application and proposed alterations.**

Source: Own Compilation

Literature Theme	Related Objectives	Methodologies	Principle	Current Application	Proposed Alterations	Impact on regional planning
Spatial planning instruments	Combine spatial planning instruments in an integrative approach to provide unique insights.	Qualitative method used to describe and explain different views of authors on the relevant principles.	Node	<p>High density mixed use nodes, located in main access points where activities are concentrated.</p> <p>Extroverted as opposed to introverted development patterns and typologies must be promoted.</p> <p>Exhibit large degree of public investment in infrastructure.</p>	<p>A node needs to exhibit socio and economic potential before being identified as a potential growth point/node in the general region.</p> <p>After evaluation of potential, nodes should be identified for investment to create balance in a region.</p>	<p>The role of an urban hierarchy as spatial planning instrument is to combine and collectively apply these spatial planning instruments in such a manner to create balanced regional development.</p> <p>Balanced regional development is only possible by identifying sustainable nodes for investment.</p> <p>By utilising the urban hierarchy as combined spatial instrument, nodes are evaluated based on these planning instruments.</p> <p>In addition to the evaluation process, planning regions can be applied in the strategic planning process to ensure effective implementation and management of the regional strategy and achievement of the spatially balanced region.</p> <p>Urban hierarchy as spatial planning instrument could help to unlock the full potential of each individual spatial planning instrument and ensure effective implementation in regional planning.</p>
			Corridor	<p>High intensity, mixed land use linear development pattern linking different nodes in a region.</p> <p>Supports movement of goods and services, helping to establish relationships between nodes (economic role).</p>	<p>Corridors should focus on the promotion of social integration and contribution towards increased densities of business and residential zones.</p> <p>Promote the establishment and accessibility of economic and social opportunities in order to create a high quality urban or regional environment.</p> <p>Different order corridors to link different order nodes in the urban hierarchy.</p> <p>More focussed on the economic potential and significance between higher order nodes.</p>	
			Planning regions	<p>Planning regions are areas which are planned to fulfil a certain role in the region.</p> <p>Proactive planning aiming to identify desired locations and development directions.</p> <p>Provide an efficient management tool.</p>	<p>Movement network is vital in the functioning of a planning region.</p> <p>A specific common objective such as creating the eastern or western linking corridors on sub-continental level study area</p>	

Literature Theme	Related Objectives	Methodologies	Principle	Current Application	Proposed Alterations	Impact on regional planning
Regional Delineation and Growth	Investigate regional delineation as a planning instrument.	Qualitative method used to describe and explain different views of authors on the relevant principles.	Regional Delineation	<p>Gravitation Model: Introduced to calculate the retail trade area based on Euclidian distance of the store and physical store size.</p> <p>Continuous development in various factors such as customer behaviour etc.</p>	<p>Relate the gravitation model to regional planning service areas through Lösch's theory.</p> <p>People are willing to travel greater distances to central places for increased services and goods.</p>	<p>Regional delineation processes and methodologies studied to determine which of the methods can be used to delineate the regional perspective and sub-continental study areas of this research.</p> <p>Based on the dynamics, aim, function, barriers and significant impact from a political point of view, the most applicable methodology could only be based on the holistic approaches of regional delineation.</p> <p>The study areas are delineated based on a combination of different holistic approaches to form a planning region as discussed in section 3.7.</p>
				<p>Voronoi Model: Also related to retail and commercial dynamics.</p> <p>Mathematical calculation based on Euclidian distance.</p> <p>Expenditure and dynamics are divided in certain areas, based on the role.</p>	<p>Functionality, different products, personal preference and type of centre is not taken into consideration in this model.</p> <p>Mathematical calculation and methods limits the method to people that is able to run the model – skills needed.</p>	
				<p>Improved Field Model: Based on the limitations of the gravitation model and Voronoi model.</p> <p>Accurately measures the diffusion effect discussed in the gravitational model.</p> <p>Based on regional accessibility.</p>	<p>Optimal method to delineate regions around urban activity.</p> <p>Impact and role of population activity important.</p> <p>Helps to clarify the basic patterns, characteristics and development trends of urban spatial morphology.</p> <p>Sensitive to the type and role of a facility or node.</p>	
				<p>Holistic Approaches: Result of certain role players in regional planning.</p> <p>Factors includes natural geographical aspects, public and state administration, identity, functional, economic and spatial structure</p>	<p>One or more of the factors can be combined in the regional delineation process.</p> <p>Practically most easily adapted and implemented on regional planning level.</p> <p>Natural barriers form a constant guideline. Top-down and bottom-up approaches impact the delineation process from political point of view.</p>	

Literature Theme	Related Objectives	Methodologies	Principle	Current Application	Proposed Alterations	Impact on regional planning
Regional Delineation and Growth	Assess the regional development phases to gather insight on regional development.	Qualitative method used to describe and explain different views of authors on the relevant principles.	Regional Development phases and growth	<p>Different models currently exist to help to assess how regions grow. Depending on the growth of the region, certain authors grouped the region's growth into certain phases.</p> <p>Some models include Rostow's, regional development phases and core-periphery models.</p> <p>Recent models focussed on integrated regional policies, emphasise on innovation, research and development, invest in human capital and the provision of infrastructure.</p>	Mainly focus on Rostow's development phases that could assist to determine the level of development of the region and provide valuable insight on the associated dynamics.	<p>Utilise Rostow's development phase to help to determine the relevant development phase of a region.</p> <p>Adapt the recent models focussing on integrated regional policies, human capital and provision of infrastructure to progress into the next regional development phase.</p> <p>By combining these approaches, valuable insights can be gathered to help promote momentum needed to assist in the progress of regional development</p>

Literature Theme	Related Objectives	Methodologies	Principle	Current Application	Proposed Alterations	Impact on regional planning
Urban Hierarchy	Gather insights-on the development and dynamics of urban hierarchies in general.	Qualitative method used to describe and explain different views of authors on the relevant principles.	General Urban Hierarchy Concept.	<p>Rank and size of settlements or nodes have a direct impact on the urban system (dynamics) of a region.</p> <p>Often based on population size of a particular node or area.</p> <p>Functional differentiation and integration in a web of globalisation.</p> <p>The relationship and interaction between settlements in a region are mainly economically based through the trade and investment in local economies and services.</p> <p>Human, economic and physical factors play an important role in determining the urban hierarchy,</p>	<p>Due to the role and function of the urban hierarchy, the potential for the application of the urban hierarchy as spatial planning instrument is created.</p> <p>Should not be seen as a hierarchy alone, but rather implemented as a planning instrument.</p> <p>Functional differentiation of nodes is directly linked to the population size. Urban hierarchy is directly linked to a specific geographic extent. Sensitive to time, innovation and development.</p> <p>Modern availability of technological innovation and economic forces leads urban settlements to be more dependent on the interaction between settlements. Should be seen as a continuous developing</p>	<p>An urban hierarchy is not just related to the central place hierarchy of function, but rather influenced by a set of factors that all contribute to the establishment of a network of urban hierarchies that promotes sufficient functioning of an urban system in a region.</p> <p>When applying the urban hierarchy as a regional planning instrument to promote balanced growth, all these factors should be taken into account to identify the correct strategic nodes in the spatial system.</p> <p>Urban hierarchy should not be seen as a phenomenon or tool to dissect a region.</p> <p>Should be applied as an important spatial planning instrument aimed to promote links between places, create balance in a region and to identify sustainable national development goals and investment strategies.</p>
			Relationship between central and non-central places and the urban hierarchy.	<p>The location of central and non-central places in a region remains a vital part of the urban hierarchy due to historic development in the region.</p> <p>Urban hierarchy is determined through the study of central and non-central places in a region.</p> <p>Type and role of places in a region with specific services linked to the urban hierarchy.</p> <p>Technological advance and transportation is the catalyst of competition and interaction between different centres in the urban hierarchy.</p>	<p>The location of different types of places in the urban hierarchy and their respective influences are important to study in this research in order to expose the potential of the urban hierarchy as regional planning instrument.</p> <p>A larger variety in the services and goods at a node result in the climb of the urban hierarchy order. Level of services and goods at offer is linked to the ability to act economically, which in turn is linked to the employment possibilities.</p> <p>The important impact and role of corridors and links between nodes are not often viewed as an important role player.</p> <p>Clear paradigm shift from a hierarchy of central places are seen to a network basis of urban hierarchy.</p>	

The table above aimed to conclude and summarise the essence of the literature themes, how it is currently applied and also propose alterations and other uses to promote a more integrated approach. The different literature themes are related to the objectives identified in Chapter One. The research paradigm and typology (see Chapter Two) influenced the methodologies used to discuss and interpret the different literature themes. The interpretation from various authors' opinions gathered valuable insights in the context of this thesis. The general application and use of the studied literature was then discussed in the current regional planning context.

The role of an urban hierarchy as a spatial planning instrument can be illustrated when the current regional planning context and the literature principles are considered in an integrative approach. By adapting the principles in this integrative approach, this research could potentially reveal new research opportunities or promote and enhance the current application of the literature principles. The empirical sections and evaluation of the study areas combined the current use in regional planning and the literature principles through mixed methodologies. These methodologies and interpretation of both qualitative and quantitative data was used in the evaluation of the different study areas. The following sections conclude this evaluation and interpretation of the data in the two delineated study areas that is seen as two planning regions.

#### **10.4. Urban hierarchy as spatial planning instrument from a regional perspective.**

In this section, the role of an urban hierarchy as spatial planning instrument will be illustrated based on the literature principles and evaluation of the regional perspective delineated study area. This delineated study area presents a planned region as discussed in Section 3.7. Before the role is illustrated, it is necessary the factors that delineated the regional perspective's study area boundaries are briefly discussed, followed by the evaluation criteria. The demarcation process took into account the literature principles including the dynamics and role of a planning region as well as the holistic approaches to regional demarcation.

##### **10.4.1. Regional perspective study area and evaluation criteria**

In the demarcation process of the regional perspective's study area, certain conditions were needed to be represented in the demarcated area. These pre-conditions were selected to effectively illustrate the role of an urban hierarchy as spatial planning instrument. The selected factors included:

- A large enough urban and established urban hierarchy;
- national significance (identified in a high level strategic document);
- vastly unbalanced regional profile;
- important internal and external economic linkages;

- potential for economic growth; and
- an investment prone area.

By using the listed factors above, the regional perspective study area was identified as the Northern Cape Province, acting as a planning region in its own capacity. The next step was to first establish a set of criteria for evaluation of the delineated study area. The main focus in the selection of the criteria for evaluation was to include important factors identified in the literature triangle and is also supported from a strategic point of view. This integrative approach was used to ultimately promote regional balance. These factors were combined and grouped into two major inputs namely the Spatial Planning Instruments and the Spatial Planning Significance. Each of these themes consisted of different factors:

#### **Spatial Planning Instruments:**

- Nodes
- Corridors
- Planning Region (refers to the study area as a planning region in its own capacity and considers the nodes and corridors from this point of view)

#### **Spatial Planning Significance:**

- Economic Performance (Measured in GVA)
- Economic Concentration (Measured through the Location Quotient)
- Population Factors (Population and Employment)

The evaluation process was done to inform the Strategic Planning process of the Northern Cape as study area. The history of - and existing regional plans and principles applicable to the study were included to identify the trends and development of strategic planning processes. The role of an urban hierarchy as spatial planning instrument will be evaluated in this chapter to propose a new approach to urban hierarchy as a spatial planning instrument that could be used to promote regional balance and achieve the outcomes and goals set out in the National Development Plan (see Section 7.3.2.3). Regional balance in this context could be promoted by utilising the integrative approach that considers the relationship between the literature themes and the role of an urban hierarchy in Figure 10-1. The three themes discussed in this triangle forms the framework for evaluation of the new approach to an urban hierarchy.

#### **10.4.2. Regional perspective strategic planning**

To clearly evaluate the role of an urban hierarchy as spatial planning instrument, the strategic planning process is based on the evaluated municipalities in the Northern Cape Province. This process symbolises a bottom-up approach in strategic planning with the need already identified

through the top-down process discussed in the National Development Plan (see Section 7.3.2.3). The start of this evaluation of the urban hierarchy as spatial planning instrument is based on weight system based on a statistical quartile approach. According to Joarder and Firozzaman (2001:86) a statistical quartile approach entitles the processing of data into appropriate comparable ranks. These weights will be based on the evaluation process in Chapter Six. This revised approach will determine areas of significance for investment. This section will utilise these generated weights to propose a revised urban hierarchy and compare it with the existing urban hierarchy. The comparison of these hierarchies will be used to make actual recommendations for focussed investment initiatives aimed to promote a spatially balanced region.

The quartile-weight approach applied to determine the revised urban hierarchy is illustrated in the table below. The quartile-weight approach entails the ranking of data in different quartiles (Joarder and Firozzaman, 2001:86). A higher weight is generated for data in the higher order quartiles. As found in the urban hierarchy literature (Chapter Five) and through best practices gathered in historic regional plans (Chapter Eight), the factors taken into account in this integrated approach is the impact of nodes (in the current urban hierarchy), the location in relation to corridors with economic links, the economic performance, economic concentration (sustainability) and the impact of population and employment. Higher weights are generated to each of these factors in cases of primary nodes, corridors, best performing and balanced economic concentration and population. The quartile-weight approach to each factor is displayed in the table below.

**Table 10-2: Urban hierarchy quartile-weights system**

Source: Own Compilation

<b>Evaluated Factor</b>	<b>Weights System (Data ranked on a scale of 100) (Quartiles: 100 – 75, 74.9 – 50, 49.9 – 25 and 0 – 24.9)</b>
<b>Nodes</b>	Home to (municipality includes): Primary Node: Weight of 4 Secondary Node: Weight of 3 Tertiary Node: Weight of 2 Rural Node: Weight of 1
<b>Corridors</b>	Proximity to (in terms of municipality): > 1 Primary Corridor: Weight of 4 Primary Corridor: Weight of 3 > 1 Secondary Corridor: Weight of 2 Secondary Corridor: Weight of 1 (Primary corridors: N8, N14, N12)

	(Secondary corridors: N1, N9, N10, N7)
<b>Economic Performance</b>	Weights generated according to economic output ranking: Rank 100 – 75: Weight of 4 Rank 74.9 – 50: Weight of 3 Rank 49.9 – 25: Weight of 2 Rank 24.9 – 0: Weight of 1
<b>Economic Concentration</b>	Average Economic Concentration (Location Quotient): 0.8 - 1.2: Weight of 4 0.6 - 0.8 & 1.2 - 1.4: Weight of 3 0.4 -0.6 & 1.4 - 1.6: Weight of 2 <0.4 & >1.6: Weight of 1
<b>Population</b>	Weights are generated according to population size: Rank 100 – 75: Weight of 4 Rank 74.9 – 50: Weight of 3 Rank 49.9 – 25: Weight of 2 Rank 24.9 – 0: Weight of 1
<b>Employment</b>	Weights are generated according to employment size: Rank 100 – 75: Weight of 4 Rank 74.9 – 50: Weight of 3 Rank 49.9 – 25: Weight of 2 Rank 24.9 – 0: Weight of 1

The information and quartile-weights system displayed in the table above is based on the evaluation conducted in Chapter Six. By applying this system, a revised urban hierarchy based on these factors are proposed. The revised urban hierarchy is based on the fundamental integrative approach literature aspects to promote regional balance (see Figure 10-1). The revised approach discussed above is specifically related to the planning region's specific development phase. The planning region and revised approach considers the role and function of each municipality. This revised urban hierarchy will guide the strategic planning process and emphasize the municipalities where external and internal investment can be focussed on in order to promote regional balance in the Northern Cape Province. Weights are generated to each municipality in the study area in the following section.

