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DWS Report No: P WMA 12/T30/00/5314/7

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE MZIMVUBU WATER PROJECT

DEA REF. No 14/12/16/3/3/2/677 (Dam Construction)
14/12/16/3/3/2/678 (Electricity Generation)
14/12/16/3/3/1/1169 (Roads)

SOCIAL IMPACT ASSESSMENT

FINAL
January 2015

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE MZIMVUBU WATER PROJECT

Report Title:	***Social Impact Assessment***
Authors:	*Dr Neville Bews*
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CONSULTANT: ILISO CONSULTING (PTY) LTD IN ASSOCIATION WITH Dr NEVILLE BEWS & ASSOCIATES

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Chief Director: Integrated Water Resource Planning

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE MZIMVUBU WATER PROJECT

LIST OF REPORTS

REPORT TITLE	DWS REPORT NUMBER
Inception Report	P WMA 12/T30/00/5314/1
Scoping Report	P WMA 12/T30/00/5314/2
Environmental Impact Assessment Report	P WMA 12/T30/00/5314/3
Environmental Management Programme	P WMA 12/T30/00/5314/14
Integrated Water Use License Application for the Mzimvubu Water Project: Technical Report	P WMA 12/T30/00/5314/4
Ntabelanga Dam borrow pits and quarry Environmental Management Plan	P WMA 12/T30/00/5314/5
Lalini Dam borrow pits and quarry Environmental Management Plan	P WMA 12/T30/00/5314/6
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Wetland Assessment	P WMA 12/T30/00/5314/16
Rapid Reserve Determination: Tsitsa River at Lalini	P WMA 12/T30/00/5314/17

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE MZIMVUBU WATER PROJECT

DEA REF No. 14/12/16/3/3/2/677 (Dam construction application)
14/12/16/3/3/2/678 (Electricity generation application)
14/12/16/3/3/1/1169 (Roads application)

This report is to be referred to in bibliographies as:

Department of Water and Sanitation, South Africa (2014). ***Environmental Impact Assessment for the Mzimvubu Water Project: Social Impact Assessment***

DWS Report No: P WMA 12/T30/00/5314/7

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SOCIAL IMPACT ASSESSORS

DECLARATION OF INDEPENDENCE

I, Neville Bews as authorised representative of Dr Neville Bews & Associates hereby confirm my independence as a specialist and declare that neither I nor Dr Neville Bews & Associates have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which Dr Neville Bews & Associates was appointed as social impact assessment specialists in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for work performed, specifically in connection with the Social Impact Assessment for the Mzimvubu Water Project Environmental Impact Assessment. I further declare that I am confident in the results of the studies undertaken and conclusions drawn as a result of it – as is described in my attached report.

Signed: N. Bews Date: January 2015

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE MZIMVUBU WATER PROJECT

SOCIAL IMPACT ASSESSMENT

Executive summary

BACKGROUND

The Mzimvubu Water Project is an integrated multi-purpose project consisting of domestic water supply, agricultural irrigation scheme, power generation, transport, tourism, conservation and industry proposed for the Eastern Cape Province. The area remains underdeveloped and one of the poorest regions in the country, despite the existence of abundant untapped water resources. The Department of Water and Sanitation has proposed the project with the intention of providing a socio-economic development opportunity for the region.

The project consists of the construction of:

- *Two dams with associated water infrastructure*
- *Domestic water supply infrastructure*
- *Agricultural irrigation scheme infrastructure*
- *Hydro-electric power generation and distribution infrastructure*
- *Road infrastructure.*

The Social Impact Assessment, as part of the Environmental Impact Assessment process, investigated the impact that these activities are likely to have on the social environment of the region to assist in informing decision making by the Department of Environmental Affairs and Tourism (DEAT) in regard to the environmental authorisation for the proposed project. In this sense the potential social impacts were identified together with mitigation measures.

APPROACH

The approach taken was to collect data from as wide a source as was possible within the constraints of time and budget available. Data was gathered during a field survey trip, which included limited engagement with Interested and Affected Parties, various interactions with the project proponents and engineers, and through secondary data sources.

