Maruleng Municipality:
A Profile of the Municipal Area

Wehnke van der Merwe & Derick du Toit
January 2016

award

USAID | SOUTHERN AFRICA
FROM THE AMERICAN PEOPLE

Acknowledgements

Authors
Wehnke van der Merwe & Derick du Toit

9 January 2016

Association for Water and Rural Development (AWARD)
P O Box 1919
Hoedspruit 1380
Limpopo, South Africa
T 015-793 0503
W award.org.za

Company Reg. No. 98/03011/08

Table of Contents

List of Maps & Tables

List of Figures

1   Introduction

This overview of Maruleng is focused on how to make environmental planning more explicit within the integrated spatial planning processes of the municipality. There is a specific focus on taking a systemic approach that will identify the complexity and interconnectedness of the major drivers in the area. Systemically looking at the area is seen as an important component that will ensure that the Socio-Ecological System is understood better as a whole. There is also a very strong focus on using the ES lens, to specifically show the connection between the social and ecological sides of the system. It is also utilised because it is seen as the angle that will most likely be able to create improved awareness of the importance of improved integrated planning within the municipality and of how important ecosystems are to the livelihoods of the people residing in them. The analytical framework ensures that all parts of the SES are described and understood. To this end thi report covers the Value; Social; Technological; Economic; Environmental; and Political features of the Maruleng area in an attempt to create the context in which the main drivers present in the area will affect the ability to ensure integrated spatial planning occurs.

Below is a map showing Maruleng firmly nested within the lower part of the Olifants River Catchment on the South African side. It covers about 6% of the land area of the Olifants River Catchment on the SA side, being one of 24 local municipalities in the area, but being unique because it is one of the few to be fully within the ORC as well as being in a key focus area for the RESILIM O Biodiversity Theme.

MAP 1: MARULENG IN RELATION TO THE SA SIDE OF THE OLIFANTS CATCHMENT
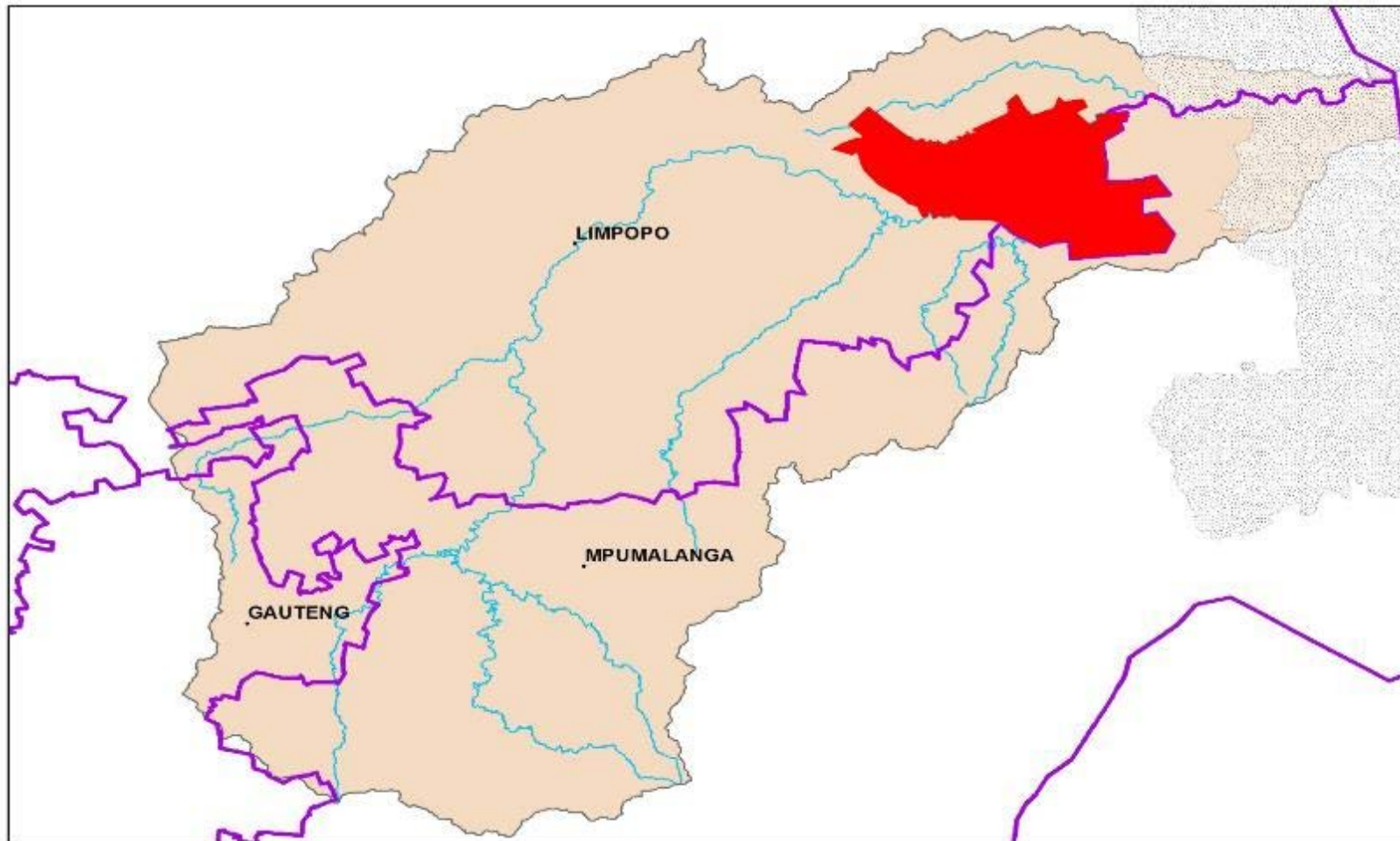
2 Values

The values encapsulating an area, unlike the other VSTEEP aspects, is based on the opinion of the people residing within the study area. It is a part of the contextualisation process that is hard to pin down and measure because is it a quantitative aspect and therefore has not been used widely. Below is a box with the main values that emerged from the Hoedspruit VSTEEP public participation meeting (the most important ones for the purpose of this report is highlighted in blue, and briefly discussed in an integrated way below).

TABLE 1: HOEDSPRUIT VSTEEP PUBLIC PARTICIPATION MEETING (SOURCE: AWARD, 2014A)

Values		
Equity	Knowledge and Understanding	Power issues
Ownership	Awareness	Sustainability
Respect	Patriotism	State of flux
Responsibility	Sense of entitlement	Participation
Self-preservation	Opportunities	Trust
Self-enrichment	Appreciation of basic survival	Legacy

As one does research on the other VSTEEP aspects some underlying values emerge, thus several interviews were undertaken to explore the values in the area. The value of the environment as a primary support tool for people's livelihoods and how they utilise its role as a beneficiation mechanism is one of the most important focus points for this report, as it is a good indication of how the people of the area will go about utilising the ecosystem services the area provides. The natural environment, as a direct source of beneficiation to primary economic sectors in the area, is very important, as the most prominent users here are also the less resilient, poorer people. Interviews held with the environmental monitors (2014) and Miss Malepe (2014) from the K2C made it clear that people are strongly influenced by the basic need for survival. This value tends to, as understood from the interviews, create a situation where people use ecosystem services without consideration of sustainability.

Theoretically, if one looks at Maslow's Hierarchy of Needs (1954: 234)[1], basic physiological survival rates as a more important element of existence than the self-realisation that would be gained from better management of the natural environment. Better management of the natural environment and the ecosystem services it provides the people of Maruleng is however fortunately emergent in the area with several natural resource use programmes run in the area in an attempt to help the people directly dependent on natural resources use it more sustainably (Diphororo Development and LEDET, 2013; Malepe, 2014; Uys, 2014).

---

[1] Maslow's hierarchy of needs is often portrayed in the shape of a pyramid with the largest, most fundamental levels of needs at the bottom (physiological) and the need for self-actualization at the top. The bottom needs must be fulfilled before one can move on to achieve higher needs.

As explained in the institutional sector, there are very prominent role players, like the Kruger 2 Canyons Biosphere, that work hard towards promoting this general push for the value of sustainability to become more prominent when utilisation of ecosystem services occur. This also works to counter the self-enrichment value highlighted above, which similar to 'a sense of basic survival', generally leads to over exploitation of ecosystem services.

Both these values are mentioned as they are a major obstacles to enforcement of better land use planning processes and the legislation put in place to enforce these planning processes to promote self-enrichment. When looking at systems complexity and resilience, this over consumption and degradation in some areas, will in the end reduce the resilience of the overall system to negative impacts (Folke et al., 2010).

One of the other dominant values that has emerged from the VSTEEP public participation process was the scenario around equity. The fact that poor communities suffered in the past due to conservation attempts through for instance forced removals to free up land for conservation, still encapsulates the deeply held value and belief system some have around natural resources utilisation and ecosystem service beneficiation. This belief is that conservation of natural resources comes at a price for poor people, and that it excludes those that are directly dependent on it, thus only benefiting those with the monetary means to enjoy it. This issue around equity limits the buy-in of poorer communities to better land use and natural resource management practices. An example of this that emerged in the VSTEEP

public participation meeting (AWARD, 2014b) was the mention that upstream pollution of rivers like the Olifants from mines and other sources of rivers causes negative effects on ecosystem service delivery downstream, most harshly effecting less resilient, poor communities who are more directly dependant on natural resources. The fact that it is harder to create buy-in into better land use planning and management that promote better ES management from these communities (about 88% of the population of Maruleng [StatsSA, Census 2011 Statistical Release, 2012]), creates a major obstacle to effective implementation of principles/values such as sustainable usage of ecosystem services through better land use planning.

The values around pristine natural areas, with a particular focus on the "African Wildlife Experience", in the Lowveld area, is currently a massive driver of tourism, the main primary economic sector in the Maruleng area (van Jaarsveld, 2014). This influences land use management and planning to the extent that the largest part of Maruleng is still in a natural state in order to ensure a thriving tourism industry (Maruleng Municipality, 2014a). This value held by the stereotypical 'tourist', drawn to the area by the wildlife and natural state of large parts of the landscape is the most positive value as it brings with it large-scale economic benefits. Whether these benefits are equally spread amongst the people of Maruleng is however questionable, and possibly creates a distorted form of land use in the municipality, as is evident in the fact that around 88% of the population lives on around 25% of the land to the west whilst the rest is vast open, natural spaces (eastern side) utilised for tourism that targets high-end markets.

3   Social

The social data was captured using the VSTEEP[2] public participation process, interviews held, StatsSA Census 2011 Data, municipal documentation and academic literature. It provides an overview of the social conditions of people in the area. Understanding this fully anthropogenic scenario is important when looking at the socio-ecological system as suggested by Complex- and Systems- theory, as the natural environment and social scenarios are closely linked (Reid, 2005). It is one whole interconnected system in which one influences the other. Therefore account has to be taken, and understanding created, of the social context of the area if effective integrated spatial planning is to occur.

The social data is often very closely linked to economic data, although for the purpose of keeping to the VSTEEP process it will be delineated for this report. To understand the current land use and development patterns better, one needs to be aware of the possible drivers behind them. Social information can often help unearth these development pattern drivers and help understand why the landscape is at it is.

3.1   Demographic information

Maruleng has a population of 94 857, by far the smallest number of Mopani's five Local Municipalities, contributing only 9% to its total population (Mopani District Municipality, 2012). Within Maruleng there are14 smaller political boundaries called wards. These wards are subdivided to help with political election representation. These were used as the smallest scale at which spatial analysis of the Census 2011 (used in this paper to create a quantitative overview and understanding of the municipality) could be done.

3.1.1   Population growth

Below is a table containing the population and household details for Maruleng during the 2001 and 2011 Censuses. It is important because in terms of development trends it helps to show the areas' population is not growing when put on a temporal scale. This means that land use demand and the coinciding pressure on ES might not presently be increasing, which is important when planning the way forward.

TABLE 2: POPULATION AND HOUSEHOLD GROWTH PATTERN (SOURCE: STATSSA, CENSUS 2011 MUNICIPAL REPORT, 2012)

Population		Households	
Census 2001	Census 2011	Census 2001	Census 2011
94383	94857	19668	24470
% increased	0.49% (474 people)	% increased	24.40% (4802 households)

From the previous table it is clear that Maruleng's population (from 2001-2011) appears to be quite stable, only marginally growing (474 people over 10 years). This broader scale look at demand on land and ES related to population size, does not however reflect what happens at a finer scale. The municipality's main town of Hoedspruit is experiencing the opposite with exponential growth in the demand for land and ES in and around the town as its population steadily increases. Interviews with several people (Du Preez, 2014; Uys, 2014) of the local area concluded that when the municipality was established in 2000 as a Category B local Authority under the Municipal Systems Act of 1998 (Maruleng Municipality, 2010) the town was demarcated as the administrative hub of Maruleng municipality, combined with the values placed around the "African Wildlife Experience" (as mentioned in the values section) and its associated influence on tourism, caused a massive demand for development space. The issue was however that the town was surrounded by private land from people unwilling to sell and soon all of the demarcated town-land was developed. Thus the large demand for land could not be met by the exhausted supply of public land, greatly increasing the price of property in the area. The increase in people within the town has also placed extra pressure on municipal drinking water delivery, meaning this basic ES is often not delivered to the residents of the town (AWARD, 2014b; Du Preez, 2014; Malepe, 2014; Uys, 2014). This is a classic example of where integrated land use planning could have helped avoid problems such as the one presented in the example.

3.1.2 Population Density

Below is a population density map done for the municipality by ward level from data collected from an online programme run by the Statistics South Africa website (StatsSA SuperWeb, 2014a). The ward population was divided by the area to calculate the amount people residing in the ward areas per Km^2.

As is clear below some areas are extremely densely populated (i.e. Ward 12 with a density of 700 people per square kilometre), especially in the wards just below the escarpment in the western side of the municipality, where all the traditional villages are. This is, as can be seen on the smaller thumbnail map, spatially strongly coincides with where the former Apartheid homeland Lebowa lies, showing the strong influence Apartheid land use planning still has on the development trends in the municipality. These former homeland areas to the west contains little economic development and major infrastructure and service backlogs whilst consisting of mainly dense residential areas in which an estimated 88% of Maruleng's population reside. These densely populated areas are described as sprawling settlements still dependent on subsistence for survival (Diphororo Development and LEDET, 2013).
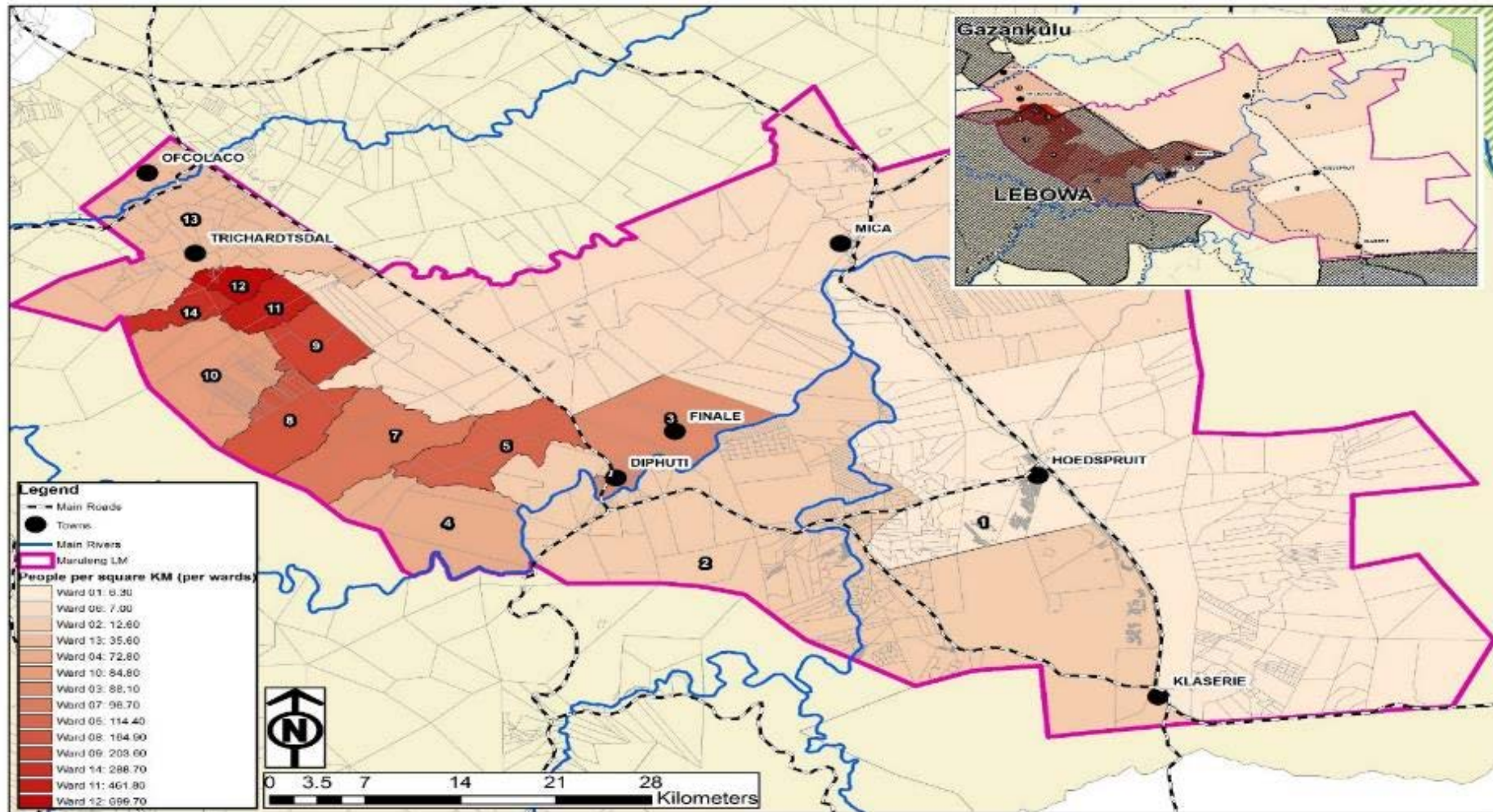
3.1.3 Population distribution

The population distribution by age and gender is displayed in the pyramid below, giving us an insight into the make-up of the population and where vulnerabilities might lie (e.g. a very young population might mean more dependency on the economically active). The pyramid below has one very prominent feature, the fact that the vast majority of the population is 15 – 34 years old.