### 10.4.2.1. Nodes

Based on the determined existing hierarchy of nodes in the Northern Cape Province, the following weights are generated based on the quartile-weights system:

**Table 10-3: Weights generated for nodes**

Source: Own Compilation

Municipality	Generated Weights				Weights
	Primary	Secondary	Tertiary	Rural	
Joe Morolong	0	0	0	1	1
Ga-Segonyana	0	3	0	1	3
Gamagara	0	3	1	1	4
Richtersveld	0	0	1	1	2
Nama Khoi	0	3	1	1	4
Kamiesberg	0	0	0	1	1
Hantam	0	0	1	1	2
Karoo Hoogland	0	0	1	1	2
Khâi-Ma	0	0	1	1	2
Ubuntu	0	0	1	1	2
Umsobomvu	0	0	1	1	2
Emthanjeni	0	0	1	1	2
Kareeberg	0	0	1	1	2
Renosterberg	0	0	1	1	2
Thembelihle	0	3	0	1	3
Siyathemba	0	0	1	1	2
Siyancuma	0	0	0	1	1
Mier	0	0	0	1	1
Kai !Garib	0	3	0	1	3
/Khara Hais	5	0	0	1	4
!Kheis	0	0	0	1	1
Tsantsabane	0	3	0	1	3
Kgatelopele	0	0	1	1	2
Sol Plaatjie	5	0	0	1	4
Dikgatlong	0	0	0	1	1
Magareng	0	0	0	1	1
Phokwane	0	3	0	1	3

From the table illustrated on the left, it can be concluded that the municipalities with a darker shade (red) are the municipalities with greater significance in terms of the urban hierarchy. These municipalities include /KharaHais and Sol Plaatjie municipalities.

By combining the different order nodes and their locations, the municipalities with a more balanced distribution also achieves high significance for spatial planning.

The municipalities with the lighter shading consist (green) of limited potential in terms of nodes and spatial distribution. Examples of these municipalities include Joe Morolong and Kamiesberg municipalities.

The quartile-weights system in terms of the distribution of nodes and hierarchy illustrates which of the municipalities are home to the combination of more significant nodes. In the total weights column, it can be concluded that municipalities with a more balanced distribution of nodes achieve high ratings, similar to the municipalities which includes the primary nodes in the Northern Cape Province. The combination of different order nodes is directly related to the relationship and interaction on a local and provincial scale.

### 10.4.2.2. Corridors

As discussed in Section 3.6, the corridors (of higher and lower order) are responsible for the links between different order nodes. These corridors are the linear connection which is used to establish relationships between different nodes and the links moving people, goods and services in a region. The combination of nodes and corridors are directly linked to the urban hierarchy and functioning of an urban system in a region. Based on the existing corridors in the Northern Cape Province, the following weights are generated based on quartile-weights system:

**Table 10-4: Weights generated for corridors**

Source: Own Compilation

Municipality	Generated Weights				Weights
	> 1 Primary Corridor	Primary Corridor	>1 Secondary Corridor	Secondary Corridor	
Joe Morolong	0	0	0	0	1
Ga-Segonyana	0	3	0	0	3
Gamagara	0	3	0	0	3
Richtersveld	0	0	0	0	1
Nama Khoi	0	3	0	1	4
Kamiesberg	0	0	0	1	2
Hantam	0	0	0	0	1
Karoo Hoogland	0	0	0	0	1
Khai-Ma	0	0	0	1	2
Ubuntu	0	3	0	1	4
Umsobomvu	0	0	2	0	2
Emthanjeni	0	3	2	0	4
Kareeberg	0	0	0	0	1
Renosterberg	0	0	0	0	1
Thembelihle	0	3	0	0	3
Siyathemba	0	0	0	1	2
Siyancuma	0	3	0	1	4
Mier	0	0	0	0	1
Kai !Garib	4	0	0	0	4
/Khara Hais	4	0	0	0	4
!Kheis	0	0	0	1	2
Tsantsabane	0	3	0	0	3
Kgatelopele	0	0	0	0	1
Sol Plaatjie	0	3	0	1	4
Dikgatlong	0	0	0	0	1
Magareng	0	0	0	1	2
Phokwane	0	0	0	1	2

The table on the left rates the municipalities in the study area according to the corridors location. In this rating the primary corridors in the study area refers to the N8, N12 and N14.

These corridors fulfil a primary role in linking the eastern and western parts of the provinces and also link the province to internal and external economies. The internal linkages refer the links between higher order nodes in the study area and also economic hubs of South Africa, while the external links refers to other countries

The secondary corridors in this case refer to the N1, N7, N9 and N10. Although these corridors also play a significant role in terms of linkages, the spatial impact and actual geographic position of these corridors result in lower potential to have a significant spatial impact in the province.

From the weights, it is clear that some municipalities fulfil a clear role in simply distributing people and goods in not just the study area, but also South Africa. An example of such a municipality is the Emthanjeni municipality, of which De Aar is the main node. The role of De Aar was also important in the National Physical Development Plan in terms of the linkage role and central location. The lesson learnt from this was that a node could not only be seen as a growth or investment node mainly based on its transportation role. Therefore, corridor ratings are also combined with nodes, economic performance and concentration as well as population and employment in this research.

Apart from the main transport orientated and distribution roles of the municipalities, other municipalities with high ratings include Sol Plaatjie, Nama Khoi, Ubuntu and Siyncuma. These cases are where more than one primary corridor intersects the municipality or where a primary and secondary corridor intersects in the municipality. In these cases, the direct links and relationships with other higher and lower order nodes are significant in terms of establishing or strengthening the urban hierarchy and urban system in a region. The municipalities with a rating of “3” are also

deemed significant in terms of being the host of a primary corridor in the study area. These municipalities include municipalities such as Gamagara and Ga-Segonyana.

In the following section, nodes and corridors are combined with other economic and spatial significance factors to eliminate the effect of previous regional planning mistakes as seen in the mentioned case with De Aar in the NPDP.

### 10.4.2.3. Economic Performance

The economic performance of the municipalities refers to the latest GVA output of the municipality. The GVA output is a statistic used to describe the profit of all services and goods delivered or produced within the municipality. This statistic is used to evaluate how the municipalities perform in terms of economic growth and contribution to growth. Based on the latest GVA output statistics per municipality in the Northern Cape Province (regional perspective study area), the following weights are generated based on the quartile-weight system:

**Table 10-5: Weights generated for economic performance**

Source: Own Compilation

Municipalities	Generated Weights		
	GVA Output	Economic Rank	Weights
Sol Plaatjie	19,238	1	4
Tsantsabane	7,050	2	4
/Khara Hais	6,234	3	4
Ga-Segonyana	4,667	4	4
Joe Morolong	4,199	5	4
Gamagara	4,190	6	4
Nama Khoi	4,144	7	4
Kai !Garib	3,639	8	3
Phokwane	2,742	9	3
Emthanjeni	2,201	10	3
Dikgatlong	1,910	11	3
Kgatelopele	1,680	12	3
Siyancuma	1,628	13	3
Richtersveld	1,352	14	3
Hantam	1,219	15	2
Umsobomvu	1,171	16	2
Khâi-Ma	1,075	17	2
Siyathemba	917	18	2
Magareng	818	19	2
Ubuntu	797	20	2
!Kheis	753	21	2
Thembelihle	703	22	1
Karoo Hoogland	602	23	1
Kareeberg	454	24	1
Renosterberg	429	25	1
Kamiesberg	404	26	1
Mier	180	27	1

The table on the left sorted all the municipalities in the study area in terms of GVA output in 2015. The economic rank was then determined based on the total GVA output. Weights were generated for each of the municipalities as determined and set out in the weights system earlier in this chapter.

From the table on the left, it is clear that the Sol Plaatjie (of which Kimberley is the main node) municipality is responsible for the largest GVA output in the province. The following topped ranked municipalities include Tsantsabane, /KharaHais, Ga-Segonyana and Joe Morolong. The GVA output in these municipalities is high, mostly due to the mining activities present in the area.

Apart from the top 5 municipalities, the sixth and seventh (Gamagara and Nama Khoi municipalities) largest GVA outputs of municipalities are also linked to mining activities in these regions. The Kai !Garib and remaining lower ranked municipalities are the first (apart from Sol Plaatjie) municipalities that are not as much dependent on mining activities. The high level of dependence on the mining sector in terms of GVA output leads the researcher to the next factor, i.e. economic concentration.

#### **10.4.2.4. Economic concentration**

In the weights generated for the economic performance in the previous section, it was concluded that the majority of the top ranked economic performing municipalities are strongly dependent on the mining sector. The mining sector alone may be responsible for a high GVA output, but the economic dependence of the municipalities is not sustainable in these cases. The municipalities where the economy is not just concentrated in one economic sector also shows potential in terms of GVA output.

To include the potential and sustainable economic output of these municipalities, the quartile system generates higher weights in these cases. Ultimately, a more balanced economy is valuable, combined with the GVA output. This section combines the GVA output (in the previous section) with the level of economic concentration (measured by the location quotient). Based on the average location quotient of the municipalities in the Northern Cape Province (regional perspective study area), weights are generated:

The average location quotient of each of the municipalities is determined from the location quotient in the primary, secondary and tertiary economic sectors. The average location quotient number was used to generate the appropriate weight based on the quartile-weight system. The matrix stipulated that a location quotient of:

- 0.8 - 1.2: Weight of 4
- 0.6 - 0.8 & 1.2 - 1.4: Weight of 3
- 0.4 - 0.6 & 1.4 - 1.6: Weight of 2
- <0.4 & >1.6: Weight of 1

A weight of 4 was generated for location quotients between 0.8 and 1.2, as these numbers represents the most balanced economies in the sectors per municipality. Lower weights were generated as municipalities exhibit an increasing more unbalanced economy in terms of the average location quotient.

**Table 10-6: Weights generated for economic concentration**

Source: Own compilation

Location Quotient - Generated Weights					
	Primary	Secondary	Tertiary	Average	Weight
Moshaweng	0.48	2.84	1.54	1.62	1
Ga-Segonyana	0.49	1.27	1.70	1.15	4
Gamagara	1.38	0.59	0.50	0.82	4
Kgalagadi	1.35	0.51	0.55	0.80	4
Richtersveld	1.51	0.63	0.70	0.95	4
Nama Khoi	0.94	0.88	1.05	0.96	4
Kamiesberg	1.19	0.86	0.89	0.98	4
Hantam	0.31	1.91	1.36	1.20	4
Karoo Hoogland	0.35	1.29	1.40	1.01	4
Khâi-Ma	1.35	0.96	0.77	1.03	4
Namakwa	2.41	0.00	0.17	0.86	4
Ubuntu	0.95	1.67	0.93	1.18	4
Umsobumvu	0.68	1.32	1.03	1.01	4
Emthanjeni	0.59	0.79	1.12	0.83	4
Kareeberg	0.24	0.45	1.23	0.64	3
Renosterberg	1.07	2.06	0.85	1.33	3
Thembelihle	1.00	0.98	1.00	0.99	4
Siyathemba	1.18	1.09	0.95	1.07	4
Siyancuma	1.50	0.77	0.92	1.06	4
Pixley Ka Seme	5.26	0.08	0.18	1.84	1
Mier	0.55	1.03	1.24	0.94	4
Kai !Garib	1.64	1.03	0.65	1.11	4
//Khara Hais	0.33	1.19	1.33	0.95	4
!Kheis	0.97	0.86	1.04	0.96	4
Tsantsabane	1.35	0.48	0.91	0.91	4
Kgatelopele	1.78	1.08	0.57	1.14	4
Siyanda	2.38	0.96	0.26	1.20	4
Sol Plaatjie	0.54	0.81	1.09	0.81	4
Dikgatlong	4.07	1.47	0.48	2.01	1
Magareng	0.98	1.02	1.00	1.00	4
Phokwane	1.65	2.40	0.77	1.61	1
Frances Baard	4.72	0.76	0.45	1.97	1

The weights in the table above are also sensitive to the total GVA output per municipality. To explain this, the Sol Plaatjie and Umsobumvu municipalities are used as examples. The Umsobumvo municipality are ranked sixteenth in terms of GVA output, while the Sol Plaatjie municipality is the largest in terms of GVA output. To achieve a balanced location quotient in a much larger economy (Sol Plaatjie) is more difficult compared to an economy of a smaller base (Umsobumvu). This table therefore rates different sized economic performance municipalities based on an equal location quotient combined with the economic performance (GVA Output).

Up to this point the structuring elements and economic factors are taken into account in the evaluation process. The third component to be included is more focussed in terms of potential in

human resources of the municipalities. The evaluation in the following section will focus solely on the actual population size of the municipalities.

#### 10.4.2.5. Population

Population is the first factor that could be related to human resources in a municipality. Population size in each of the municipalities can also be linked to the ability of the municipality to attract people through positive pull factors. Based on the 2013 population per municipality in the Northern Cape Province (regional perspective study area), the following table weights are generated:

**Table 10-7: Weights generated for population size**

Source: Own Compilation

Generated Weights			
Municipalities	2013 Population	Rank	Weights
Sol Plaatjie	249,788	1	4
//Khara Hais	105,503	2	4
Moshaweng	74,706	3	4
Ga-Segonyana	72,452	4	4
Kai !Garib	60,134	5	4
Nama Khoi	58,261	6	4
Phokwane	49,079	7	4
Dikgatlong	42,922	8	4
Emthanjeni	40,469	9	4
Siyancuma	38,490	10	3
Tsantsabane	29,449	11	3
Gamagara	28,767	12	3
Umsobumvu	23,310	13	3
Hantam	22,866	14	3
Kgatelopele	22,026	15	3
Magareng	21,663	16	3
Siyathemba	21,614	17	3
!Kheis	20,603	18	2
Ubuntu	17,502	19	2
Richtersveld	15,474	20	2
Thembelihle	14,298	21	2
Khâi-Ma	13,480	22	2
Kamiesberg	13,354	23	2
Karoo Hoogland	11,419	24	2
Kareeberg	10,970	25	2
Renosterberg	10,022	26	1
Mier	8,085	27	1
Kgalagadi	5,858	28	1
Siyanda	5,595	29	1
Frances Baard	3,118	30	1
Pixley Ka Seme	2,500	31	1
Namakwa	1,110	32	1

As mentioned in the quartile-weight system, the municipalities were first ranked according to the latest (2013) population size. The next step was to generate weights for the municipalities based on the ranking of population size.

The lowest weights were generated to the sparsely populated municipalities. This is not to penalise the municipalities according to the matrix, the generated weights only give the higher populated municipalities benefit compared to smaller municipalities.

The municipalities with a larger population already succeeded in attracting people to the area through possibly a positive pull factor of some kind. Different positive pull factors may exist, depending on the area.

Positive pull factors in some cases may include access to better social and economic services, employment opportunities and overall higher level of social interaction (see Section 5.5). An example of such a case is the Sol Plaatjie municipality. People from the general Northern Cape (and other provinces) are drawn to Kimberley for improved opportunities in terms of quality of life

and possible employment. The result of attracting people to this municipality is also linked to increased urbanisation, which is seen in rural dominated areas such as the Northern Cape Province.

In some other cases positive pull factors may also be based on the cultural heritage. The cultural heritage refers to the previous homelands as discussed in the Good Hope Plan. Today some of the villages in these areas are still run by chiefs and leaders that have a great impact on the villages. The Moshaweng municipality is a good example where villages in the north of the municipality still attract people based on cultural significance. Residents of these villages are often awarded or given a stand to live on and build their houses.