Social impacts are rated in accordance with the Environmental Impact Assessment Regulations, 2010 and the criteria drawn from the Integrated Environmental Management (IEM) Guidelines Series, Guideline 5: Assessment of Alternatives and Impacts, published by the (DEAT, 2006), as well as the Guideline Document on Impact Significance (DEAT, 2002)

SOCIAL ENVIRONMENT

The district and local municipalities directly associated with the project are:

- *Joe Gqabi District Municipality (DC14)*
  - *Elundini Local Municipality (EC141);*
- *O.R. Tambo District Municipality (DC15);*
  - *Nyandeni Local Municipality (EC155)*
  - *Mhlontlo Local Municipality (EC156);*
- *Alfred Nzo District Municipality (DC44)*
  - *Umzimvubu Local Municipality (EC442)*
  - *Ntabankulu Local Municipality (EC444).*

The area is characterised by high poverty and out-migration resulting in sex ratio imbalances, a high proportion of female headed households and a low population growth rate. Consequently there is a high dependency ratio and a high level of food access inadequacy. The population also lacks basic amenities and relies heavily on subsistence farming. At one time a system of communal land ownership and land management was introduced which seems to have fallen into disuse. Nevertheless, allocated fields still retain a value through folk memory and would need to be addressed through the traditional authority structures.

Turning towards the areas directly affected by the project, it has been identified by means of a field survey that, with regard to the Ntabelanga Dam Basin, 62 structures and 19.9136 km^2 of cultivated land will be lost. The Lalini Dam Basin, technically preferred Option 1 will result in the loss of 12 dwellings, 2 being abandoned and 7.59 km^2 of cultivated land. In total, it has been established that 160 structures and 0.69 km^2 of cultivated land could be lost as a result of the linear infrastructure components of the project.

Apart from the structures and cultivated areas that will be lost as a result of the project 124 structures have also been identified as being within 5 m of the project and therefore are at risk. The facilities at risk are largely associated with the linear components of the project which include access roads, pipelines and power lines and, as a relatively wide servitude is currently being used for the purpose of identifying these components, it is possible to re-align the routes to avoid the majority, if not all of these structures at risk. The primary mitigation measures applied in these instances is avoidance and considering that the pipeline will be buried it is possible that the servitudes can be restored to their original condition after construction. The facilities within the project servitude/footprint and those at risk, will be addressed more specifically below as associated with each of the various components of the project.

SOCIAL IMPACT VARIABLES

The social impact variables considered across the project are clustered in the following seven main categories.

1. *Health and social well-being impacts*
2. *Quality of the living environment (Liveability) impacts*
3. *Economic impacts and material well-being impacts*
4. *Cultural impacts*
5. *Family and community impacts*
6. *Institutional, legal, political and equity impacts*
7. *Gender relations impacts.*

The social impact of the various project components, including the no project option, were assessed during the construction and operation phase, according to the above variables, and mitigation measures proposed, which are summarised in the Impact Statement.

DAMS AND ASSOCIATED WATER INFRASTRUCTURE

Most negative impacts will occur during the construction phase of the project as a result of the need for resettlement, the loss of land and the influx of the construction workforce. The size and extent of the project will result in these impacts being significant and wide spread, however, they will largely be of a temporary nature and many can be mitigated. Notwithstanding this, however, the impact of resettlement on both the displaced and host communities must not be under estimated. It is also important to reduce the impact of the influx of construction workers by utilising local labour as far as possible.

The negative operational impacts, although they extend over a long period, are likely to be less significant with the more significant impacts, such as economic development and investment and the provision of domestic and agricultural water, being of high significance for the area. The provision of water, for both domestic and agricultural use, is likely to have an effect on the division of labour. On the domestic front this is likely to be positive in nature releasing women from the arduous and time consuming task of collecting water. With regard to agriculture, however, this may result in an increased work burden being placed on women due to double or triple cropping with women undertaking such tasks as weeding.

ELECTRICITY GENERATION AND DISTRIBUTION INFRASTRUCTURE

As with the construction of the dams and associated water infrastructure most social impacts are related to the construction phase of the project. As this aspect of the project is not a stand-alone project it must be considered on a cumulative basis together with the rest of the project components, as the cumulative effect will be greatest. A unique aspect of the generation and distribution of electricity concerns exposure to electromagnetic fields. There has been wide international concern regarding the effect that electromagnetic fields have on public health and a possible link to various cancers. On a positive basis the hydro-electricity scheme has the potential to positively contribute to the economy, which would have positive social benefits.