This means that resilience to negative economic impacts should be higher than if it was a top- or bottom- heavy pyramid because the majority of the people are of working age. This precipice will however only be true if unemployment rates are not too high. This will be explored in the economic section.
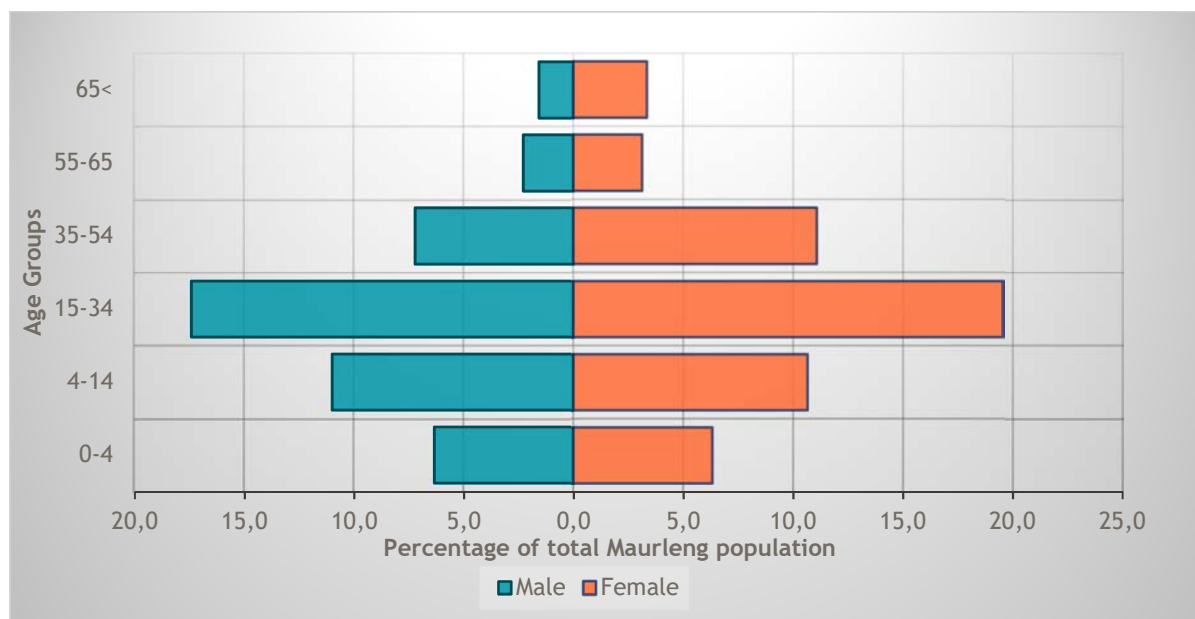
Figure 1: Population Distribution Pattern (Source: StatsSA SuperWeb, 2014a)

3.2 Education

There are 38 primary schools, 1 combined school and 23 secondary schools with approximately 32000 learners, with the IDP (Maruleng Municipality, 2014a) also citing a serious shortage of schools and basic infrastructure (electricity, water, sanitation).

The grade 12 pass rate of the municipality was 41.7% in the 2011 academic year. Maruleng also does not have a single institution of higher education, a possible cause of only 2% of the Maruleng population being enrolled in, or having finishing tertiary education (StatsSA, Census 2011 Municipal Report, 2012.

To determine the education levels, StatsSA SuperWeb (2014b) data was utilised. The data was refined into 6 categories, with the categories going from no schooling up to tertiary education. The focus was placed on data of schooling and thus a category in which 13418 people were placed, called 'not applicable' was removed from the analysis. It should also be noted that the statistics is representative of the whole population and not only people of an economically active age, as accessed from the Statistics Census 2011. For the purpose of this report specifically looked at these numbers through the lens of vulnerability.

Vulnerability is defined as any form of education less than Matric obtained or Tertiary Education[2] in this instance.

As can be seen in the below graph (all the categories shaded from red to yellow), the amount of vulnerable people (parameter used: Not completing Matric or higher education), lies

at 86% of the population of Maruleng to which the educational part of the Census 2011 questionnaire applied. This is startlingly high, and if aligned with rural livelihood typologies (Neves and Toit, 2013; Tittonell, 2012), means the possibility of higher direct dependency on natural resources, and thus vulnerability to negative environmental drivers, increases dramatically within a rural landscape.
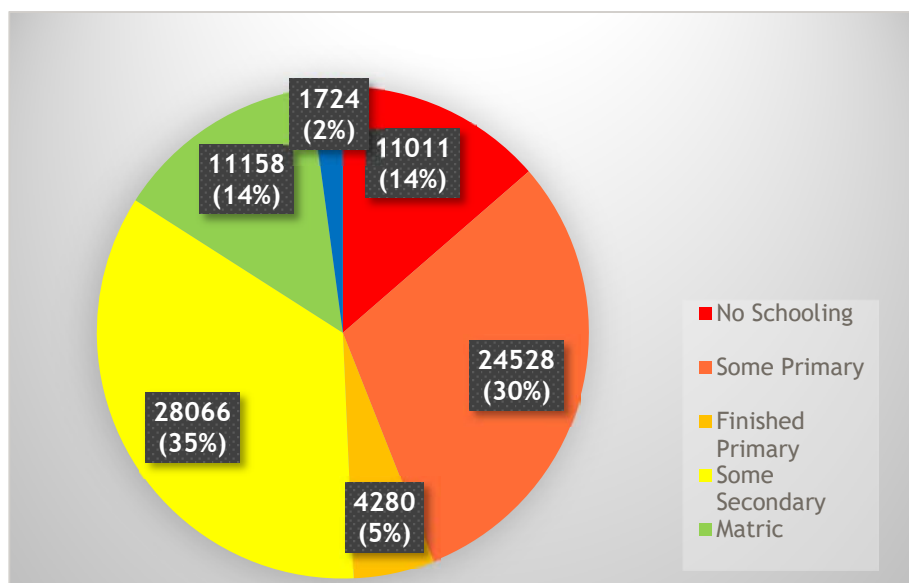
Figure 1: Education Levels (Source: StatsSA SuperWeb, 2014b)

Below is a set of six heatmaps dividing the categories of the above pie chart into six different maps to get a more explicit spatial picture of where the largest vulnerable areas lie when using education as an indicator. Because the vulnerability line for education was drawn at anything below Matriculation, the first four maps show the number of people per Ward, with the higher the number, the warmer the colour, whilst the last two maps (showing people who has obtained matric and tertiary education levels) do the opposite, with the higher a number the cooler the colour (Because it is above the vulnerability line). No access to spatial analyst on ArcGIS meant a single interpolated map that combines the inputs from the 6 different maps, to create an

overarching view of the education level per ward, could not be created. Analysing the maps below, it is clear that the eastern side of the municipality tends to have less vulnerability (cooler colours), whilst the south-western area seems very vulnerable (warmer colours) when using the lens of education. In terms of resilience, as cited by Jenson and Fraser, (2011), lack of education often coincides with a more direct dependency on the natural environment (Ecosystem Services). This is very important for land use management and planning because it means that direct use of ES will, in the areas of high population, lack of education and low employment numbers, have a tendency to be high.

---

[2] *This line has been chosen because having matric or a tertiary education means that chances of getting absorbed into the job market becomes higher, thus making an individual more resilient to negative drivers such as economic* *downturns, increasing mobility, employability & access to resources as well as reducing reliance on direct natural resources/ES usage.*

MAP 3: EDUCATIONAL LEVEL
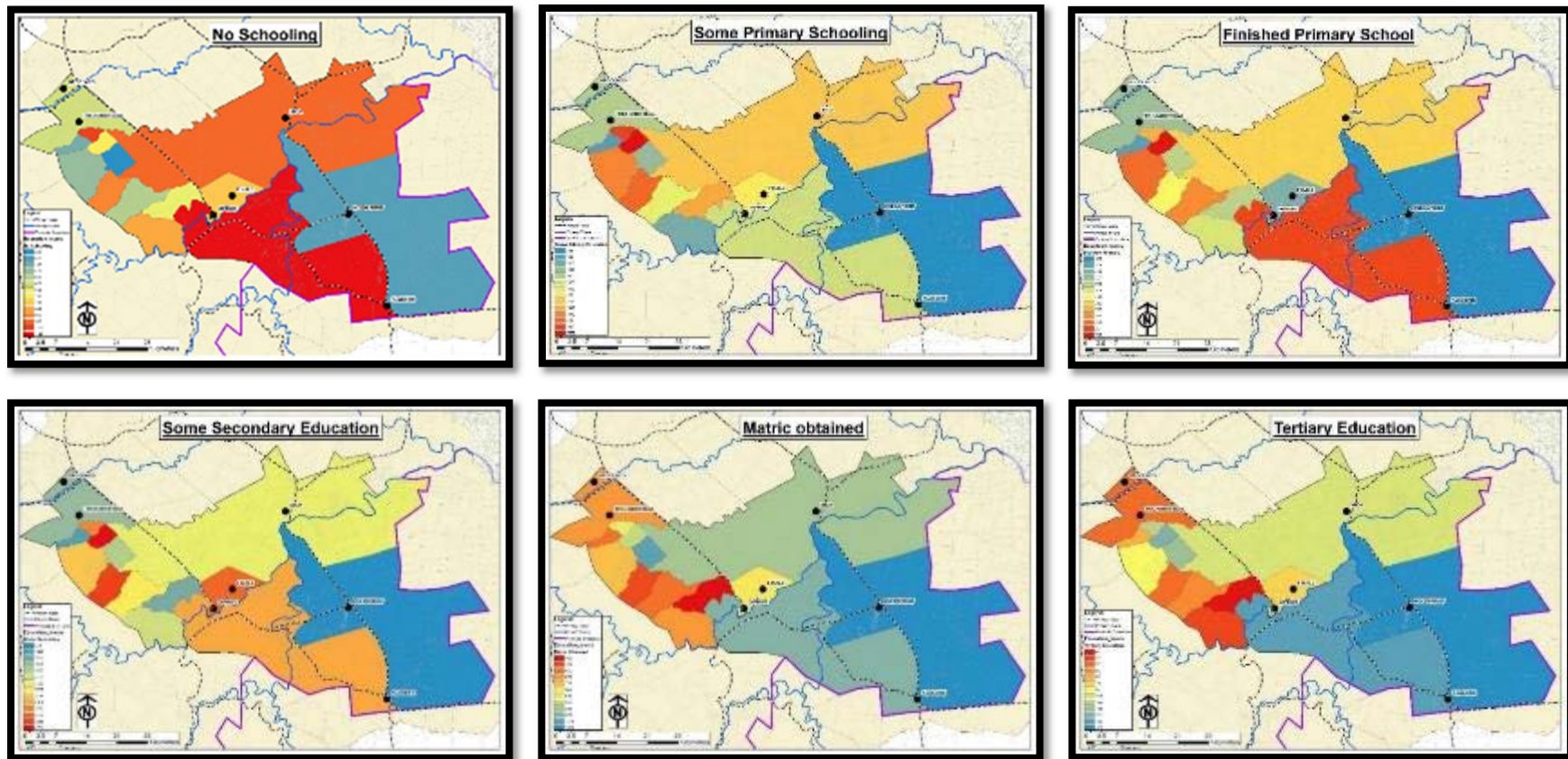
3.3 Health

In South Africa, from a national level perspective, health care tends to be more problematic in and around rural areas when compared to urban areas, with Maruleng not being an exception. The municipality is served by one hospital in the north west, in the Sekororo village, the most densely populated area in the municipality (Ward 12 on the population density map). Furthermore the Maruleng Municipality's IDP (2014) reports that 10 other clinics exists throughout the municipality. This means there is one clinic for every 9485.7 people.

One of the biggest threats to improved health for the people of Maruleng is HIV/AIDS. It can be seen as a wicked problem when looking at applying the systemic view, due to it entrenching itself in a SES and becoming reinforced through the results it brings to the fore. Some data in the Maruleng Municipality's IDP (2010) suggests that around 2000 the prevalence in Maruleng lay around 27%. The StatsSA, Community Survey of 2007 indicated that during that 2007 year period it decreased to about 26.8%. The percentage of HIV positive people were at that stage still higher than the average prevalence in Limpopo (22.1%), as stated by the National Department of Health (2011).

Maruleng is also affected by other diseases such as tuberculosis, cholera and malaria, although less information is available on these, it is understood to be having less of an influence (AWARD, 2014b; Business Trust, 2007).

The issues caused by HIV/AIDS is endless, but the main concern for this publication is the fact that it causes:

- A portion of the population becomes economically inactive (it hits the age groups of 2–49 the hardest, increasing economic dependency)

- An increase in child-headed households

- The pressure it puts on an already overburdened health system

- Causing pollution through the ARVs

- The fact that it puts pressure on plant and animal species because of higher demand for traditional medicine

- Its nature of being a wicked problem that causes other social and economic issues to occur that often perpetuates its own existence

  (Diphororo Development and LEDET, 2013; Environmental Monitors, 2014; Limpopo Provincial Treasury, 2012; Malepe, 2014)

The overburdened public health services in Maruleng is alleviated by some NGOs working on health in the area. An example thereof is the Hlokomela Health Clinic run as an NGO looking at healthcare for women (Du Preez, 2014), helping to reduce the vulnerability of the people.

4 Technological

The technological contextualisation for the area was done through the VSTEEP public participation process, StatsSA Census 2011 data, interviews and municipal public participation meetings.

It is mostly based on the status quo of development impediments and opportunities evident in the Maruleng municipality area.

4.1   Human settlement and development trends

MAP 4: MARULENG AND BROADER AREA LAND US
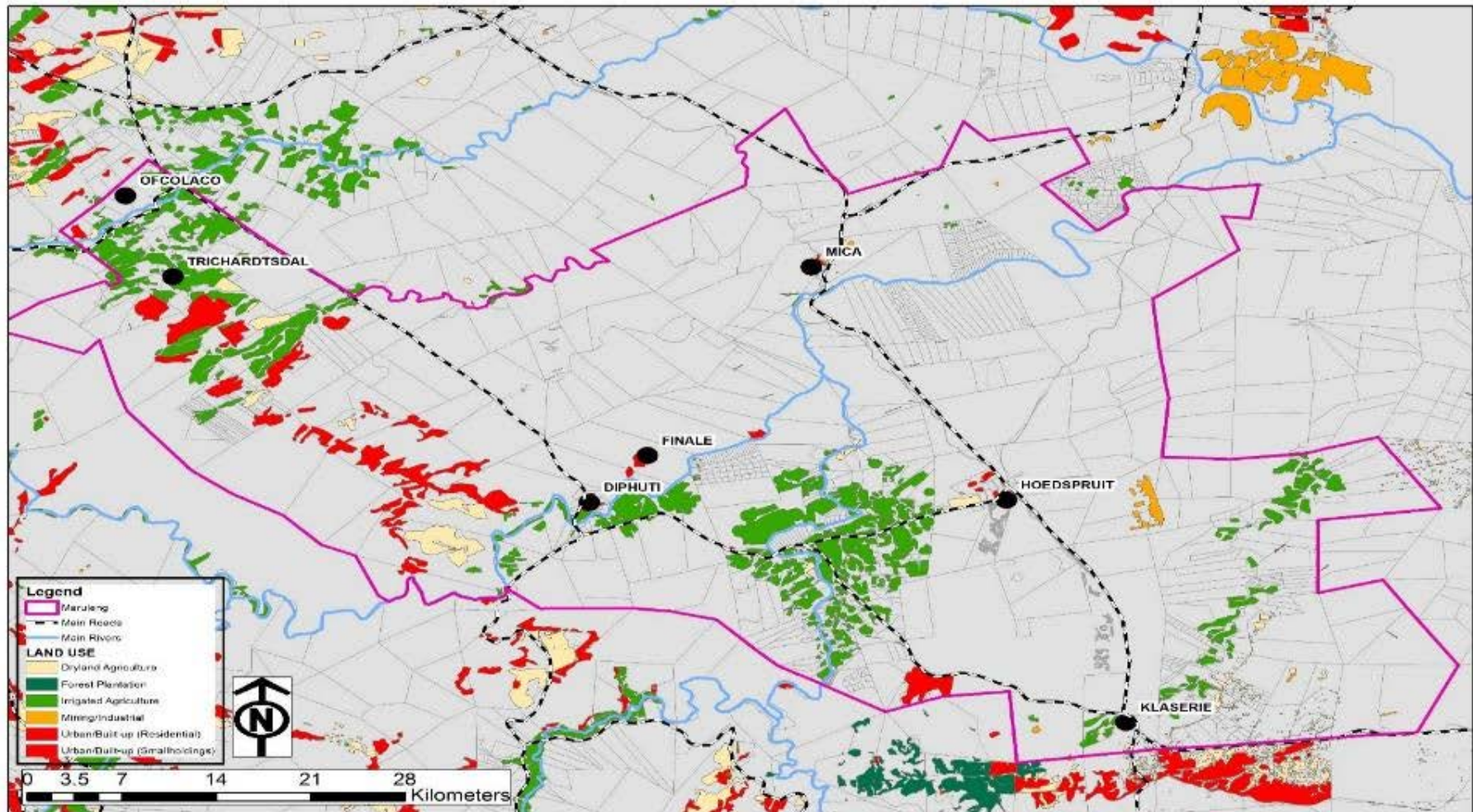
The spatial pattern of Maruleng is greatly influenced by the legacy of apartheid, with the majority of its population concentrated in the rural areas in the western part of the municipality as can be seen in the above Land Use Map. The Town of Hoedspruit is the main urban node in the study area, with Kampersrus (not on map) and Trichardtsdal a second order urban node according to the (Plan Associates, 2014). There are no defined nodal points in the traditional village areas in the west below the escarpment area (indicated in red on the above map) where the majority (around 88% of the population) reside. Interviews with the Environmental Monitors (2014) in the area painted a picture of almost non-existent service delivery in these area. All 08 of them recorded having been directly dependant on some or other form of ES, either water from wetlands or rivers, or firewood for cooking or lighting. This is more broadly

discussed in the ecosystem services demand section under the environmental part of this VSTEEP overview. The development of the municipality is varied, with the eastern and northern (which also contains limited mining in the Mica area) areas mostly covered by private nature reserves focussed on the African wildlife tourism markets (for both international and South African upmarket tourists). The central eastern part contains Hoedspruit and is thus the administrative and commercial centre of the region, whilst also containing many game reserves. The southern quadrant mainly contains tourism activities centred on the Blyde Canyon, with also the largest amount of irrigated agriculture happening here, around the Blyde river as can be seen in Green on the above map (Maruleng Municipality, 2014a; Plan Associates, 2014).

4.2 Infrastructure

The SWOT analysis done for the Maruleng IDP (2013) states that infrastructure upkeep is a major concern, this is enforced by constant raising of infrastructure issues at municipal meetings which included bridges, waste management, roads, streetlights and water supply (Du Preez, 2014; Maruleng Municipality, 2014b, 2014c).

 The biggest concern however is the backlog of basic infrastructure such as water, electricity and sanitation occurring in and around the villages in the western part of the municipality. This is discussed more explicitly in the ecosystem services demand section. With regards to housing the Maruleng's draft LED Strategy (2013) states that a backlog of around 1050 houses exists.