To counter act and eliminate discrepancies in terms of human resource potential of population, the GVA output and employment generated weights balance out the cultural heritage effect of only the population. These areas are also well known as areas where people live during weekends, while being employed in other areas. In the following section the effect of total employment in the municipalities are illustrated.

#### **10.4.2.6. Employment**

Employment statistics of the municipalities in the regional perspective study area forms the second factor related to human resources. Employment can serve as an indication of potential economic activity and increased ability to take part in economic activities. If a person is employed, the likelihood of receiving a sustainable income is higher than a person only living off grants. With this increased income, people employed are more likely to actively take part in economic activities. Based on the latest 2015 employment statistics the municipalities in the Northern Cape Province are generated with the following weights:

**Table 10-8: Weights generated for total employment**

Source: Own Compilation

Generated Weights			
Municipalities	2015 Employment	Rank	Weights
Sol Plaatjie	72340	1	4
Kai !Garib	34368	2	4
/Khara Hais	30205	3	4
Ga-Segonyana	22788	4	4
Gamagara	16558	5	4
Phokwane	15769	6	4
Nama Khoi	13143	7	4
Tsantsabane	12128	8	3
Emthanjeni	10931	9	3
Dikgatlong	9676	10	3
Siyancuma	9589	11	3
Joe Morolong	8575	12	3
Hantam	6917	13	3
Umsobomvu	6711	14	3
Ubuntu	5659	15	2
Siyathemba	5375	16	2
!Kheis	4774	17	2
Thembelihle	4530	18	2
Kgatelopele	4492	19	2
Khâi-Ma	4474	20	2
Richtersveld	4193	21	2
Karoo Hoogland	4178	22	1
Magareng	3845	23	1
Kareeberg	3282	24	1
Renosterberg	2793	25	1
Kamiesberg	2217	26	1
Mier	1335	27	1

The municipalities in the table on the left were ranked first according to the total employment, from where weights were generated as explained in the urban hierarchy quartile-weight system.

Municipalities with a higher employed population are more likely to exhibit an increased level of economic activity when compared to municipalities with a lower employment base.

The generated weights for employment should balance out the effect of cultural heritage significant areas as discussed in the population section.

From the table above, it is clear that the Sol Plaatjie municipality (Kimberley) exhibits the largest employed population by far when compared to the other municipalities in the study area. The large employed population in this municipality confirms that employment is likely one of the major pull factors in the study area. The municipalities following after the Sol Plaatjie municipalities are likely home to primary sector, labour intensive employment activities. A strong primary sector basis in a municipality forms the basis to potentially develop supporting employment opportunities in the secondary economic sectors. This effect is taken into account in the economic concentration and GVA output sections.

The employment generated weights concluded the human resource potential and the last of the factors considered to determine a revised urban hierarchy based on spatial structuring elements, spatial significance, economic significance and potential to develop further with increased relationship between other nodes in the regional perspective study area. The following section calculates the revised urban hierarchy according to the quartile-weight system in the previous sections.

#### 10.4.2.7. Revised urban hierarchy

The purpose of this section is to propose a revised urban hierarchy through the explained approach in the study area based on the previous sections. This revised urban hierarchy will then be compared to the existing urban hierarchy based on population (see Section 5.2) and hierarchy based on settlement typology (see Section 6.6). The role of an urban hierarchy as spatial planning instrument would become clear in this comparison. The first step is to determine the revised urban hierarchy based on the generated weights. The following table calculates the revised hierarchy in the study area with the main assumption that most of the activities are focussed in the capital areas of each municipality.

**Table 10-9: Calculating the revised urban hierarchy of the Northern Cape Province**

Source: Own Compilation

WEIGHT BASED ON URBAN HIERARCHY MATRIX									
	Municipalities	Nodes	Corridors	Economic Performance	Economic Concentration	Population	Employment	TOTAL	New Urban Hierarchy
Top Order	Sol Plaatjie	4	4	4	4	4	4	24	1
	//Khara Hais	4	4	4	4	4	4	24	1
	Nama Khoi	4	4	4	4	4	4	24	1
	Kai !Garib	3	4	3	4	4	4	22	2
	Ga-Segonyana	3	3	4	4	4	4	22	2
	Gamagara	4	3	4	4	3	4	22	2
Middle Order	Tsantsabane	3	3	4	4	3	3	20	3
	Emthanjeni	2	4	3	4	4	3	20	3
	Siyancuma	1	4	3	4	3	3	18	4
	Phokwane	3	2	3	1	4	4	17	4
Emerging Order	Umsobumvu	2	2	2	4	3	3	16	5
	Ubuntu	2	4	2	4	2	2	16	5
	Thembelihle	3	3	1	4	2	2	15	5
	Siyathemba	2	2	2	4	3	2	15	5
	Kgatelopele	2	1	3	4	3	2	15	5
	Hantam	2	1	2	4	3	3	15	5
	Khâi-Ma	2	2	2	4	2	2	14	6
	Richtersveld	2	1	3	4	2	2	14	6
	Dikgatlong	1	1	3	1	4	3	13	6
	!Kheis	1	2	2	4	2	2	13	6
	Magareng	1	2	2	4	3	1	13	6
Lower Order	Kamiesberg	1	2	1	4	2	1	11	7
	Karoo Hoogland	2	1	1	4	2	1	11	7
	Moshaweng	0	0	4	1	4	1	10	7
	Kareeberg	2	1	1	3	2	1	10	7
	Mier	1	1	1	4	1	1	9	8
	Renosterberg	2	1	1	3	1	1	9	8

The table above calculates the total generated weights in each of the factors that are used to determine a revised hierarchy based on economic, literature, population and regional planning and structuring elements. This revised hierarchy focus more on the capital town in each of the municipalities in the study area. By utilising the municipalities and published data, the approach also considers the general role of the municipality in the context of the study area, which directly influence the general dynamic in the region. The revised approach to urban hierarchy ranks the different municipalities according to the grand total of generated weights overall through the quartile-weights system.

From the table the first major conclusion that is made is the combination of Sol Plaatjie, //KharaHais and Nama Khoi municipalities in the top order hierarchy. Although the Sol Plaatjie and //KharaHais municipalities are much more significant in the top order hierarchy, it should be noted that Nama Khoi municipality fulfils a similar role in the western parts of the study area. With this example it is clear that the revised hierarchy is not focussed only on the current status of statistics but also focus on the role the node plays in the study area.

The second conclusion that is clear is that, due to the different total generated weights, the municipalities in the study area are more evenly distributed (balanced) through the study area. The revised hierarchy consist of a larger top and middle order, supported by a significant emerging order in the revised hierarchy. The role of an alternative approach to urban hierarchy as spatial planning instrument in this case is therefore to promote regional balance where different nodes are strategically positioned to advance in the urban hierarchy. This alternative approach to urban hierarchy converts the limitation of data based on municipal areas into a valuable contribution that considers the role of the municipality within the study area.

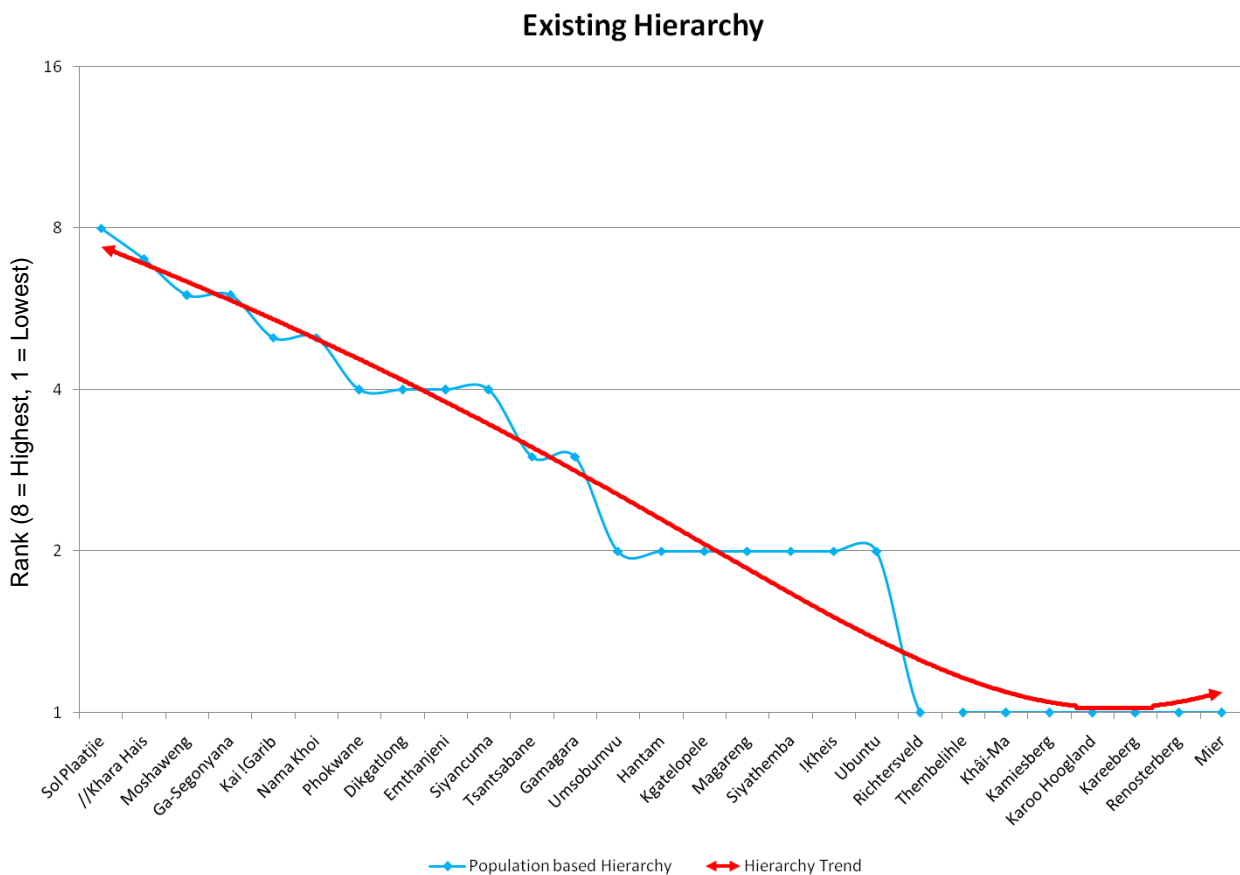
This revised hierarchy can then be used to guide internal and external investment of different scales to certain areas to create more balance spatially. By implementing this revised approach, it can be expected that a more balanced urban hierarchy could be promoted. With a more balanced region the urban system in the study area will also adapt as linkages and relationships between the capitals of the municipalities and lower order towns are supported. Positive spin-offs from higher order nodes are expected into the emerging order. The adapted urban systems in turn will result in a more balanced economic activity and flow of people and services.

To further guide the application of the revised approach to urban hierarchy as spatial planning instrument and support the implementation process, the revised hierarchy is grouped into four main groups as follows:

- Top Order Hierarchy
- Middle Order Hierarchy

- Emerging Order Hierarchy
- Lower Order Hierarchy

This grouping process can be used to guide internal and external investment strategies as well as upliftment programmes in the study area. This grouping can also help in applying and designing a strategy for investment to promote regional balance. This strategy should guide decision on where to first focus investment in the study area. This step is needed to prevent that all the investment is only focussed on certain areas as seen in the NPDP plan (see Section 7.3.1.1). The strategy will also counter act the issues as seen in the RIDP (Section 7.3.1.3), where incentives were spread too thin in an effort to create a spatially balanced South Africa. To first determine where priority investment areas can be focussed, the revised urban hierarchy will be compared to the current hierarchy based on population size. The following figure illustrates the current urban hierarchy based on population in the study area.



**Figure 10-2: Existing urban hierarchy based on population**

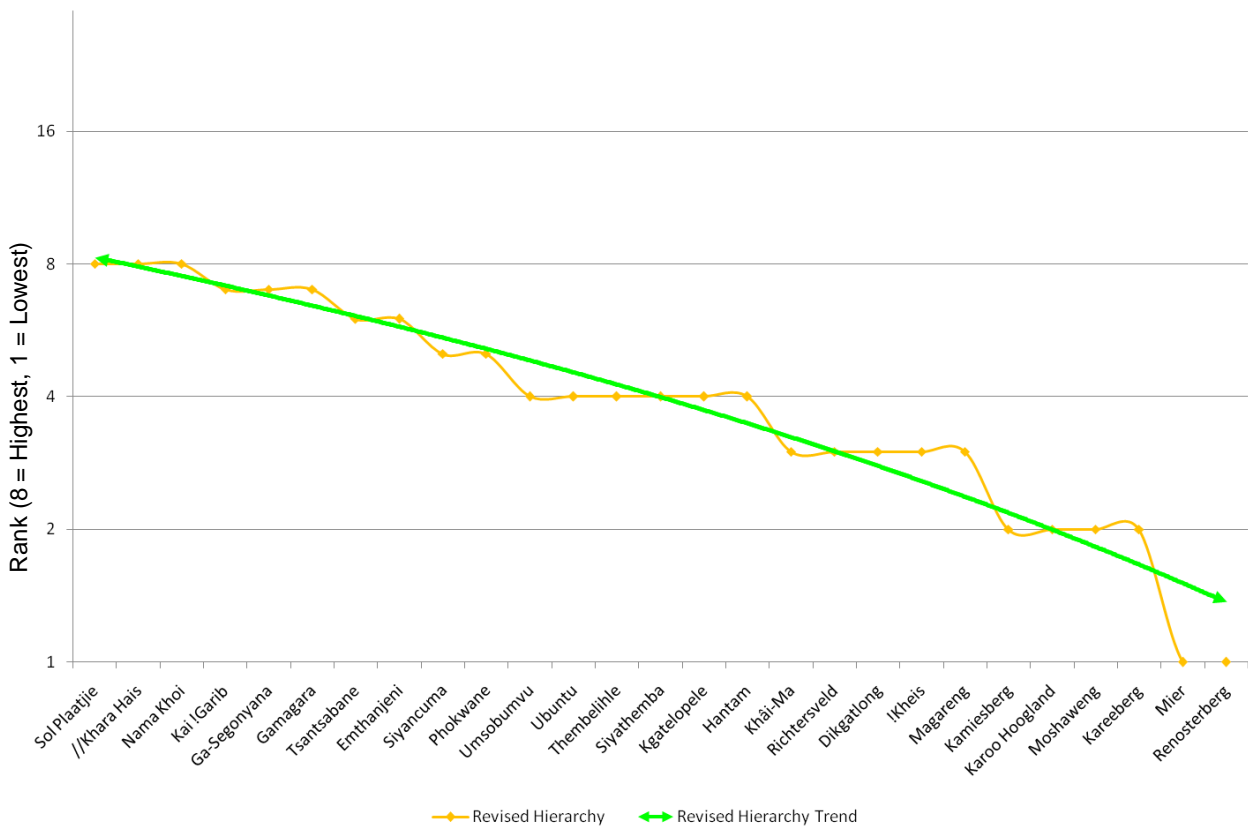
Source: Own compilation based on Stats SA (2015)

From the figure above, it is clear that the current hierarchy based on only population is unbalanced. The red line indicates the general unbalanced distribution trend of different order

nodes in the hierarchy. The figure shows that Sol Plaatjie and //KharraHais forms the top order hierarchy which is much more advanced in the hierarchy, followed by the Moshaweng, Ga-Segonyana and Kai !Garib municipalities. Some municipalities are still grouped in more or less the same level of the hierarchical order. In the distribution, it is clear that few top order hierarchies are found with an abundance of lower order municipalities.