ROAD INFRASTRUCTURE

As with the electricity generation and distribution infrastructure the realignment and upgrading of roads is not a separate project and must, at the social level, be assessed together with all the other project components. The unique aspect of the road infrastructure concerns easier access to the area, which will carry with it both positive and negative consequences. On the positive side communities living in the area will have easier access into and out of the area as will tourists wanting to visit the area. On a more negative basis, easier access could hasten the effects of globalisation and the changes to local norms and culture. Vulnerable groups may also face greater psychological and social impacts due to rapid change as a result of greater access and exposure to outsiders

LALINI DAM ALTERNATIVES

With regard to the Lalini Dam, three dam sizes are under consideration:

Option	*Structures lost*	*Cultivated land inundated*
1	*12*	*7.58762 km^2*
2	*2*	*4.9539 km²*
3	*77*	*12.08256 km²*

Of these Option 1 is the technically preferred option while Option 2 emerges as the socially preferred as it involves the loss of fewer structures and less land. The technically preferred option is acceptable with the careful application of mitigation measures aimed at reducing the impact, particularly on displaced and host communities.

CONCLUSION AND RECOMMENDATIONS

It is clear that the area is underdeveloped and poor and that the proposed project holds potential for significant development and growth in the area. There are, however, a number of concerns relating to institutional capacity in the area and the need for correct implementation of the various project benefits, suggested by Mike Muller, which would need to be in place to ensure project success.

With the Constitutional and policy obligations placed on the authorities to deliver water to the poor, the project holds the potential to move beyond this and uplift the state of development in the area. However, only through a carefully coordinated, planned and management effort and with close cooperation between the different agencies and broad based community buy in, is the project likely to succeed.

Due to a lack of available information the effect that the project will have on communities living both up- and downstream of the dams was not assessed. It is, however, important to consider these communities and to investigate, assess and mitigate any negative effects that the dams may have on these communities.

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE MZIMVUBU WATER PROJECT –

SOCIAL IMPACT ASSESSMENT

DEA REF No. 14/12/16/3/3/2/677 (Dam construction application)
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Acronyms and abbreviations

AD	Anno Domini
AIDS	Acquired immunodeficiency syndrome
AsgiSA-EC	Accelerated and Shared Growth Initiative for South Africa – Eastern Cape
BID	Background Information Document
BUF	Buffalo City Metropolitan Municipality
CFRD	Concrete-faced rockfill dam
DC10	Cacadu District Municipality
DC12	Amarole District Municipality
DC13	Chris Hani District Municipality
DC14	Joe Gqabi District Municipality
DC15	O. R. Tambo District Municipality
DSR	Draft Scoping Report
DEIR	Draft Environmental Impact Assessment Report
DC44	Alfred Nzo District Municipality
DM	District Municipality
DWS	Department of Water and Sanitation
EC141	Elundini Local Municipality
EC156	Mhlontlo Local Municipality
EC422	Umzimvubu Local Municipality
EC444	Ntabankulu Local Municipality
EC	Eastern Cape
ECRD	Earth Core Rockfill Dam
ECSECC	Eastern Cape Socio Economic Consultative Council
EF	Earthfill (dam)
EIA	Environmental Impact Assessment
EMFs	Electromagnetic fields
EMPR	Environmental Management Programme Reports
ESIA	Environmental and Social Impact Assessment
EWR	Environmental Water Requirements
FAO	Food and Agricultural Organisation
FSL	Full Supply Level
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
I&AP	Interested and Affected Party
IEM	Integrated Environmental Management
IDP	Integrated Development Plan
ILO	International Labour Organisation
MAR	Mean annual runoff (from catchment)
NEMA	National Environmental Management Act
NMA	Nelson Mandela Bay Metropolitan
NWA	National Water Act
NDP	National Development Plan

NBA	Dr Neville Bews and Associates
RAP	Relocation Action Plan
SAPS	South African Police Services
SANRAL	South African National Road Agency Limited
SIA	Social Impact Assessment
SDF	Spatial Development Framework
SLA	Sustainable Livelihood Approach
SMC	Study Management Committee
SMME	Small Medium and Micro Enterprises
SPV	Special Purpose Vehicle
Stats SA	Statistics South Africa
STDs	Sexually Transmitted Diseases
TCTA	Trans Caledon Tunnel Authority
ToR	Terms of Reference
UN	United Nations
WRYM	Water Resources Yield Model
WSA	Water Services Authority
WTW	Water Treatment Works
WTP	Water Treatment Plant
WULA	Water Use Licence Application
WHO	World Health Organisation

List of Units

MW	Mega Watt
m	Metres
km	Kilometres
km^2	Square Kilometres
GW	Gigawatt
GWh/a	Gigawatt hour per annum
ha	Hectare
°C	Degrees Celsius
%	Percentage

1. INTRODUCTION

1.1 BACKGROUND

The Department of Water and Sanitation (DWS) commissioned the Mzimvubu Water Project, an integrated multi-purpose (domestic water supply, agriculture, power generation, transport, tourism, conservation and industry) project, with the intention of providing a socio-economic development opportunity for the region.