4.3 Transport

According to Maruleng's Draft LED Strategy (2013), the municipality has a total of 563.2km road network of which only 321.79km (51%) is tarred. The maintenance of roads remains a major challenge. Issues associated with the road network in Maruleng include the following:

- Local farmers regard the poor condition of roads as the key inhibitor to increased exports

- The internal/local road network in the villages is in a poor state, which negatively effects public transport to serve these areas

- Lack of continued road network in the surrounding village areas

(Maruleng Municipality, 2010)
Maruleng has four main access points via road (the red roadlines in the map below). There is an entry point from the west leads (R527) to Ohrigstad, and upon entry descends the escarpment, leading to Hoedspruit. It is of importance because it is the main access route to Hoedspruit from all the traditional areas in the west. It can be seen exiting into the Greater Tubatse municipality in the map below.

The road (R36) north of it exiting into Greater Tzaneen municipality is also seen as important because it allows access to the rest of the

municipal area for the densely populated Sekhororo villages in the north west.

The road corridor (indicated with the orange line in the map below) in the western part, running from Phalaborwa and Tzaneen in the north, through Hoedspruit and out through Bushbuckridge in the south is of high significance to this study as it is seen as a national priority in the National Transport Masterplan 2005-2050 from the National Department of Transport (Parida, 2010). It is thus likely to see future development. It is also a road corridor that is currently under severe pressure according to several locals (AWARD, 2014b; Malepe, 2014; Maruleng Municipality, 2014d), from mining trucks driving from the Phalaborwa mining complex. The exact figure is unknown but the data (AWARD, 2014b; Du Preez, 2014) estimated the numbers of trucks running through the R40 daily at 80-200 a day. Due to the nature of this report, in its attempt to be more systemic, the influence these trucks have on the level of ES demand in the form of game viewing, hunting and other tourism activities in nature reserves, needs to be monitored as it might have implications. An example could be tourists not wanting to have the unpleasant experience of sitting behind trucks in traffic or having a higher accident risk on the roads due to it being degraded by trucks, a social issue touching all residents in the area. Although this report will not look at the trucking it acknowledges that it is an unknown and potentially negative driver. The roads leading to the main town of Hoedspruit are also under pressure from around 40 busses commuting to and from the town every day. These shuttle people who works in Hoedspruit from the local villages in the west, as well as people from Acornhoek, situated about 30km south, in the Bushbuckridge municipality.

MAP 5: TRANSPORT CORRIDORS (SOURCE: PLAN ASSOCIATES, 2014)
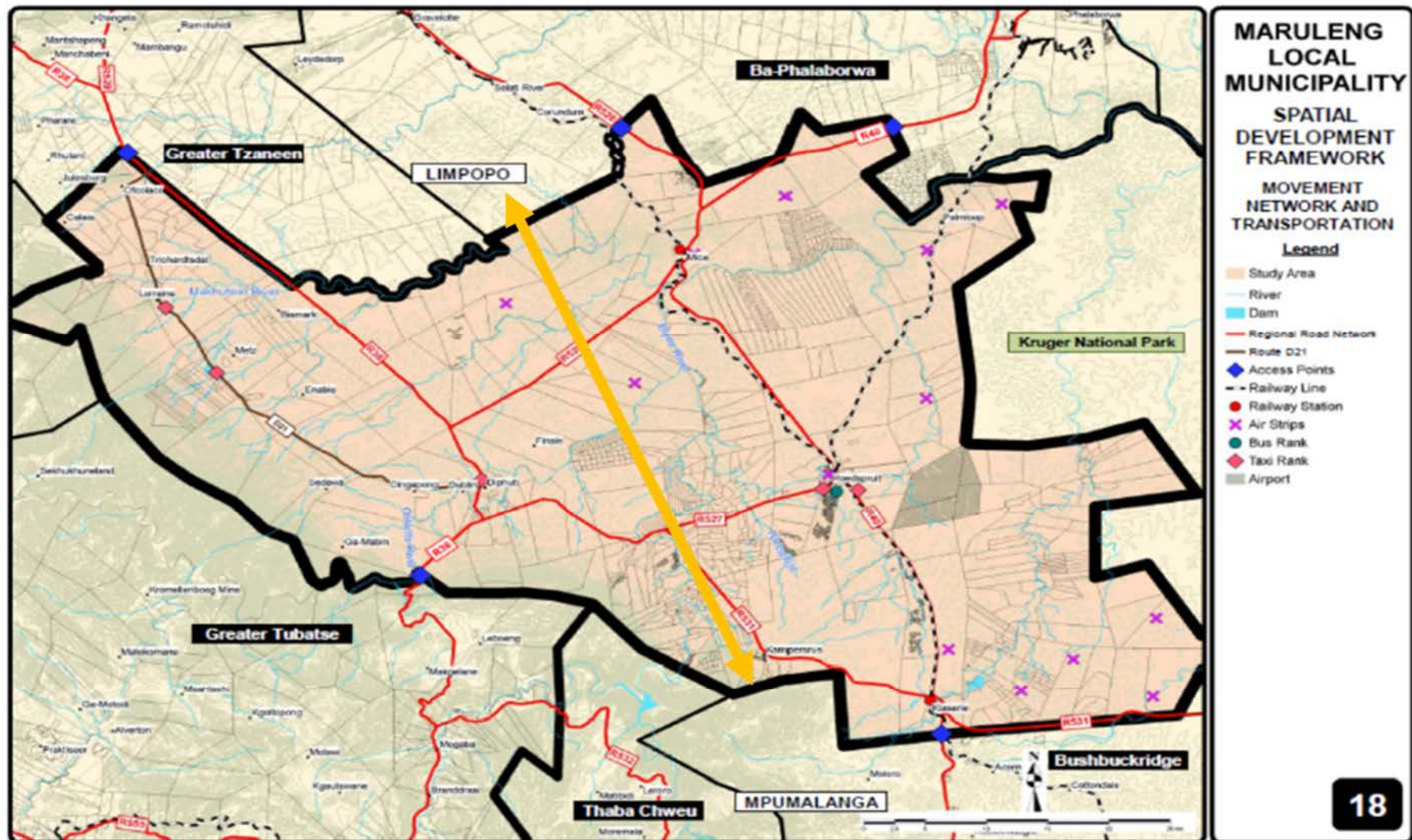
Other forms of transport in the area include a railway line passing from the north through to the south in the western part of the area, similar to the R40. Maruleng also has a second order airport (East Gate Airport) in the mid-eastern part that is served with daily flights to and from OR Thambo International Airport in Johannesburg and Cape Town International Airport. Many of the higher end private nature reserves also have private airstrips. These and the East Gate Airport mostly serve the tourism industry (nature reserves) in and slightly beyond Maruleng, with Phalaborwa and Nelspruit the closest other second order airports (van Jaarsveld, 2014).

Connectivity is an important principle of resilience (Simonsen et al., 2014). For instance. connectivity allows people and animals to more effectively evacuate hazardous areas in disaster risk situations, and therefore is important to help increase the resilience of local people who are already vulnerable. When wanting to promote integrated land use planning one has to take into perspective how well connected development is to other areas.

The villages to the west of the municipality where the large majority of people reside is, for instance, quite vulnerable as it has only one major road serving the area (the R36). Spatial planning thus needs to take these type of scenarios into account when thinking, for example, further development and how to best integrate land use management and planning that promote optimal land use. It is difficult however as thinking systemically means one cannot only look at economic incentives or optimal land use but also has to take into perspective things like social and environmental conditions of an area when making decisions regarding the spatiality of development.

Better connectivity is also a dual edged sword for the utilisation of ES, because, as indicated earlier, bad transport networks hinder local farmers' ability to export produce, thus creating an issue of access to markets. Too much connectivity can also be bad because as mentioned in Walker & Salt, (2012: 69), road systems means better access to ES and thus more usage, often leading to exploitation.

4.4   External development

Looking at external developments is important for understanding the way the whole SES functions. Taking a broader view also helps one see external developments that might play a big role in defining how land use planning is affected within a municipality's boundaries. An example hereof is the fact that Tzaneen sits about 30km north west of the edge of the municipality. It being a reasonably large town, combined with its proximity to the rural settlements around the north western escarpment means that most people in that area rather take their money out of the municipality to do their shopping in Tzaneen. (AWARD, 2014a; Environmental Monitors, 2014; Maruleng Municipality, 2014d). Another example is the fact that to the south of Maruleng lies Acornhoek, which is part of the bigger Bushbuckridge area, an area covering 10 250km^2, containing 541 248 people in 2011, mostly within densely populated traditional settlement setups (Bushbuckridge Local

Municipality, 2012). This influences Maruleng in several ways, including putting pressure on some of the natural resources found in the area (e.g. plants and animals used in traditional medicine) that gets sourced from Maruleng to feed the large demands of Bushbuckridge.

As can be seen on the land use map, there is a massive mining undertaking just north of the eastern side of Maruleng. This is the Phalaborwa Mining Complex, where sulphur, copper and other minerals are mined (Ba-Phalaborwa Local Municipality, 2013). This results in a large amount of trucks along the R40, creating some social and environmental issues in the Maruleng area. These few examples are intened to create a contextual background, and are by no means an exhaustive indication of all the external drivers. They are intended to show that external drivers have tangible effects within an area and should be considered when looking at integrated land use and spatial planning.

5 Economic

The primary economic sectors can be seen as very reliant on the environment (natural and changed) and this is one of the main reasons an ecosystem services approach was taken. Looking at the ecosystem services demand section on page 35, it is also clear how many people are directly dependent on the environment for basic services

such as drinking water and fuel wood as part of fulfilling their basic needs not being able to be obtained through financial means. This section will look at some socio-economic data as well as briefly discussing the main sectors contributing to GDP.

5.1 Socio-Economic Overview

EMPLOYMENT AND DEPENDENCY
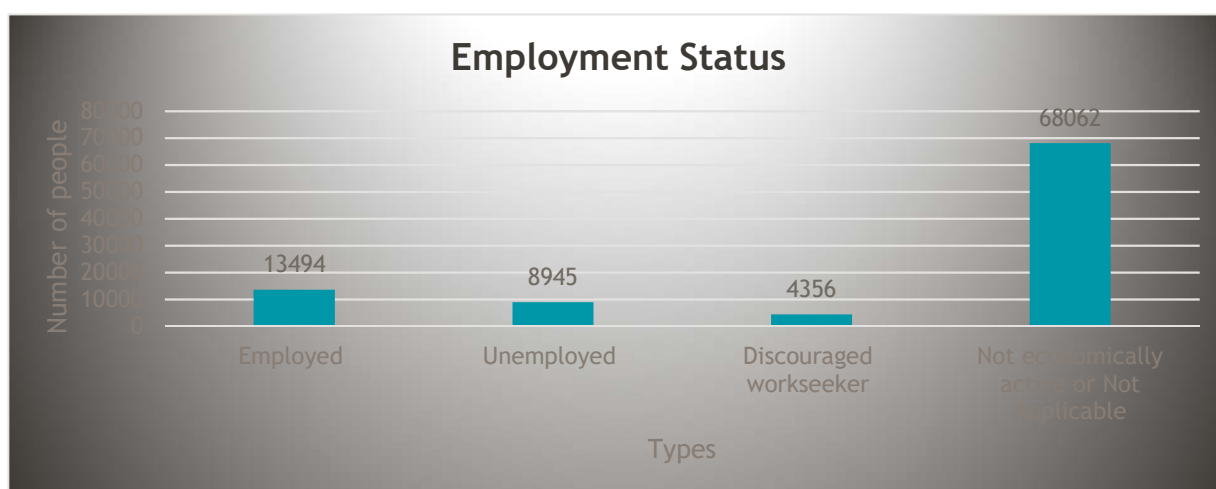
Figure 2: Employment Status (Source: StatsSA SuperWeb, 2014c)

Only a small portion of Maruleng Municipality's population is formally employed as can be seen in the figure above. The 13 494 people formally employed is only about 14.23% of the entire Maruleng population creating a large dependency ratio for the area where 86% of the population is dependent (not economically active; not

applicable[3]; unemployed or a discouraged work seeker) on the 14% of the population that is economically active. This creates vulnerability for communities and often increases the direct dependency of people on natural resources like fuel wood and game meat for subsistence.

---

[3] Not economically active" is stated in the Census 2011 Metadata Report (2012) as "unemployed people of a working age not seeking employment" and "Not applicable" as "If age is less than 15 or greater than 65 years".
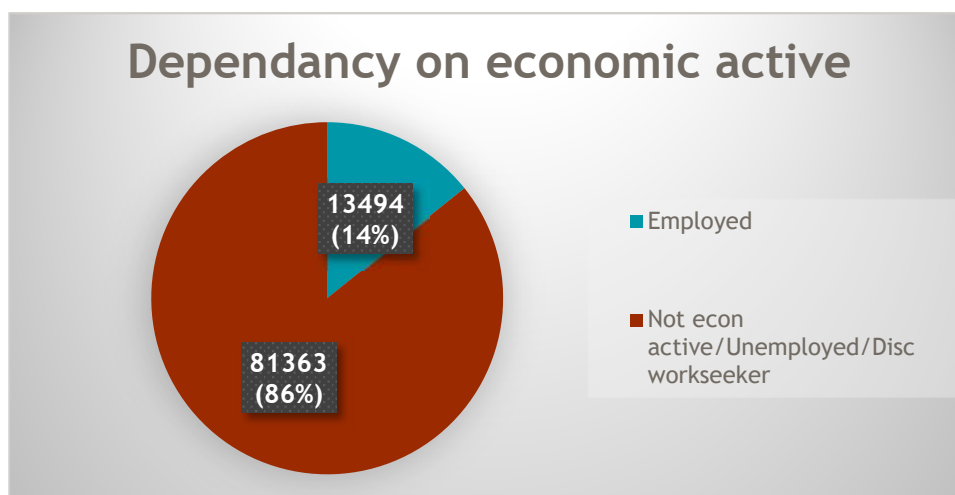
Figure 3: Economic Dependency (Source: StatsSA SuperWeb, 2014c)

When one looks at the employment figures adding the unemployed and discouraged workseekers and employed then dividing the unemployed and discouraged workseekers [(8945 + 4356) / (13 494 + 8945 + 4356 = 26 795) the broader unemployment (with Discouraged Workseekers included) adds up to 49.64%. This leads one to hypothesise that the dependency levels increases the direct demand on ecosystem services in all its forms. It also suggests that some of these communities with the high dependency levels are not very resilient due to their inability to diversify income (Neves and Toit, 2013), often creating a scenario where economic dependence on one breadwinner for a large amount of people develops, a factor closely linked to uniformity, a known resilience reduction factor.

HOUSEHOLD INCOME

The household income profile serves as an important indicator of the socio-economic well-being of the study area, and is therefore looked at in detail in this report. Below is a graph which indicates Household incomes per category as a percentage out of 100 for the specific area (i.e. in Maruleng 15.6% of the population receives no formal form of household income). On average Maruleng is relatively similar to Mopani and Limpopo, but with the lower income ranges there is a difference with Maruleng's (No Income to R38 400 per annum categories) being a bit higher than the Mopani and Limpopo averages (van Jaarsveld, 2014), indicating that Maruleng is a less well-off municipality. This places most households in the marginally lower income level categories. In 2001 88% if the population lived below the annual Household Subsistence Level (HSL) (R19 200 or less per household per annum, at the time), using an inflation calculator[4], it is estimated that in 2011 83% of people lived below the HSL level (R38 400 or less per household per annum).

---

[4] The inflation was calculated through using an inflation calculator that measured the total goods and services price increase from 2001 to 2011 at 78%, with the rand losing 44% of its purchasing power. This was calculated using StatisticsSA's Consumer Price Index data.
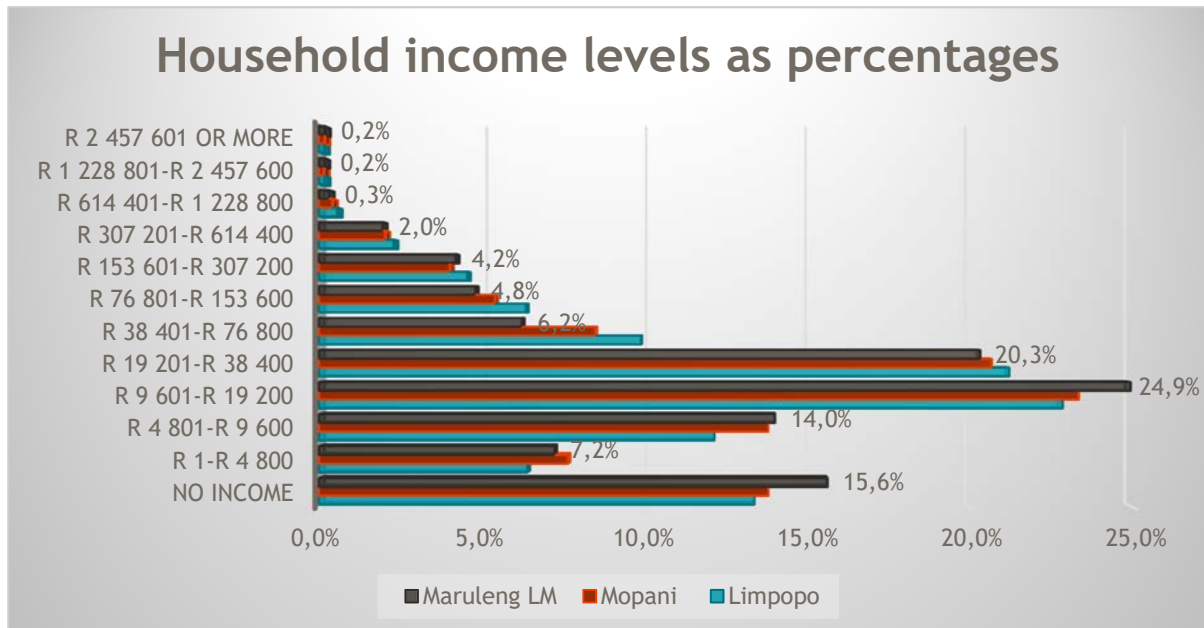
Figure 4: Household Income for Maruleng, Mopani and Limpopo (Source: van Jaarsveld, 2014)

Below is a graph further delineating income per ward[5]. The data is displayed as Income Category per ward with regards to the total amount for Maruleng. From the below graph it is clear that Ward 01, in the eastern side, in which Hoedspruit lies, is by far the most prosperous, with 46% of the households in Maruleng earning R307 601 and above per annum and 37% of the households earning R153 800 – R307 601, living in that ward. The rest of the wards share a fairly equal income spread.
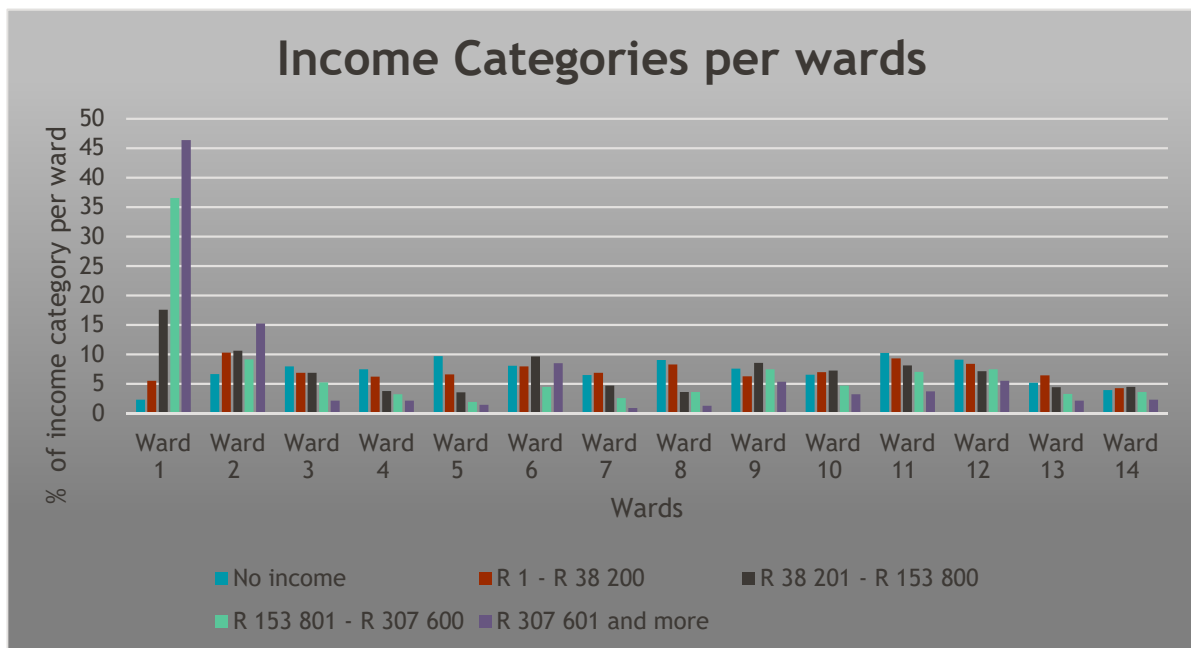
Figure 5: Household Income Levels per Ward (Source: StatsSA, Census 2011 Statistical Release, 2012)

---

[5] *Please note the income categories have been aggregated in order to insure that the data is easier to display.*

5.2 Economic Sectors

The salient features of the economic conditions in the various local areas are discussed in this section. In order to facilitate a situation whereby the individual economic activities throughout the District can be measured, a standardized

classification is utilised. The following sub-section offers a delineation of the various economic sectors as per the Standard Industrial Classification, used internationally.