The effect of the unbalanced spatial distribution is the limitation of economic activities and an urban system only focussed and built around the top hierarchy nodes. The unbalanced spatial distribution and limitation on economic activities through the urban system and relationships shows the economic unbalanced nature of the regional perspective study area. As seen in the previous regional plans on a regional perspective (Chapter Seven), the main aim is to achieve a spatial and economic balanced region. The next step is to study the revised urban hierarchy based on the alternative approach's factors as discussed (Section 6.6). The following figure illustrates the revised hierarchy.

**Revised Hierarchy**



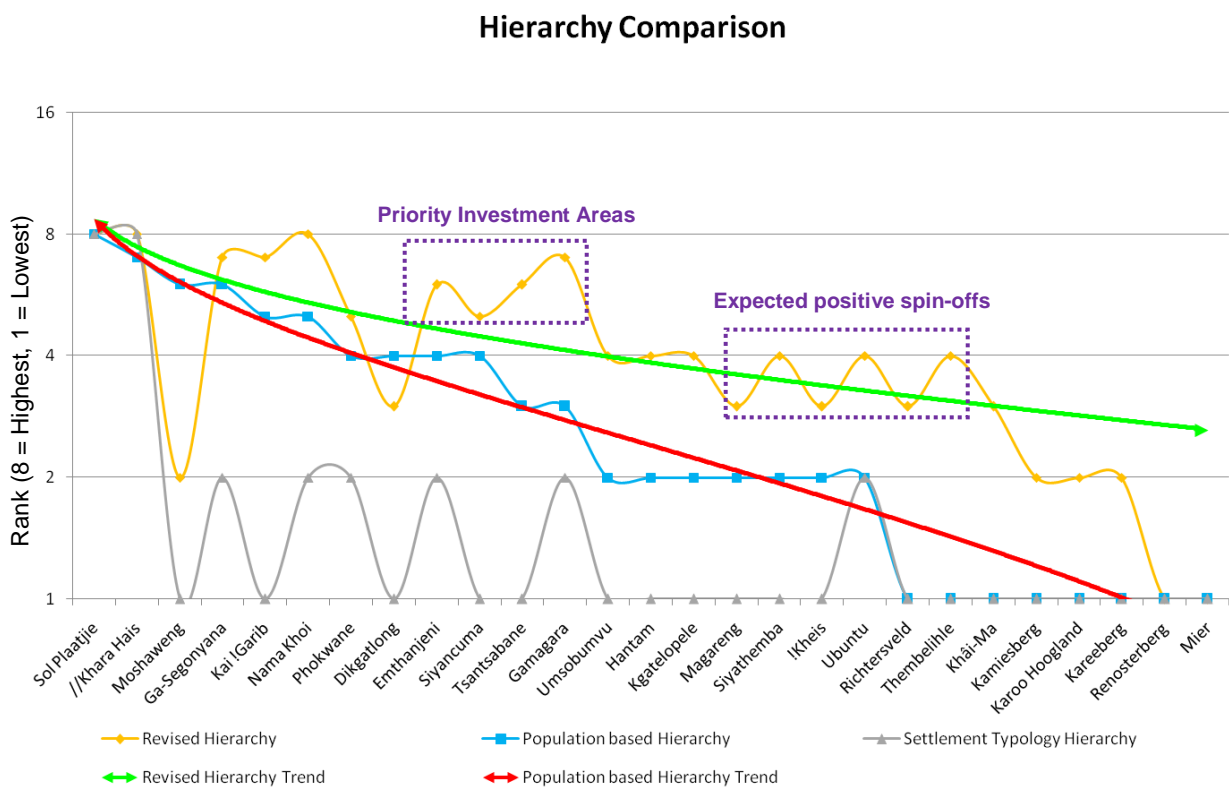
**Figure 10-3: Revised urban hierarchy**

Source: Own compilation

The figure above clearly shows a more balanced urban hierarchy in the study area. The same principles were applied in ranking and grouping the same sequence of municipalities. From the

figure, it is clear that the revised approach to urban hierarchy (focused on economic, social, literature and spatial planning elements) result in a more balanced region. As already discussed (see Section 7.3), a more balanced region can help to create an economically balanced region as well.

Evident from the figure above is that, although based on various factors in the revised approach, the municipalities are more evenly distributed in the region. The primary aim (Chapter One) was to consider the role of an urban hierarchy as spatial planning instrument. When considering this new revised integrative approach to urban hierarchy, regional balance in regions of a specific development phase could be promoted. In order to identify where to implement the areas that need to be focused on for investment to promote regional balance, the current hierarchy based on population (Section 5.2), hierarchy based on settlement typology (see Section 6.6) and the revised hierarchy is compared. The following figure combines these hierarchies.



**Figure 10-4: Areas for investment identified through the revised hierarchy**

Source: Own Compilation, Stats SA (2015) and CSIR (2013)

By comparing the different hierarchies, it is clear that the main unbalanced effect and gap in the spatial system is between the top and middle order hierarchy. In order to recommend a strategy for investment and identify areas which should be invested in, this gap need to be focussed on. A strategically designed investment framework is recommended that includes priority investment areas. This framework should address the areas highlighted in the figure above where more equal

potential in the urban hierarchy is expected. Emthanjeni, Siyancuma, Tsantsabane and Gamagara are identified as priority investment areas. By investing in these areas, the municipalities are given the opportunity to develop and advance in the middle order urban hierarchy, which will promote regional balance (equal potential) in terms of node size. Additionally, it is expected that positive spin-offs from the investment strategy should also help to develop lower order nodes. Ga-Segonyana, Kai !Garib and Nama Khoi are areas that already support the middle and high order hierarchy and would align with the proposed balanced region.

According to the NCPSTDF (2012:128) Gamagara, Tsantsabane, Siyancuma and Emthanjeni are areas with lower need for investment due to its development status. The NCPSTDF (2012:128) is more focussed on the lower order hierarchy, which needs a much more aggressive investment strategy, which might not be sustainable considering the potential of the areas. The revised approach suggests that, if focussed investment strategies are applied in these areas, development should be supported that would give these areas the opportunity to advance in the hierarchy and promote regional balance. Additionally, these areas will also support the lower order hierarchy (Magareng, Siyathemba, !Kheis, Ubuntu, Richtersveld and Thembelihle) by creating positive development spin-offs and a higher level of integration.

The areas of investment are tested and correlated against the settlement typology hierarchy (see Section 6.6.). The settlement typology hierarchy (Section 6.6.) are used to guide the order of priority investment areas. From the figure, areas higher in the urban hierarchy (according to the settlement typology classification) already consist of potential and would more easily develop and advance in the urban hierarchy. These areas already consist of positive pull factors and increased agglomeration benefits (see Section 3.5.2), which should succeed in attracting investment more successfully. By focussing on the proposed investment priority areas, incentives can be offered more specifically, creating the most appropriate opportunity for investment and growth.

The gaps between the revised hierarchy and the existing urban hierarchy based on population need to be smaller. With smaller gaps, the spatial distribution of nodes of different order should develop into a more balanced regional manner. By adapting this new integrative approach to urban hierarchy, these gaps are limited resulting in a more balanced spatial system. This new approach considers the region's development phase and therefore suggests a stronger focus to create more middle order urban hierarchies. If more middle order nodes are developed, the spatial system would not only be more balanced regionally, but would change the urban system, the internal and external relationships between areas.

With increased linkages and relationships, economic activity would not only be focussed on one or two nodes in the study area, but would be more equally balanced through different areas. The approach that is recommended in this instance is to first create a more balanced spatial

distribution of nodes, which is directly linked to the economic approach in the region. An unbalanced economic approach (focussed on investment in the priority areas) is recommended to drive and develop a more spatially and economically balanced spatial system.

A more balanced region would promote effective interaction between different nodes in the study area. This increased interaction and relationship between the areas would result in increased economic activity and development. Investment incentives would therefore also be more sustainable if applied through this methodology and revised integrative approach to urban hierarchy, uplifting certain chosen areas and nodes to have an impact on the greater region. The application of an urban hierarchy as spatial planning instrument is recommended through a top down approach of implementing and identifying areas that could help to promote spatial balance in the region.

The external or internal investment and development in these identified areas are expected to have a bottom up effect to ultimately contribute to the region's balanced state. In the study area the role of an urban hierarchy as spatial planning instrument is to propose an appropriate urban hierarchy based on different factors (as discussed) to identify areas in the existing urban hierarchy that could be invested in and developed to ultimately promote regional balance through unbalanced economic interventions. This proposed approach is unique to the region's specific development phase and also considers the region's dynamics. In the following section the role of an urban hierarchy as spatial planning instrument on a sub-continental scale is illustrated.

#### **10.5. The role of an urban hierarchy as spatial planning instrument on sub-continental scale**

In this section, the role of an urban hierarchy as spatial planning instrument will be evaluated based on the literature principles and evaluation of the selected countries in the sub-continental scale study area. Only the selected countries in the sub-continental scale were evaluated (see Section 8.5). The evaluation of these countries corresponds with the approach and evaluation utilised on the study area of the regional perspective (Section 10.3). The approach on sub-continental scale is more focussed on nodes forming part of a link, due to data limitations and to consider the urban hierarchy within the SADC selected countries. The selection of these countries was done after a preliminary filtration and evaluation process was done on SADC level (Section 8.5). The SADC evaluation is related to the main goal to promote regional integration within the SADC (see Section 9.3). The following section will explain how these countries were selected and what the idea and role of this selection process is.

### **10.5.1. Sub-continental scale rationale and evaluation criteria**

Africa is well-known for its largely unutilised potential and various inhibiting factors such as the large difference between the rich and poor population, limited infrastructure and various political and safety issues. Despite all these issues, Africa remains one of the most important continents attracting external investment. The global investment in Africa is driven by various opportunities including agriculture, mining, education, health etc. According to Games (2012:1) South Africa offers various attractive features for businesses and companies globally looking to invest in Africa. For this reason, South Africa is well-known as the gateway into Africa. Apart from forming the gateway into Africa, the SADC envisions effective regional integration of member countries to promote and sustain development (Section 9.3.2). The need to promote regional integration within the SADC and also connect the countries with South Africa is addressed in proposing the Eastern and Western links.

These countries along the Eastern and Western links form part of a common strategic platform of engagement in the SADC. For the linkage and integration purpose in this research, it was not necessary to evaluate all the member countries of the SADC, only the countries south of and between Kenya and Angola would seem necessary and would be able to connect the different countries. The next step was to further exclude countries and to identify the countries which are most likely to support development, sustainable and safe to propose the western (to Angola) and eastern links (to Kenya) in the SADC. To take this into account a preliminary evaluation process was applied on the SADC member countries by using the following factors (Section 8.5):

- Population
- Economic growth
- Human Development Index
- Risk Analysis
- Labour and Employment
- Ease of doing Business

By including all the factors listed above the SADC countries were filtered based on social, economic and business-related factors. After these factors were applied, it was found that the member countries eligible to be included as countries forming the links between South Africa, Kenya and Angola were Namibia, Angola, Botswana, Zambia and Tanzania. South Africa is not seen as part of the sub-continental study area, as a different planning region (Northern Cape Province) is evaluated separately. Additionally, South Africa consists of different and more detailed datasets on municipal level (Section 10.3). The selected countries were then used to delineate the sub-continental study area. The evaluation of the countries was aligned with the approach followed in the regional perspective's study area discussed in Section 10.3.

Although the same approach was utilised, the main challenge was the availability, range of data and constant census data that could be applied in general regions. In the sub-continental scale, the approach is specifically focussed on the actual nodes and not the regions of the nodes as seen in Section 10.3. By focussing on the nodes for evaluation purposes, a new approach to urban hierarchy irrespective of national boundaries could be followed. This approach would promote regional integration within the selecting countries through the different links. The criteria used were also based on structuring elements and statistical significance. In terms of the structuring elements, the same methodology used in regional perspective's study area was applied, by evaluating each country based on nodes and urban hierarchy and corridors.

The statistical significance is where the availability of data throughout the member countries had an effect. From the different census evaluation used nationally, it was found that population and labour force/employment numbers were the constant factors covered in all the censuses, except for Angola. The census data in Angola did not include any statistics focussed on employment or labour force. Angola's evaluation was not negatively influenced by this lack of data (Section 10.4.2). If Angola was penalised from this perspective, the proposed approach to urban hierarchy would be skewed and have an impact on regional integration in the SADC. The evaluation on Angola ultimately only excluded the employment factor, but still consisted of a revised urban hierarchy, which will be compared and combined in the sub-continental study area.

The economic concentration and performance statistics (as applied in the regional perspective study area - Section 10.3), were not available on regional level for evaluation in the selected countries. The final factors used in the evaluation therefore included nodes, urban hierarchy, corridors, population and labour force/employment statistics (Section 8.5). These factors were more generally evaluated compared to the regional perspective's study area, but included the same integrative approach. The following section on sub-continental scale strategic planning uses the evaluation based on these mentioned factors in Chapter eight.

#### **10.5.2. Sub-continental scale strategic planning**

The methodology and planning process in this section is directly linked to the initial evaluation per country included in the sub-continental study area. In order to recommend and propose an effective strategy, each of the countries will be studied individually, before considering the role of an urban hierarchy as spatial planning instrument on the study area. This approach is again driven through a bottom-up approach per country and is generally aligned to the same approach followed in the regional perspective section (Section 10.3).

The main objective of promoting regional integration and development within the SADC (see Section 9.3.2) is however derived through a top-down approach. It is important to note that the

methodology and approach in the sub-continental study area is marginally different from the approach in the regional perspective study area. The methodology is based on the evaluation of higher level and more generalised data, compared to the detailed data used in the regional perspective's study area. In this case the main outcome is to illustrate the role of an urban hierarchy as spatial planning instrument to promote the links and relationships between the selected countries to promote regional integration. The general methodology of quartile-weight system, as seen in the previous study area's evaluation (Section 10.3), is also applied on this study area.

The weight system would apply the same general criteria per region of each of the countries selected. Weights are generated for the countries, due to the large difference and general dynamics of different regions in different countries. Once all the regions are generated with weights on a country scale, the total weight of the countries would be combined to inform the strategic planning process of the sub-continental study area. The weight system illustrated below is also based on literature insights of urban hierarchy and through best practices, the factors taken into account is the impact of nodes (in the existing urban hierarchy), the location in relation to corridors with economic links and the impact of population and employment. Each of these factors is linked to higher generated weights in the primary nodes, corridors, and population and employment/labour force.

**Table 10-10: Sub-continental hierarchy quartile-weight system**

Source: Own Compilation

Evaluated Factor	Weights System (Data ranked on a scale of 100) (Quartiles: 100 – 75, 74.9 – 50, 49.9 – 25 and 0 – 24.9)
<b>Nodes</b>	Host of (regions includes): Primary Node: Weight of 4 Secondary Node: Weight of 3 Tertiary Node: Weight of 2 Rural Node: Weight of 1
<b>Corridors</b>	Proximity to (in terms of regions): > 1 Primary Corridor: Weight of 4 Primary Corridor: Weight of 3 > 1 Secondary Corridor: Weight of 2 Secondary Corridor: Weight of 1 None: Weight of 0
<b>Population</b>	Weights are generated according to population size: Rank 100 – 75: Weight of 4

	Rank 74.9 – 50: Weight of 3 Rank 49.9 – 25: Weight of 2 Rank 24.9 – 0: Weight of 1
<b>Employment</b>	Weights are generated according to employment size: Rank 100 – 75: Weight of 4 Rank 74.9 – 50: Weight of 3 Rank 49.9 – 25: Weight of 2 Rank 24.9 – 0: Weight of 1

The information and weights system displayed in the table above is based on the evaluation conducted in Chapter Eight. By applying this system, a revision in the existing urban hierarchy is proposed based on the four mentioned factors that are founded on literature principles and statistical significance. This revised hierarchy can be used to plan the routes (corridors) linking different higher order nodes that would promote regional integration between the countries and also link South Africa with Kenya and Angola.

