

**The bright lights of city regions –  
Assumptions, realities and implications of changing population dynamics:  
Zooming in on the Gauteng city region**

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Authors:

Amy Pieterse\*  
Elsona van Huyssteen  
Gerbrand Mans  
Johan Maritz  
Willemien Faling  
\*apieterse@csir.co.za

Designation & Affiliation(s):

Candidate Researcher  
Principle Researcher  
Senior Researcher  
Senior Researcher  
Senior Researcher  
Council for Scientific and Industrial Research, Built Environment  
South Africa  
Tel: +27- 12- 841 2566

**Abstract**

It is well known that the city regions attract migrants from across the country because of their roles as economic engines and job baskets in South Africa. To address urbanisation implications it is imperative to better understand some of the assumptions about the nature and dynamics of population growth and internal migration across the South African landscape, and in particular within the Gauteng city region as the largest of the city regions. Three key issues emerged that are related to assumptions of migration and urbanisation. Firstly, even though poverty has been perceived as largely a rural issue, the urbanisation of poverty is in fact occurring at a large scale and city regions, particularly the Gauteng city region, is dealing with an enormous, and increasing number of poor people. Secondly, the attractiveness of city regions has caused a great increase in the proportion of young people and young work seekers. And lastly, that the biggest proportion of migration flows is occurring between metropolitan areas and that migration is not only a rural-urban process as generally believed. The other issues that emerged and that need further investigation is the reality of circular migration, the effect of changing household sizes and the ability of city regions and other settlements to absorb newcomers.

**Keywords**

Population change, poverty, migration, Gauteng city region, metropolitan areas

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## **1. Introduction**

It has often been reiterated that Africa's future is an urbanised future. South Africa's urban transition during the post-apartheid period have been characterised by the role of city regions and cities, and to some extent also a range of towns, acting as major attractors of growth and migration over the last number of years. Cohen (2004) maintain that, internationally, the current urban transition differs greatly from that which was experienced in the early to middle 20<sup>th</sup> century in Europe and the United States. The scale of urban population growth is unprecedented, it is occurring at a rapid pace and it is occurring in countries where urbanisation is detached from economic development (ibid). It is estimated that by 2011 more than 70% of South Africa's population were already living in cities, towns and settlements (Van Huyssteen et al., 2013) across the country and that the growth rate for the range of cities and towns remained relatively high, compared to the rest of the country. In a recent study on the population dynamics and growth of cities and towns conducted as part of the Regional Dynamics and Interactions (Regional DnI) Initiative by the Council for Scientific and Industrial Research (CSIR), Built Environment it has been estimated that of the 51,8 million South African population (StatsSA, 2011), about 42% reside within the four city region areas of Gauteng, Cape Town, eThekweni and Nelson Mandela Bay (Van Huyssteen et al., 2013). In addition to the estimated 57% of the formal economy generated in the city regions (ibid), these areas also play an important role as economic engines and job baskets of South Africa, by housing large parts of the informal economy and large numbers of small businesses.

In spite of the growing urban population, the complexities of the South African urban and rural landscape and strong urban rural linkages, amongst other factors lead to a situation where migration to urban areas is often non-permanent, with evidence of rural-urban circular migration, as well as of high levels of intra-metropolitan migration (SACN, 2009; Collinson et al., 2006a; Beukes, 2013). Given the major political and policy emphasis on rural development, and the challenges of increasing rural poverty and job creation, many studies are aimed at understanding and redressing the implications of these migration patterns on rural areas (see Bank & Minkley, 2005; Scoones & Wolmer, 2003, Hemson et al., 2004 and Collinson et al., 2006b).

Whilst recognising the challenges of rural South Africa and the impact of continued migration and centralisation in rural South Africa and on the range of smaller and medium sized towns, scholars and practitioners agree that a range of key questions need to be asked about the nature of urban growth and migration in order to inform government support in urban areas and the ability of metropolitan municipalities to absorb incoming migration and changes in population dynamics. (Collinson et al., 2006b; Cross, 2001; Collinson et al., 2006a; Posel & Marx, 2011; Landau et al., 2013; Beukes, 2013; Kok et al., 2003; SACN, 2009).

Urbanisation is often cast as a 'problem' of the influx of people from rural areas to urban areas. Often pitched as a double sided edge of rural areas that are losing resources and capacity to urban areas, and on the other hand urban areas that are faced with limited capacity to absorb the migration, and an ever

increase in service delivery backlogs. However, to address urbanisation implications it is imperative to better understand some of the assumptions about the nature and dynamics of population growth and internal migration across the South African landscape, and in particular within the city region areas.

Amidst the myriad of challenges to address issues relating to migration (especially labour migration), poverty and the youth remain central in engaging “great futures” in metropolitan areas (see Beukes, 2013; Todes, 2010; Roux, 2009 and Kok et al., 2003). As such this paper is aimed at contributing towards a more nuanced understanding of urbanisation, migration and urban growth in city regions in South Africa, specifically the Gauteng city region, by highlighting three key issues related to perceptions about migration and urbanisation:

- ONE: Contrary to perceptions about poverty as largely a rural issue, South Africa is seeing an ‘urbanisation of poverty’ with the result that urban areas now shoulder a larger number of poor people (in absolute terms) more than rural settlements in aggregate. Metropolitan areas/city region areas in particular are experiencing an urbanisation of poverty.
- TWO: In accordance to perceptions that young work seekers are attracted by the bright lights and explore opportunities in cities, the percentage of entrants into the job market increased significantly since 1996.
- THREE: Contrary to urbanisation often being cast as a ‘problem’ of rural-urban migration, it is evident that a large portion of migration happens between metropolitan areas.

The paper highlights these three key issues by drawing on recent research and analyses by the authors that has been conducted as part of the ongoing Regional Dynamics and Interactions (Regional DnI) advanced spatial analyses by the CSIR, Built Environment and a specific study by the authors into population change, trends and dynamics across the continuum of rural to urban settlements, as input into the national Integrated Urban Development Framework (IUDF) for the South African Cities Network (SACN) and the Department of Cooperative Governance and Traditional Affairs (COGTA). The studies and analyses were made possible by the recent Statistics South Africa (StatsSA) demographic data release, the updated Geospatial Analyses Platform (CSIR, 2013a), the recently updated typology of Functional Settlement in South Africa (Van Huyssteen et al., 2014) (which was originally developed to support the development of the national urban development framework) and the recently developed Temporal Analyses Tool (CSIR, 2013b). It is important to note that this paper only covers internal migration and international migration has not been included.

The findings highlighted in the paper clearly indicate that urbanisation to South African city region areas are indeed characterised by the urbanisation of poverty as well as an urbanisation of youth, with most migration taking place between city regions and cities. This is especially evident for the Gauteng city region, where these trends manifest most noticeably. This not only confirms perceptions about city regions as increasingly being the spaces where the future of South Africa’s youth will be determined, but also once again rings the alarm bells for urgent, focused and innovative government support to address urban poverty, development and service delivery implications.

## **2. Background**

The next section will provide brief background on migration, the city region areas and on the methodology and data sets used to analyse functional regions and settlements.

## 2.1 Issues on migration – providing context

Kok et al. (2003) differentiates between the two main types of migration in South Africa, namely permanent migration and labour or circular migration. Labour migrants will usually move on their own and form a one-person household at their new location, whereas permanent migrants will move with their entire household or parts thereof. The existing research on internal labour migration trends in post-Apartheid South Africa is incomplete at best (Posel, 2004; Beukes, 2013). The research that does exist mainly provides a cross-sectional snapshot of a subpopulation, looks at census data to examine changes in migration patterns or studies a population of a specific geographical or administrative area (Reed, 2013). Beukes (2013) also argues that these arbitrary political and administrative boundaries within which migration is measured also make meaningful analysis difficult.

The effects of circular migration such as single headed households, absent members and health implications are often experienced within the household. Circular migration also provides many households with opportunities that would have otherwise been out of reach. The migrant worker benefits directly from the opportunities that the city has to offer and shares these benefits with their rural household of origin. Households living in poverty will migrate to places where “poverty reduction is most likely to occur” (Skeldon, 2012: 48). The city offers the migrant worker with access to employment, government infrastructure and services that are not necessarily always available in the rural areas. Urban areas are popularly regarded as places of opportunity, and therefore they attract a large amount of people, including the poor.

Cross (2001) argues that the high levels of mobility are putting infrastructure planning at risk. She also identifies a myriad of possible consequences that migration can have on the country and its citizens, namely it raises the demand for land and housing through the establishment of more single person households; it destabilises traditional institutions; it damages social capital networks; and it raises the risk of corruption because weakened communities may not be able to oppose power figures. Rapid urbanisation puts immense pressures on a government’s ability to provide public services. And looking beyond our borders, the mushrooming of informal settlements and slums in the major cities of the rest of the developing world are evidence of the widespread struggle to accommodate a growing population (Buhaug & Urdal, 2013). In a study done by Perlman (2007) on the *favelas* in Rio de Janeiro, Brazil; she found that the persons and households that moved to the *favelas*, did so to move away from poverty and these informal settlements in the city of Rio de Janeiro provided them with the opportunity to integrate into the city and to access to opportunities.

It has been a central concern for policy makers in South Africa since Apartheid to determine the scale and nature of migration within the country. Since 1994 one of the major objectives of government was to alleviate poverty and provide everyone with equal access to basic services such as housing. In the context of rural-urban migration and the powerful urban-pull factors, the responsibility falls on metropolitan areas to be able to absorb migrants and to provide them with the basic services that they need to enter the urban labour market. The labour market often struggles to absorb fast-growing populations and together with the higher levels of noticeable inequality in large cities and metropolitan areas, are latent sources of urban frustration which can contribute to social unrest and disorder (Buhaug & Urdal, 2013). Some of the questions that need to be asked are do we need to improve the conditions and provide economic

opportunities in the rural areas or do we need to focus our resources on improving the cities and to encourage urbanisation. These questions have some major implications for South African policy.

Government has had no consistent approach to migration because of the sensitivity of the subject and the possible negative effects on either the places of origin or destination. As a result, the growth experienced in the metropolitan and city region areas has largely been met with reactive and sometimes aggressive responses (Turok, 2012). This can especially be seen in government reactions toward informal settlements that emerge as a consequence of rapid expansion (Turok, 2012). It is important for government to understand and acknowledge the dynamics of internal migration. For government to plan properly and to achieve its developmental goals, it is required to address the social, economic and physical consequences of population movement. Government must be able to anticipate changing trends in migration and their possible consequences to ensure that policy is pro-active instead of re-active.

Migration and urbanisation have been seen as a single process, but evidence have shown that urban-urban and rural-rural migration is much more powerful than expected, even more so than rural-urban migration (Cross, 2001; Roux, 2009; Kok et al., 2003; Collinson et al., 2006a). This is reflective of the fact that migration processes needs to be monitored effectively to ensure that policy addresses the issues at hand.

## **2.2 Background on methodology to analyse settlement types and growth in settlements specifically**

This analysis makes use of the recent update of the typology of South African settlements, which was originally developed to support the development of the national urban development framework (Van Huyssteen et al., 2014). This typology was born from a collaborative research project between the CSIR, the Presidency, SACN and COGTA in 2008/2009 aimed at providing an overview of the diverse South African urban landscape (see figure 1).

The main spatial analyses platforms, tools and research that form the foundation of the analysis include:

- The Geospatial Analyses Platform (CSIR, 2013a), which is the platform and spatial data infrastructure on which the above mentioned typology was developed;
- The Temporal Analyses Tool (CSIR, 2013b), is the tool that enables the alignment and comparison of StatsSA's census data from the three most recent census years namely 1996, 2001 and 2011 to any spatial unit courser (larger) than the small areas layers (SAL) used by StatsSA for the collection and reporting of data for the 2001 and 2011 censuses; and
- Recent settlement growth research conducted in 2013 and 2014 by the CSIR. The body of work was funded by CSIR, and published as policy briefs within the StepSA<sup>1</sup> initiative during 2013 (Van Huyssteen et al, 2013).

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<sup>1</sup>Spatial Temporal Evidence for Planning South Africa (StepSA) is a collaborative initiative in support of integrated development and spatial planning across the different sectors of government and scales of planning. The purpose of the StepSA platform (<http://stepsa.org/>) is to develop and provide access to spatial information, integrated analyses and tools in support of modelling, simulation and spatial analyses.