Figure 6: Main GVA[6] Producing Sectors in Maruleng (Source: Wilson, 2012)

The main categories as set out in the South African Standard Classification of all Economic Activities (1993) are for the purpose of looking at the main economic sectors, as can be seen in the above graph. A total of 9 sectors are distinguished. As can be seen the most prominent contributor to GVA in Maruleng is Community Services, at 38.8% of the total GVA for the area. This is the case because of the large development and 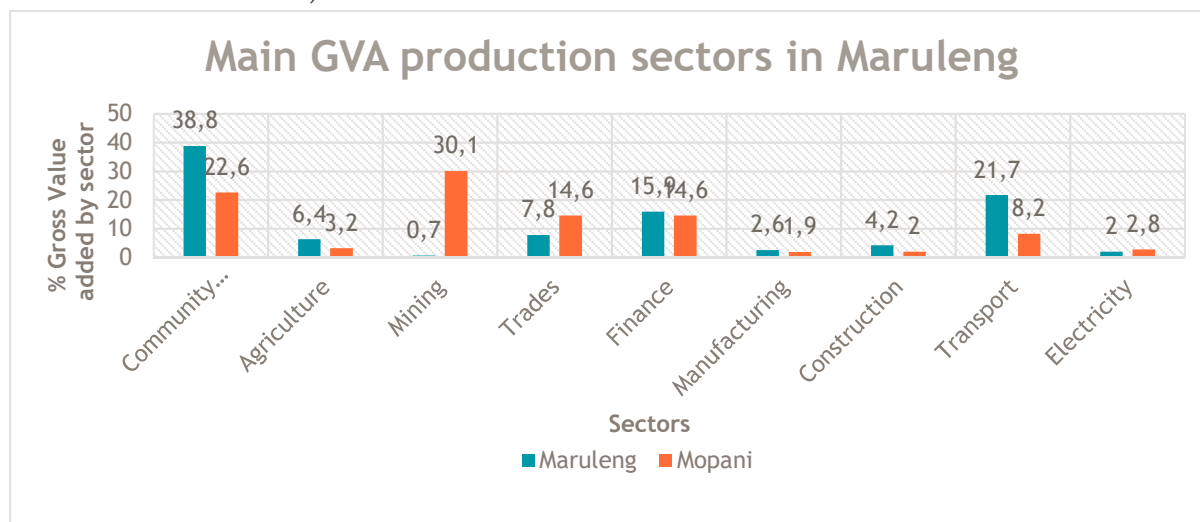social upliftment investments occurring in Maruleng from provincial and national departments. The transport sector also makes a sizeable contribution to GVA (21.7%) due to massive demand for transport from the villages (western side) to Hoedspruit (the economic hub of Maruleng) and other areas, due to the purchasing power of those areas not being met with a large enough local supply in the rural areas (Uys, 2014). Another prominent feature is the incredibly small contribution mining makes to GVA in Maruleng, especially when compared to the district municipality, Mopani, in which it is situated.

A frequently asked question about the above standard 09 categories is "into which sector tourism falls". This is a question of particular relevance since the perceived idea is that tourism is Maruleng's main economic driver, as by example of Maruleng Municipality having the slogan "Wildlife Haven" (Fhatanani Management Services, 2013). The tourism sector however generally gets delineated into other economic sectors, with for example the high GVA for transport being a clear link to tourism through the several traveling agencies and transport nodes (like for instance the Eastgate Airport) present in this area. Tourism as the primary sector from which many other secondary and tertiary economic activities flow is thus uncalculated for in Maruleng's latest IDP, which is an area of concern because integrated planning that takes a systemic approach to understanding the area cannot be created if one of the main drivers is not understood.

---

[6] *Gross Value Added is the value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector.*

Even though Statistics South Africa does not have readily available data on the Gross Value Added per sector with regards to tourism in Maruleng or the employment by sector, there is an online programme accessible through Quantec (2015), a statistical and econometrics company, that provide contractors that develop documents like IDPs and LEDs with economic statistic information. Their data was used to attain the below GVA and Formal Employment information
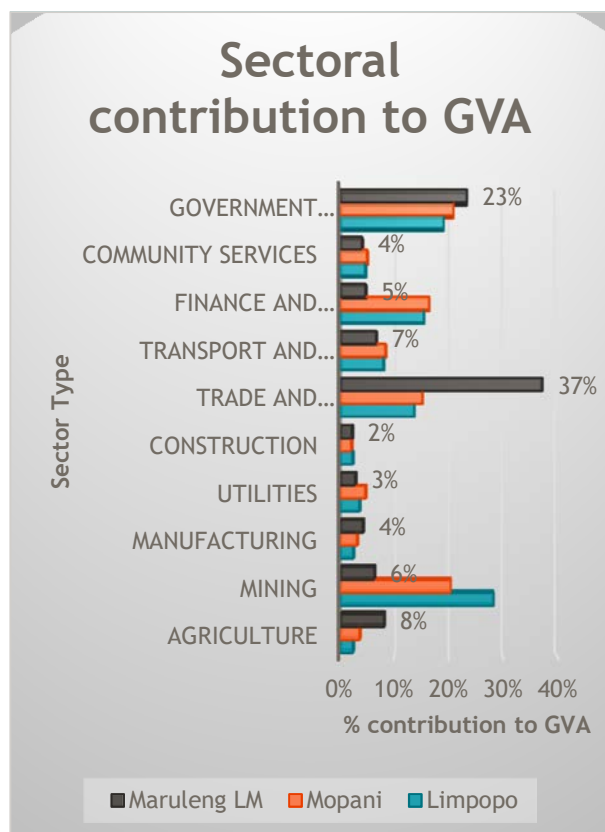
Figure 7: Main GVA Producing Sectors
(Source: Quantec, 2015)

Figure 8: Sectoral Contribution to Formal Employment
(Source: Quantec, 2015)

The GVA contribution graph above clearly indicates some prominent differences compared to the graph by Wilson (2012). The most important fact that the Trade and Accommodation category represents tourism more directly, making more explicit the economic benefits of tourism in its contribution to GVA and employment.

Below the main GVA and employment sectors will be discussed briefly to help create a contextual understanding of how they became prominent.

COMMUNITY SERVICES

When looking at the high GVA for Community Services, this is likely due to Maruleng been identified as a Presidential Poverty Node Priority, with several government funded projects like the Comprehensive Rural Development Programme from the DRDLR (Department of Rural Development and Land Reform), Biosocial Projects, the Working for Water/Wetlands/Fire from DEA and the Expanded Public Works run by the Department of Public Works, being prominent in the Maruleng area, particularly the western side where all the traditional areas are (Diphororo Development and LEDET, 2013; Uys, 2014). These projects have various focusses, with especially the environmental projects being of high interest for this report. Looking at their spatial footprints and purposes could help with understanding how to better promote truly integrated local municipal level spatial planning that acts as an informative tool for not only the municipality, but also other institutions working in the area.

AGRICULTURE

The agricultural sector of Maruleng is quite varied, combining different market opportunities with the available ES and the means to exploit that. Below is a quick summary of the main types and their spatiality:

- Commercial mango; citrus and avocado are farms spatially focussed along the Blyde River and citrus near the northern western area of Trichardtsdal (as can be seen on the Land Use Map on page 14)

- Some commercial game farms (breeding with the likes of buffalo and sable) also occur throughout the area, including the south western part of the escarpment and the north western part of the municipality on the eastern side of the R36

- Subsistence farming occurs all around the western part of the municipality around the rural settlements

(Business Trust, 2007; Fhatanani Management Services, 2013)

Agriculture is in all its various forms is one of the most prominent sectors with regards to employment as can be seen in Figure 9 above. When looking at GVA it is a lot less prominent though. This is a well-recognised trend, with agriculture being a good wealth spreading mechanism through informal agriculture (Duraiappah et al., 2011).

Formal labour intensive agriculture also exists in Maruleng with citrus and mango creating a large number of jobs that gets reflected in the employment per sector category. According to Statistics South Africa data for the 2001 Census (Statistical Release, 2002) around 41% of employees worked in the agricultural industry whilst the data from Wilson (2012) on Maruleng indicated around 29% of people employed in this sector. A speculative guess is that this decrease is occurring due to mechanisation and therefore is a shift from agriculture to more tourism orientated activities.

MINING

Whist mining is a priority sector for Limpopo and the general upper Olifants catchment area there is no prominent mining in Maruleng. The town called Mica has some limited mining activity although none of Maruleng's IDPs (2007; 2011 & 2013) indicate the relevance. Statistics South Africa Census data for 2001 (StatsSA, Statistical Release, 2002) indicated that mining in Maruleng made up 0.9% of the employee total, whilst from the Maruleng IDP (2013) data it seemed to have gone down to 0.7% by 2012, thus making it an insignificant driver in the Maruleng area, although large scale mining is happening very close to Maruleng with the large Phalaborwa Mining Complex just north of the boundary (indicated in orange on the Land Use Map on page 14).

The amount of development through various government programmes, as mentioned under Community Services, has led to a new type of ecosystem service utilisation and exploitation emerging in the form of sand mining for construction purposes. According to an interview held with environmental monitors (2014) in the Metz area, several non-perennial rivers are being mined intensely for building sand. This informal and direct usage of ecosystem services causing degradation to the natural environment could possibly have negative future effects and therefore is an issue that needs to be tracked.

TOURISM

Maruleng Municipality is wedged between some of Limpopo's prime tourist attractions, including the Kruger National Park, Timbavati Private Reserve and Blyde River Canyon. Significant tourism-related activities exist as the main economic

contributor in Maruleng (Plan Associates, 2014). The existing airport plays a significant role in increasing tourist traffic and establishes the Maruleng as a gateway to the Kruger National Park and surrounding areas (van Jaarsveld, 2014).

The vision of the Maruleng IDP (2013) is for the many cultural opportunities within the municipal area to be developed into tourist attractions as well as the growth and development of the agriculture sector. The IDP (2013) states that tourism related economic activities should be promoted and facilitated by accommodating private sector investment in the development of game reserves, game lodges, tourism related manufacturing and trade and hospitality developments. From a land use planning perspective that wants to promote improved environmental management, the type of tourism happening in Maruleng is very positive. It is a non-consumptive use of ES that promotes keeping the environment in a pristine condition, whilst also promoting socio-economic upliftment through the jobs it creates and its strong impact on the GVA. It thus promotes improved social, environmental, spiritual and economic conditions in the municipality, helping maintain an integrated land use pattern that very actively promotes improved environmental management and planning that helps keep large portions of land in a natural condition.

6 Environmental

Because this report is focussed mostly on improved incorporation of environmental factors into spatial planning at local municipality scale the largest focus will be placed on this

.

environmental section. The ecosystem service angle taken means that the environmental sector is divided between ecosystem service supply and demand

6.1 Ecosystem Service Supplies and its state

Ecosystem services supply is what the environment provides to the people of an area (Corvalán et al., 2005). Supply of this kind is hard to bound, with the complex system of biodiversity factors all coming together in different configurations that brings different bundles of benefits (Reid, 2005). The consumption patterns (Speed of consumption, type of consumption, utilisation methods etc) of these bundles also determines the ability of the ecosystems to deliver sustainably. The following overview of the ES supplies in the area is focussed on creating an informative understanding of what currently exists. It is however only expanded upon as singular units, with limited discussion on their interaction as a SES system and what that entails for ES supply due to the complex nature thereof, and it being outside of the scope of this paper

6.1.1 Biophysical overview

The biophysical overview is a very brief summary of the area with regards to soil and vegetation. It is key to understand these underlying features that often plays a large role in determining a lot of factors with regards to the ability to produce ES, which this paper insists should then inform spatial planning and land use management that will insure optimal & sustainable use (i.e. determining the ability to provide groundwater, agricultural potential and the possibility of resource extraction via mining).

- **Geological systems:** Transvaal sequence (sedimentary and metamorphosed rocks) and Archean granite and Gneiss Basalt complex (sedimentary rocks with intruding lava)

- **Lithology:** Undifferentiated rocks and various mixed lithologies; predominantly carbonate rocks (limestone and dolomite); predominantly meta-arenaceous rocks (quartzite, gneiss & migmatite); alluvium (clay, sand, gravel & boulders) and basic/intermediate/mafic extrusive rocks (basalt & andesitic lava)

- **Topography:** High mountains of the Great Escarpment (including the Drakensberg and Wolkeberg Mountains); mountains and Foothills; Lowveld (undulating plains & extremely irregular undulating plains)

- **Soils:** Glenrosa and/or Mispah forms; Miscellaneous land classes- rocky areas with miscellaneous soils; Red-yellow apedal- freely drained soils- red- high base status- < 300 mm

deep; Red-yellow apedal- freely drained soils; red and yellow- dystrophic and/or mesotrophic

- **Biomes:** Contains savannah, grassland and forest Biomes

- **Bioregions:** Lowveld, Mesic Highveld Grassland and Zonal & intrazonal Forest Bioregions

(Evironomics and MetroGIS, 2009; SANBI, 2004)

6.1.2 Topography

Below is a map of Maruleng's topography. As one can see the left (western side) boundary runs along the Drakensberg escarpment from the north to the south. This escarpment reaches heights of up to 1900 meters above sea level (masl).

The escarpment gives way to the Lowveld towards the east, consisting of areas ranging from 763 masl close to the escarpment, to a general height of 600-439 masl throughout the rest of the municipality, with a general decline from west to east.

Topography is an important contributing factor with regards to the ability of an area to deliver ES (Rodrıguez and Agard, 2005), but another important factor is its ability to promote the general resilience of a landscape to certain negative drivers (Driver, *et al,* 2012). The topography of Maruleng, combined with other socio-political drivers, like the Apartheid formation of homelands for instance, meant that people settled in the areas close to the escarpment where amongst other factors, their demand for direct ES could be provided for by the environment. An example of this is the area's ability to provide water, as will be made explicit in the ES Demand section.

MAP 6: TOPOGRAPHY
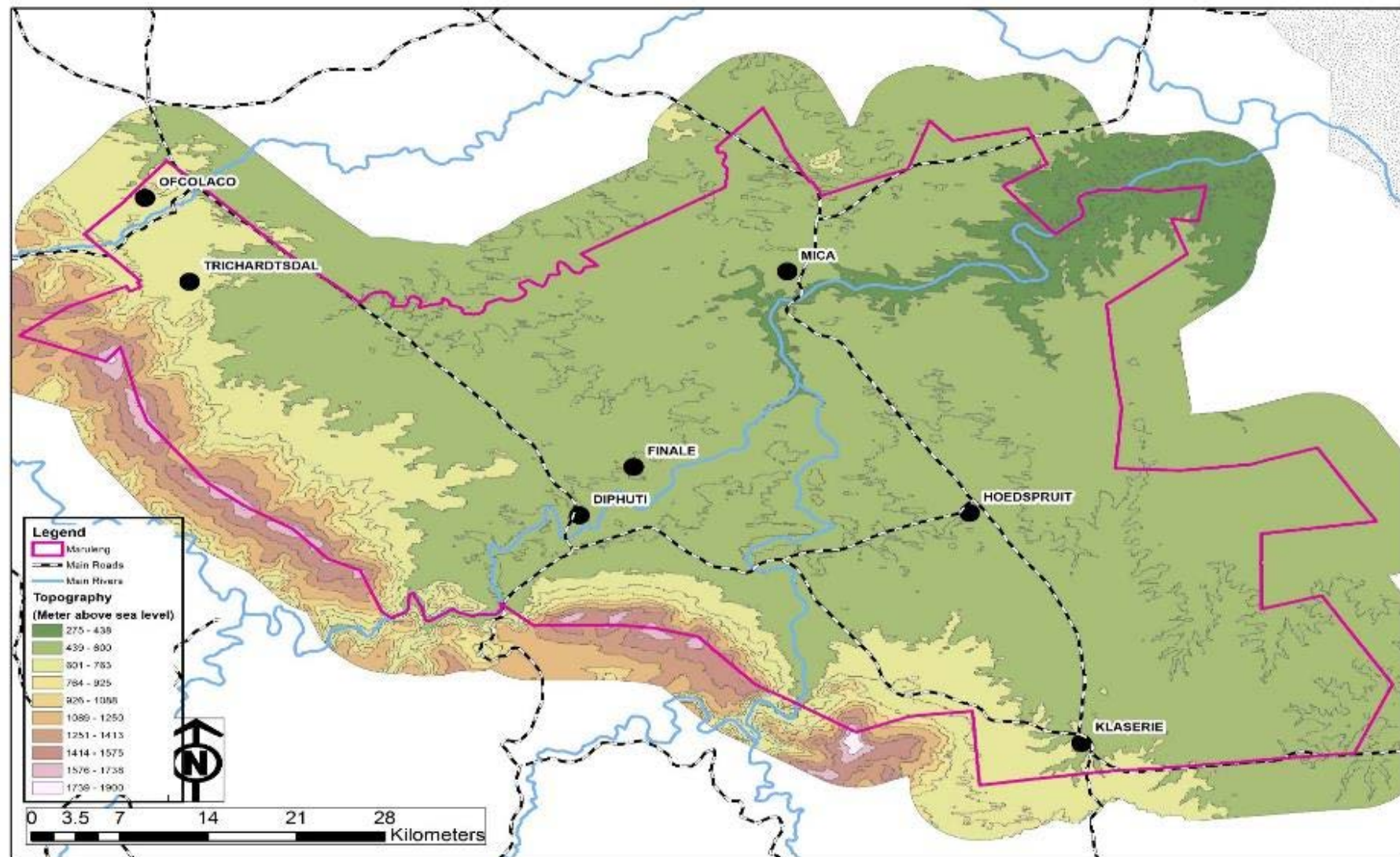
6.1.3   Biomes

Maruleng contains three different biomes, predominantly consisting of savannah in the foothills and Lowveld area over undulating plains & extremely irregular undulating plains (Evironomics and MetroGIS, 2009), as can be seen in the map showing where these biomes occur below. The Forest areas mostly occur on the east facing mountain slopes of the western escarpment and some natural forest patches remain along the Blyde river before it enters the Olifants. This is recognised as a vulnerable ecosystem by SANBI's B-GIS (2014) site. The vast majority of Maruleng however consists of
.