Certain nodes along these routes could also be strategically identified to attract external investment to promote a continuous and sustainable eastern and western link aimed to promote integration and connection. The role of an urban hierarchy in this instance would be to create a basic more balanced spatial system but more primarily propose the most sustainable links to promote and grow relationships along. The following sections generate the weights for each of the different links in the individual countries based on the table above.

#### **10.5.2.1. Western link**

Namibia is the only country in the western link between South Africa and Angola. Being the single link between these two countries, the corridor and linking role of Namibia is important. The table below generates the weights based on the sub-continental hierarchy quartile-based system. The weights generated will be used to propose the optimal corridor development by applying the urban hierarchy as spatial planning instrument.

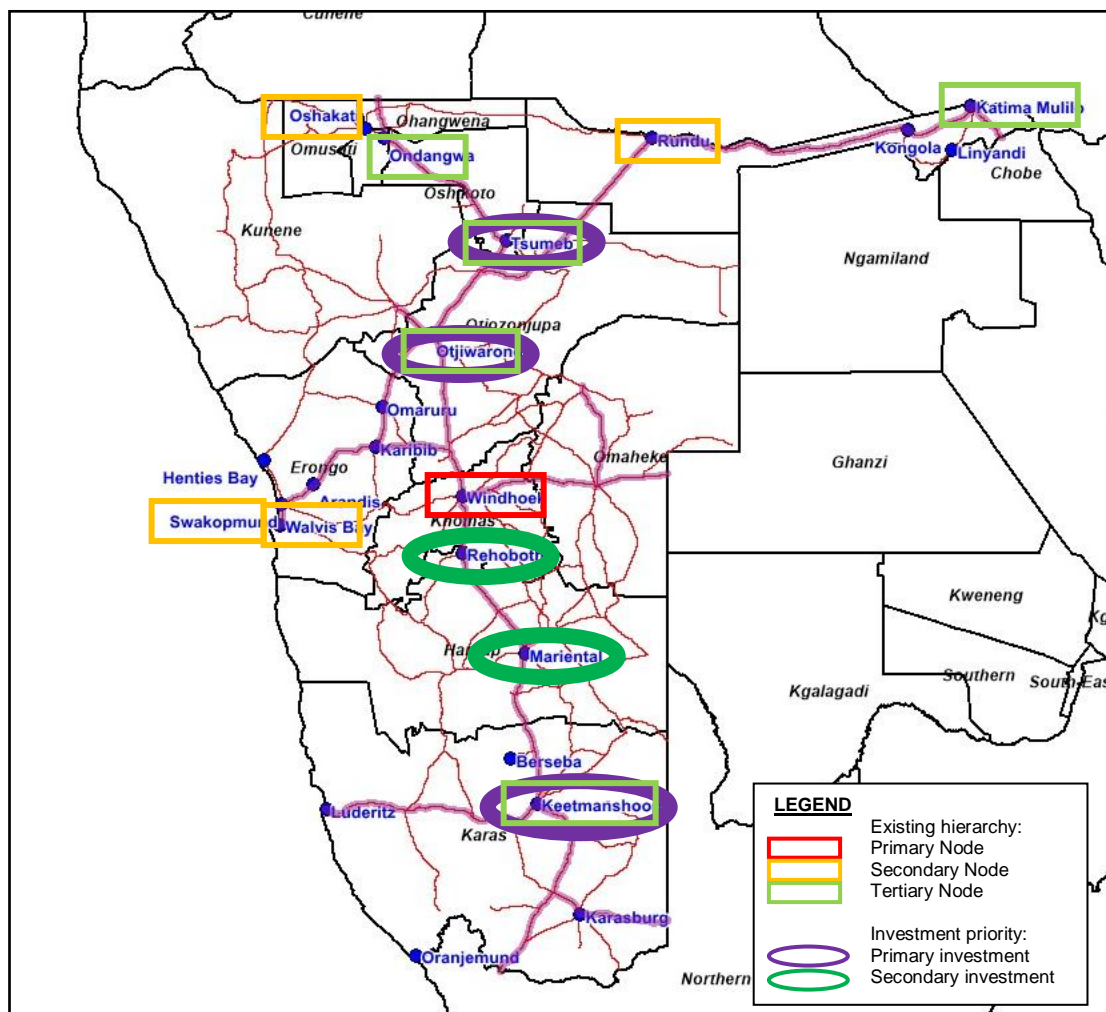
**Table 10-11: Urban hierarchy according to weights system for Namibia**

Source: Own Compilation

Regions	Nodes	Weights	Corridors	Weights	Population	Weights	Employment	Weights	Total Weight
Caprivi	Tertiary	2	None	0	90,100	1	26,866	1	4
Erongo	Secondary	3	Secondary	1	150,400	2	65,869	2	8
Hardap	Rural	1	Primary	3	79,000	1	25,557	1	6
Karas	Tertiary	2	Primary	3	76,000	1	33,419	1	7
Kavango	Secondary	3	None	0	222,500	2	56,102	2	7
Khomas	Primary	4	Primary & Secondary	4	340,900	3	144,780	4	15
Kunene	Rural	1	None	0	88,300	1	24,973	1	3
Ohangwena	Rural	1	Primary	3	245,100	2	57,321	2	8
Omaheke	Rural	1	Secondary	1	70,800	1	28,652	1	4
Omusati	Rural	1	None	0	242,900	2	64,882	2	5
Oshana	Secondary	3	Primary	3	174,900	2	55,730	2	10
Oshikoto	Tertiary	2	Primary	3	181,600	2	49,522	2	9
Otjozondjupa	Tertiary	2	Primary	3	142,400	2	51,977	2	9

From the table above, it can be concluded that most of the general activities in Namibia is concentrated in the Khomas Region, which is also home to Windhoek, the capital city of Namibia. The Khomas Region and Windhoek forms the top tier in the determined and existing hierarchy. The second, or middle tier regions include Oshana, Oshikoto, Otjozondjupa, Ohangwena, Erongo, and Omusati. From this revised hierarchy, it is clear that a definite difference between the top order, middle and lower order hierarchy exists in Namibia.

Apart from the spatially unbalanced pattern, a positive conclusion that could be made according to the weight system is the number of middle order regions in Namibia. These middle order or second tier regions and nodes already include some level of development foundation, which can be further developed or supported in an effort to advance in the hierarchy. As mentioned before, with Namibia forming the only country linking South Africa with Angola, the development of a linking corridor is considered the main focus of the country. In order to apply the urban hierarchy as spatial planning instrument to recommend which areas to focus investment on, the existing and revised hierarchy is combined in the following figure.



**Figure 10-5: Existing and revised Namibia urban hierarchy and nodes for development.**

Source: Own Compilation

As seen from the figure above, it is clear that the existing urban hierarchy of Namibia is already developed along a positive north to south pattern that forms the link between South Africa and Angola. It can therefore be concluded that in terms of the role of the urban hierarchy as spatial planning instrument, the instrument can identify which existing and lower order nodes could be invested in as an effort to evolve in higher order nodes in Namibia. The existing urban hierarchy can also be expanded by focussing on nodes on the corridor in order to strengthen and support the corridor's functioning and relationship.

In terms of the existing nodes in the hierarchy it is recommended to develop Tsumeb, Otjiwarongo and Keetmanshoop into secondary nodes in the existing urban hierarchy in an effort to support the development of the primary north to south corridor. Secondly, smaller urban nodes such Rehoboth and Mariental could be focussed on to develop into tertiary and lower order nodes in the urban hierarchy of Namibia. The development of these towns would possibly be supported by focussing on the relationship and connectivity between larger order urban nodes. The ultimate

effect and role of applying the urban hierarchy as spatial planning instrument is to promote corridor development in Namibia to support integration, while expanding the existing urban hierarchy. The expansion of the existing urban hierarchy is expected to result in a slightly more balanced spatial distribution of nodes in Namibia.

Angola is the final country in the western link that is included in the western link and needs to be connected with South Africa. It should be noted that Angola is one of the African countries, with a large language barrier and availability of a diverse statistic set. The evaluation in Angola will therefore exclude the employment factor. As seen in the evaluation in Chapter Eight, it was clear that Luanda, as the capital of the country, is considered as the main node in which most of the activity in the country is concentrated in. The actual link between South Africa, Namibia and Luanda is therefore of great significance to promote integration. The weights system below would therefore be used to focus on the corridor linking potential to Luanda.

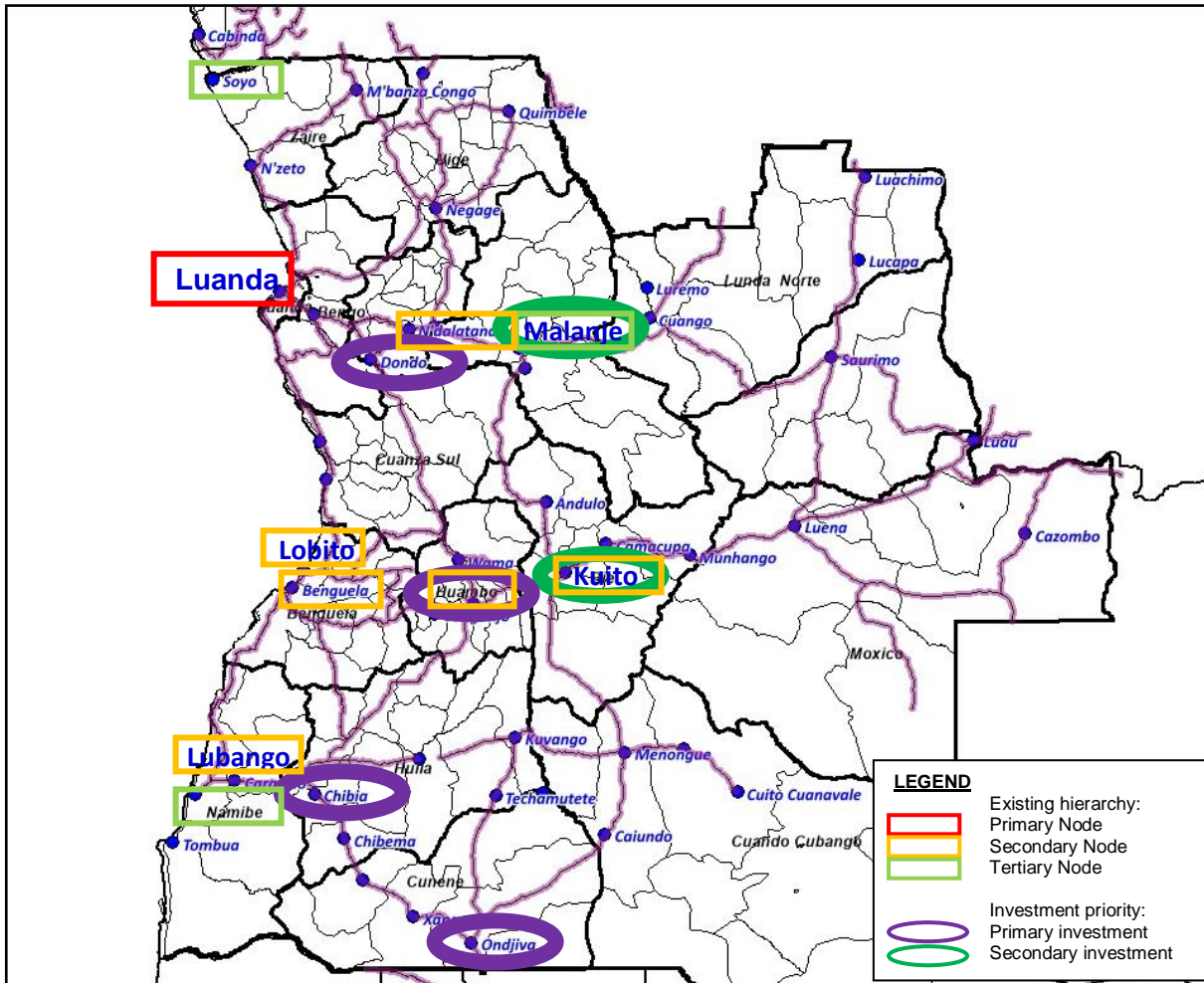
**Table 10-12: Urban hierarchy according to weights system for Angola**

Source: Own Compilation

Province	Nodes	Weights	Corridors	Weights	Population	Weights	Total Weight
Cabinda	Rural	1	None	0	688,285	1	2
Zaire	Tertiary	2	None	0	567,225	1	3
Uige	Rural	1	None	0	1,426,354	1	2
Luanda	Primary	4	Primary & Secondary	4	6,542,944	4	12
Kwanza Norte	Secondary	3	Secondary	1	427,971	1	5
Kwanza Sul	Rural	1	Primary	3	1,793,787	2	6
Malanje	Tertiary	2	Secondary	1	968,135	1	4
Lunda Norte	Rural	1	Secondary	1	799,950	1	3
Benguela	Secondary	3	None	0	2,036,662	2	5
Huambo	Secondary	3	Primary	3	1,896,147	2	8
Bie	Secondary	3	Secondary	1	1,338,923	1	5
Moxico	Rural	1	Secondary	1	727,594	1	3
Cuando Cubango	Rural	1	Secondary	1	510,369	1	3
Namibe	Secondary	3	None	0	471,613	1	4
Huila	Rural	1	Primary	3	2,354,398	2	6
Cunene	Rural	1	Primary & Secondary	4	965,288	1	6
Lunda Sul	Rural	1	Primary	3	516,077	1	5
Bengo	Rural	1	Primary	3	351,579	1	5

As seen from total weight in the table above, it is confirmed that Luanda forms the main node in which most of the activities in Angola is focussed in. In addition to this, the provinces forming the second order hierarchy includes Huambo, Huila, Kwanza Sul and Cunene. The second order hierarchy is followed by various low order nodes and regions. The spatial distribution of nodes and current hierarchy of Angola displays a largely unbalanced nature of the country.

The next step is to combine the existing hierarchy and the results of the weight system in order to recommend which areas could be focussed on to support the western corridor development and link with Angola. The primary focus would therefore be to utilise the urban hierarchy as spatial planning instrument in Angola to primarily support corridor development between Luanda and Namibia and secondly to promote a more spatial balanced set of nodes throughout Angola along the proposed corridor. The following figure combines the existing status quo with the results of the revised urban hierarchy.



**Figure 10-6: Existing and revised Angola urban hierarchy and nodes for development.**

Source: Own Compilation

The combination of the existing urban hierarchy and revised hierarchy based on the weights system revealed that two different approaches could be followed to promote corridor development to Luanda and also to promote regional balance. The first proposal is illustrated in the purple nodes. These nodes could be used to implement incentives in and attract internal and external investment. The Huambo node can form the mid-Angola node and is ideally located amongst an existing urban hierarchy. The relationships between these nodes are expected to create a more balanced distribution of nodes and start a mid-Angola urban system. The Ondjiva node in the

south of Angola is important to form a main node and start of the corridor. This node is linked to the first and second options to link Luanda with Namibia.

The second proposal links Ondjiva with Kuito, Malanje and N'dalatando to ultimately connect Luanda with Namibia. This second option should be implemented as a longer term strategic outcome in Angola. The longer term strategic outcome can promote effective development and expansion in the first option's set of nodes. After the spatial effect of the first option had time to develop, the second option can create an alternative lower order hierarchy and gradually start to add more nodes in the urban hierarchy towards the eastern parts of Angola. These two proposals can collectively result in connecting Luanda with Namibia and also promoting a more balanced urban spatial system by applying the urban hierarchy as spatial planning instrument in Angola.