From this settlement typology, city regions have been identified as a functional settlement type, together with city areas, regional service centres 1-3, service towns, local and niche towns, high density settlement areas, sparse rural areas, and dense rural areas (see figure 1). The city regions of South Africa include the Gauteng city region, Cape Town city region, eThekweni city region and Nelson Mandela Bay city region (see table 1). The Gauteng city region will be the focus of this paper.

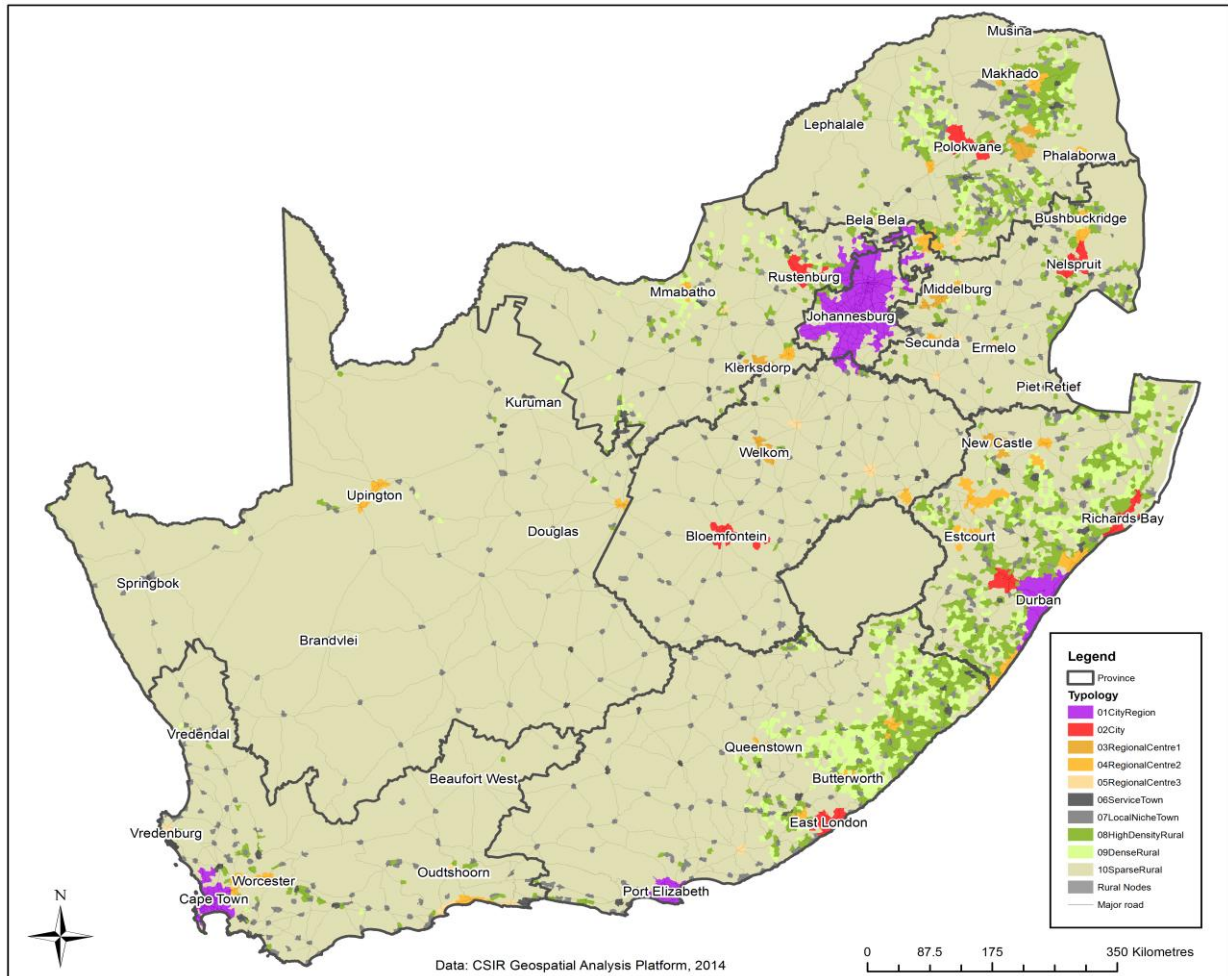


Figure 1: Spatial representation of functional settlement types for South Africa

Type	Name	Province	Population	Count of type per province
01CityRegion (CR)	Port Elizabeth CR	Eastern Cape	1 149 989	1
01CityRegion	Gauteng CR South	Free State	173 416	Cross cutting Gauteng City Region
	Gauteng CR Ekurhuleni	Gauteng	3 182 680	
	Gauteng CR Johannesburg	Gauteng	4 434 816	
	Gauteng CR South	Gauteng	852 968	
	Gauteng CR Tshwane	Gauteng	2 875 740	
	Gauteng CR West	Gauteng	797 770	

	Gauteng CR North	Limpopo	518	
	Gauteng CR North	Mpumalanga	316 912	
	Gauteng CR West	North West	525 143	
01CityRegion	eThekwini CR	KwaZulu-Natal	3 673 345	1
01CityRegion	Cape Town CR	Western Cape	3 872 895	1

Table 1: The functional city regions of South Africa

The Gauteng city region is a functional region and cuts into four other provinces besides Gauteng, i.e. the Gauteng City Region relates to five provinces namely the Free State, Limpopo, Mpumalanga and the North West.

### 3. Highlighting three key issues related to perceptions about migration and urbanisation

As set out in the Introduction, the paper is aimed at highlighting three key issue related to urbanisation and migration. In the next section each of the issues will be addressed, a brief overview will be provided of the methodology and data used to explore the issues and a summary of key findings, especially related to the city regions will be provided.

#### 3.1 Using shifts in age cohorts to explore population movement and change

##### *Introduction:*

Here the age cohort changes are explored between 1996 and 2011. These changes provide an indication of in- and out-migration of certain age cohorts for specific settlement types or areas. Initially a national overview will be provided followed by considering the Gauteng city region specifically, and interpreting age cohort change from 1996 to 2011. In light of the delayed release of the official StatsSA migration data, the shifts that occurred in certain age cohorts between 1996 and 2011 are analysed. Also in addition to this analysis, the Independent Electoral Commission (IEC) data on voter registration has been used to provide a broad picture of patterns of population movement across the country. This analysis tracks the movement of voters between local municipalities between elections. Even though this data is at local municipality level, it provides a clearer picture of national migration patterns and the underlying trends.

##### *Methodology:*

A key indicator that is utilised as an indication of migration is the shifts in age cohorts between different years. This analysis provides an indication of in- and/or out-migrations by tracking the spatial distribution of a certain group of people between 1996 and 2011. For example comparing the spatial distribution of the cohort aged 0-9 in 1996 and where they find themselves as 15-24 year olds in 2011, provides an indication of where young adults have most likely moved to (given influences such as mortality etc.) but without the knowledge of where people are coming from or going to. This will show whether this specific age cohort stayed the same (no in-migration) or whether it grew significantly (in-migration).

Age cohorts of ten year intervals were prepared. The change was measured over a period of 15 years calculating the change between the 1996 and 2011 censuses (see table 2). The age cohorts used for the analysis were the 0-9; 10-19; 20-29; 30-39; 40-49; 50-59; 60+ year old people of 1996. This alignment allows for a more accurate analysis of the impact of the working age population on migration trends due

to the 0-9 year olds of 1996 being the entrants in the working age group in 2011, namely the 15-24 year olds. In table 2 1996 and 2011 corresponding age cohorts are shown. All descriptions refer to the 2011 age cohort, unless otherwise specified.

CSIR cohort description	Entrants	Young adult seekers	Adult strivers	Middle age grinders	Transitioners	Retired	Vulnerable
1996	0-9	10-19	20-29	30-39	40-49	50-59	60+
2011	15-24	25-34	35-44	45-54	55-64	65-74	75+

Table 2: Corresponding age cohorts between 1996 and 2011

The IEC provided the unit record voter register in an anonymised format and the items received included person identifier, which is a unique number for every person in the data set, Gender, Four-digit birth year, and the voting district where the person was registered in 1999, 2000, 2004, 2006, 2009 and 2011. In addition to the tabular data, the voting districts were also supplied in geospatial file format for each election, namely national, provincial and municipal elections. Because voting districts differ between consecutive elections, the 2011 election period was selected as the base spatial unit and all prior election data were to relate to it. Using an area proportioning approach the 1999, 2000, 2004, 2006 and 2009 areas were apportioned to the 2011 voting districts. Then a randomisation procedure was then used to determine the most appropriate 2011 voting district for each registered voter. These allocations provided the basis for the subsequent migration trend analyses.

The greatest limitation of this data is that it only represents registered voters and excludes those who are not eligible to vote as well as those who choose not to vote or register as a voter. Despite this, a sample of 23.7 million in 2011 is adequate to be a feasible alternative source for looking at migration trends.

*Key findings:*

The following map (figure 2) shows the growth or decline in absolute numbers of persons aged 0 to 14 years between 1996 and 2011. It is clear that the city regions have experienced the greatest increase in the number of 0-14 year olds. Other cities and mining towns such as Rustenburg, George, East London and Makhado have also seen a net gain, as well as several small towns across the North West and KwaZulu Natal. A decrease can be found in some of the rural areas in the Eastern Cape, Limpopo and KwaZulu Natal.



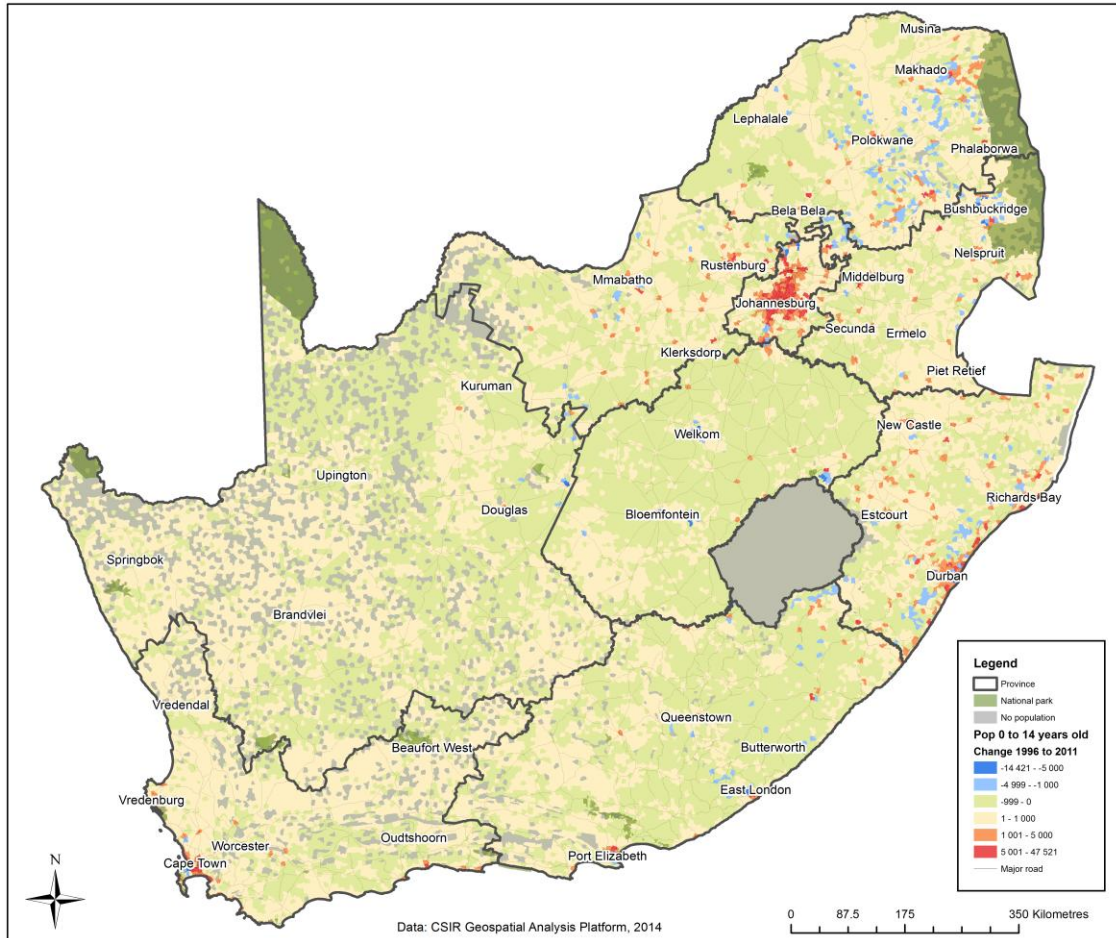


Figure 2: Growth in the absolute number of population between the age of 0 and 14 years old