Savannah (as can be seen on the map below (light green), as well as in the Biomes table below, with the map also indicating some grasslands occurring in the area, mostly at higher altitudes. Different biomes contribute different ecosystem services (Rodrıguez and Agard, 2005), in combination with different situations (environmentally and anthropogenically) but unfortunately this paper does not go into detail about these due to limited information, it would however be of future interest to identify the certain bundle of ecosystem services biomes produce under certain environmental circumstances

TABLE 3: BIOMES (SOURCE: SANBI, 2004)

BIOMES

NAME	Size
FORESTS	21.7ha (0.01% of municipality)
GRASSLAND	10013.9ha (3.09% of municipality)
SAVANNAH	314394.6ha (96.91% of municipality)
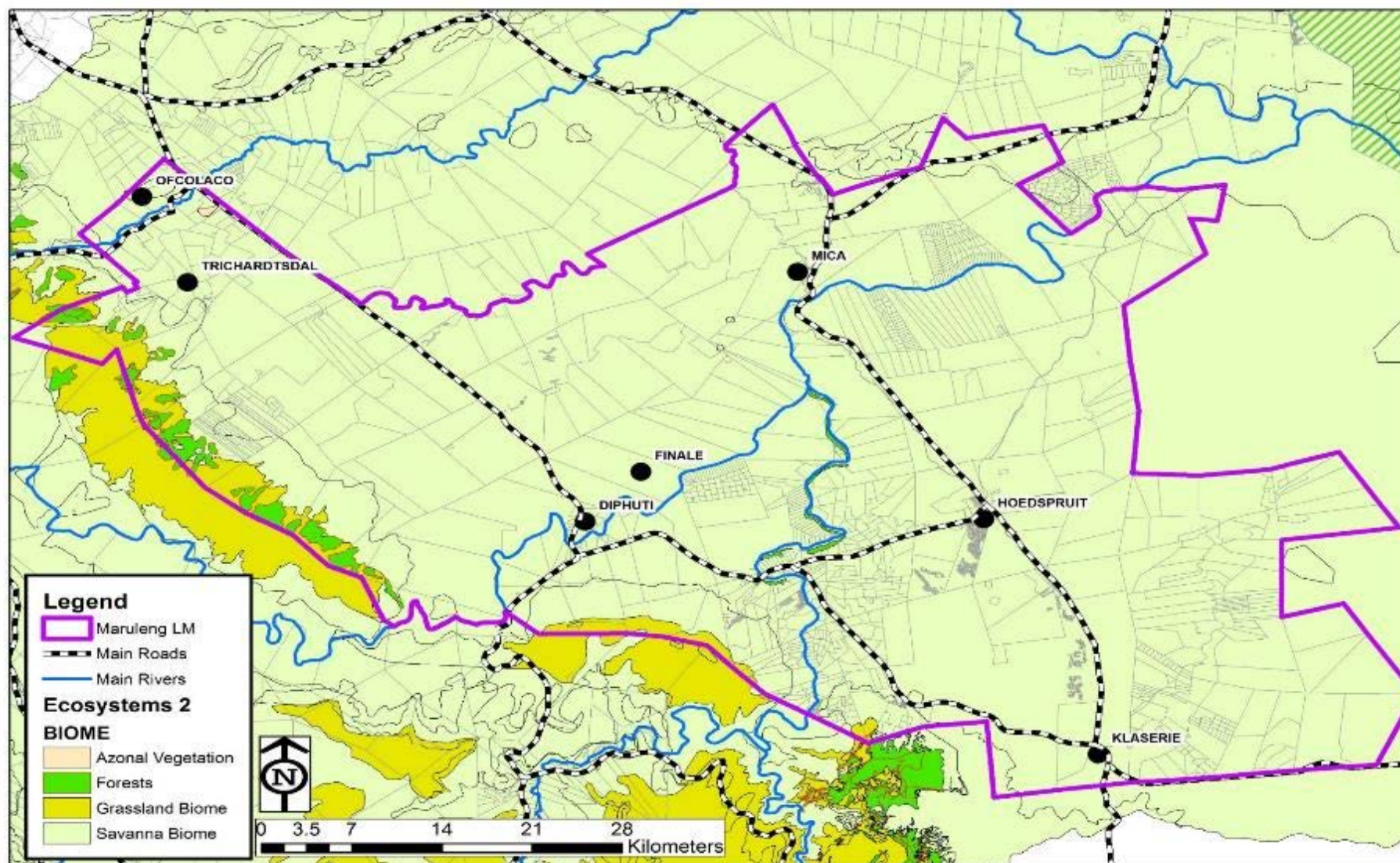
Map 7: Biomes

6.1.4 Threatened Ecosystems & key ecosystem production areas

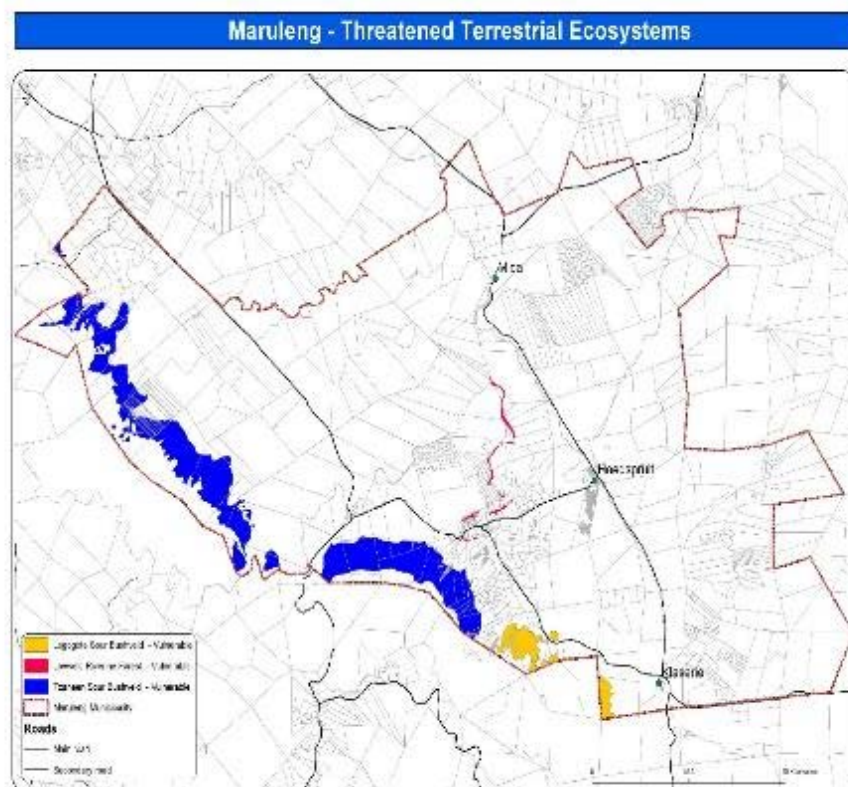TABLE 4: THREATENED ECOSYSTEMS *(SOURCE: SANBI, 2004)*

Critically Endangered (CR)	
There are no critically endangered ecosystems in Maruleng Municipality	
Endangered (EN)	
There are no endangered ecosystems in Maruleng Municipality	
Vulnerable (VU)	
Name	**Size**
Legogote Sour Bushveld	2177.8ha (0.67% of municipality)
Lowveld Riverine Forest	403.5ha (0.12% of municipality)
Tzaneen Sour Bushveld	17223.8ha (5.31% of municipality)

There are in total 3 vulnerable/threatened ecosystems in Maruleng covering 19805 hectares (6.1% of the total municipal area) as can be seen in the above table (SANBI, 2004). Below is a map of the threatened ecosystems, as well as a map showing the key Strategic Water Resource Areas. These two maps are put side by side to show the clear overlap between them. The map showing the areas supporting climate change resilience also highlight the escarpment areas these maps below do, as very important areas.

.

This correlation is a clear indication that the escarpment area is key to keep in a natural state through labelling it a Critical Biodiversity Area (as done through the Limpopo Conservation Plan V2 (2013). For land use planning these areas are thus key to recognise and do as much as possible to protect from development, as it is not only a key area as far as the above mentioned reasons, but it is also very important in terms of ES delivery to the villages just below this escarpment area.

When looking at development planning these areas are pristine due to them being unreachable but from interviews (Malepe, 2014; Uys, 2014) it emerged that the competition for land and feed due to the high density and rural livelihoods below the escarpment, has created a scenario where cattle have started grazing higher and higher up the mountains.
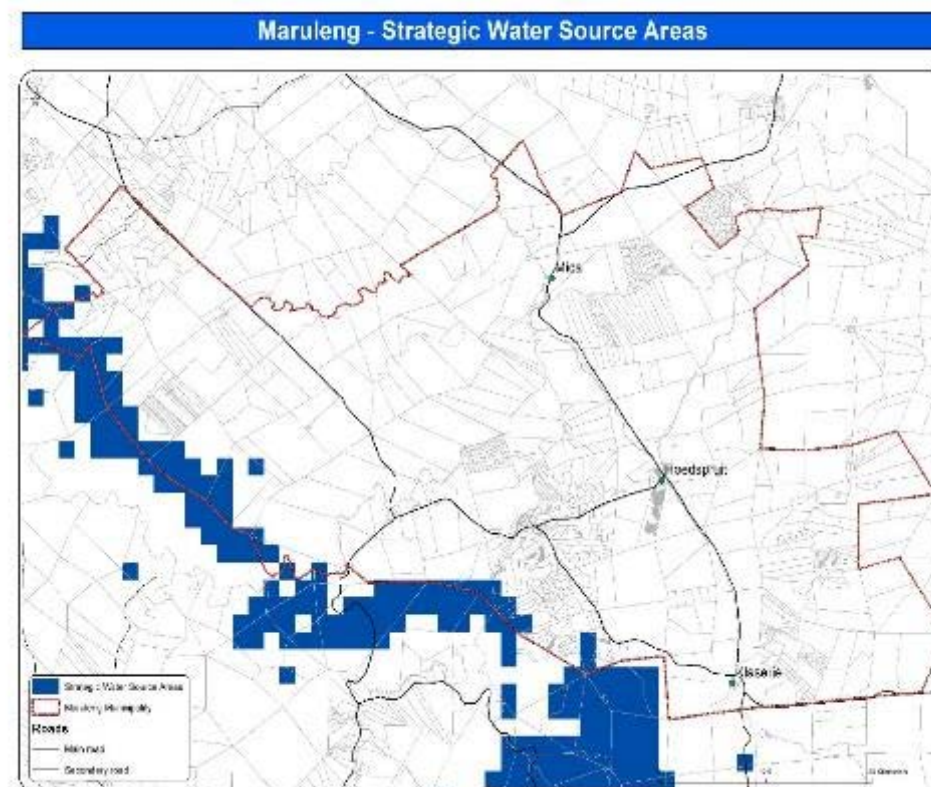
Even though then limited land development is occurring around some of these threatened terrestrial ecosystems and strategic water source areas along the escarpment, other land use activities might impede the ability of these key areas to produce ES for the communities below the escarpment and people further down into the Maruleng municipality.

6.1.5 Water Related Ecosystem Service Provision

MAP 9: WATER RELATED ECOSYSTEM SERVICE FEATURES
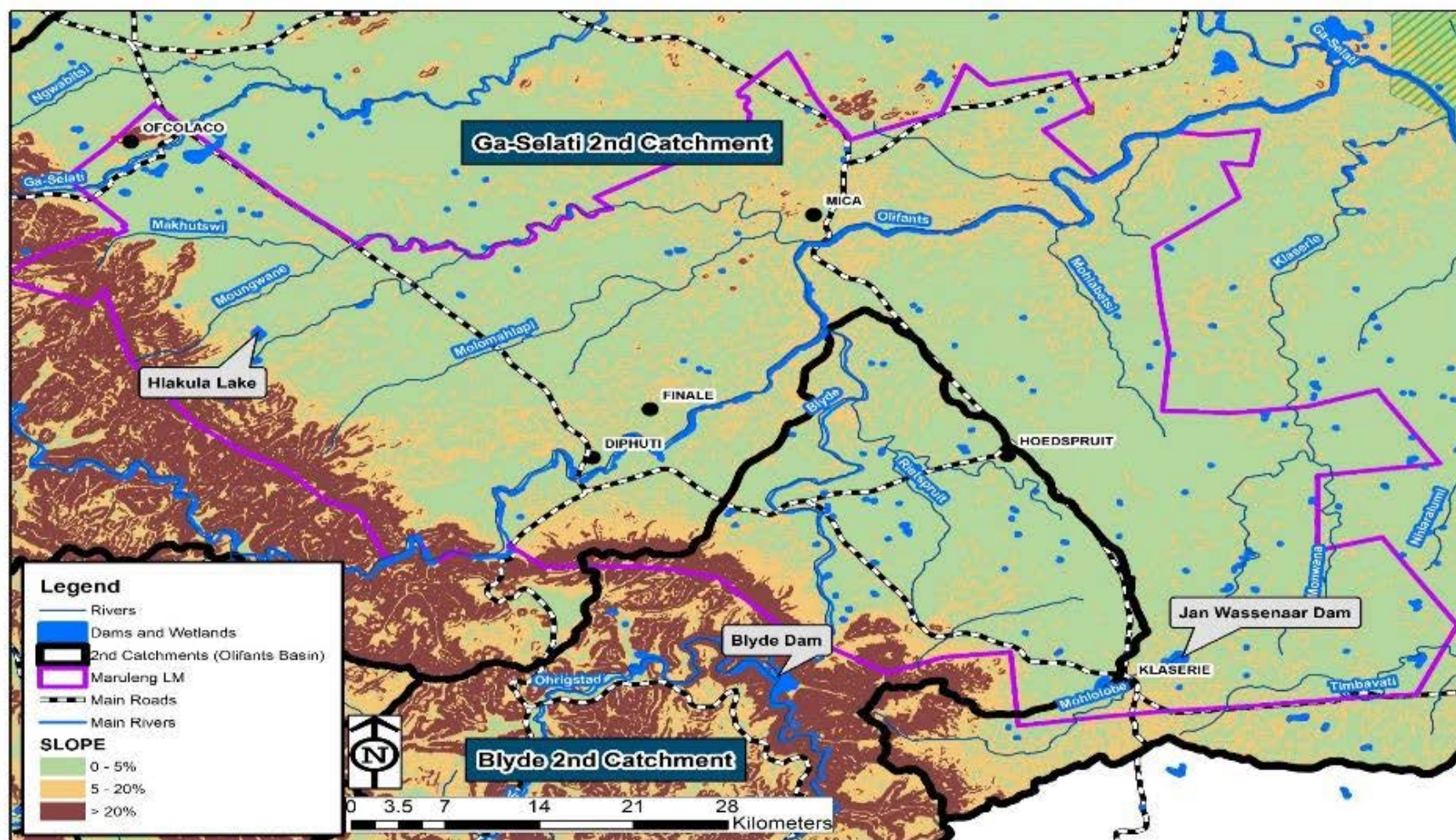
RIVERS

Rivers play a key role in the landscape, acting as the life arteries running through terrestrial ecosystems. They insure high biodiversity persists, promote general ecosystem resilience through promoting diversity, and also provide key services to the people (Butler et al., 2003). Water related ecosystems is highly diverse and extremely important for human development, therefore some information on the rivers, as main source of water related ecosystem services, will be provided.

Maruleng lies completely within the Olifants River Catchment and, according to the SANBI B-GIS website (2004) the main rivers in the municipality is as follows (main rivers size wise indicated in brackets):

- Blyde (main 2nd Catchment River) B

- Ga-Selati (main 2nd Catchment River) C

- Klaserie AB

- Makhutswi C

- Olifants(Main Primary Catchment River) D

- TImbavati C

In addition to the main rivers stated by SANBI B-GIS site, the rivers running from the escarpment on the Western side of the municipality has been included because it originates from a key water strategy area and also because the demand for ecosystem services from that rivers is extremely high due to the large amount of people living below the escarpment area (About 88% of the total Maruleng population of 94 000) (van Jaarsveld, 2014).

These rivers are:

- Molomahlapi AB

- Moungwane Z

- Malhutswi C

Please note that the Present Ecological state rating symbols given to each of these rivers' status as can be seen by the symbol behind each above comes from the NFEPA, 2010. Below can be seen a Table with the ratings and what these ratings imply:

TABLE 5: ECOLOGICAL RIVER CATEGORIES (SOURCE: NFEPA, 2010: 51)

ECOLOGICAL CATEGORY

SYMBOL	Description
A	Unmodified, natural.
B	Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.
C	Moderately modified. A loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged.
D	Largely modified. A large loss of natural habitat, biota and basic ecosystem functions have occurred.
E	Seriously modified. The loss of natural habitat, biota and basic ecosystem functions are extensive.
F	Critically/Extremely modified. Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat and biota in the worst instances the basic ecosystem functions have been destroyed and the damage is irreversible
Z	Rivers C-F where no data and no expert opinion is available, modelled based on percentage natural land cover.