#### **10.5.2.2. Eastern link**

Botswana is the only country that fulfils a dual role in terms of linkages and regional integration. Although Botswana was initially selected to form a connection in the eastern link, its location adjacent to Namibia result in the proposal to form a central link connecting the eastern and western corridors with each other. It should however be noted that Botswana consist of various natural limiting factors such as the Okavango Delta and the Kalahari Desert. These natural phenomena result in most of the activity in Botswana focussed in the eastern parts of the country. It is expected that, based on the weights system, Botswana should exhibit a significant unbalanced spatial system. In the following table the regions included in the Census are generated with weights as set out in the sub-continental weight system.

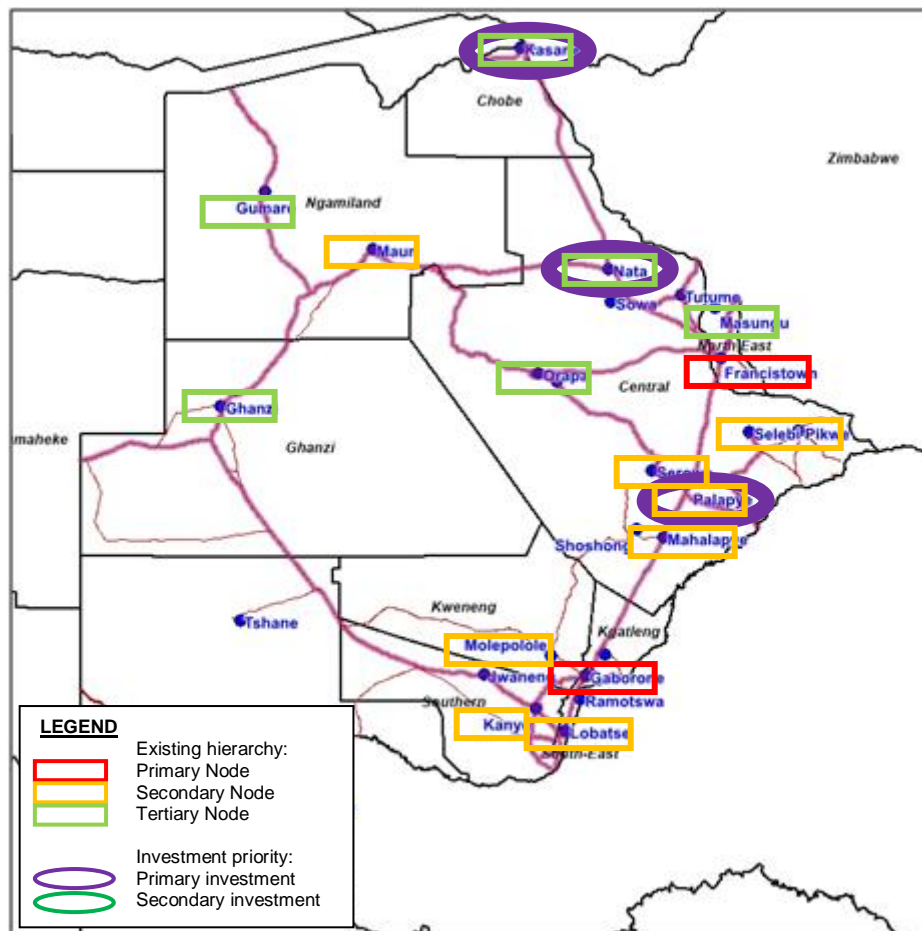
**Table 10-13: Urban hierarchy according to weights system for Botswana**

Source: Own compilation

Province	Nodes	Weights	Corridors	Weights	Population	Weights	Employment	Weights	Total Weight
Gaborone	Primary	4	Primary	3	231,592	2	109,551	3	12
Francistown	Primary	4	Primary & Secondary	4	98,961	1	40,345	1	10
Lobatse	Secondary	3	Primary & Secondary	4	29,007	1	11,431	1	9
Selibe-Phikwe	Secondary	3	None	0	49,411	1	20,622	1	5
Orapa	Tertiary	2	None	0	9,531	1	4,471	1	4
Jwaneng	Rural	1	Secondary	1	18,008	1	9,294	1	4
Sowa	Rural	1	Secondary	1	3,598	1	1,726	1	4
Southern	Rural	1	Primary & Secondary	4	129,247	2	30,332	1	8
Barolong	Rural	1	None	0	54,831	1	12,498	1	3
Ngwaketse West	Rural	1	None	0	13,689	1	3,430	1	3
South East	Rural	1	Primary	3	85,014	1	31,875	1	6
Kweneng East	Rural	1	None	0	256,752	3	31,875	1	5
Kweneng West	Rural	1	None	0	47,797	1	81,590	2	4
Kgatleng	Rural	1	Primary	3	91,660	1	30,592	1	6
Central Serowe/Palapye	Secondary	3	Primary	3	180,500	2	50,152	2	10
Central Mahalapye	Secondary	3	Primary	3	118,875	1	29,178	1	8
Central Bobonong	Rural	1	None	0	71,936	1	17,269	1	3
Central Boteti	Rural	1	None	0	57,376	1	14,068	1	3
Central Tutume	Rural	1	None	0	147,377	2	34,851	1	4
North East	Rural	1	Primary	3	60,264	1	15,569	1	6
Ngamiland East	Tertiary	2	None	0	90,334	1	25,488	1	4
Ngamiland West	Secondary	3	Secondary	1	59,421	1	14,113	1	6
Chobe	Tertiary	2	None	0	23,347	1	10,710	1	4
Delta	Rural	1	None	0	2,529	1	1,628	1	3
Ghanzi	Tertiary	2	Secondary	1	43,095	1	13,129	1	5
CKGR	Rural	1	None	0	260	1	181	1	3
Kgalagadi South	Rural	1	None	0	30,016	1	8,462	1	3
Kgalagadi North	Rural	1	None	0	20,476	1	6,456	1	3

From the table above, it can be concluded that Botswana consists of an unbalanced spatial system as a result of the impact of the natural physical limitation. The table above illustrates the revised hierarchy with the top tier consisting of Gaborone, Francistown and Central Serowe/Palapye. The secondary tier of the hierarchy is proposed to include the Lobatse, Southern, Kweneng East, Kgatleng, Central Mahalapye, North East and Ngamiland West regions. The rest of the regions evaluated consist of lower potential in terms of the total weight and is proposed to form the low order hierarchy.

The figure below combines the current urban hierarchy with the revised hierarchy as determined through the weights system. By combining the existing hierarchy with the revised results, areas are proposed for external or internal investment in an effort to promote regional balance, integration and also strengthen and support the proposed eastern link between South Africa and Kenya.



**Figure 10-7: Existing and revised Botswana urban hierarchy and nodes for development**

Source: Own compilation

From the figure above, the urban hierarchy of Botswana is focussed in the east of the country. The eastern parts of the country are also proposed to form the actual corridors linking South Africa with Zambia. With an established hierarchy, the recommended results in the case of Botswana focus on nodes to promote development to support the proposed eastern link. It is proposed to develop Palapye (currently classified as a secondary node) into a higher order node in the urban hierarchy. This will improve the relationship and link between Gaborone and Francistown.

Secondly, the areas north of Francistown are also taken into consideration in the recommendation. Kasane and Nata are both nodes currently classified as tertiary nodes in Botswana. To promote the northern linkage, it is proposed to promote initiatives in these two nodes to support the development of the northern Botswana corridor. If these nodes develop as secondary nodes in Botswana, the relationship with Francistown as primary node would support the northern Botswana urban system and relationships between these nodes. With the northern Botswana corridor strengthened, South Africa could be linked with Zambia through Botswana.

The provinces in Zambia is evaluated and generated with weights based on the discussed system. In Zambia, the provinces are extensive and cover large areas of the country when compared to the other countries evaluated. Despite the extent of the provinces, the criteria used are not sensitive to size, but rather refer to the significant areas of population and employment apart from the structuring elements. In the table below, the weights are generated according to each included factor of the evaluation.

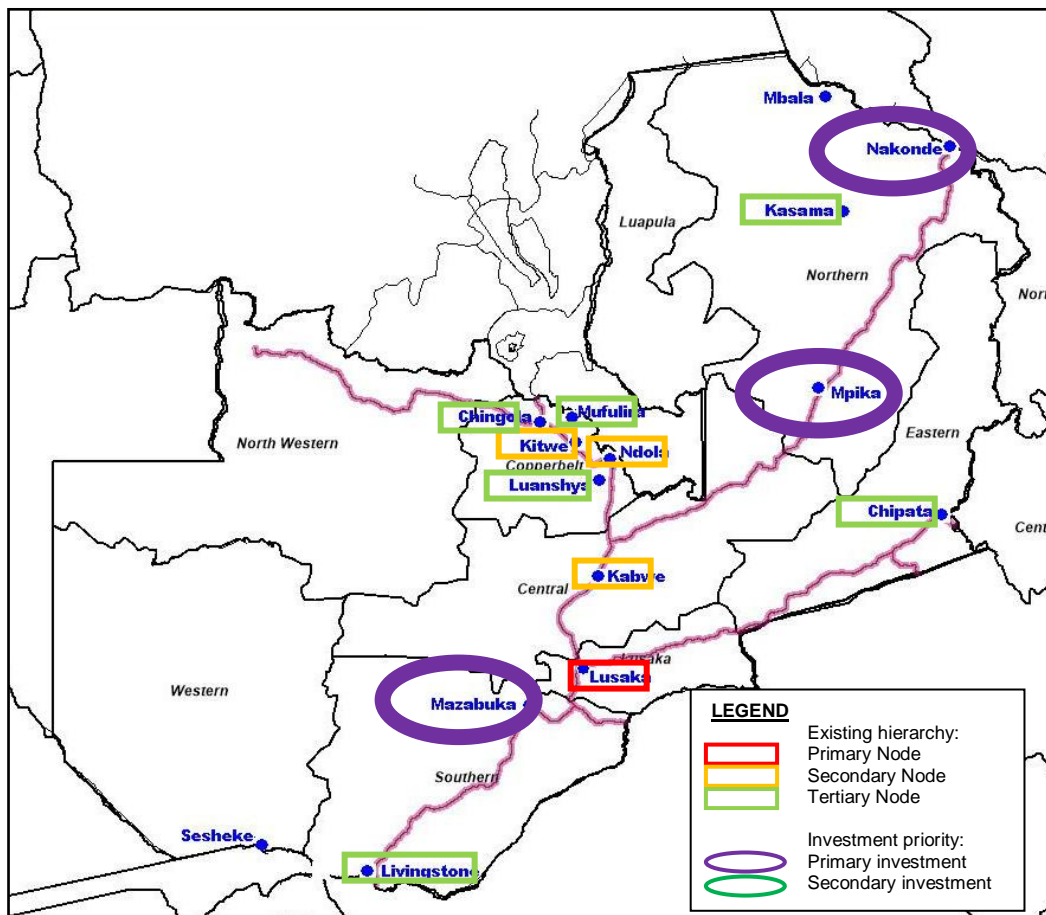
**Table 10-14: Urban hierarchy according to weights system for Zambia**

Source: Own Compilation

Province	Nodes	Weights	Corridors	Weights	Population	Weights	Labour Force	Weights	Total Weight
Central	Secondary	3	Primary & Secondary	4	1,307,111	2	394,281	2	11
Copperbelt	Secondary & Tertiary	4	Primary	3	1,972,317	3	643,903	3	13
Eastern	Tertiary	2	Secondary	1	1,592,661	2	533,661	3	8
Luapula	Rural	1	None	0	991,927	2	322,203	2	5
Lusaka	Primary	4	Primary & Secondary	4	2,191,225	3	720,884	3	14
Muchinga	Rural	1	Secondary	1	711,657	1	243,787	1	4
Northern	Tertiary	2	Secondary	1	1,105,824	2	362,923	2	7
North Western	Rural	1	None	0	727,044	1	219,767	1	3
Southern	Tertiary	2	Primary	3	1,589,926	2	497,059	2	9
Western	Rural	1	None	0	902,974	2	320,702	2	5

From the table above, it is clear that the main regions and urban hierarchy of Zambia is concentrated in Lusaka, the Copperbelt and Central provinces. The main distribution network and corridors are also linked to these areas, as these areas form the magnet to attract activities due to existing infrastructure and agglomeration benefits (Section 3.5.2). The attraction of activities towards these areas is confirmed by the weights in the population totals and also total employment.

When all the factors are combined, the most significant potential lies in the Lusaka and Copperbelt provinces of Zambia. The second tier is proposed to include the Eastern and Southern provinces and to a lesser extent the Northern Province. The conclusion based on the total weights will be correlated with the existing hierarchy in Zambia. The following figure illustrates the existing hierarchy as well as the urban nodes that could be considered for development.



**Figure 10-8: Existing and revised Zambian urban hierarchy and nodes for development.**

Source: Own Compilation

From the figure above, it can be concluded that Mazabuka (located in the Southern province), Mpika and Nakonde nodes (located in the Northern Province) could be considered for development, based on the weights system. The Northern and Southern provinces in the evaluation is proposed to form the second highest priority provinces after Lusaka and the Copperbelt Province. Investment in the mentioned nodes could further support the existing urban hierarchy in Zambia and would promote relationships and integration in the country too. By focussing on these nodes, a more spatially balanced pattern could also be promoted, linked to the main corridors in Zambia. The corridor development between Tanzania and Botswana could be supported by promoting investment in these nodes in Zambia.

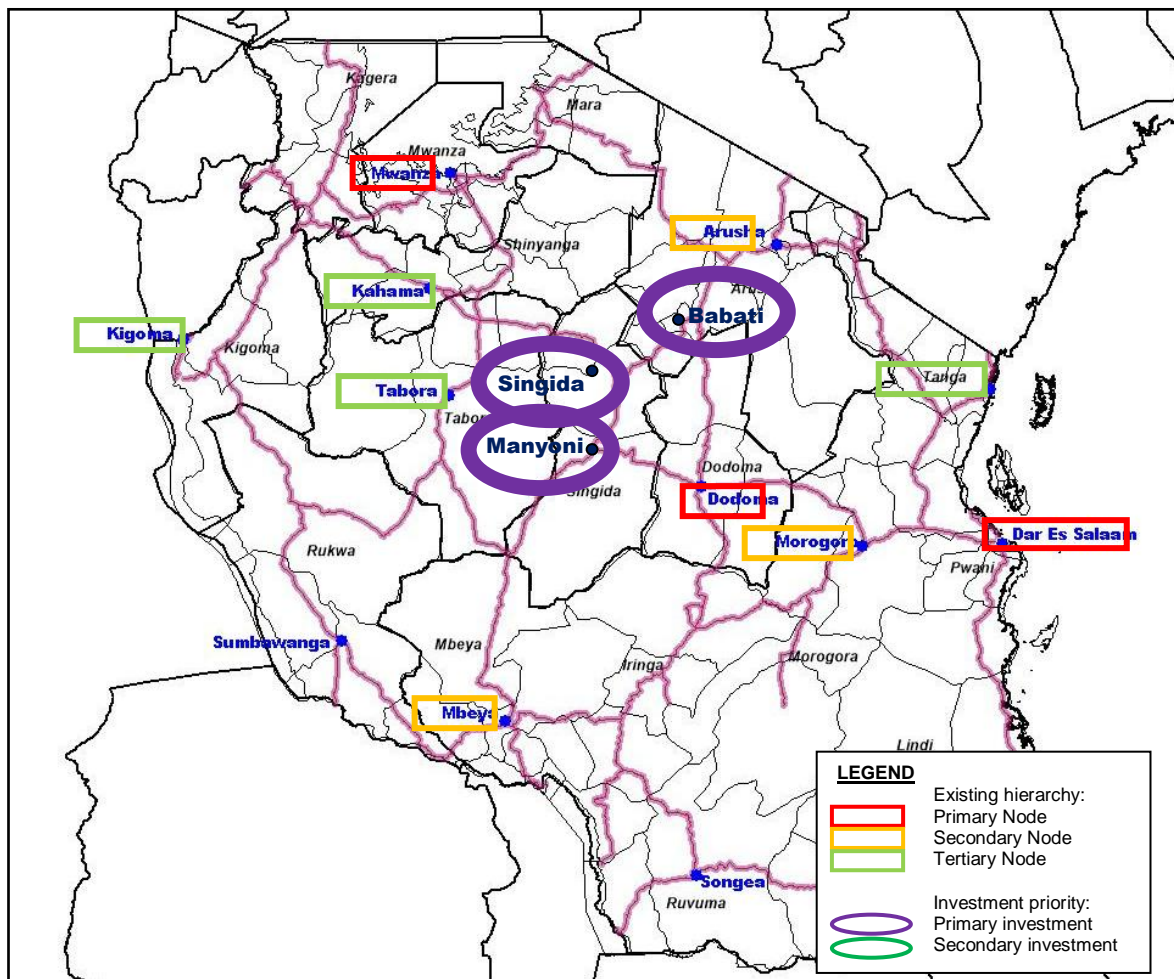
Tanzania consists of more regions compared to Zambia, as seen in the previous section. Although more regions are found in Tanzania, an unbalanced spatial and economic region can be noted in the country. The evaluation system generated appropriate weights for each region in Tanzania according to the set-out criteria.