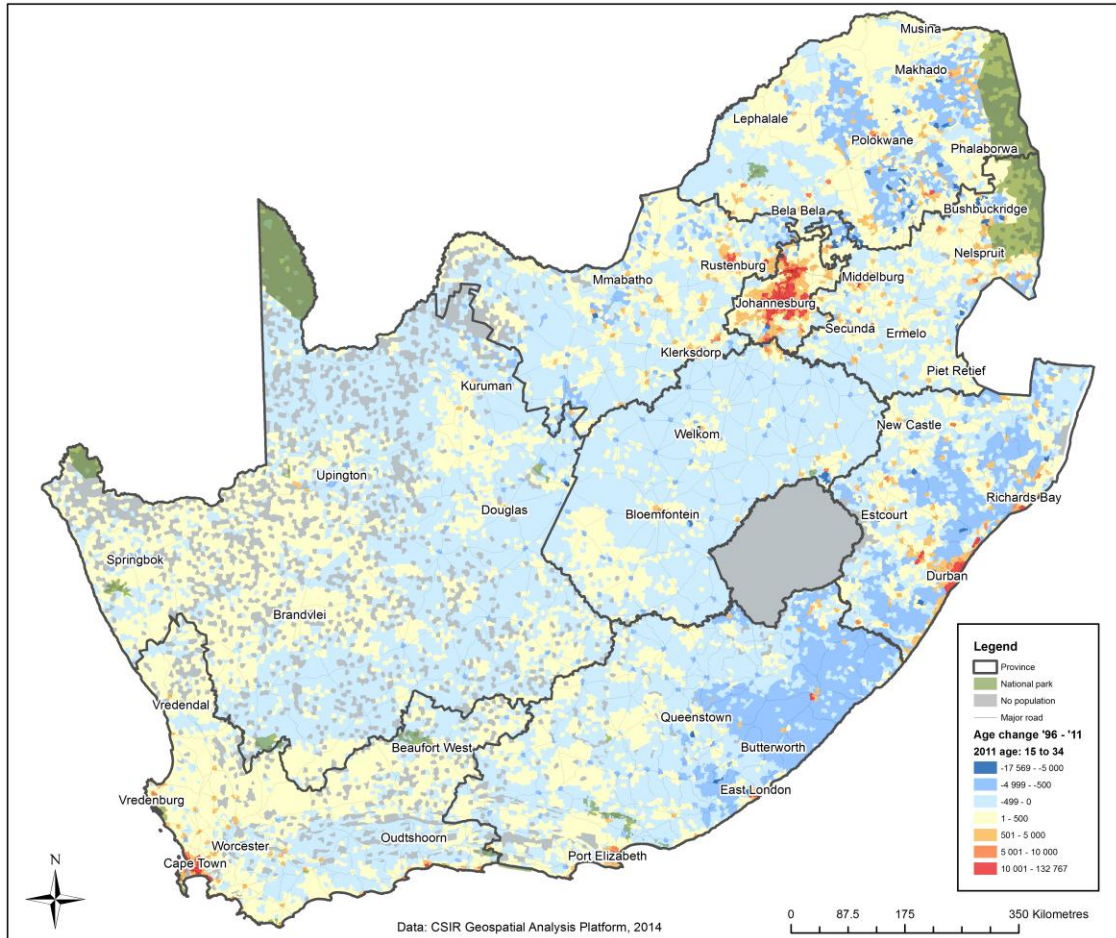


Figure 3: Population change between 1996 and 2011 for working age cohort 15-34 in 2011

Figure 3 illustrates a very different picture than the one above. Here, red indicates a significant increase in the number of persons aged 15 to 34, while blue indicates a significant decline between 1996 and 2011. There has been a considerable increase in this age cohort across all of the city regions. Cities and regional centres such as Rustenburg, Richard's Bay, Pietermaritzburg and Mthatha have also seen a growth in the number of 15 to 35 year olds between 1996 and 2011. There has been a decrease across most parts of the country, especially in the rural parts of the Eastern Cape, Limpopo and KwaZulu Natal.

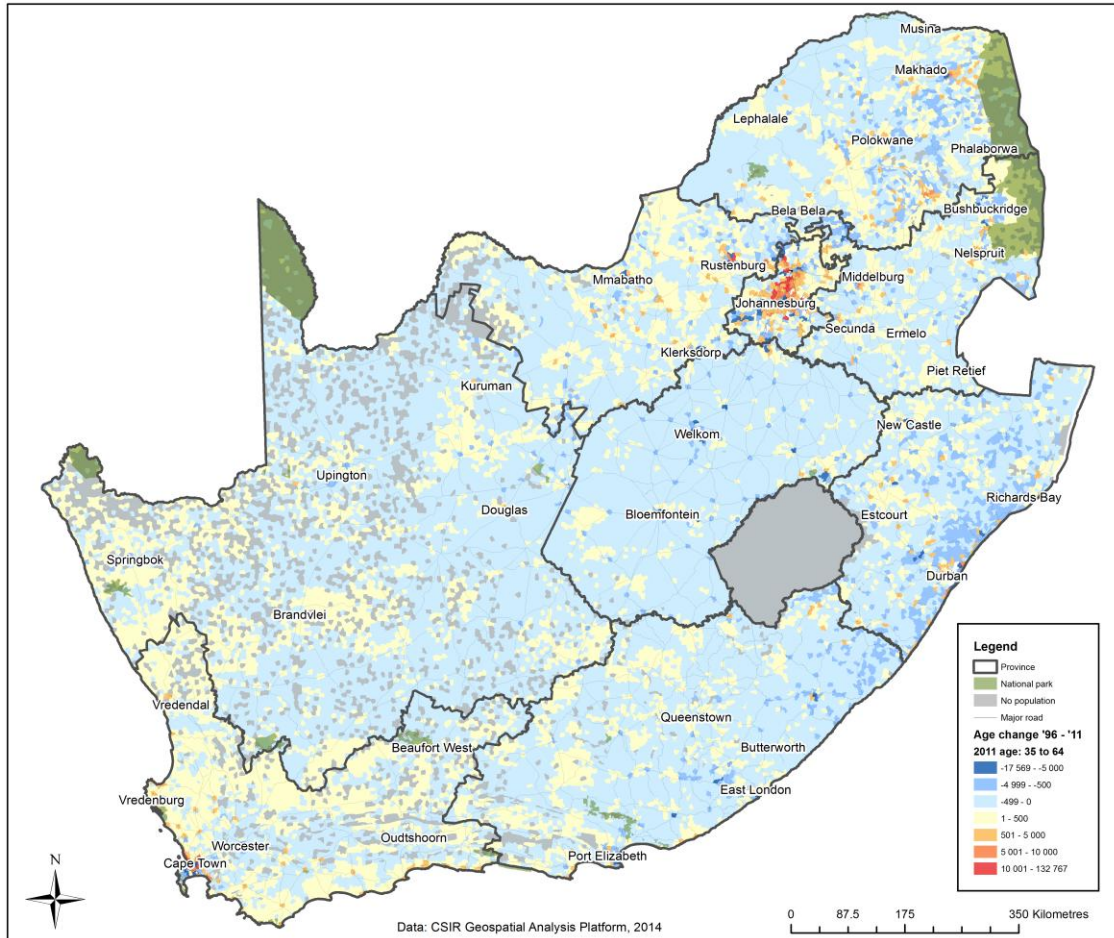


Figure 4: Population change between 1996 and 2011 for working age cohort 35-64 in 2011

In the 35 to 64 age cohort a much less dramatic movement is noticeable (figure 4) compared to the 15 to 35 age cohort (figure 3). The movement that occurred was still significant with respect to city regions and settlements with growing mining activity.

When looking at the IEC data only three broad age categories are used namely persons of student age (18 to 24 years), persons who are economically active (25 to 55 years) and finally persons who can be part of the retirement age group (55+ years). The following map (figure 5) shows from where the economically active group has moved and the map thereafter (figure 6) shows where they have moved to. Gauteng, Limpopo, the Eastern Cape and KwaZulu Natal stand out as places of origin for the student age group while the city regions and other large employment centres, such as the mining areas of Rustenburg and Sekhukhune, seem to attract this age category. What is especially interesting is that the city region areas play an important role as a place of origin and as a destination for migrants.



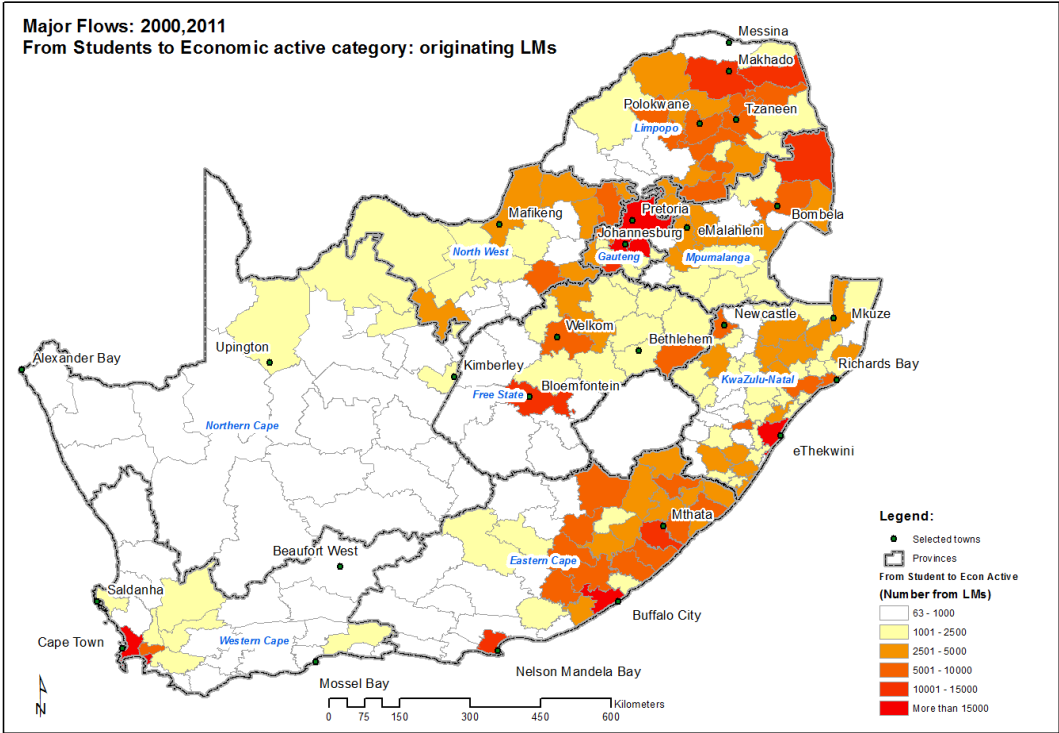


Figure 5: Major flows: from Student to Economically active category - Originating LM