Of these rivers the most important ones when relating to ecosystem services provided to the Maruleng area is the last named three (smaller)- and the Olifants- river due to the high demand for river related ecosystem services in the areas they run through, as can be seen when analysing the StatsSA census data of 2011 by Ward level done in the Ecosystem Services Demand section below.

The quantitative data is backed up by some very good qualitative data as well with the interview with six environmental monitors (2014) living in the villages beneath the escarpment stating the importance of these rivers and the ecosystems services related through that to villages just below the escarpment. Overconsumption and unsustainable use is an issue though.

DAMS AND WETLANDS AND GENERAL WATER SUPPLY

According to SANBI's B-GIS website (2004) the Maruleng area contains some 612 wetlands covering 1381.4ha (0.4%) of Maruleng Municipality. Wetlands often provide key ecosystem services to people like filtering water, decreasing the flowspeed of rivers and acting as flood control mechanism during high rainfall scenarios. In Maruleng, according to

an interview held with the environmental monitors (2014) it was confirmed that some villages (Santeng and Willows) collect water from wetlands and dams in the area. The statistical data from the Census of 2011(StatsSA, Statistical Release, 2012) backs this up, as will be made explicit in the ES Demand section below.

THE LARGER PICTURE

When looking at the situation more systemically the importance of the Olifants river and Ga Selati river (even though it only cuts through the North Western corner of the municipality) becomes evident when looking at downstream scenarios. The Olifantsriver runs through Maruleng to the Ba-Phalaborwa municipality and then enters the Kruger National Park, the effects of water usage and pollution is therefor very important to control in order to help protect the pristine ecosystems found in this icon of South African nature conservation, the Kruger National Park. Further downstream the Olifantsriver enters Mozambique, and by international bilateral agreements South Africa needs to provide at least the Ecological Reserve Requirement[7]* to Mozambique, as well as making sure the water is of a certain quality.

In the same way the effects of upstream use also influences what happens in Maruleng, and upstream users have a responsibility to Maruleng's citizens. This is however problematic currently with the upper catchment of the Olifants being one of the most intensely mined areas in South Africa (Evironomics and MetroGIS, 2009) causing the Olifantsriver to have a PES rating of D (Largely modified. A large loss of natural habitat, biota and basic ecosystem functions have occurred), before the most pristine river in the catchment (the Blyderiver with a rating of AB) enters it in the middle northern area of Maruleng, increasing its PES state to C through insuring some dilution of the pollution happening upstream occurs (NFEPA, 2010).

7 The Ecological Reserve Requirement is a minimal amount of water needed. to not necessarily protect the aquatic ecosystem per se, but to maintain aquatic ecosystems in such a way that they can continue to provide the goods and services to society. The Reserve (ecological and basic human needs) is the only right to

water; all other water uses are subject to authorizations (Rapid Ecological Water Requirements assessment for the Crocodile West and Marico catchments, DWA: 02 & National Water Act 0f 1998, South Africa)

6.2 Ecosystem Service Demand

There are four main spheres of ES: Regulating ES; Provisioning ES; Cultural ES and Supporting ES. This sector tries to cover at least the one or two most prominent of these spheres under this demand section for Maruleng.

6.2.1 Provisioning ES

Ecosystem service demand is not easily quantifiable, especially over a broad area, for this reason this provisioning section will only focus on specific aspects that has clearly quantifiable data. For this the Census of 2011 (StatsSA, Census 2011 Statistical Release, 2012) had some utilisable data. The three Ecosystem Service demand categories looked at are as follows:

- Energy for heating

- Energy for cooking

- Water demand

In order to analyse these effectively at a Ward level scale it was simplified into two main categories:

- Direct Local Natural Resource/Ecosystem Service Dependency

- Other sources that is not of a direct nature

These categories were chosen as they help create a clear line one can draw to better understand who is possibly vulnerable or not. Vulnerability in this instance focusses on the level of direct natural resource usage because people who are directly dependant on natural resources tend to be more vulnerable/less resilient to negative environmental drivers, and needs to be clearly recognised in order to insure that land use and spatial planning occurring takes their plights into consideration and makes room to incorporate their needs into the planning processes. Below is a chart showing direct natural resource (ecosystem service) dependencies per ward for the three Provisioning categories (Heating, Cooking, Water Use) mentioned above. The amount of people per ward, the amount of people from that ward using a provisioning service and the percentage of direct natural resource dependency per ward is shown.

TABLE 6: DIRECT NR USAGE PER WARD (COOKING, HEATING, WATER) (SOURCE: STATSSA SUPERWEB, 2014D, 2014E, 2014F)

| Ward	Total Ward Population	Direct NR Usage (Heating)	% of Ward Dependant on NR for Heating	Direct NR Usage (cooking)	% of Ward Dependant on NR for Cooking	Direct NR Usage (Water Source)	% of Ward Dependant on NR for Water
1	5471	596	11%	613	11%	2077	38%
2	8219	4240	52%	4682	57%	4979	61%
3	6859	5562	81%	5966	87%	3560	52%
4	6298	2894	46%	5760	92%	3048	48%
5	5927	5022	85%	5509	93%	3334	56%
6	7187	5446	76%	5672	79%	6340	88%
7	6183	4640	75%	5625	91%	4538	73%
8	7668	6939	90%	7014	92%	7092	92%
9	6368	3667	58%	3760	59%	823	13%
10	6647	4548	68%	5388	81%	4944	74%
11	8792	5463	62%	7049	80%	3953	45%
12	8259	4108	50%	5974	73%	3980	48%
13	6084	4070	67%	5160	85%	4493	74%
14	4659	3393	73%	3565	77%	2207	47%

ENERGY FOR HEATING
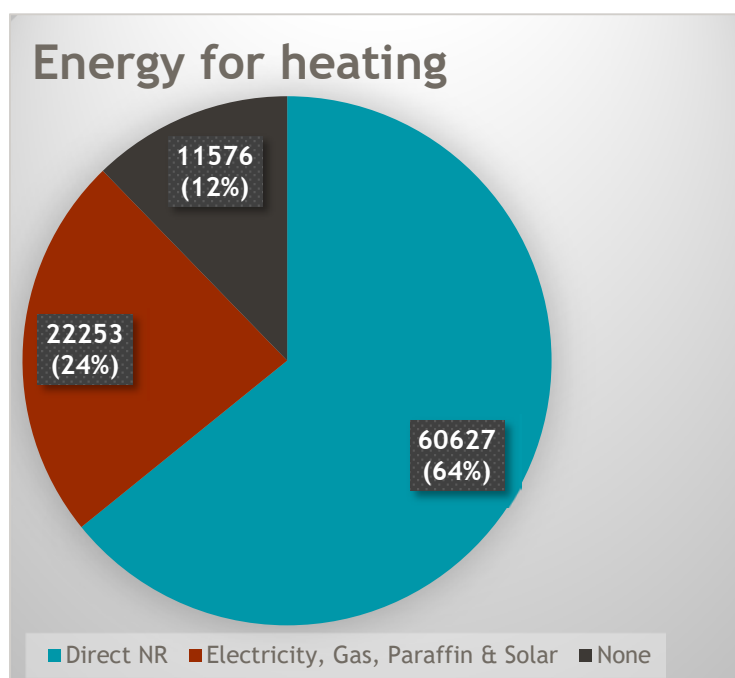
Figure 9: Energy for Heating – Entire Maruleng

Direct NR refers to direct consumptive natural resource usage. Of the 60627 people in Maruleng falling within the Direct NR category 60567 use firewood and in the electricity, gas paraffin & solar category the vast majority uses electricity (21356). There is quite a large number of people in the municipality that does not use any form of heating, this is due to the temperate climate thus there is no demand, with also a possible lack of resources causing some people to simply not have access to any source of heating.

Below is a Dot Density map representing the direct natural resource usage dependency on ES such as firewood and animal dung for heating purposes in the Maruleng area. Each dot on the below map represents 30 people directly utilising natural resources for heating purposes. The densities was done according to ward level, with a massive demand clear for all the wards (3-14) along the escarpment where the traditional areas exists.

MAP 10: DOT DENSITY ES DEMAND MAP FOR MARULENG, PER WARDS- ENERGY FOR HEATING
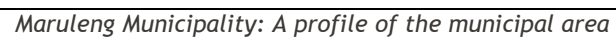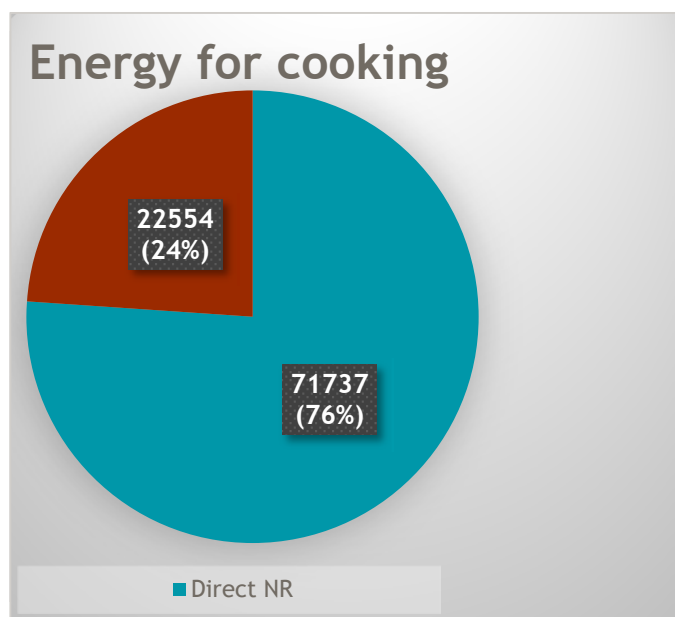
ENERGY FOR COOKING

Figure 10: Energy for Cooking – Entire Maruleng

Similarly as in the energy for heating section above the Direct NR category contains Wood and Animal Dung with wood making up the vast majority of this (71523) primary consumption pattern. Below is a Dot Density map representing the direct natural resource usage dependency on ES such as firewood and animal dung for cooking purposes in the Maruleng area. Similar to the above Energy for Heating section, the most demand lies in the traditional areas along the escarpment. The fact that the vast majority of the population resides in that area might however create a disillusionment with the percentage people of the area actually dependant when analysing the data at ward level, and therefor Table 6 has been

included on page 35. It indicates the percentage people of each ward dependent on natural resources. An example here is Ward 08 of which 92% of its residents are directly dependant on direct natural resource usage for cooking. It is a Ward under severe vulnerability with its people also 90% dependant on direct natural resource usage for cooking and 92% for water. From a spatial planning perspective it makes this ward for example extremely important to understand as a whole SES, as all development around that area will have to be done in such a way as to not disturb the ability of the natural environment in that area, in order not to disturb the production of ES on which these highly vulnerable people are highly dependent..
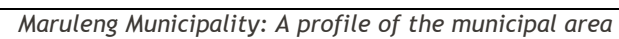
WATER DEMAND

Only a limited amount of people receive piped water in the municipal area, showing the direct dependence of the people of the municipality on the rivers, wetlands and dams in the area. The biggest dam in Hoedspruit is the Klaserie dam which was traditionally used for the agriculture in the area. Because of the area being a quarantine zone for buffalo and the lack of fertility of the area and profitability of the wildlife and tourism economy the farming in the area was stopped (Diphororo Development and LEDET, 2013). This major dam as a form of ES supply, is however far from where the biggest demand for direct water utilisation lies (the western escarpment area). Hoedspruit, the economic and administrative hub of the area receives water from the Blyderiver. The municipality's water management schemes is however failing at the moments with interviewees (Du Preez, 2014; Uys, 2014) of the area reporting that the town itself have been receiving water from the airforce base (Drakensig) about 1km north of the Hoedspruit town.
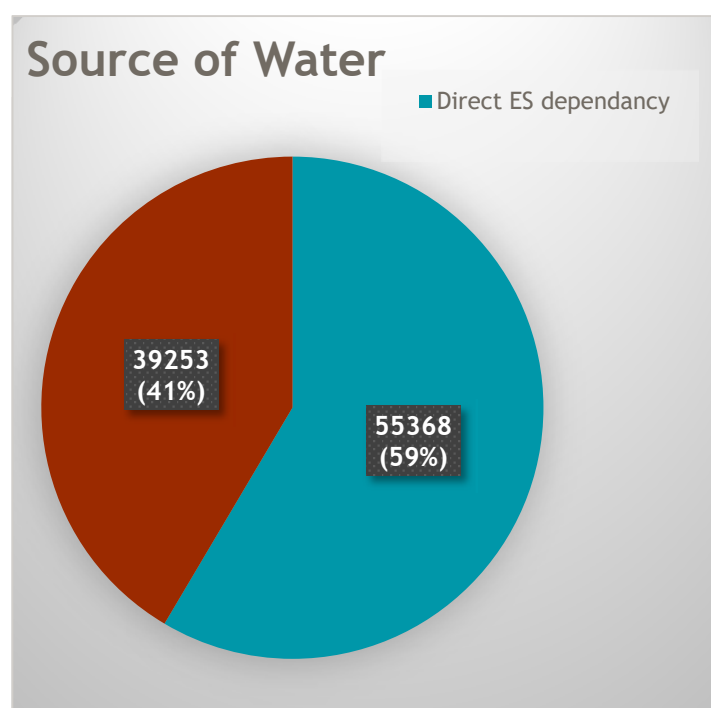

Figure 11: Source of Water – Entire Maruleng

Above is a figure showing what source of water is being utilised by the people of Maruleng. For the purpose of this paper it has been divided into Direct Ecosystem Service Dependency and Municipal- & Other- Schemes. The prior consists of resources taken directly from the environment on a regular basis, including water from boreholes; raintanks; river; stagnant dams and springs. The latter consists of water from municipal schemes; vendors; tankers and the 'other' category.

As can be seen from the figure Direct ES dependency for water lies at 59% for the municipality's population. This is a substantial amount, with the map below the graph spatialising where most of these people and their demand lies. The map makes it clear that most of these people occur in the informal villages below the escarpment.

MAP 12: DOT DENSITY ES DEMAND MAP FOR MARULENG, PER WARDS - WATER USAGE
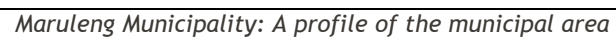
6.2.2   Protected areas as a Cultural ES

MAP 13: PROTECTED AREAS AND CONSERVATION LAND USE (SOURCE: HOLNESS ET AL., 2014)
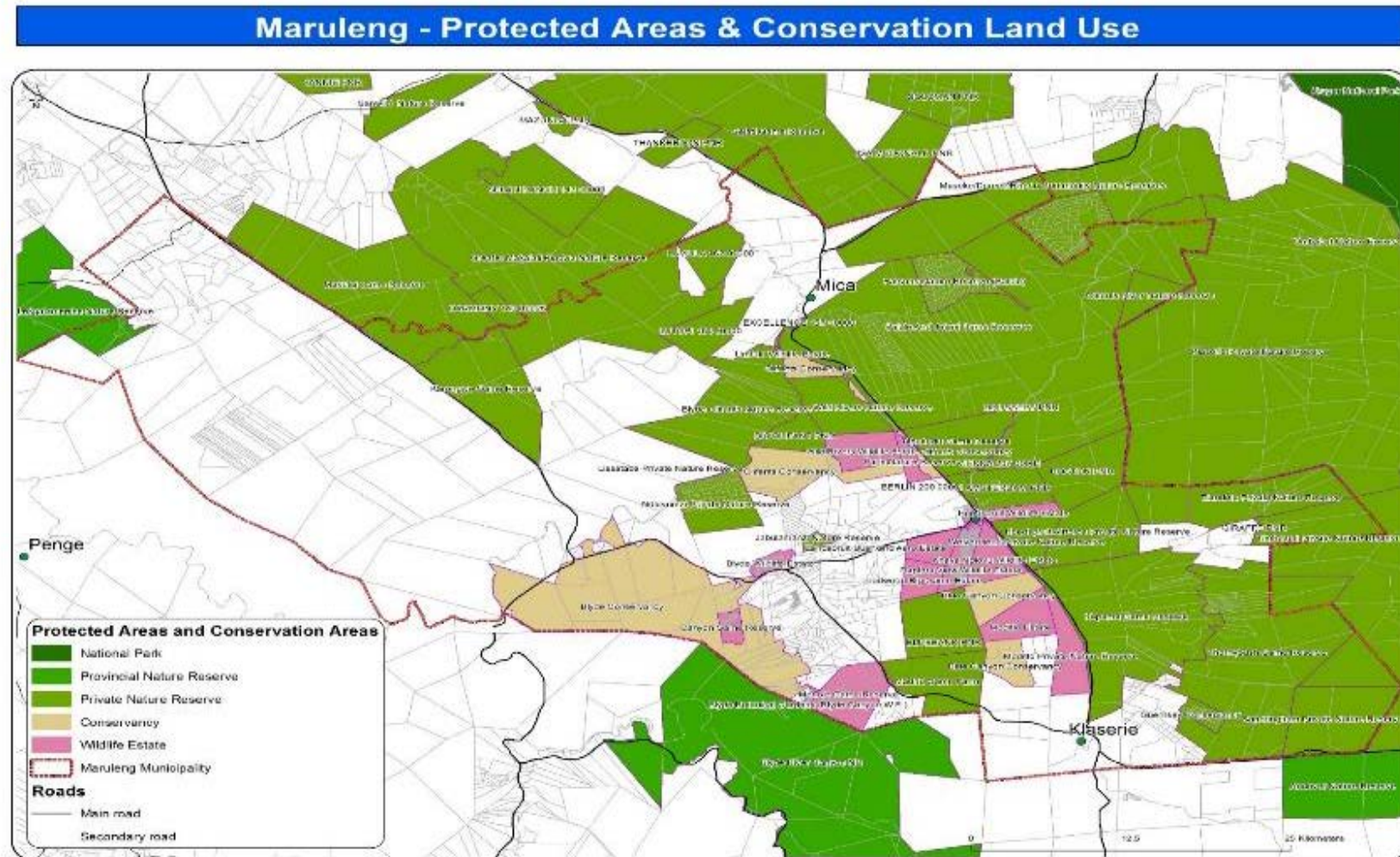
Protected areas are put under demand for ES because it is one of the main form of Cultural ES demand in the Maruleng area. Above is a map of the protected and conservation network (PACN) within and bordering Maurleng Municipality. These areas have been ground truthed and mapped by AWARD (2014) as input into Maruleng Municipality's updated SDF document, aimed to be released late 2014. The different type of PAs are indicated as it gives a clear indication of the economic beneficiary types emerging from it as a form of ecosystem service. It is clear that PAs tend to be most prominent in the eastern side of the municipality due to the high population densities on the western side, creating different land use scenarios, as well as the PAs mostly being east due to the close proximity of this area to the Kruger National Park. As discussed in the economic section of this status quo report the PAs are the dominant driver of tourism, contributing a great deal to the local economy (Quantec, 2015).