**Table 10-15: Urban hierarchy according to weights system for Tanzania**

Source: Own Compilation

Regions	Nodes	Weights	Corridors	Weights	Population	Weights	Employment	Weights	Total Weight
Dodoma	Secondary	3	Primary & Secondary	4	2,083,588	1	853,986	1	9
Arusha	Secondary	3	Primary & Secondary	4	1,694,310	1	664,427	1	9
Kilimanjaro	Rural	1	None	0	1,640,087	1	729,528	1	3
Tanga	Tertiary	2	None	0	2,045,205	1	882,213	1	4
Morogoro	Secondary	3	> 1 Primary	4	2,218,492	1	1,002,049	1	9
Pwani	Rural	1	None	0	1,098,668	1	460,518	1	3
Dar es Salaam	Primary	4	Primary	3	4,364,541	2	1,719,467	2	11
Lindi	Rural	1	None	0	864,652	1	422,236	1	3
Mtwara	Rural	1	None	0	1,270,854	1	629,119	1	3
Ruvuma	Rural	1	None	0	1,376,891	1	636,824	1	3
Iringa	Rural	1	Primary	3	941,238	1	419,147	1	6
Mbeya	Secondary	3	Primary	3	2,707,410	2	1,123,966	2	10
Singida	Rural	1	Secondary	1	1,370,637	1	554,188	1	4
Tabora	Tertiary	2	Secondary	1	2,291,623	1	851,963	1	5
Rukwa	Rural	1	None	0	1,004,539	1	411,165	1	3
Kigoma	Tertiary	2	Secondary	1	2,127,930	1	863,004	1	5
Shinyanga	Tertiary	2	Secondary	1	1,534,808	1	566,072	1	5
Kagera	Rural	1	None	0	2,458,023	1	1,095,971	1	3
Mwanza	Primary	4	Secondary	1	2,772,509	2	982,154	1	8
Mara	Rural	1	Secondary	1	1,743,830	1	655,803	1	4
Manyara	Secondary	3	Primary & Secondary	4	1,425,131	1	558,162	1	9
Njombe	Rural	1	None	0	702,097	1	331,298	1	3
Katavi	Tertiary	2	None	0	564,604	1	219,277	1	4
Simiyu	Rural	1	Secondary	1	1,584,157	1	596,409	1	4
Geita	Rural	1	None	0	1,739,530	1	687,212	1	3

As seen from the table above, most of the activities in Tanzania are concentrated in two main regions, i.e. Dar es Salaam and Mbeya. The structuring elements or regional planning elements generated weights in all the regions, proposing the potential regions where external or internal investment strategies could be focussed on. Apart from the two main regions mentioned, Manyara, Morogoro, Dodoma and Arusha can potentially form part of the top order hierarchy. These regions are then followed by the Iringa and Mwanza regions. The revised hierarchy is compared to the existing urban hierarchy in Tanzania to determine which main nodes could be proposed to expand the urban hierarchy based on the potential determined.



**Figure 10-9: Existing and revised Tanzanian urban hierarchy and nodes for development**

Source: Own Compilation

By comparing the existing and revised urban hierarchies, it is clear that the central area of Tanzania does not consist of an established urban hierarchy between Dodoma and Mwanza. It is proposed that this spatially unbalanced system could be supported by the identified areas in purple, based on the weights of the regions. By expanding the current urban hierarchy towards the central areas of Tanzania, a more balanced spatial distribution of nodes could be promoted. With Singida, Babati and Manyoni earmarked for external investment, the relationships and links between Dodoma and Mwanza will be strengthened. Secondly, Morogoro can also be a potential investment node, strengthening the relationship between Dar es Salaam and Dodoma. From this set of nodes, it can be concluded that an urban polycentric form around Dodoma (the capital) could develop. This polycentric form should work collectively to improve overall connection and linking relationships between nodes in the country.

If the urban hierarchy are expanded in these areas, the links between the top hierarchy urban nodes would be strengthened, improving the relationship between the east and west of Tanzania. This expansion of the urban hierarchy would also strengthen the north to south connection in

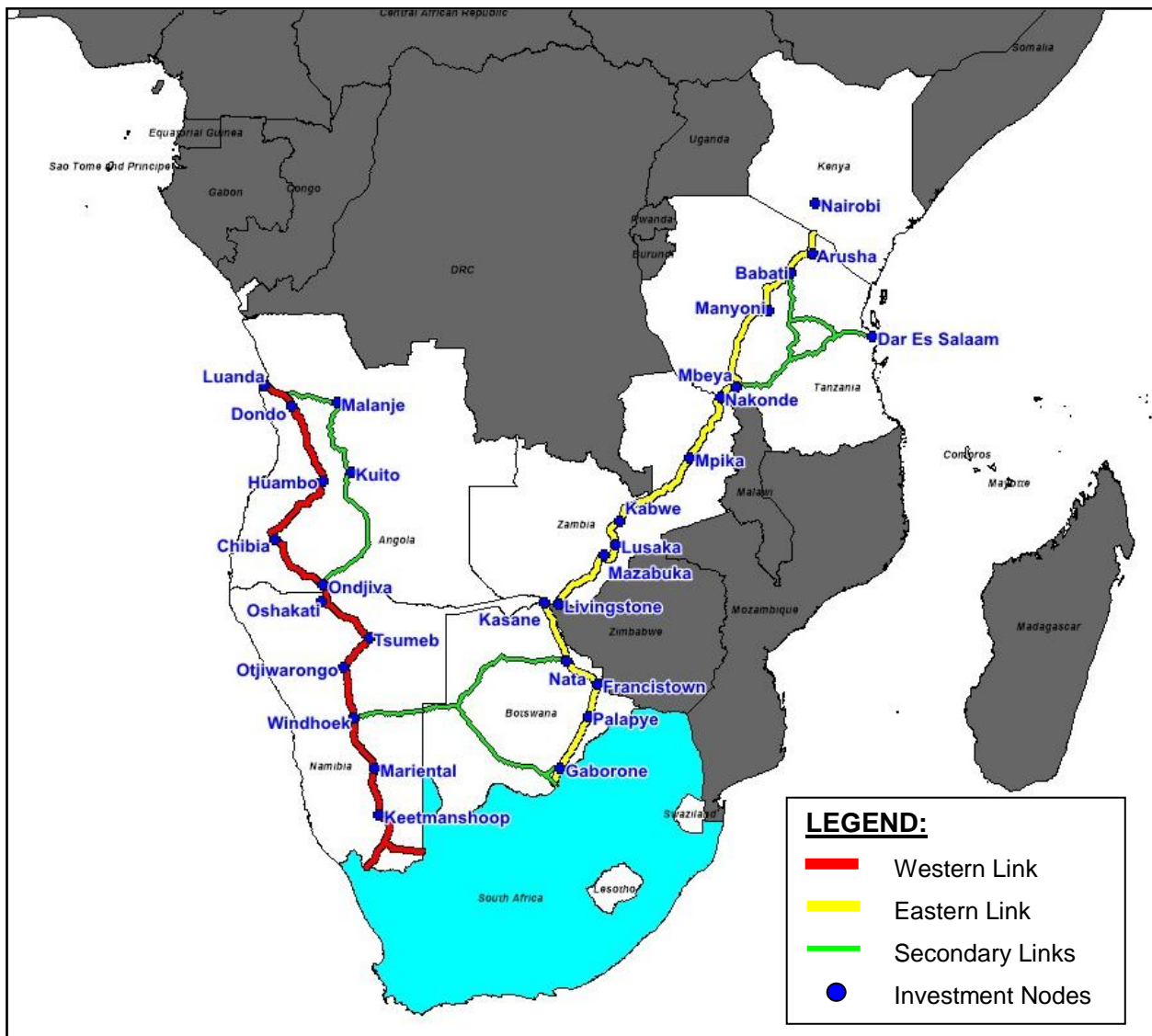
Tanzania, which plays a significant role in the connection between Zambia and Kenya through Tanzania. The proposed nodes, based on the total weight, would support north to south as well as east to west corridor development in Tanzania.

In Tanzania, the urban hierarchy as spatial planning instrument could therefore be used to promote a spatial balance and supporting links between different areas internally and externally. This proposed investment process would uplift the entire country in terms of relationships and linkages between nodes and different areas of Tanzania while simultaneously forming the final connecting link of the eastern corridor. In the following section the proposals of all the countries in the previous sections are concluded to illustrate the role of an urban hierarchy as spatial planning instrument on the sub-continental scale.

### **10.5.2.3. Discussion of sub-continental study area proposals**

In the previous few sections the evaluation of the selected countries (completed in Chapter Eight) were linked to the sub-continental hierarchy quartile-weights system. This system used is applied on the sub-continental scale study area to illustrate the role of an urban hierarchy as spatial planning instrument. Through this approach the regions and urban hierarchy of each of the selected countries are taken into consideration, within its unique development phase irrespective of national boundaries, in the strategic planning and recommendation phase.

In the study area, it is important to take into consideration the outcome and focus used to delineate the study area. In this case the main outcome is to promote regional integration within the SADC to support development (Section 9.3.2). By applying the urban hierarchy as a spatial planning instrument, it was found that eastern- and western links in the study area could be differentiated to promote integration and establish relationships. In the following figure the strategic planning proposals are illustrated as a conclusion of the application of urban hierarchy as spatial planning instrument in each of the countries.



**Figure 10-10: Recommended linkages between Kenya and Angola with South Africa**

Source: Own Compilation

After applying the urban hierarchy as spatial planning instrument in each of the individual countries, certain investment nodes were proposed to support the corridor development in each of the countries. This methodology took into consideration the potential in terms of population, employment as well as structuring element potential in nodes (current urban hierarchy) and existing corridors through the weights system. Weights were generated for each of the regions in the country to evaluate the more appropriate potential areas for development. This approach allows the researcher to consider areas within specific development phases irrespective of national boundaries and limitations. This integrative approach enables the identification of nodes within the countries to promote regional integration along the eastern and western links and also promote regional balance.

After the strategic planning methodology was applied in the regions of each of the countries, the results are compiled to recommend and propose the eastern and western linking corridors. This integrative process is based on literature foundations, best practices and structuring potential (spatial planning instruments) and is proposed to be applied through a bottom-up regional planning approach. This bottom-up approach is applied to achieve the top top-down identified outcome of promoting effective regional integration to support development in the SADC (Section 9.3). The revised urban hierarchies of each country are combined to represent the entire sub-continental study area. The revised approach to determine the hierarchy in the entire study area serves as a guide to recommend which areas could potentially be focussed on for investment purposes. The following table illustrates the revised hierarchy in the study area.

**Table 10-16: Sub-continental scale revised urban hierarchy**

Source: Own Compilation

Link	Country	Regions	Country Hierarchy	Study Area Hierarchy	Priority	Link	Country	Regions	Country Hierarchy	Study Area Hierarchy	Priority	Link	Country	Regions	Country Hierarchy	Study Area Hierarchy	Priority
Western Link	Namibia	Caprivi	4	4	Low	Eastern & Central Link	Botswana	Gaborone	12	1	High	Eastern Link	Zambia	Central	11	1	High
		Erongo	8	2	Second			Francistown	10	1	High			Copperbelt	13	1	High
		Hardap	6	3	Emerging			Lobatse	9	2	Second			Eastern	8	2	Second
		Karas	7	2	Second			Selibe-Phikwe	5	3	Emerging			Luapula	5	3	Emerging
		Kavango	7	2	Second			Orapa	4	4	Low			Lusaka	14	1	High
		Khomas	15	1	High			Jwaneng	4	4	Low			Muchinga	4	4	Low
		Kunene	3	4	Low			Sowa	4	4	Low			Northern	7	2	Second
		Ohangwena	8	2	Second			Southern	8	2	Second			North Western	3	4	Low
		Omaheke	4	4	Low			Barolong	3	4	Low			Southern	9	2	Second
		Omusati	5	3	Emerging			Ngwaketse West	3	4	Low			Western	5	3	Emerging
		Oshana	10	2	Second			South East	6	2	Second			Dodoma	9	1	High
		Oshikoto	9	2	Second			Kweneng East	5	3	Emerging			Arusha	9	1	High
		Otjozondjupa	9	2	Second			Kweneng West	4	4	Low			Kilimanjaro	3	4	Low
		Angola	Cabinda	2	4			Low	Kgatleng	6	2			Second	Tanga	4	4
	Zaire		3	4	Low		Central Serowe	10	1	High	Morogoro		9	1	High		
	Uige		2	4	Low		Central Mahalapye	8	2	Second	Pwani		3	4	Low		
	Luanda		12	1	High		Central Bobonong	3	4	Low	Dar es Salaam		11	1	High		
	Kwanza Norte		5	3	Emerging		Central Boteti	3	4	Low	Lindi		3	4	Low		
	Kwanza Sul		6	2	Second		Central Tutume	4	4	Low	Mtwara		3	4	Low		
	Malanje		4	4	Low		North East	6	2	Second	Ruvuma		3	4	Low		
	Lunda Norte		3	4	Low		Ngamiland East	4	4	Low	Iringa		6	2	Second		
	Benguela		5	3	Emerging		Ngamiland West	6	2	Second	Mbeya		10	1	High		
	Huambo		8	2	Second		Chobe	4	4	Low	Singida		4	4	Low		
	Bie		5	3	Emerging		Delta	3	4	Low	Tabora		5	3	Emerging		
	Moxico		3	4	Low		Ghanzi	5	3	Emerging	Rukwa		3	4	Low		
	Cuando Cubango		3	4	Low		CKGR	3	4	Low	Kigoma		5	3	Emerging		
	Namibe		4	4	Low		Kgalagadi South	3	4	Low	Shinyanga		5	3	Emerging		
	Huila	6	2	Second	Kgalagadi North		3	4	Low	Kagera	3		4	Low			
Cunene	6	2	Second					Mwanza	8	2	Second						
Lunda Sul	5	3	Emerging					Mara	4	4	Low						
Bengo	5	3	Emerging					Manyara	9	1	High						
								Njombe	3	4	Low						
								Katavi	4	4	Low						
								Simiyu	4	4	Low						
								Geita	3	4	Low						

From the table above the western, central and eastern links are grouped per country. The grouping per country serves as a recommendation of on which areas the countries can focus for development to help achieve the revised hierarchy and prominent corridor development in the study area. The western link is proposed between South Africa and Angola, more specifically Luanda. In terms of the western link, Namibia and Angola is the only countries included in the process. By applying the urban hierarchy as spatial planning instrument in Namibia, it was found that an already established corridor in Namibia exists. Based on the existing hierarchy, the links in this corridor is not significantly supported by higher order nodes.