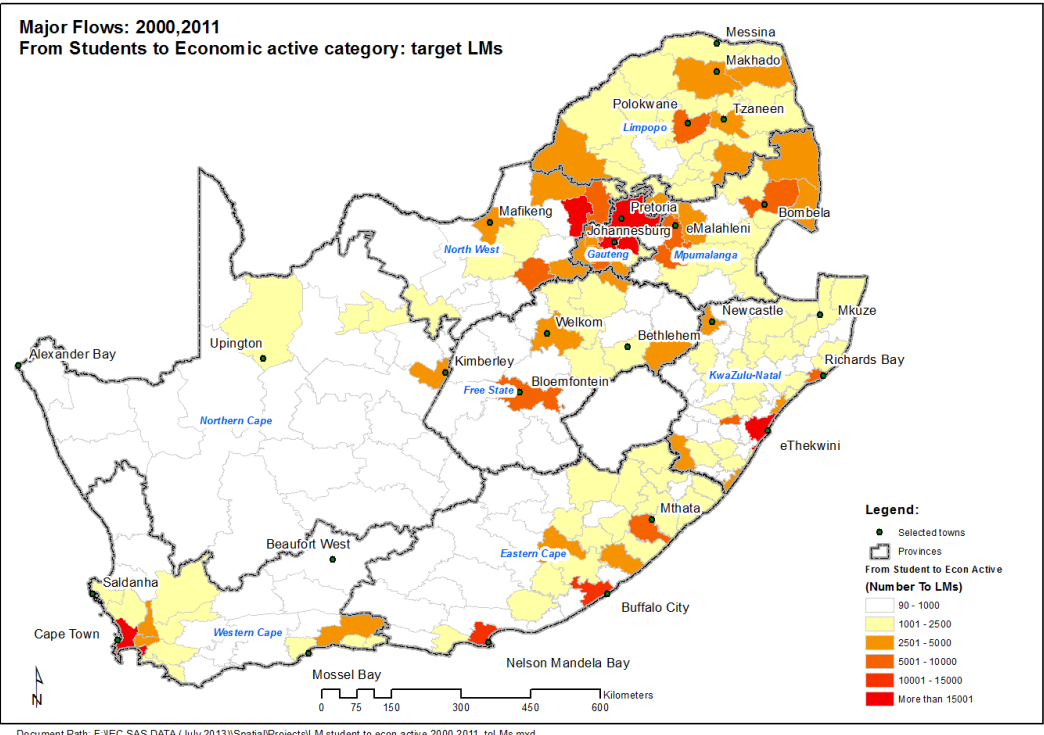


Figure 6: Major flows: from Student to Economically Active category – Target LM

Figure 7 below illustrates, specifically for the Gauteng city region, the percentage change in the population for each age cohort in a different colour using the 1996 age cohort as the baseline. The height of the bar indicates the percentage change over the 15 year period from 1996 to 2011. The Gauteng city region has seen a significant growth in the Young Adult Seekers cohort, meaning people who were 10-19 years old in 1996, and 25-34 years old in 2011, have increased by over 100%. Growth of this age cohort has occurred at a significant rate, higher than would be expected in terms of natural growth, indicating a high rate of in-migration. The 1996 age cohort of 0-9 (15-24 years Entrants in 2011) also increased considerably with a 65% positive change. It seems to be that the city regions, the cities and the rural areas are the places from which these groups are originating. The proportion of people over 50 years in 1996 and over 65 years in 2011, have declined significantly for the Gauteng city region. This shows that the city region mostly attract younger people. Gauteng has the lowest proportion of population aged over 65 (Peberdy, 2013), which may indicate that people are retiring elsewhere. This change can have a significant impact on the city region's population profile.

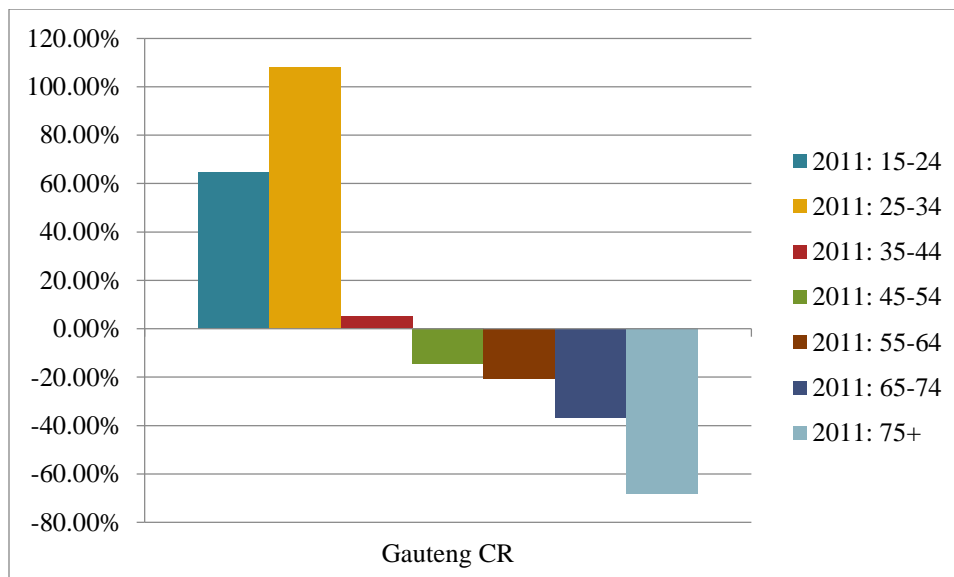


Figure 7: Percentage (%) change per age category over 15 years for the Gauteng city region

### 3.2 Exploring shifts in urban poverty

#### *Introduction:*

South Africa has experienced an increase in the number of people and households who are living in poverty between 1996 and 2011. Here the extent and the spatial differences are explored by looking at the national picture and then at the Gauteng city region.

#### *Methodology:*

Firstly a poverty measure was established and then it was aligned with the CSIR settlement typology to show spatial and temporal differentiations of poverty. In a recently completed report on household income and expenditure patterns in South Africa for the year 2011 a classification on income levels per

household was developed by the Bureau of Market Research (BMR) at the University of South Africa (Unisa) (BMR, 2013).

Income levels and household classification defined by the BMR were:

- Poor (R0 - R54 344 income per annum)
- Low emerging middle class (R54 345-R151 727 income per annum)
- Emerging middle class (R151 728-R363 930 income per annum)
- Realised middle class (R363 931-R631 120 income per annum)
- Upper middle class (R631 121-R863 906 income per annum)
- Emerging affluent (R863 907-R1 329 844 income per annum)
- Affluent (R1 329 845+ income per annum)

To establish the proportion of households living in poverty for this study, the *Poor* income category as defined by BMR was used. This definition cannot be directly extracted from the 2011 census income categories and these had to be adapted in order to calculate the total number of households within the *Poor* range. The first category in the 2011 census data is R0 – R48 000 per household per annum (R4000 per month). This category and a proportional number of households from the R48000 to R96000 category was added together to bring this in line with the BMR cut off of R54 355. This approach was based on the assumption that the number of households within each income bracket is equally distributed.

The 1996 census data's first category is R0 to R24 000 per household per year. To calculate the relative 2011 income category for comparative purposes the Consumer Price Index (CPI) from 1996 to 2011 was used to inflate R24000 (1996) to establish the equivalent cut off of this group in 2011. Table 3 shows the CPI value and inflated values of R24 000. This amounts to R53 447 and is close to but slightly below the R54 344 cut off of defined by BMR. The same proportional allocation method as described above was used to add the additional amount of households to the category in order to bring it in line with the BMR categories.

	<b>Year</b>	<b>CPI</b>	<b>Inflated value</b>
	2011	6.41	53 447
	2010	3.37	50 227
	2009	6.04	48 590
	2008	9.35	45 822
	2007	7.57	41 904
	2006	4.82	38 955
	2005	2.02	37 164
	2004	2.20	36 428
	2003	-1.63	35 644
	2002	13.51	36 235
	2001	4.59	31 923
	2000	6.99	30 523
	1999	2.24	28 528
	1998	8.95	27 903

	1997	6.71	25 610
<b>Base year</b>	1996		00

Table 3: Census 1996 household income values inflated with CPI

*Key findings:*

Poverty has increased nationally between 1996 and 2011, but the distribution of poverty differs significantly across space. The change in the number of households living in poverty between 1996 and 2011 are illustrated in figures 8 and 9, respectively. Blue and green indicates less than 100 households living in poverty per mesozone<sup>2</sup>, while yellow indicate between 101 and 500 households living in poverty per mesozone. Orange and red illustrates areas with a very high concentration of households living in poverty, over 15 000 households per mesozone. The extent and increase in the levels of poverty can be clearly seen in the city regions. Concentrations of poverty are also seen in the Northern provinces as well as along the eastern coast of the Eastern Cape and KwaZulu Natal.

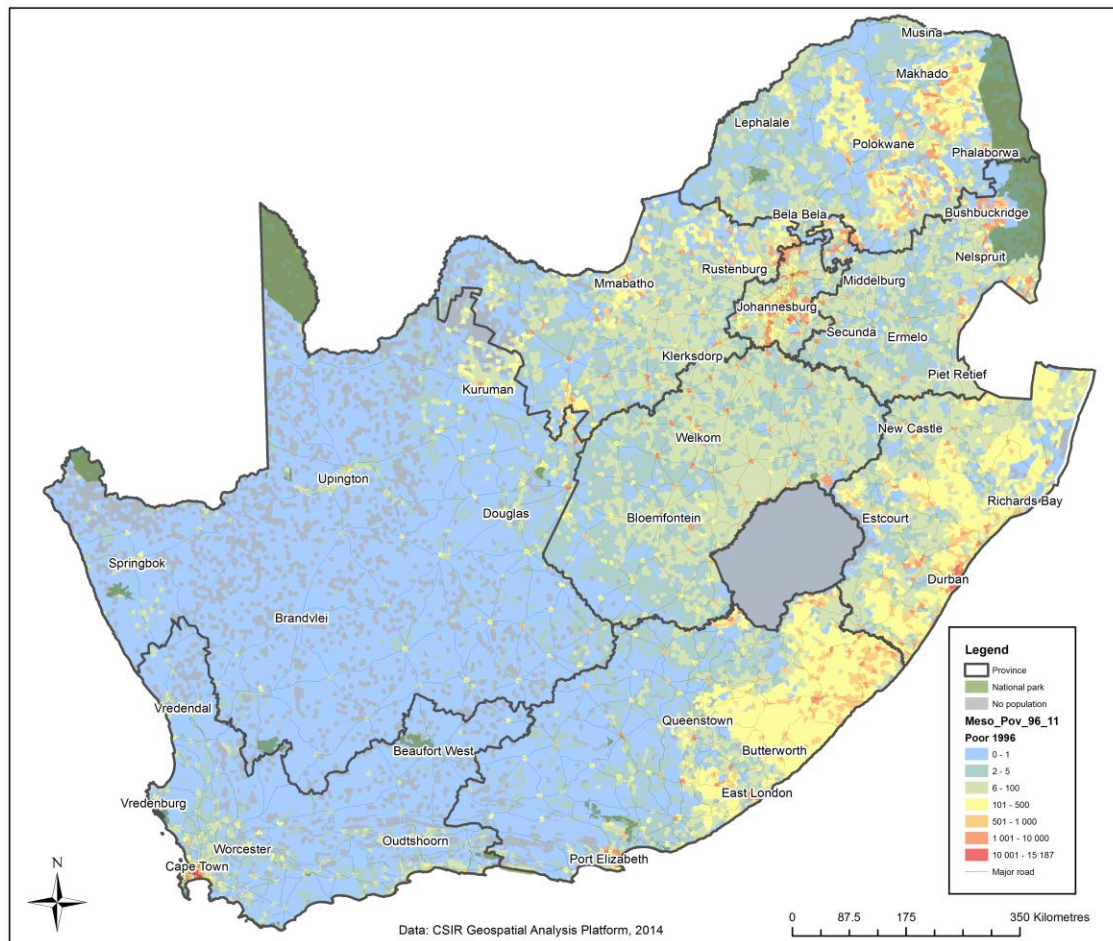


Figure 8: Number of households living in poverty per mesozone in 1996

<sup>2</sup>Based on the CSIR mesoframe methodology, a meso-scale geoframe was developed and is the primary component of the Geospatial Analysis Platform (GAP) (<http://www.gap.csir.co.za>). The meso-scale geoframe for South Africa demarcates South Africa into a 'grid' of about 25 000 mesozones of around 50km<sup>2</sup> each. They coincide with important administrative and physiographic boundaries.