The different types of protected areas all contribute to the economy through different land use purposes. Below is a very brief summary of what each of these contribute:

■ National Parks and Provincial Nature reserves: These are fully protected areas which contribute through mainly tourism, but also through other methods such as selling of game.

■ Private Nature Reserves: These are the main drivers of the tourism industry in Maruleng, with it also being the most prominent form of PA in Maruleng as indicated in the above PA map. The area has a lot of high end private nature reserves that cater for particularly international tourists. Some limited hunting may also occur in these areas to help keep game numbers in check.

■ Conservancies: Conservancies are declared as being able to have a wide variety of land use activities which stretch from tourism to hunting and in some cases, like that of the Blyde Conservancy on the eastern side of Maruleng, acting as game breeding areas.

■ Wildlife Estates: Wildlife estates is a new kind of development quite unique to the Lowveld area, with Maruleng having around 20 wildlife estates. No academic writing could be found on wildlife estates, but AWARD (2014), doing some work it, describes it as an informal protected area (not necessarily having a formal proclamation status), with a residential land use value included through having housing plots on it (stretching in density from 0.5-21 Hectares). Wildlife estates have similar characteristics to those of the more well-known golf estates and gated communities found in South Africa. It is usually a fenced in area containing game, from basic antelope and other herbivores (as for example in the Hoedspruit Wildlife Estate) to more upmarket ones like Moditlo containing the big five (lion, leopard, buffalo, elephant and rhinos). Wildlife estates are similar to, and possibly originated from shareblocks which usually is blocks of land up to 21 hectares in size, with housing on it) owned within a nature reserve by private owners. For tourism the wildlife estate's role is yet to become clear though examples like the Zandspruit Aero and Bush Estate (which has its own aeroplane runway) is a clear indication of the trend taken by wildlife estates as being a getaway for people trying to escape from the bustling city life to the "wildlife Haven" that is the Lowveld in which Maruleng is nestled. Furthermore these wildlife estates have several lodges within them that makes up a portion of the beds per night when looking at the tourism industry in the area.
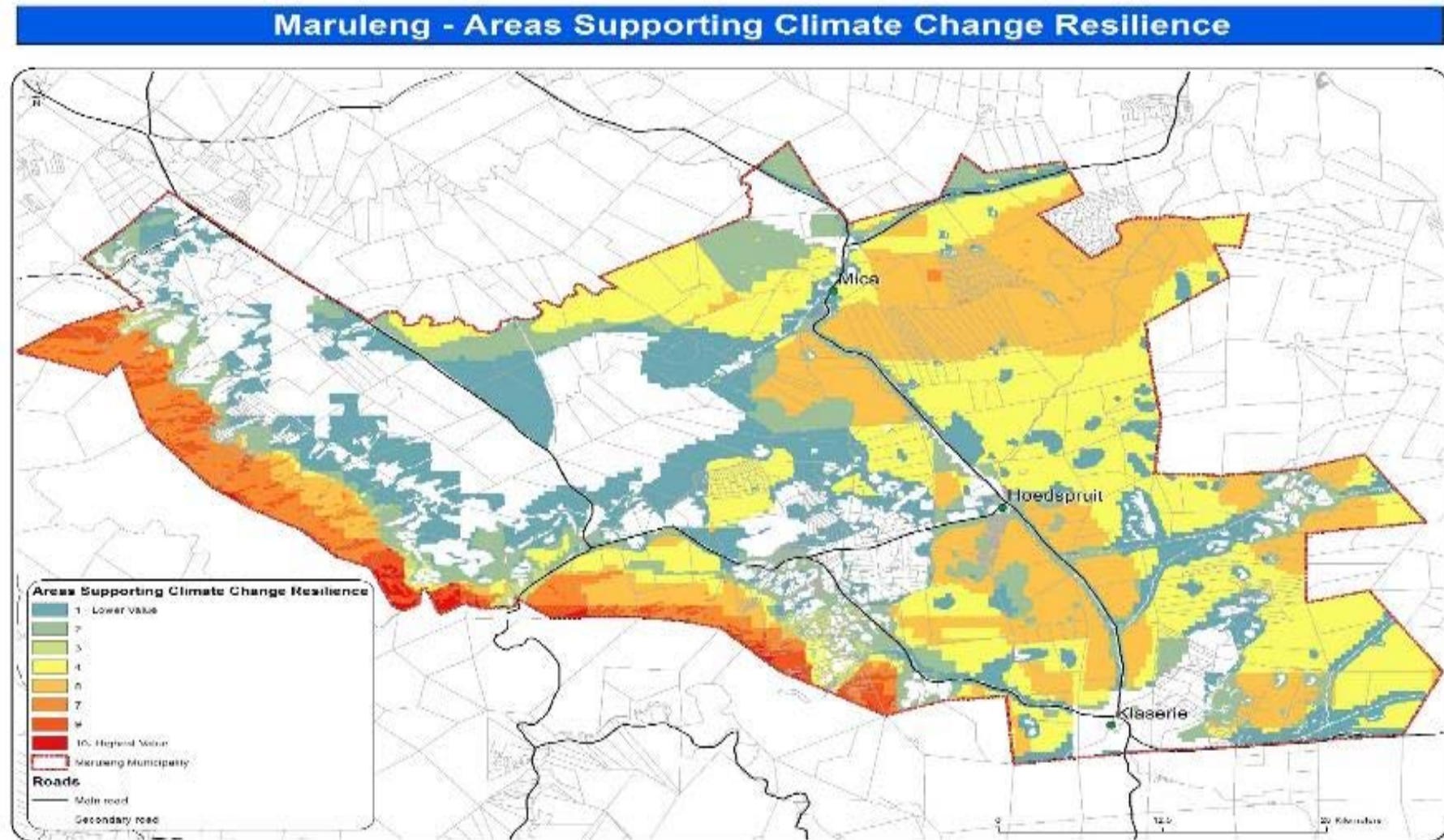
6.2.3 Climate Change Resilience as a Regulating ES

Climate change is a major driver in the Lowveld area. It is predicted that the area will be heavily affected by climate change with some predictions claiming a possible temperature rises of up to 2 °C in the future (Desmet, *et al*, 2013). It is also claimed that the area will also become drier in the winter months and wetter in the summer months, overall receiving more rain, especially around the areas with high altitudinal differences, like the escarpment around the western border of Maruleng (AWARD, 2014b). Climate change regulation thus becomes an

ecosystem service that's demand will increase rapidly in the near future, and for this reason it was included in this paper. Below is a map that highlights areas around Maruleng that will promote resilience to climate change if in a natural state. It is clear that the escarpment will play an important role, due to the various in altitude occurring there, whilst the northeastern area where several private game reserves occur also acts as an important buffer area that will be less affected by climate change.

Maruleng - Areas Supporting Climate Change Resilience

The areas that could support climate change were chosen with regards to the criteria in the below column, as guided by a national study done by Driver, *et al* (2012)

TABLE 7: KEY FEATURES PROMOTING CLIMATE CHANGE RESILIENCE (SOURCE: DRIVER, ET AL 2012)

KEY FEATURE	REASON
RIPARIAN CORRIDORS AND BUFFERS	Increases connectivity in landscape
AREAS WITH IMPORTANT TEMPERATURE, RAINFALL AND ALTITUDINAL GRADIENTS	Provides the shortest possible movement paths as required for a species or ecosystem to remain within its acceptable climate range
AREAS OF HIGH DIVERSITY	These are areas where relatively high numbers of biomes, vegetation groups or vegetation types occur in close proximity, which supports biodiversity's adaption capacity
AREAS OF HIGH PLANT ENDEMISM	These are areas where species have survived previous eras of climate change, and hence are likely to be very important for supporting future biodiversity adaptation capacity Generally these areas also contains a high diversity of species, many endemic to the area concerned
REFUGE SITES (INCLUDING SOUTH-FACING SLOPES AND KLOOFS)	These sites tend to be wetter and cooler that the surrounding landscape, and represent key shorter term refuge which allow species to persist in regions
PRIORITY LARGE UNFRAGMENTED LANDSCAPES	These include existing protected areas as well as large areas identified in the National Protected Area Expansion Strategy The ecological processes which support climate change adaptation are more likely to remain functional in unfragmented landscapes than in fragmented ones

Areas received highest scores where a number of these features overlapped, lower scores where there was not much overlap and no score where specific features supporting resilience to climate change impacts were not identified. Looking at this map the high importance areas lies all along the escarpment. This area provides a lot a lot of climate change resilience because of the gradient changes found in the area, with regards to important temperature, rainfall and altitudinal gradients; it being an area of high diversity; It having prominent refuge sites and having been untouched by development thus acting as an unfragmented landscape.

It is important to note that Maruleng (as being part of Mopani District Municipality) is prioritized for a climate change study by SANBI. Mopani and another district municipality in the Northern Cape has been selected for this process that also includes a vulnerability study (Manoko, 2015).

6.2.4 Carbon sequestration as Regulating ES

With the majority of the Maruleng municipality being under natural savannah vegetation an important, less direct ecosystem service, carbon sequestration, although not quantified yet, is also a very important part of what the largely natural state of Maruleng, provides its people. Quantifying this accurately would be highly time and skill intensive, instead, a rough sum has been made, using the assumption that the carbon sequestration level of the savannah found in Maruleng is similar to that found in an area in northern Australia where the study has actually been done. This six year study from 2001-2006 in the Howard Springs ecosystem in Darwin revealed that per hectare the savannah found in that area was able to absorb more or less 2 tonnes of carbon per hectare per year. This number calculated in the carbon absorption from vegetation and soils and the emissions of plants, animals, and the veldfires frequenting the area (Chen et al., 2003). The savannah is similar to that of the Maruleng area in some sense but contain less shrub and bushes, having more trees and grass. The area is also less intensively grazed than the savannah found around Maruleng. These are prominent differences but the fact is that this calculation is done on a very broad scale to simply attain a modest idea of what the possible levels of carbon sequestration could hypothetically be.

This drive to quantify the ES emanates from several people in interviews, including Kruger (2015), Biodiversity Manager from LEDET, stating the need for making the value of ecosystems more explicit if progress is going to be made with influencing key people in government to insure better integration of environmental aspects into the local municipal spatial planning level.

The calculation[8] states that 628789.2 tonnes of carbon absorbed by the 96.91% of Maruleng's land area covered by savannah per annum.

The three main shortcomings of the calculation for the derived amount of carbon absorbed, is as follows:

- It is not measured against other land use types thus there is no idea whether savannah actually does allow for better carbon sequestration per hectare than for example the citrus plantations found in the area.

- A lot of variables will differ between the two savannah types (animal occurrence – livestock and indigenous, rainfall patterns and soil fertility, plant type and abilities to absorb carbon, fire frequency etc)

- The SANBI B-GIS data indicates that 96.91% of the land is covered by savannah but this clearly does not calculate in altered land (i.e. farming land, built up land and so forth)

---

[8] *314394.6ha (as per SANBI's B-GIS site) * 2 t.p.a (as per Australian savannah carbon sequestration study) = 628789.2 tonnes of carbon absorbed*

6.2.5 Agriculture as Supporting ES

Agriculture is sustained by several types of ES, but most prominent is that emanating from the Support ES category, like nutrient cycling and pollination. The Maruleng agricultural sector is delineated below into the most prominent agricultural households by category. According to Malepe, (2014) and Fhatanani Management Services (2013) the two biggest sectors, namely Livestock production and Poultry production are both largely subsistence based, showing the large direct dependency of the vulnerable on ES like grazing for animals. Production of other crops and vegetables are largely done by commercial farmers, with the (Maruleng Municipality, 2014a) promoting the area as a major producer of export mango and citrus.
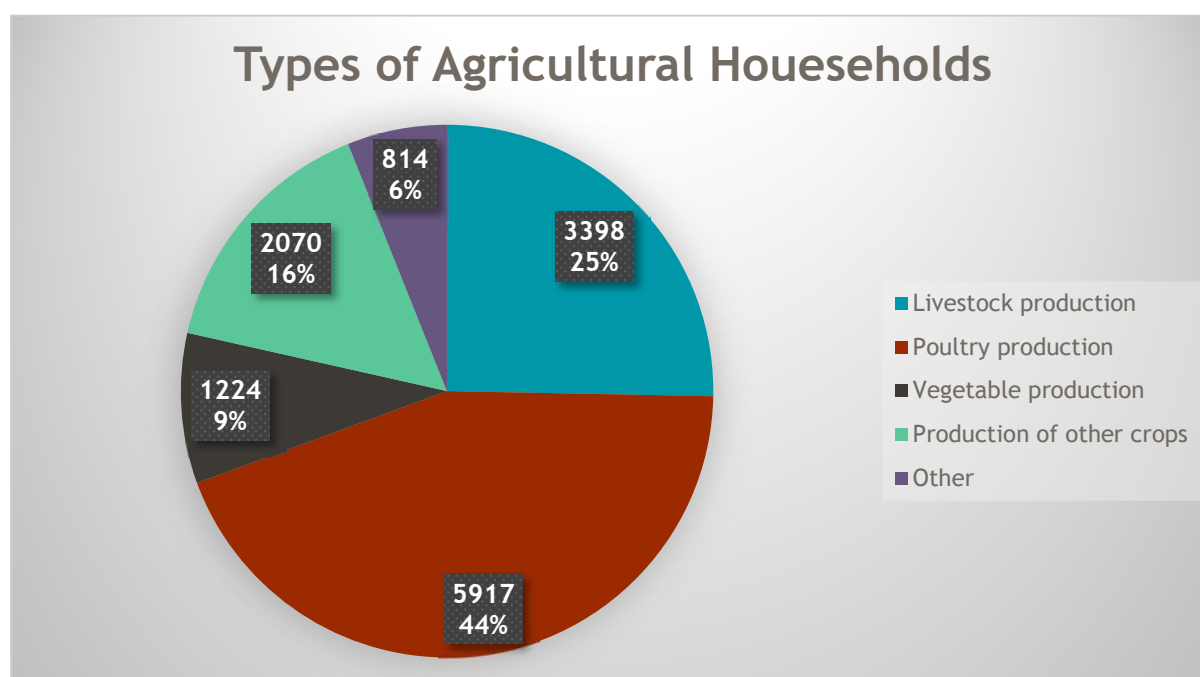

Types of Agricultural Houeseholds

- Livestock production
- Poultry production
- Vegetable production
- Production of other crops
- Other

3398 25%
5917 44%
1224 9%
2070 16%
814 6%

Figure 12: Types of Agricultural Households (Source: StatsSA, Census 2011 Municipal Report, 2012)

7 Political

7.1 Boundaries

Maruleng is the southern most of the 5 Local Municipalities in Mopani Distritct Municipality, situated in the eastern side of Limpopo (Aurecon, 2014). To the east of Maruleng lies Mpumalanga and more specifically Bushbuckridge Local Municipality which in terms of land use is almost entirely private nature reserves, and more east lies Kruger National Park. The part of Bushbuckridge Municipality bordering south of

Maruleng is a former Apartheid Homelands area and is thus heavily populated with rural communities, with the Bushbuckriidge area stretching down to Hazyview, containing well over a million people (Bushbuckridge Local Municipality, 2012.)

The Ba-Phalaborwa- and Greater Tzaneen-Municipalities (both in Mopani) border Maruleng to the north and Lepelle-Nkumpi

Municipality to the west, and the Greater Tubatse Municipality to the south west, both part of the Greater Sekhukune District Municipality of Limpopo. The Greater Sekhukhune area to the west and southwest is also former Apartheid homelands with large rural communities (Sekhukhune District Municipality, 2012). The border between it and Maruleng is the Drakensberg escarpment with Maruleng completely nestled within the Lowveld below the escarpment. The area above the escarpment to the west (Sekhukhune) was also a former homeland with some areas having extremely high population densities and poverty being rife. The area however has a platinum belt running

.

from the south east up in a half circle shape up to the Penge area on the map below, which will possibly see some development in the future if markets are favourable. This is mentioned because it might have some possible effects on the water quantity and quality of the Olifants river running into Maruleng (which provides various ecosystem services to several communities) (Evironomics and MetroGIS, 2009). Ba-Phalaborwa to the north have Phalaborwa as their main town which is a tourism and mining town with the mining in particular creating systemic problems for the Maruleng area, as was discussed in the Technological section.