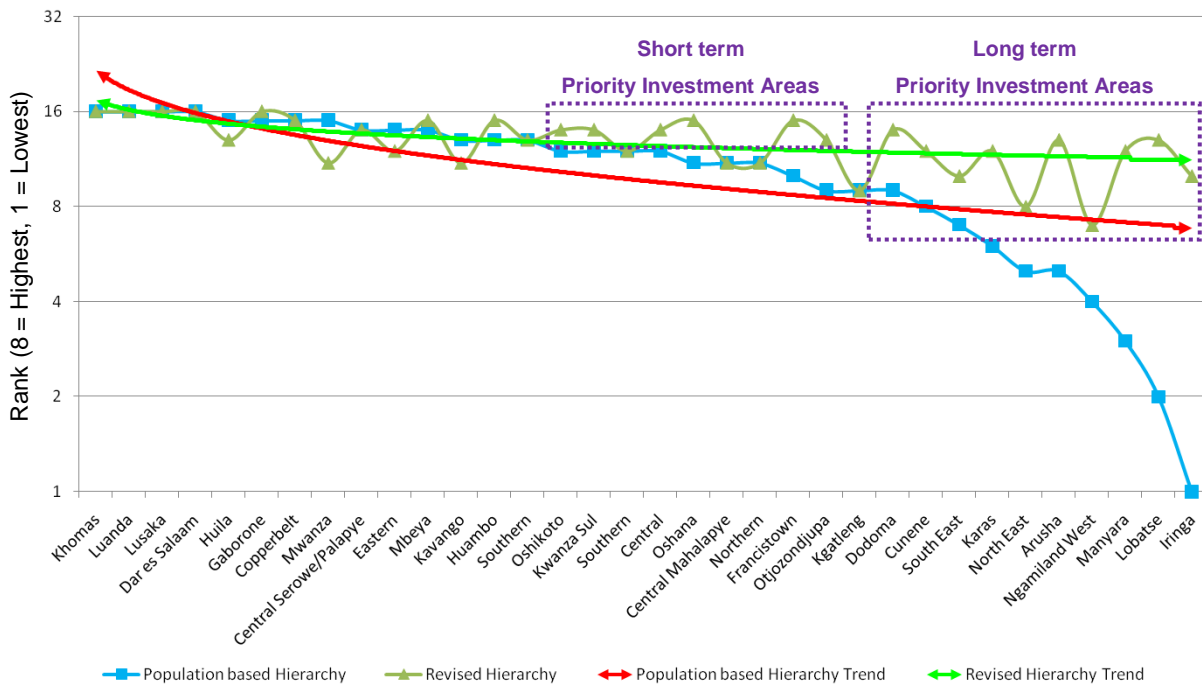
It is recommended to support the functioning between nodes in Namibia to strengthen the functioning of the corridor and link with Angola. In Angola, a primary western linking corridor and a secondary link is recommended. This secondary link could be implemented to fulfil a similar role of a secondary corridor (discussed in Chapter Three) on a regional basis. The primary function of the secondary link is to develop an alternative corridor and to promote regional balance and integration between the nodes in the urban hierarchy in Angola.

The eastern link located between South Africa and Kenya includes Botswana, Zambia and Tanzania. The eastern link is proposed by linking the primary and top order urban hierarchy nodes in Botswana and Zambia. These top order nodes are supported by various smaller nodes that should be focused on to promote the effective functioning of the eastern corridor, while providing a more developed urban hierarchy and urban system. In Tanzania, Dar es Salaam is not considered as node in the primary eastern linking corridor, but still remains a significant role-player in the general dynamic of the region.

A secondary corridor in Tanzania is also proposed to link Dar es Salaam with the primary eastern linking corridor. This network and secondary link also provides a platform for other smaller urban nodes in Tanzania to evolve and advance in the urban hierarchy to establish a more complex and balanced urban system in Tanzania. Apart from the secondary corridors recommended in Tanzania and Angola a third network of secondary corridors is also recommended between the eastern and western linking corridors. This provides the opportunity for not only north to south linkages, but also central linkages between Botswana and Namibia.

To guide the recommendations on the phasing the investment on corridors within the countries in the study area, the existing and revised urban hierarchies should be compared. The existing urban hierarchies will be based on the population rank of the different areas. The comparison of these hierarchies will reveal which areas will need significant investment to advance in the urban hierarchy. Additionally, the comparison will also reveal where investment is supported by existing infrastructure and agglomeration benefits (Section 3.5.2).

## Hierarchy Comparison



**Figure 10-11: Study area western and eastern link specific hierarchy comparison**

Source: Own Compilation

From the figure above, the areas with limited deviation from the existing hierarchy are identified as short term, high priority investment areas. These areas already consist of the necessary infrastructure and agglomeration benefits to ensure maximum benefit from investment strategies (Section 3.5.3) to promote regional balance and integration. Secondly, the areas with a larger deviation from the existing hierarchy would require a much larger investment strategy to create regional balance. Positive spin-offs from the short-term investment areas in the middle order hierarchy is expected to support the lower order hierarchy in the long term. The areas which correlate with the existing hierarchy already fulfil a specific function in the study area and the western and eastern links. By comparing the figure above with Figure 10-10, specific investments on the corridor can be prioritized. The following table indicates the specific areas for investment in terms of long-term and short-term priorities.

**Table 10-17: Long- and short-term corridor investment**

Source: Own Compilation

Western Link		Eastern Link	
Link	Priority	Link	Priority
Keetmanshoop - Mariental	Long-term	Gaborone - Palapye	Short-term
Mariental - Windhoek	Long-term	Palapye - Francistown	Short-term
Windhoek - Otjiwarongo	Short-term	Francistown - Nata	Long-term
Otjiwarongo - Tsumeb	Short-term	Nata - Kasane	Long-term
Tsumeb - Oshakati	Short-term	Livingstone - Mazabuka	Short-term
Oshakati - Ondjiva	Short-term	Mazabuka - Lusaka	Short-term
Ondjiva - Chibia	Short-term	Lusaka - Kabwe	Short-term
Chibia - Huambo	Short-term	Kabwe - Mpika	Long-term
Huambo - Dondo	Long-term	Mpika - Nakonde	Long-term
Dondo - Luanda	Long-term	Nakonde - Mbeya	Long-term
		Mbeya - Manyoni	Long-term
		Manyoni - Babati	Short-term
		Babati - Arusha	Short-term

The table above illustrates which of the proposed links in the eastern and western corridor of the study area should be focussed on in the long-term and short-term. As mentioned, the proposed short-term investment strategies are linked to areas which already consist of the appropriate infrastructure and potential. Investment focussed on these areas is likely to have a significant impact on corridor development in the short term. As these links develop over-time, a spill-over effect is expected to help the lower order hierarchy areas advance in the urban hierarchy. It is recommended to first establish the prominent eastern and western links, before secondary links are promoted (refer to Figure 10-10).

The SADC (2012:23) included Zimbabwe in the eastern link. Zimbabwe was excluded from the links in the preliminary evaluation phase (Section 8.5.1). In the SADC's (2012:23) strategies the north to south corridor in the western link is not completed and linked to Luanda. The revised approach identifies Dondo to invest in to support the continuous development of the western link. In Namibia, the primary corridor aligns with the SADC's vision. The SADC (2012:23) envisions two secondary corridors (from Windhoek and Tsumeb) between the eastern and western links in the study area. The revised approach proposes that investment should be focused on the secondary corridor from Windhoek. Intensive investment in this corridor should result in more prominent progress in establishing the secondary links.

In terms of Botswana, the vision of the SADC (2012:23) corresponds with the proposed Botswana link up to Francistown, before entering Zimbabwe via Bulawayo. By excluding Zimbabwe, the revised approach proposes that Nata and Kasane could be focused on to develop an alternative eastern corridor link into Zambia. The existing corridor in Zambia aligns with the proposed corridor up to Lusaka. The revised corridor suggests that Mazabuka could be focused on as a node to

strengthen the primary corridor in Zambia. The SADC (2012:23) does not focus on specific nodes on the corridor to the north into Tanzania, resulting in a fragmented and ineffective corridor. The revised approach proposed that Mpika and Nakonde could be identified as areas to promote investment and ensure the potential development of the northern corridor. Finally, the SADC (2012:23) primarily focus on the corridor development to Dondo and Dar es Salaam. The revised approach identifies Mbeya, Manyoni, Babati and Arusha as nodes to invest to develop a primary corridor linking Dodoma with Kenya. The proposed secondary corridor from Dodoma to Dar es Salaam aligns with part of the SADC's (2012:23) primary corridor in Tanzania.

In the strategic planning process of the sub-continental study area, it was found that an urban hierarchy could be applied as spatial planning instrument to promote regional integration and balance in the SADC. The revised approach to urban hierarchy enables the identification of nodes that could be invested in to support the development of primary and secondary corridors. The revised integrative approach to an urban hierarchy as spatial planning instrument, in this case, could be used to help achieve regional interconnection and establish relationships between countries and nodes while promoting regional balance irrespective of national boundaries. In the sub-continental study area this approach could help to establish effective corridor development in areas where the development is fragmented and isolated.

## **10.6. Conclusion**

In Chapter Ten the strategic planning and recommendation process in both the study areas were discussed. The first part of the chapter included the synthesis where the research aims and objectives, methodology, approach, literature and empirical investigation were integrated and collectively discussed. The integration of these parts of the thesis served as a platform where valuable insights were gathered that were applied in the proposals of the specific study areas. In terms of the literature, the basis and three main themes applicable to this research were indicated to clarify the basic literature principles applicable in the role of an urban hierarchy as spatial planning instrument. Proposed alterations in the literature foundation were included in that could be potentially applied in different areas of study. By recommending the potentially different approaches, or by differing from these principles, this research creates a platform for new interpretations to the applicable themes. This integrative platform promotes regional balance in the combination of the relevant literature themes.

After the synthesis part of this chapter, the evaluation and investigation of the role of an urban hierarchy as spatial planning instrument was evaluated from the regional perspective's study area. The study area was delineated and approached as a planning region in the evaluation and recommendation phases. The evaluation was based on a quartile-weight system used to propose a revised urban hierarchy approach. The revised urban hierarchy is compared to an urban

hierarchy based on population (Section 5.2) and the settlement typology hierarchy (Section 6.6). The comparison of these hierarchies served as a platform to identify potential areas for investment. These areas are grouped in investment priorities. These groupings are proposed to benefit from areas showing existing potential, infrastructure and agglomeration benefits. By following this approach, focussed investment strategies are assigned to appropriate areas, limiting the risk of wasting investment initiatives in areas with limited potential. Additionally, these groupings of investment priorities are likely to result in positive spin-offs in lower order areas resulting in potential advance in the urban hierarchy. This process ultimately results in promoting a more balanced spatial nature of the region.

From the regional perspective study area, it was concluded that an urban hierarchy could be applied to help achieve a more balanced distribution of nodes, resulting in a more spatially balanced region. The role of an urban hierarchy in this study area was to propose a revised and more spatially balanced hierarchy, which could be used to identify areas that need to be invested in to promote a more spatially balanced region. An integrative approach as determined in this study is based on regional planning instruments, the region's structure, social and economic factors is proposed in regional planning. The additional elements included in the new integrative approach to urban hierarchy enables strategic planning processes to accurately identify appropriate areas for investment to promote regional balance and to gain maximum benefit from investment strategies. These investment strategies are recommended to be implemented through an unbalanced approach, allowing maximum benefit on focussed investment areas.

Illustrating the flexible implementation nature of the proposed integrative approach to revise urban hierarchy, the sub-continental study area was approached in a largely similar method as applied from a regional perspective. The proposed approach and role of an urban hierarchy considers regional balance through the urban hierarchy irrespective of national boundaries. The revised hierarchy is also specifically linked to the region's specific development phases that consider the existing dynamic and role of nodes in the SADC. The sub-continental study area is also approached as a planning region delineated with the primary promotes regional integration and development in the SADC countries. A primary point of departure is to link South Africa with Kenya and Angola and promote regional integration between these countries through corridor development. These linking corridors were grouped in the eastern and western links between the last-mentioned countries and South Africa as gateway into Africa.

The contribution in the strategic planning process and recommendations on the sub-continental study area includes the revision of an urban hierarchy that could be applied to guide investment to promote corridor development and regional integration in the SADC countries. The role of the urban hierarchy is therefore to apply a generic integrative approach based on literature principles

and statistical data on different scales not limited to national boundaries. Unique about this proposed integrative approach is that through the comparison of the revised and existing hierarchy specific areas and nodes along the different corridors can be identified and linked to short to long term investment priorities. From a regional planning point of view this approach could also support implementation and monitoring process of investment. The approach supports a bottom-up approach promoting inter- and intra-regional integration. In addition to this, secondary corridors are proposed on a regional basis that were identified to support the relationships between different order nodes and regions while facilitating the gradual development of a spatially more balanced urban hierarchy on sub-continental scale.

Finally, the primary aim (Section 1.4) was to illustrate and consider the role of an urban hierarchy as spatial planning instrument. Associated with the identified primary aim, certain objectives were identified to help in achieving the aim. These objectives were addressed in the following manners:

1. To derive unique insights by combining spatial planning instruments with urban hierarchies in an integrative approach and illustrate how these insights might assist in achieving progress towards a higher level of spatial balance in a region.

**Spatial planning instruments (nodes, corridors and planning regions) are used in an integrative approach which includes social and economic aspects. These multiple factors are considered when evaluating a region to propose specific interventions to promote spatial balance in the region irrespective of national borders and data limitations.**

2. To determine appropriate urban hierarchies relevant to a region's unique development phase.

**The temporal perspective gathered from the first objective provides valuable insights that are used to propose a revised urban hierarchy specifically linked to the region's development phase from a social and economic point of view.**

3. To interpret an urban hierarchy through nodes with similar social and economic characteristics, relevant to the region's development phase.

**The insights from the first objective are integrated with the revised urban hierarchy to group nodes and areas with similar characteristics based on social and economic indicators specific to the region's development phase.**

4. To determine and potentially propose customised policy approaches for a planning region in different phases of development.

**Unique policy approaches are proposed on the new founded insights and a new integrative approach that combines top-down and bottom-up principles. These policy approaches are aimed to identify areas with the most potential to promote unbalanced economic investment to gather maximum benefit from these strategies and promote an integrated and more spatially balanced region.**

In reaching the objectives it is confirmed that an integrative approach (where spatial planning instruments and urban hierarchies are combined) to urban hierarchy for regions in a specific development phase should be considered to promote regional balance. This approach provides unique insights based on literature principles and different sets of data, irrespective of national boundary and data limitations. The urban hierarchy as spatial planning instrument could be used as an integrated instrument to identify areas that might be considered for development. These areas should be supported through an economically unbalanced approach with the focus of promoting regional balance. This approach to urban hierarchy considers the role and dynamics of nodes and areas in specific delineated regions. By considering the recommendations, strategic planning process and methodology, it can be concluded that the role of an urban hierarchy as spatial planning instrument could be used to develop linkages, to establish relationships between different areas and to promote and facilitate regional balance in different geographic scales.

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