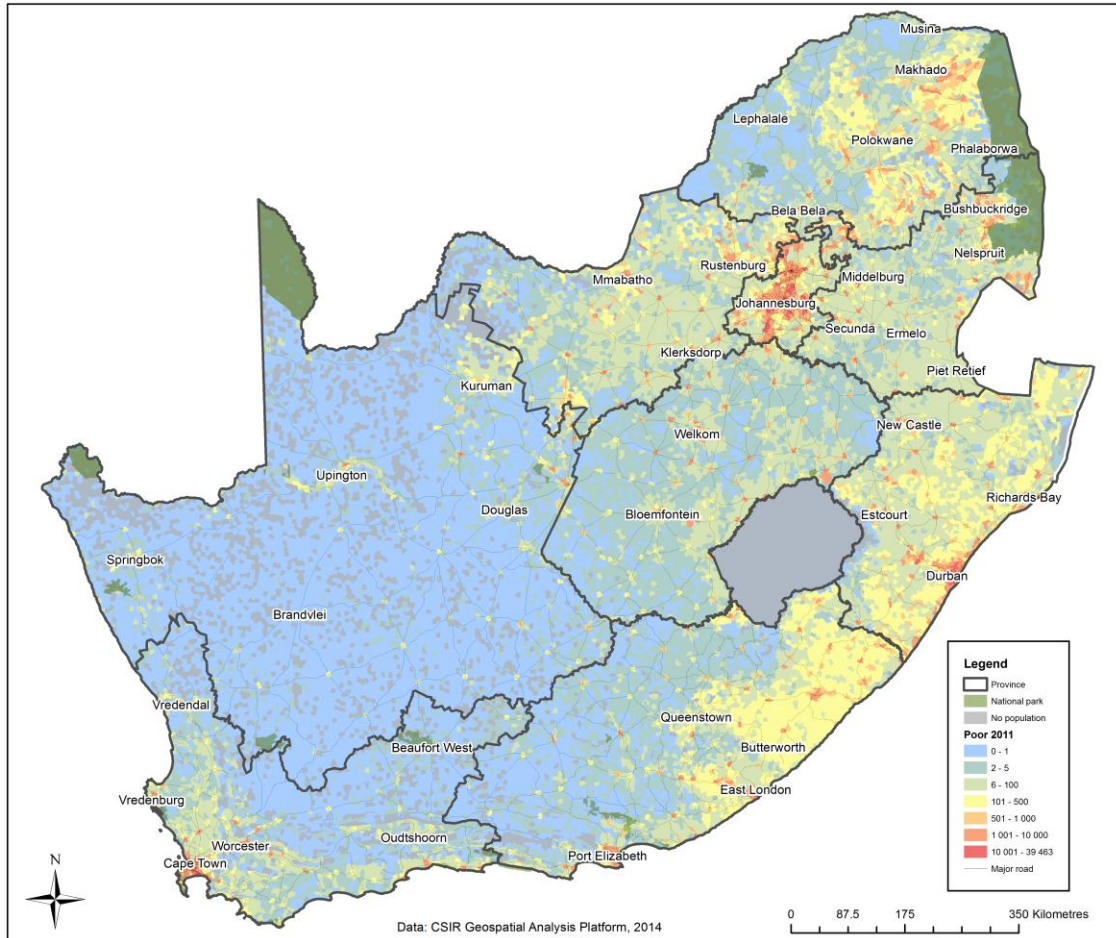


Figure 9: Number of households living in poverty per mesozone in 2011

Figure 10 illustrates the proportion of households that were living in poverty in 1996 and 2011 for both the Gauteng city region and South Africa. The proportion of households living in poverty is higher for South Africa than for the Gauteng city region. There has been a small national increase in the proportion of households living in poverty, but the increase within the city region has been significant between 1996 and 2011.



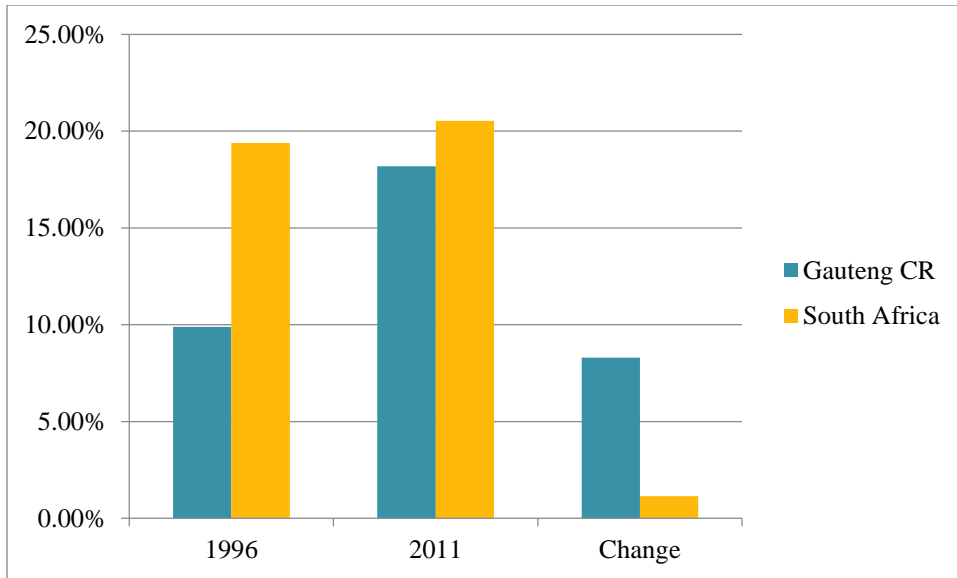


Figure 10: Change in the proportion of households living in poverty between 1996 and 2011

Figure 11 shows the change in the number of households living in poverty between 1996 and 2011. The increase in the number of households living in poverty within the Gauteng city region is alarming. The number households living in poverty has more than tripled within only 15 years. The implications of this drastic increase of urban poverty need to be considered.

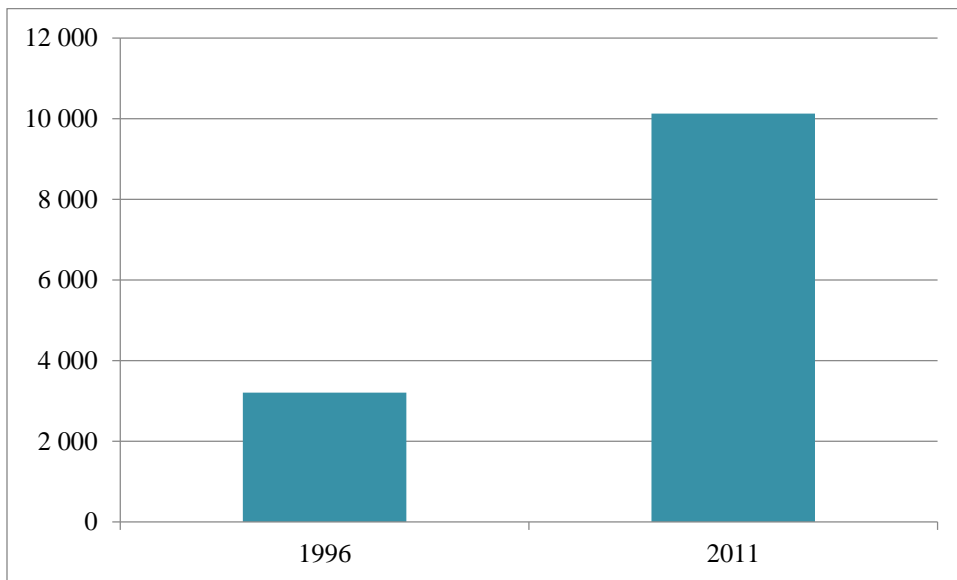


Figure 11: Number of households in the Gauteng City Region living in poverty for 1996 and 2011

The urbanisation of poverty has often been blamed on rural poverty pushing people to migrate, but even as rural poverty has declined, urbanisation has continued and urban poverty has increased. Rural poverty has generally declined and the number of rural households living in poverty is far lower than urban households living in poverty. Even though poverty is a national problem in South Africa, the Gauteng city region has experienced a drastic increase in the proportion of households living in poverty. People living

in urban areas are more dependent on cash incomes and the cost of urban living is often higher (Tacoli, 2012). South African urban settlements have complex spatial forms that further marginalised the urban poor. Urban land is often difficult to access close to economic opportunities. More affordable land and housing are located on the periphery which results in high transport costs and in long travel times (Posel et al., 2013; Turok, 2012). Those households that are living in poverty are often caught in poverty traps because of spatial inequalities and difficulties associated with entering and competing in the urban market (Tacoli, 2012; Posel et al., 2013).

### **3.3 Exploring shifts in inter-municipal migration**

#### *Introduction:*

A general assumption has been that the dominant migrational flow is from rural to urban areas. Even though the rural-urban flow is significant, the urban-urban flow is much greater. A very large number of persons move between city regions as well as within a city region. The flows that are discussed here point toward overall migration trends.

#### *Methodology:*

Inter-municipal migration data has not been made available by StatsSA at the time of analysis, therefore to determine the extent of inter-municipal migration, data from the IEC was applied as this indicated origin and destination information. The data period represents change between 2001 and 2011. It was also decided to make a selection of only the highest flows. Using the flow data model, flow lines were created indicating all flows. Similarly origin- and destination matrices were constructed and flow lines generated to indicate only major net migration trends. It must also be noted that the IEC information only represent the migration behaviour of registered voters. It is therefore used only to understand key trends.

#### *Key findings:*

The map below (figure 12) provides an overview of national inter-municipal migration trends. The grey and blue areas signify municipalities that experienced a net outflow of population, while the orange and red signify municipalities that experienced a net gain of population through migration. Once again metropolitan municipalities stand out as net gainers of migrants. A significant migration flow occurred between the different metropolitan municipalities, most notably from eThekweni to Gauteng and from Gauteng to Cape Town. Migration flows are also strong from the rural municipalities to the metropolitan municipalities.

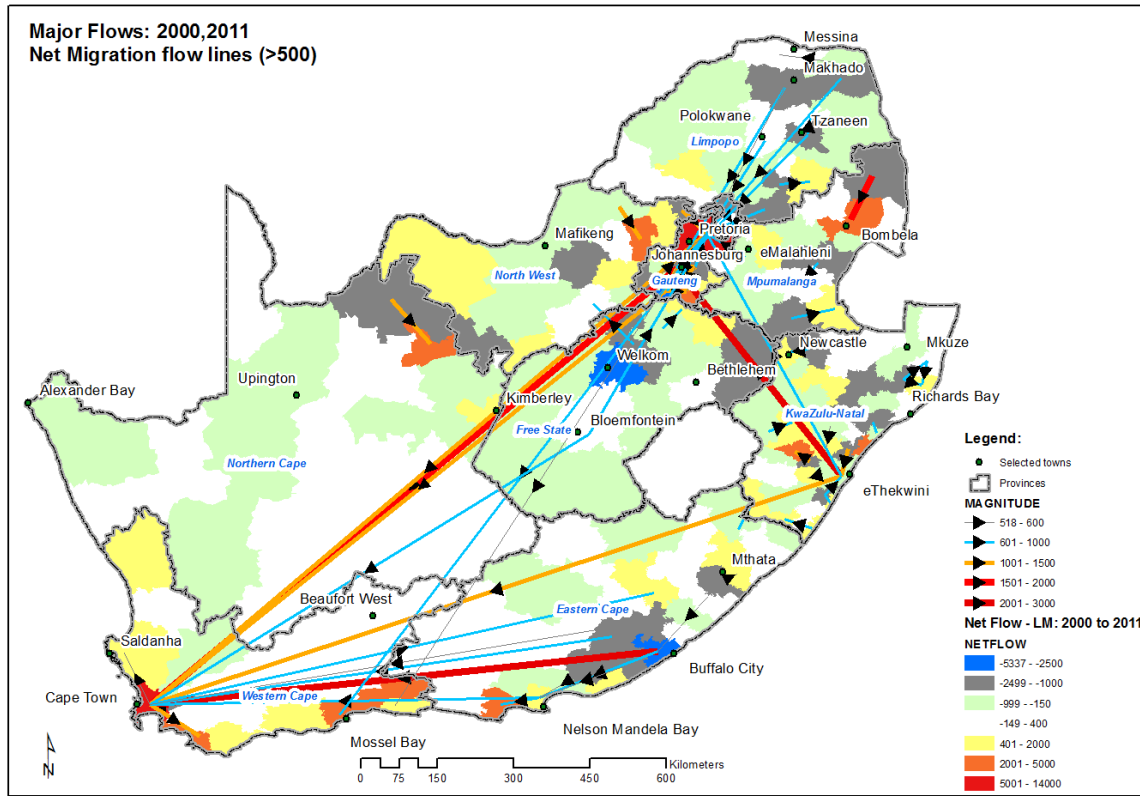


Figure 12: Inter local municipality net migration flows between 2001 and 2011

The analysis revealed that the largest flows of population movement occurred within and between the city regions. The various municipalities that make up the Gauteng city region (market 1 in figure 13) reflect both high in-migration and out-migration between 2001 and 2011.