MAP 15: POLITICAL BOUNDARIES AROUND MARULENG
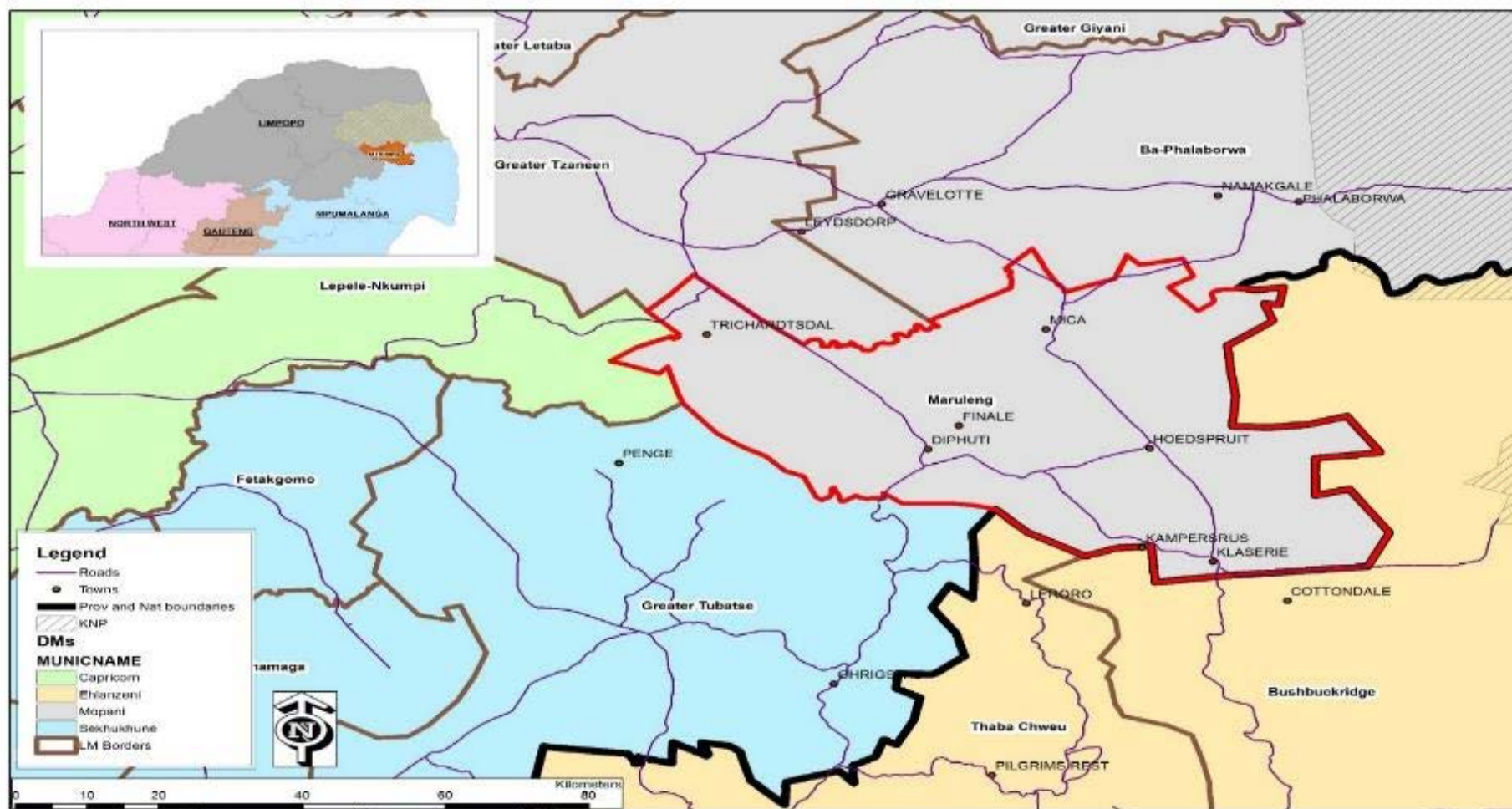
7.2 Authorities

The headquarters of Maruleng Municipality is located in the main town of Maruleng, Hoedspruit, in the western part of the municipality. The municipality however, being situated where it is, creates a situation wherein it often only able to provide limited services to communities in the farther (western) reaches of the municipality, increasing direct dependency on natural resources and thus vulnerability to environmental degradation. This lack of service delivery has been noticed as a repetitive issue throughout all the public participation processes attended for Maruleng Municipality (Maruleng Municipality, 2014d, 2014e).

Maruleng is also home to several traditional authorities, such as the Sekhororo Tribal Authority (Green in below map) in the north western parts and the Mametja Tribal Authority

(Blue in below map) in the mid-western part, whilst a smaller Tribal Authority, the Letsoalo's (Red in below map) also exists around the north western area. These authorities play an important role in the communities even though they are outside of the government spheres. They could play a key role with regards to guiding communities into better land use management and planning processes that could help preserve the production of key ES (Manoko, 2015; Steenkamp, 2015), as will be discussed more in the institutional overview. Their role is also evident from literature with the K2C Man Plan (Diphororo Development and LEDET, 2013) stating that the land within the rural villages are often managed and divided for subsistence farming purposes by the local authorities.

7.3 Land claims

Land claims are a big driver of land use planning and management. Maruleng's IDP (Maruleng Municipality, 2014a) states that large areas in the north-western, central, north-eastern and south-eastern parts of the municipality is affected by land claims. It gets portrayed negatively because it often occurs that areas that come under claim gets degraded due to the knowledge of the owners that the land will be lost to claimants. Another negative element of this dual sided sword is that when an area exchanges ownership the new claimant-owners often do not have the capacity to maintain the levels of ES production, with help from government's side being severely limited most of these areas, through mismanagement, stops producing the optimal amount of ES linked to the basic constituents of wellbeing through agricultural practices. The literature gets supplemented with evidence from an interview with Miss Malepe (2014), coming from and working on the Biodiversity Social

Project run in the area. She revealed a portion of a citrus farm claimed just north of the Oaks area provided a lot of people with work prior to claims, but after the claims and land transfer the area became mismanaged, resulting in several job losses. This is an example of attempts to spread the benefits of ecosystem services, but in the process destroying the ability for the area to produce these ES through mismanagement and according to Miss Uys (2014), lack of guidance and financial support, that was needed by the local people to insure better beneficiation. Hoedspruit, as can be seen in the figure below, has 21 claims of which 05 has been settled. Most of these claims are from the Moletele Communal Property Association (ref 4028) who originally come from the Bushbuckridge area to the south- and Sekhororo (ref 2089)- Tribal Authorities. Other claimants include the Mpuru Letebele (ref 5346); Mokgwanatjane (ref 836) and Baropodi Ba Moraba (1453).

TOTAL NUMBER LODGED	21
TOTAL AFTER CONSOLIDATION	20
TOTAL SETTLED	5
HECTARES RESTORED	16 702.25
HOUSEHOLDS BENEFITED	2820
BENEFICIARIES	19492
CLAIMS OUTSTANDING	16

The authorities under which these lands are claimed are important to involve in order to insure improved land use management processes that will insure the most sustainable utilisation of ES happens. With the original Land Claims window that closed in 1998, reopening through the Restitution of Land Rights Amendment Act from this year (2014) up until 30 June 2019, the beneficiation around the ES produced through land claims for the Maruleng area, as a prominent land use management and planning driver is going to be an interesting lead to follow (Vecchiatto, 2014).

MAP 16: TRIBAL AUTHORITIES (SOURCE: PLAN ASSOCIATES, 2014)
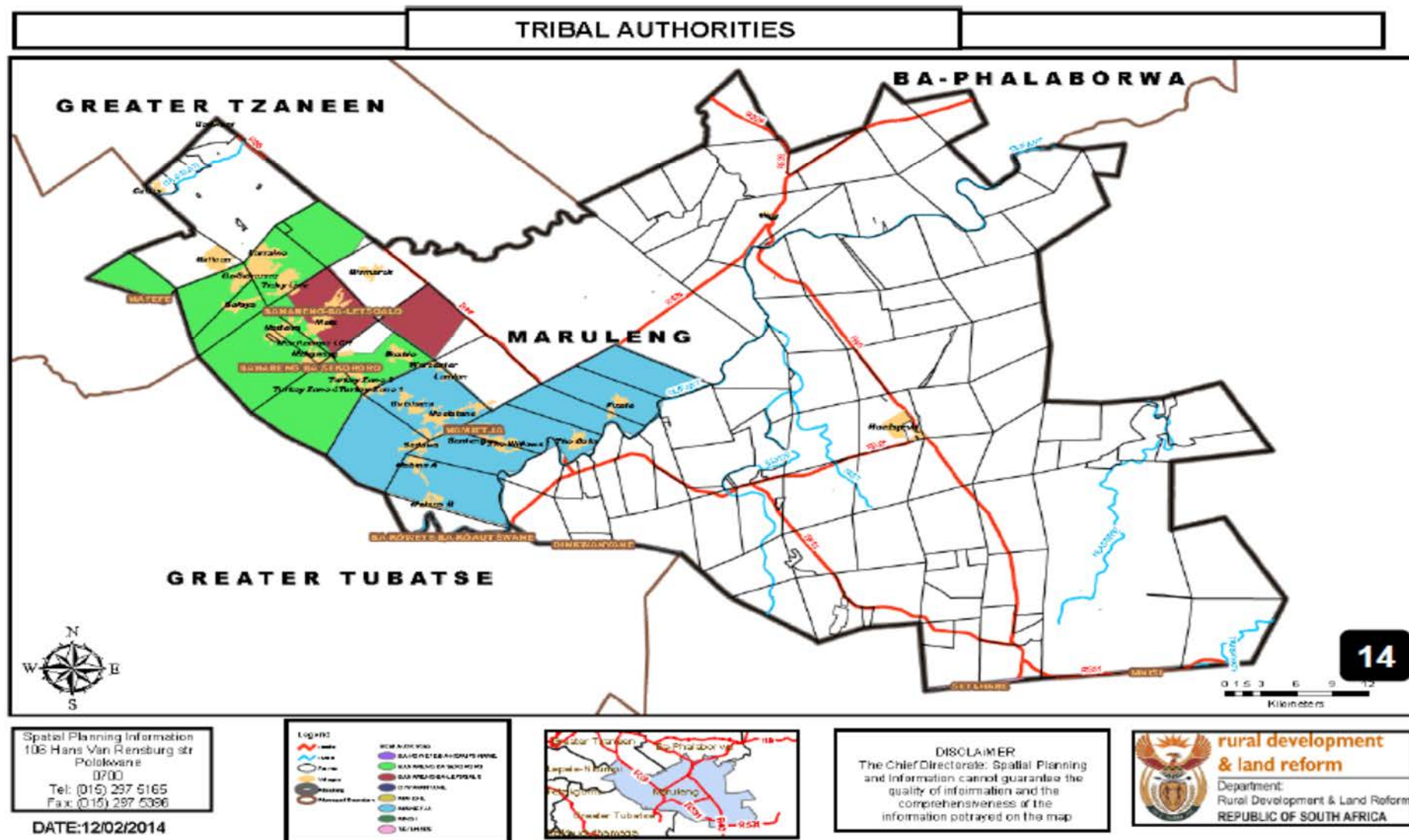
8 Bibliography

Aurecon, 2014. Mopani Draft SDF 2014 (Municipal Planning Document). Mopani District Municipality, Giyani.

AWARD, 2014a. Hoedspruit VSTEEP workshop - characteristics.

AWARD, 2014b. Hoedspruit VSTEEP Workshop - narrative.

Ba-Phalaborwa Local Municipality, 2013. Ba-Phalaborwa IDP 2014-15 (Municipal Planning Document). Phalaborwa.

Bushbuckridge Local Municipality, 2012. Bushbiscridge IDP 2013-14 (Municipal Planning Document). Bushbuckridge.

Business Trust, 2007. Maruleng Profile (No. CIPPN 6). National Department of Local and Provincial Government, Polokwane.

Butler, C., Chambers, R., Chopra, K., Dasgupta, P., Duraiappah, A.K., Kumar, P., McMichael, T.A., Niu, W.-Y., 2003. Ecosystems and human well-being. Ecosystems and human well-being a framework for assessment 71–84.

Chen, X., Hutley, L.B., Eamus, D., 2003. Carbon balance of a tropical savanna of northern Australia. Oecologia 137, 405–416. doi:10.1007/s00442-003-1358-5

Corvalán, C., McMichael, A.J., Hales, S., World Health Organization, 2005. Ecosystems and human well-being health synthesis: a report of the millennium ecosystem assessment. World Health Organization, Geneva.

Desmet, P. G., Holness, S., Skowno, A. & Egan, V.T. (2013). Limpopo Conservation Plan v.2: Technical Report. Contract Number EDET/2216/2012. Report for Limpopo Department of Economic Development, Environment & Tourism (LEDET) by ECOSOL GIS.

Diphororo Development, LEDET, 2013. K2C Management Plan (No. V3). K2C.

Du Preez, C., 2014. Questionnaire - Christine Du Preez Hlokomela & Ward 01 councillor.docx.

Duraiappah, A.K., De Oliveira, T., Barkin, D., 2011. Consequences of Responses on Human Well-being and Poverty Reduction. Journal of Agrarian Change 55, 40.

Driver, A., Sink, K.J., Nel, J.N., Holness, S., Van Niekerk, L., Daniel, S F., Jonas, Z., Madjiet, P.A., Harris, L. & Maze, K. 2012. National Biodiversity Assessment 2011: An assessment of South Africa's biodiversity and ecosystems. Synthesis Report. South African National Biodiversity Institute and Department of Environmental Affairs, Pretoria.

Environmental Monitors, 2014. Questionnaire - Environmental Monitors, Biosocial Projects.

Evironomics, MetroGIS, 2009. Environmental Management Framework for the Olifants and Letaba Rivers Catchment Areas (Environmental Management Framework Report). Department of Environmental Affairs, Pretoria.

Fhatanani Management Services, 2013. Maruleng LED Draught 2013 (Municipal Planning Document). Maruleng Municipality, Hoedspruit.

Folke, C., Carpenter, S.R., Walker, B., Scheffer, M., Chapin, T., Rockström, J., 2010. Resilience thinking: Integrating resilience, adaptability and transformability. Ecology & society 15.

Holness, S., Coetzee, M., Van der Merwe, W., 2014. Maruleng SDF Biodiversity and Environmental Issues (Municipal Planning Input Document No. V1). Association for Water and Rural Development, Hoedspruit.

Jenson, J.M., Fraser, M.W., 2011. A Risk and Resilience Framework for Child, Youth, and Family Policy. Social Policy for Children and Families: A Risk and Resilience Perspective 5.

Kruger, J., 2015. Questionnaire - Johan Kruger LEDET.docx.

Limpopo Provincial Treasury, 2012. Socio-Economic Review 2012 (Governmental Overview No. DT 55694). Limpopo Provincial Department, Polokwane.

Malepe, M., 2014. Questionnaire - Mina Malepe K2C.docx.

Manoko, A., 2015. Questionnaire - Mr MA Manoko LEDET.docx.

Maruleng Municipality, 2014a. Maruleng Draft IDP 2014-15. Maruleng Municipality.

Maruleng Municipality, 2014b. Local Economic Development Strategy Review.

Maruleng Municipality, 2014c. SDF Forum Review Phase 02 Meeting.

Maruleng Municipality, 2014d. IDP and Budget Public Participation Meeting.

Maruleng Municipality, 2014e. IDP Representative Forum Meeting.

Maruleng Municipality, 2010. Maruleng IDP 2011-12. Maruleng Municipality.

Maslow, A. 1954. *Motivation and Personality*. 3rd edition. Harper & Row Publishers, New York, USA.

Mopani District Municipality, 2012. Mopani IDP 2013 2014 (Municipal Planning Document). Mopani District Municipality, Giyani.

National Department of Health, 2011. The National Antenatal Sentinel HIV and Syphilis Prevalence Survey. Department of Health, Pretoria, South Africa.

Neves, D., Toit, A., 2013. Rural livelihoods in south Africa: complexity, vulnerability and differentiation. Journal of Agrarian Change 13, 93–115.

Parida, P., 2010. Strategic planning for sustainable land use transport alignment in south africa. Association for European Transport, Johannesburg.

Plan Associates, 2014. Maruleng SDF Draft 2014 (Municipal Planning Document). Maruleng Municipality, Hoedspruit.

Quantec. 2015. Economic Statistics Maruleng Municipality, 2013. (http://www.quantec.co.za/), Viewed 16 February 2015.

Reid, W.V.C., Millennium Ecosystem Assessment (Program), 2005. Ecosystems and human well-being: general synthesis : a report of the Millennium Ecosystem Assessment. Island Press, Washington, DC.

Rodrıguez, J.P., Agard, J.R., 2005. Interactions among Ecosystem Services. Ecosystems and Human Well-Being: Scenarios: Findings of the Scenarios Working Group 2, 431.

Sekhukhune District Municipality, 2012. Sekhukhune District Municipality Draft IDP 2013 (Municipal Planning Document). Sekhukhune District Municipality, Marble Hall.

Simonsen, S., Biggs, R., Schluter, M., Schoon, M., Bohensky, E., Cundill, G., Dakos, V., Daw, T., Kotschy, K., Leitch, A., Quinlan, A., Peterson, G., Moberg, F., 2014. Applying Resilience Thinking: Seven Principles for Building Resilience in Socio-Ecological Systems (Book Broschure). Stockholm Resilience Centre, Stockholm.

South African National Biodiversity Institute (SANBI). National Spatial Biodiversity Spatial Assessment Terrestrial Ecosystem Status [vector geospatial dataset] 2004. Available from Biodiversity GIS website (http://bgis.sanbi.org/nsba/terrestrialStatus.asp), downloaded on 6 September2014.

South African Social Security Agency (SASSA). 2013. You and Your Grants 2013/14. Pretoria: SASSA.

Statistics South Africa. 2007. Community Survey 2007: Statistical release P0301. Pretoria: Statistics South Africa.

Statistics South Africa. 2012. Census 2011 Metadata. Pretoria: Statistics South Africa.

Statistics South Africa. 2012. Census 2011 Municipal Report – Limpopo. Pretoria Statistics South Africa.

Statistics South Africa. 2012. Census 2011 Statistical release – P0301.4. Pretoria: Statistics South Africa.

Statistics South Africa. 2012. Poverty Profile of South Africa: Application of the poverty lines on the LCS 2008/2009. Pretoria: Statistics South Africa

StatsSA SuperWeb, 2014a. Population Density. Super Web Hosting Co. Inc.

StatsSA SuperWeb, 2014b. Highest Educational Level. Super Web Hosting Co. Inc.

StatsSA SuperWeb, 2014c. Official Employment status. Super Web Hosting Co. Inc.

StatsSA SuperWeb, 2014d. Energy for Cooking. Super Web Hosting Co. Inc.

StatsSA SuperWeb, 2014e. Energy for heating. Super Web Hosting Co. Inc.

StatsSA SuperWeb, 2014f. Source of water. Super Web Hosting Co. Inc.

Steenkamp, K., 2015. Questionnaire - Karen Steenkamp, LEDET.

Tittonell, P., 2012. Farm typologies and resilience: The diversity of livelihood strategies seen as alternative system states.

Uys, M.-T., 2014. Mari Tinka Uys interview (K2C coordinator), Kruger to Canyons Biosphere.

Van Jaarsveld, P., 2014. Maruleng Municipality Tourism Strategy Plan - Phase 02 (Municipal Planning Document). Urban-Econ Development Economists, Mbombela.

Vecchiatto, P. 2014. Government to reopen land claims process. Business Day Live.

Walker B. & Salt, D. (2012*). Resilience Practice: Building Capacity to Absorb Disturbance and Maintain Function*. USA: Island Press.

Wilson, D. 2012. *A Regional Economic Overview Focusing on Rural and Concentrated Economies*. IHS Global Insight Southern Africa.

Available: http://stats.oecd.org/Index.aspx

AWARD is a non-profit organisation specialising in participatory, research-based project implementation. Their work addresses issues of sustainability, inequity and poverty by building natural-resource management competence and supporting sustainable livelihoods. One of their current projects, supported by USAID, focuses on the Olifants River and the way in which people living in South Africa and Mozambique depend on the Olifants and its contributing waterways. It aims to improve water security and resource management in support of the healthy ecosystems to sustain livelihoods and resilient economic development in the catchment.

About USAID: RESILIM-O

USAID: RESILIM-O focuses on the Olifants River Basin and the way in which people living in South Africa and Mozambique depend on the Olifants and its contributing waterways. It aims to improve water security and resource management in support of the healthy ecosystems that support livelihoods and resilient economic development in the catchment. The 5-year programme, involving the South African and Mozambican portions of the Olifants catchment, is being implemented by the Association for Water and Rural Development (AWARD) and is funded by USAID Southern Africa.

USAID FROM THE AMERICAN PEOPLE | **SOUTHERN AFRICA**