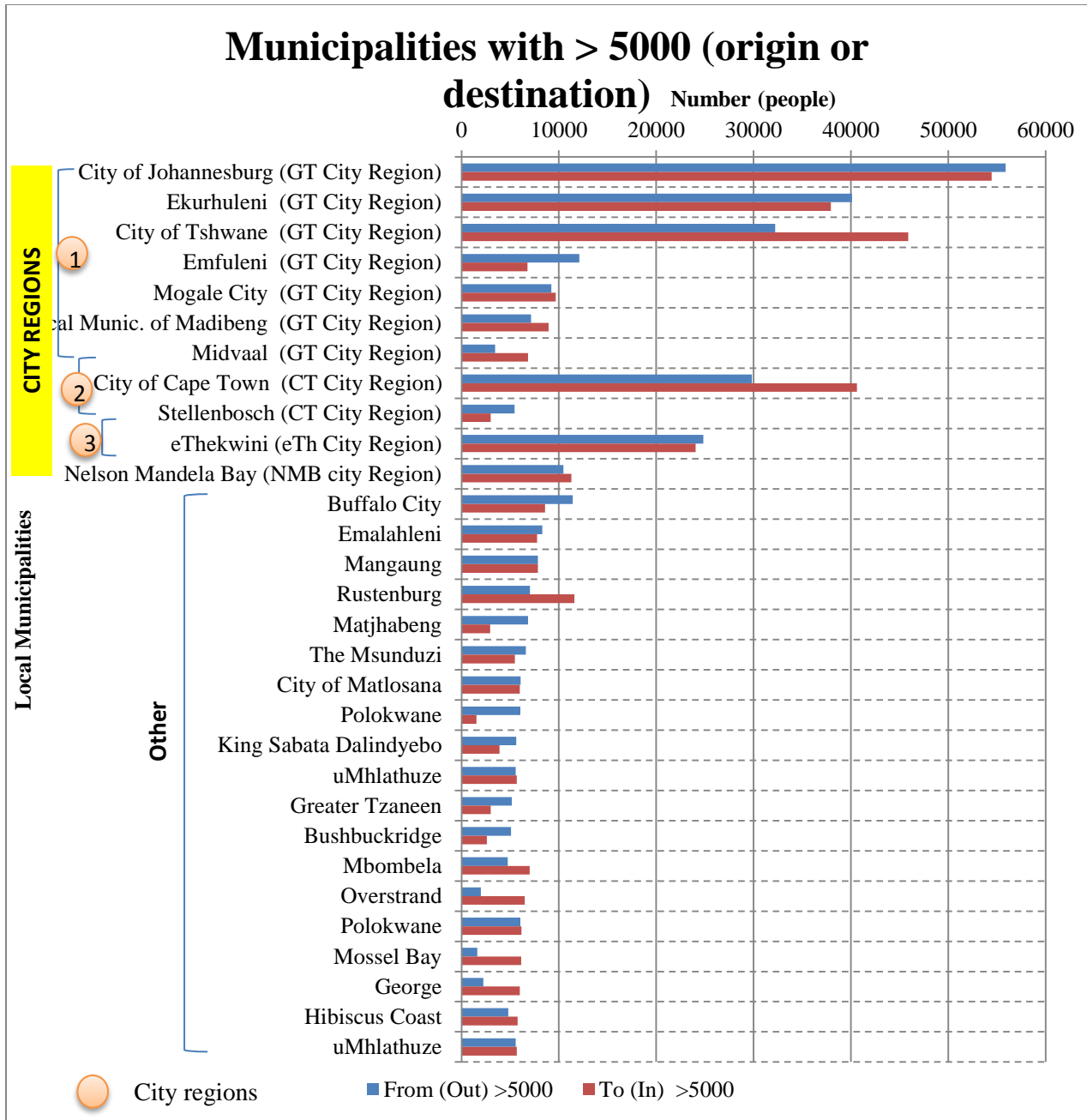


Figure 13: Main inter-municipal flows (exceeding 5000) for the period 2001-2011.

Figure 14 presents a circularly composited view of municipalities with main flows exceeding 2000 people between 2001 and 2011. For the purposes of readability, the figure only represents selected flows and not the full spectrum of inter-municipal flows.

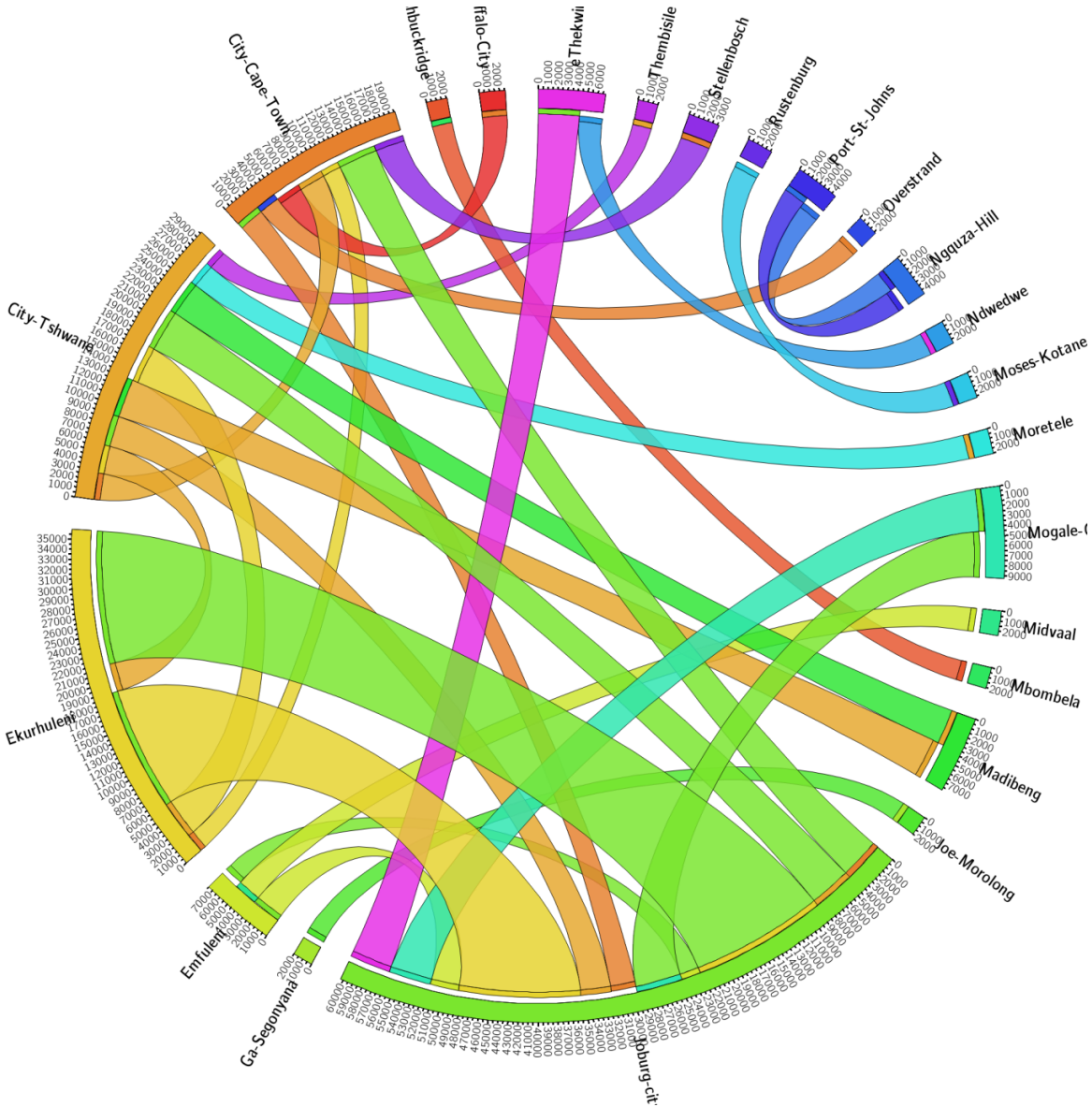


Figure 14: Circular flow diagram representing main origin and destination flows (only selected origin destination pairing municipalities with flows exceeding 2000).

In figure 14 the origin flows touch the outer ring of municipalities while flow lines stop short of destination municipalities. The number/volumes of flows are represented by the extent and numbering of the outer ring. It shows that significant migration occurs between the City of Cape Town, City of Tshwane, Ekurhuleni and the City of Johannesburg. The Gauteng city region has emerged as both a popular destination and place of origin of migrants. These high levels of inter- and intra- city region mobility warrants further investigation to explore the full extent and impact thereof.

#### 4. Other considerations, questions and implication related to a more in-depth understanding of migration

In addition the issues as discussed above, there are other important issues and trends to consider. Certain trends and changes have been noted and they do raise some concerns for the Gauteng city region and its role as a great place in South Africa. The changes and issues that need to be considered are changes in household size, circular migration and the ability of the city region to absorb and cope with in-moving migrants. Although the data does not provide a very clear picture, noteworthy questions are raised.

##### 4.1 Changes in household size – a major impact

The graphs below indicate the changes in average household size between the census years of 1996, 2001 and 2011 respectively for the Gauteng city region as well as for South Africa. The average household size is has decreased slightly for the city region as well as for South Africa, but the average household size within the city region is 3 persons per household compared to the national average of 4 persons per household. It seems that average household size has stabilised in the Gauteng city region. Since the national population is still growing in size, this means that the number of households is increasing while household size is decreasing (See figures 15 and 16).

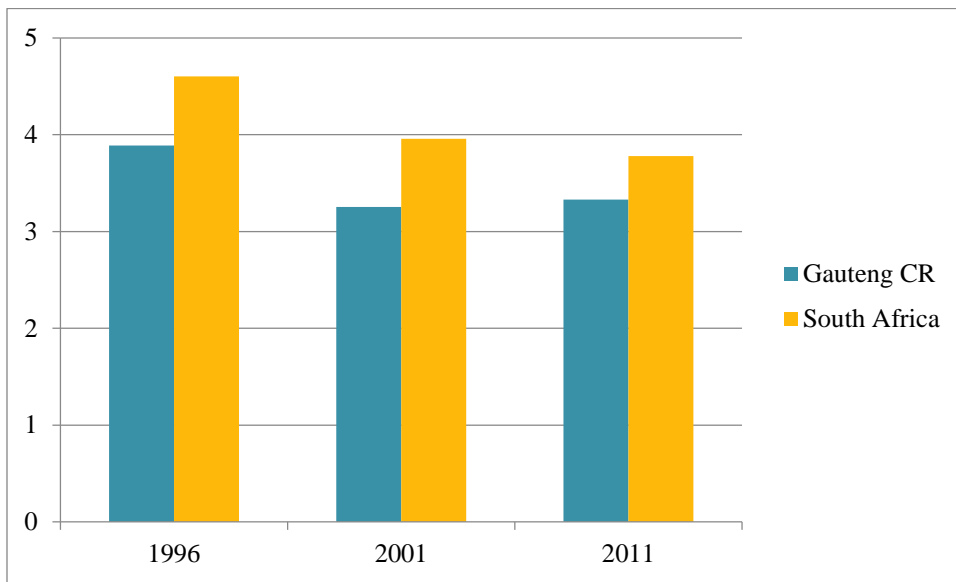


Figure 15: Change in the average household size for 1996, 2001 and 2011

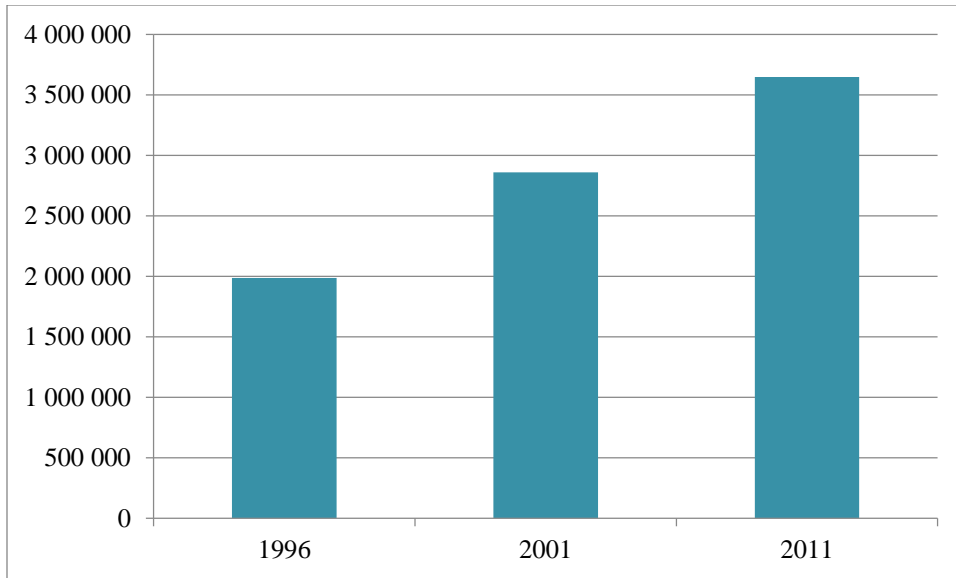


Figure 16: Change in the number of households for 1996, 2001 and 2011 for the Gauteng City Region

The population is growing and so are the number of households, but the number of households is growing at a rate of almost double that of the population. Migration often leads to more single person households being established and that can possibly explain the decline in the average household sizes in the graph above. Youth migration is also a big contributing factor to the increase in the number of households. Previously under apartheid it was unheard of that unmarried youth moved independently from place to place, but at present this trend contributes greatly to the decline in household size (Todes, et al., 2010). The implications of this is that more housing and other supporting household infrastructure needs to be provided by government in places that attract the most labour migrants, such as the Gauteng city region. This also indicates that housing needs will differ and that appropriate typologies and forms of ownership need to be made. Entering the urban land market is especially difficult for labour migrants whom often do not have the necessary urban networks or capital to gain access to the urban land market.

#### **4.2 The possible impact of circular migration – a big unknown**

Internal circular and labour migration was associated with influx controls and the Apartheid government and it was a general assumption that circular migration would decline rapidly in the 1990s (Beukes, 2013). Since then, circular migration data needs has not been sufficiently addressed and the relationship between household of origin and destination is neglected (Posel, 2004). Understanding this relationship is essential when distinguishing between temporary and permanent migration (Beukes, 2013).

Circular migration leads to households often having a rural as well as an urban base and that an individual member of the household moves back and forth between the two. Because of the close relationship between rural and urban households, rural households are very much affected by urban social and health problems (Hemson et al. 2004). Circular migration also provides many rural households with opportunities that would have otherwise been out of reach (Beukes, 2013).

The above analyses of change in household size and numbers revealed that household sizes have generally declined between 1996 and 2011, but total population has increased. This means that the number of households has increased significantly in this time. The reasons behind the increase in the number of households are mostly unclear. One possible explanation may be that circular migration is declining because new permanent households are established by migrants. Another possible explanation may be that circular migration is increasing as more households are split up as a migrant household member establishes another, more temporary household in another settlement. Distinguishing between a temporary and a permanent household is very important in determining if a migrational move is circular or permanent.

In a study by Posel and Marx (2011) the relationship between urban land markets and migration patterns were investigated. They looked at how the conditions at the destination affect the nature of migration and particularly if the migration is permanent or temporary. They found that the ability of migrants to access the urban land market directly influences their decision on returning to their household of origin or not, thereby affecting the nature and form of migration. If migrants can easily access housing and services in their new settlement, they are more likely to settle there permanently. Considering the difficulty that is generally experienced by migrants in accessing the urban economy and urban land markets, it may indicate that circular migration is continuing (Posel, 2004).

Recently, the 2011 Gauteng City Region Observatory Quality of Life Survey revealed that 46% of migrants in Gauteng consider Gauteng their home (Peberdy, 2013). This may indicate that the remaining 54% of migrants in Gauteng are there only on a temporary basis and intend to return to their household of origin. This does not answer any questions, but rather reveal more around the state of circular migration. When data is limited or insufficient, research concepts are often manipulated to be compatible with the data that is available. This can lead to misinterpretation of observations and ultimately false conclusions (Morrison, as cited by Beukes 2013: 26). The need for data on circular migration is not just a local issue and the need is increasing (Skeldon, 2012) as it has been proven that this form of migration influences health, infrastructure and households; therefore a comprehensive understanding thereof is essential to the process of assembling evidence for government planning (Beukes, 2013).

#### **4.3 The ability to absorb newcomers – a remaining question**

For the Gauteng city region to be truly great and to address inequalities, it needs to be able to absorb and accommodate the people that are attracted to the region. From the analyses in the previous sections, it can be clearly seen that the city region is experiencing an influx of people, especially of young, economically active people. Providing services and jobs to these in-migrants is fundamental to their ability to make a living in the Gauteng city region. Two factors are used to check the ability of the Gauteng city region to absorb or accommodate the growth it is experiencing: (a) access to services, and (b) access to employment. The level of change in access to employment and good services was used as the absorption indicator.

A composite value for access to services was determined by calculating the average number of households who received either good or not-so-good service based on the level of access to: energy source for lighting; refuse removal; toilet facilities; and water source. The combination of variables per service type used to determine the binary classification is put forward below.



<b>Source</b>	Electricity	Candles	Gas	Paraffin	Other
<b>Access</b>	Good	Not-so-good			

Table 4: Binary classification of source of lighting

<b>Service</b>	Communal refuse dump	No rubbish disposal	Own refuse dump	Other	Removed by local authority at least weekly	Removed by local authority less often
<b>Access</b>	Not-so-good				Good	

Table 5: Binary classification of type of refuse service

<b>Type</b>	Flush or chemical toilet	Bucket latrine	Pit latrine	Other
<b>Access</b>	Good	Not-so-good		

Table 6: Binary classification of type of toilet

<b>Service</b>	No access to piped water	Public tap	Other	Piped water in dwelling	Piped water on site
<b>Access</b>	Not so good			Good	

Table 7: Binary classification of water service

After the binary classification of all four types of services the average number of households receiving *good* and *not-so-good* services was calculated. Based on this, the change between 1996 and 2011 could be determined.

The Gauteng city region generally enjoys high levels of access to good services, where close to 90% of households have access to good services (see figure 17). The level of access to good services is also much higher for the city region than the national average. The growth in access to good services in the city region has been small at an average of 6.3% for all services between 1996 and 2011 (see figure 18). Between 1996 and 2011 households have increased by over 50% in the city region, which raises concerns about the ability of the region to accommodate and absorb the influx of households. Considering that the levels of services have increased despite the influx of households, does indicate that household service needs are being met, but that backlogs are possibly not being addressed.

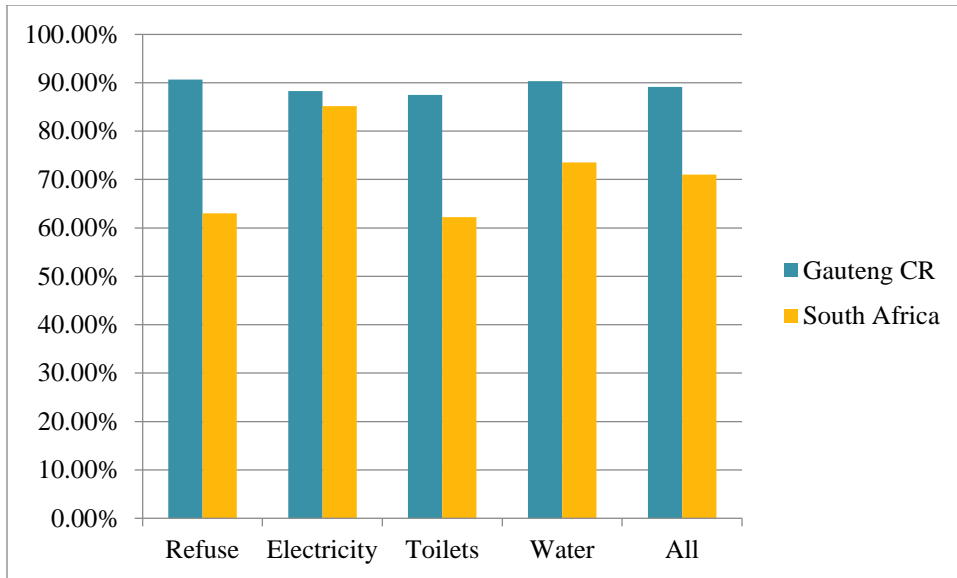


Figure 17: Level of access to good services in 2011

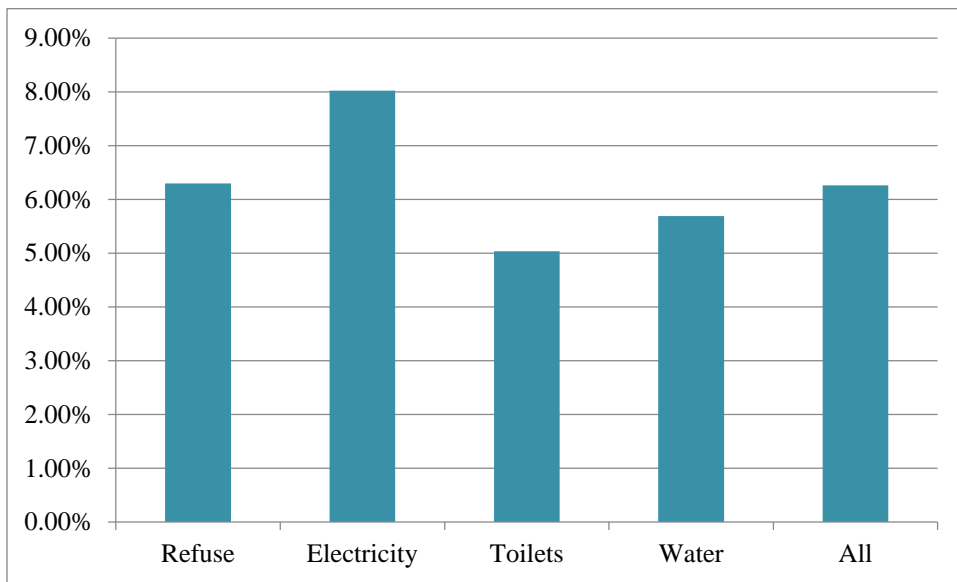


Figure 18: Change in the proportion of households with access to good services between 1996 and 2011 for the Gauteng city region

In figure 19 the level of employment for the Gauteng city region is shown and compared to the national level of employment. The change in the level of employment between 1996 and 2011 for the Gauteng city region and South Africa is also shown. The city region has a higher level of employment than the national average, but the growth in level of employment for the region between 1996 and 2011 has been small.

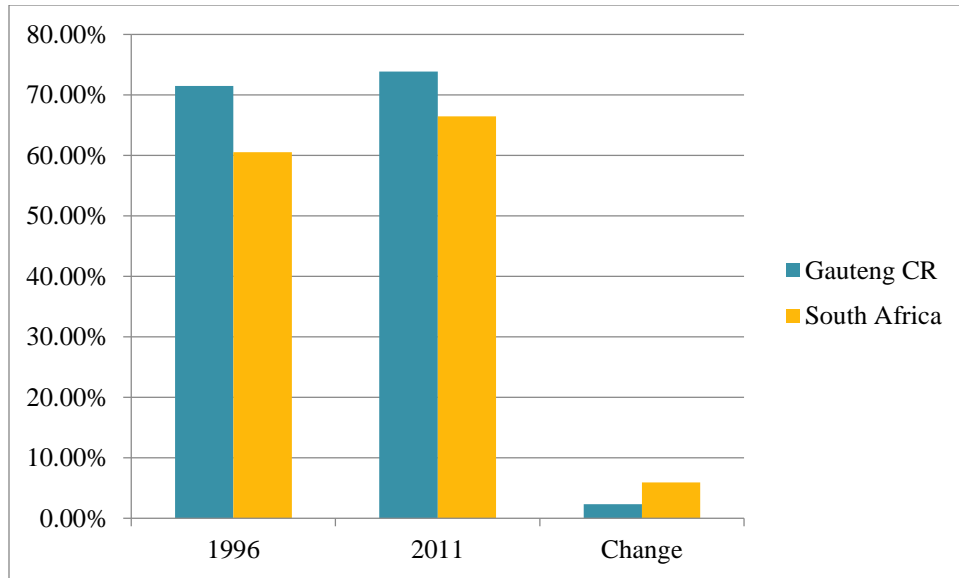


Figure 19: Change in the actual level of employment between 1996 and 2011

A survey done by the Human Sciences Research Council revealed that the majority of migrants cite ‘employment-related issues’ as their main reason for moving to a certain location (Wentzel, Viljoen, & Kok, 2006). Access to opportunity remains an important factor in the decision-making process of a household or household member wanting to migrate.

People are increasingly moving to places where they can access social grants, housing, health services and education. Access to services and infrastructure is a motivating factor for some migrants (Cross, 2009). Limited access to low cost and affordable housing, together with the high cost of living in urban areas has also been argued to cause continuing circular migration (Posel & Marx, 2011). It has been found that migrants living in cities were expected to not have the same sort of access to good services as permanent or long term residents do (Bennet, et al., 2014).

However, access to basic services and employment is just two of the aspects that provide an indication of absorption capacity. Others that need to be considered include access to health, education and social amenities, to name but only a few. Using accessibility to measure the absorption ability of a settlement of region is a complex exercise and warrants further investigation.

## 5. Conclusion

This paper has clearly indicated that even though poverty has been perceived as largely a rural issue, the urbanisation of poverty is in fact occurring at a large scale and city regions, especially the Gauteng city region, are dealing with an enormous and increasing number of poor people. Also the attractiveness of city regions has caused a great increase in the proportion of young work seekers. What also emerged, from the research, is the fact that the biggest proportion of migration is occurring between metropolitan areas and not only a rural-urban process as generally assumed.

In a place such as the Gauteng city region which attracts a large proportion of migrants, the population is unlikely to be stable, given that real growth occurs over long periods of time. The population turnover is

significant as the labour market forces draw in and discards labour force participants (Götz, as cited by Beukes, 2013). With a significant proportion of the population growth being within that of the economically active age cohorts, the stability of the labour market is essential. In the context of their powerful pull factors, the responsibility falls on city regions such as the Gauteng city region to be able to absorb migrants and to provide them with basic services and an environment where the economic opportunities that they need to enter the urban labour market, can be accessed and established.

The population is continuing to increase despite the relative poverty in the region. Great concerns exist around the ability of city regions to provide sufficient opportunities to its ever increasing population. Even though the Gauteng city region has a smaller proportion of households living in poverty than what is found nationally, this proportion is increasing drastically. But in-migration to the Gauteng city region will continue for as long as relative economic issues persist in the other provinces. The opportunities that exist in the city region will continue to attract migrants from across the country.

Some issues remain uncertain and need further exploration. Much speculation is taking place on the effect of changing household size and continuing circular migration, and a better understanding is needed in order for government and policy to respond appropriately. What is also uncertain at the moment is the ability of city regions, as well as other settlement types, to absorb the in-moving population. There are many factors that influence the absorption ability of a settlement or region, and these factors need to be investigated so that an appropriate response can be formed.

This paper has illustrated that the Gauteng city region has cemented its status as a great place; people have continued to move to the region in search of opportunity and it seems that they will continue to do so in the future. The onus now rests on government to maintain this status and to ensure that the growing population of the city region has access to the opportunities they came in search of by address these issues raised in an innovate and sustainable manner.

## 6. References

- Bank, L. & Minkley, G. 2005. Going nowhere slowly? Land, livelihoods and rural development in the Eastern Cape. *Social Dynamics: A Journal of African Studies*, 31 (1), 1-38.
- Bennet, R., Hosegood, V., Newell, M., & McGarth, N. 2014. Understanding family migration in rural South Africa: Exploring children's inclusion in the destination households of migrant parents. *Population, Space and Place*. doi: 10.1002/psp.1842.
- Beukes, A. 2013. *A research synthesis of internal labour migration trends in post-Apartheid South Africa*. Research report submitted in partial fulfilment of the requirements for the degree Bachelor of Town and Regional Planning in the Faculty of Engineering, Built Environment and Information Technology, University of Pretoria.
- Buhaugh, H. & Urdal, H. 2013. An urbanization bomb? Population growth and social disorder in cities. *Global Environmental Change*, 23, 1-10.
- Cohen, B. 2004. Urban growth in developing countries: A review of current trends and a caution regarding existing forecasts. *World Development*, 32 (1), 23-51.
- Collinson, M., Kok, P., & Garenne, M. 2006a. *Migration and changing settlement patterns: Multilevel data for policy*. Report 03-04-01, Pretoria: Statistics South Africa.
- Collinson, M., Tollman, S. M., Kahn, K., Clark, S., & Garenne, M. 2006b. Highly prevalent circular migration: households, mobility and economic status in rural South Africa. *Africa on the move: African migration and urbanisation in comparative perspective*, 194-216.
- Cross, C. 2001. Why does south africa need a spatial policy? Population, migration, infrastructure and development. *Journal of Contemporary African Studies*, 19(1), 111–127.
- Cross, C. 2009. *Migration in relation to services*. Centre for Poverty, Employment and Growth. HSRC.
- CSIR (Council for Scientific and Industrial Research). 2013a. Geospatial Analysis Platform (GAP).
- CSIR (Council for Scientific and Industrial Research). 2013b. Temporal Analyses Tool (TAT).
- Hemson, D., Meyer, M. & Maphunye, K. 2004. *Rural Development: The provision of basic infrastructure services*. HSRC position paper.
- Kok, P. C., O'Donovan, M., Bouare, O. & Van Zyl, J. 2003. *Post-Apartheid Patterns of Internal Migration in South Africa*, Cape Town: HSRC Press.
- Landau, L. B., Segatti, A., & Freemantle, I. 2013. Urbanisation and migration: The governance of mobility and spatial inequalities. In: Pillay, U., Hagg, G., Nyamnjoh, F. & Jansen, J.D. (eds.), *State of the Nation South Africa 2012 - 2013: Addressing poverty and inequality* (pp. 355 - 377). Cape Town: HSRC Press.
- Peberdy, S., 2013. *Gauteng: A province of migrants*, Gauteng City-Region Observatory.
- Perlman, J. E. 2007. Elusive pathways out of poverty: intra- and intergenerational mobility in the favelas of Brazil. In: Narayan, D. & Petesch, P. (eds.), *Moving Out of Poverty: Cross-Disciplinary Perspectives on Mobility* (pp. 227-271), Washington: World Bank.
- Posel, D., & Marx, C. 2011. The interaction between informal land markets and rural-urban migration. *Urban Land Mark: Development Policy Research Unit*, 3 (74).
- Posel, D., & Marx, C. 2013. Circular migration: A view from destination households in two urban informal settlements in South Africa. *The Journal of Development Studies*, 49(6), 819-831.
- Posel, D., 2004. Have migration patterns in post-apartheid South Africa changed? *Journal of Interdisciplinary Economics*, 15(3/4), 277–292.
- Reed, H.E., 2013. Moving across boundaries: Migration in South Africa, 1950–2000. *Demography*, 50(1), 71–95.

- Roux, N. 2009. *Migration and urbanisation: Towards a 10-year review of the population policy implementation in South Africa (1998-2008)*, Department of Social Development.
- SACN (South African Cities Network), the Presidency and DCOG (Department of Cooperative Governance). 2009. *National spatial trends overview*. Unpublished Report, CSIR.
- Scoones, I. & Wolmer, W. 2003. Livelihoods in crisis: Challenges for rural development in Southern Africa. *IDS Bulletin*, 34 (3), 1-14.
- Skeldon, R., 2012. Going round in circles: Circular migration, poverty alleviation and marginality. *International Migration*, 50 (3), 43-60.
- StatsSA (Statistics South Africa). 2011. *Statistical Release P0301.4: Census 2011*. [Online]. Available: <http://www.statssa.gov.za/publications/P03014/P030142011.pdf> [Accessed 6 June 214].
- Tacoli, C. 2012. Urbanization, gender and urban poverty: Paid work and unpaid care work in the city. *Urbanization and Emerging Population Issues Working paper 7*. Human Settlements Group, International Institute for Environment and Development.
- The Bureau of Market Research (BMR) of the University of South Africa (Unisa). 2013. *Household Income and Expenditure Patterns in South Africa, 2011*. [Online]. Available: <http://www.unisa.ac.za/contents/faculties/ems/docs/Press429.pdf> [Accessed 21 May 2013].
- Todes, A., Kok, P., Wentzel, M., Van Zyl, J., & Cross, C. 2010. Contemporary South African urbanization dynamics. *Urban Form*, 21, 331-348.
- Turok, I., 2012. Urbanisation and development in South Africa: Economic imperatives, spatial distortions and strategic responses. *Urbanisation and Emerging Population Issues Working Paper 8*. Human Settlements Group, International Institute for Environment and Development.
- Van Huyssteen, E., Manfred, G., Maritz, J., Le Roux, A. & Nigidi, M. 2014. *Update of the CSIR/SACN South African Settlement Typology*. Unpublished Report, CSIR.
- Van Huyssteen, E., Mans, G. and Nigidi, M. 2013. *Reaching development outcomes through a dedicated focus on cities, towns and settlements*. StepSA Policy Brief Series: Policy Brief 3. [Online]. Available: [www.stepsa.org.za](http://www.stepsa.org.za) [Accessed 2 March 2014].
- Wentzel, M., Viljoen, J. & Kok, P., 2006. Contemporary South African migration patterns and intentions. In: Pieter Kok, D. Gelderblom, & J. Van Zyl, (eds.), *Migration in South and South Africa: Dynamics and determinants* (pp. 171-204), Cape Town: HSRC Press.

### **Authors Profile/ Short Biography**

Amy Pieterse is a Candidate Researcher, working in the Spatial Planning and Systems competency area at the CSIR. During her time at the CSIR she has worked on various projects which includes spatial analyses done within the Spatial and Temporal Evidence for Planning (StepSA) initiative to inform planning and investment decision making processes, and exploring spatial change in the South African population. She obtained a Bachelor of Town and Regional Planning, with distinction, from the University of Pretoria in 2013. Her research report focussed on providing a comprehensive synthesis of the current body of knowledge on internal labour migration trends in post-Apartheid South Africa, as well as identifying research gaps, needs and possibilities in this field. Amy's other research interests include internal population dynamics, spatial planning, sustainable urban development and strategic planning.

Elsona van Huyssteen is an urban and regional planner and researcher, associated with the CSIR (National Research Council) and University of Pretoria in South Africa. She has been actively involved in the development of spatial planning policies, instruments and processes in support of collaborative national, regional and municipal planning. Over the last number of years her focus has also included decision-support for municipal, regional and national planning processes and investment through the analyses of urban and rural spatial trends and dynamics. She has a passion to find innovative ways to support key actors and institutions in this field and has been actively involved in planning practice and capacity building through her career.

Gerbrand Mans has more than 11 years' experience as researcher and GIS professional, first at Stellenbosch University and now at CSIR. A major focus of the work Gerbrand is involved in centres on the study of population types, their dynamics and how these vary geographically. Geo-demographics is therefore a key focus area in terms of experience and also personal interest. Other fields of experience and interest are the use of dasymetric mapping and areal interpolation in order to breakdown large area data to smaller geographical units. These techniques are useful to do accurate accessibility analysis and are also strongly related to the field of geo-demographics. Broader interests are in the field urban geography, but with a specific focus on the linkages between urban and rural environments from a human activity point of view.


Johan Maritz is a senior researcher at the CSIR's Built Environment Unit – he is a town and regional planner by training and holds a masters diploma from the University of Dortmund, Germany. His background includes experience in the research of land use planning, public transport modelling, accessibility and interaction modelling, geographic information systems (GIS), decision support systems, geo-portal development and implementation and web map applications. He has undertaken various geo-spatial projects and contributed to many more as a project team member. More recently he has also become involved in rural service system design and development and this has led to projects that focus on rural transport- and logistical challenges. He is currently busy with his PhD focusing on the impact of Information and Communication Technologies (ICT) on rural accessibility at Utrecht University.

Willemien van Niekerk joined the CSIR Built Environment in December 2011 as a senior researcher in the Urban and Regional Planning research group. Past and current projects she has been involved in include the South African Risk and Vulnerability Atlas for the Department of Science and Technology, an Infrastructure Master Plan for the Mpumalanga Province, neighbourhood profiling for the South African

Cities Network, developing an Integrated Transport Modelling Centre for the Gauteng Province, and developing future scenarios for the City of Ekurhuleni in the CSIR Water Sustainability Flagship Project. Before joining the CSIR Willemien was a lecturer in the Department of Town and Regional Planning, University of Pretoria, where she lectured under- and post-graduate students in planning history, spatial planning and urban planning interventions. Willemien holds a master degree in Urban and Regional Planning from the University of KwaZulu Natal, and is busy with her PhD in Public Management and Administration at the African Centre for Disaster Studies, North West University. Her fields of interest are urban planning and disaster risk reduction.



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