Environmental authorisation is required for the infrastructure components of the project. The purpose of the Environmental Impact Assessment (EIA) is to assess the components of the project that are listed activities by the National Environmental Management Act (NEMA) for which the DWS has the mandate and intention to implement. The EIA process will provide the information that the environmental authorities require to decide whether the project should be authorised or not, and if so under what conditions.

As part of this EIA process Dr Neville Bews & Associates (NBA) have been contracted to undertake a Social Impact Assessment.

1.2 PURPOSE OF THIS REPORT

The purpose of the study is to identify the social baseline conditions in which the proposed project will unfold and to acquire an understanding of the proposed project. Against this background, the primary objective was to identify the issues and concerns associated with the Mzimvubu Water Project and to identify, assess and propose mitigation for the likely social impacts that may occur as a result of the proposed project. These social impact variables are categorised as follows:

- Health and social well-being
- Quality of the living environment
- Economic and material well-being
- Cultural
- Family and community
- Institutional, legal, political and equity and
- Gender relations

1.3 DETAILS AND EXPERTISE OF THE SPECIALIST

Qualifications:

University of South Africa: B.A. (Honours) – 1984
Henley Management College, United Kingdom: The Henley Post-Graduate Certificate in Management – 1997
Rand Afrikaans University: M.A. (cum laude) – 1999
Rand Afrikaans University: D. Litt. et Phil. – 2000

Projects:

The Social Impact Assessment (SIA) for the Gautrain Rapid Rail Link; The impact assessment for the Australian – South African sports development programme; SIA for Kumba Resources, Sishen South Project; Evaluation of a Centre for Violence Against Women for The United Nations Office on Drugs and Crime; SIAs for the following Exxaro Resources Ltd.'s mines, Leeuwpan Coal Mine Delmas, Glen Douglas Dolomite Mine Henley-on-Klip, Grootegeluk Open Cast Coal Mine Lephalale; SIA for the South African National Road Agency Limited (SANRAL) on Gauteng Freeway Improvement Project; SIA for SANRAL on the N2 Wild Coast Toll Highway; Research into research outputs of the University for the University of Johannesburg; SIA for Waterfall Wedge housing and business development in Midrand Gauteng; SIA for the Environmental Management Plan for Sedibeng District Municipality; Social and Labour Plan for the Belfast Project on behalf of Exxaro Resources Ltd; SIA for the Transnet New Multi-Product Pipeline (Commercial Farmers) on behalf of Golder Associates Africa (Pty) Ltd; SIA for the Proposed Vale Moatize Power Plant Project in Mozambique on behalf of Golder Associates Africa (Pty) Ltd; SIA for Kumba Resources Ltd.'s proposed Dingleton Resettlement Project at Sishen Iron Ore Mine on behalf of Water for Africa (Pty) Ltd; SIA for Gold Fields West Wits Project for EcoPartners; SIA for the Belfast Project for Exxaro Resources Ltd; SIA for Eskom Holdings Ltd.'s Proposed Ubertas 88/11kV Substation on behalf of KV3 Engineers (Pty) Ltd; SIA for the Mokolo and Crocodile River (West) Water Augmentation Project for the Department of Water and Sanitation on behalf of Nemai Consulting and the Trans Caledonian Water Authority; Assisted Octagon Consulting with the SIA for Eskom's Nuclear 1 Power Plant on behalf of Arcus GIBB Engineering & Science. SIA for the 150MW Photovoltaic Power Plant and Associated Infrastructure for Italgest Energy (Pty) Ltd, on behalf of Kalahari Survey Solutions cc. SIA for Eskom Holdings Limited, Transmission Division's Neptune-Poseidon 400kV Power Line on behalf of Nemai Consulting. Ncwabeni Off-Channel Storage Dam for security of water supply in Umzumbe, KwaZulu-Natal. Social Impact assessment for Eskom Holdings Limited, Transmission Division, Forskor-Merensky 275kV ±130km Powerline and Associated Substation Works in Limpopo Province. Social impact assessment for the proposed infilling of the Model Yacht Pond at Blue Lagoon, Stiebel Place, Durban. ABC Prieska Solar Project; Proposed 75 MWp Photovoltaic Power Plant and its associated infrastructure on a portion of the remaining extent of ERF 1 Prieska, Northern Cape. Sekoko Wayland Iron Ore, Molemole Local Municipalities in Limpopo Province. Langpan Chrome Mine, Thabazimbi, Limpopo; Jozini Nodal Expansion Implementation Project, KwaZulu-Natal, on behalf of Nemai Consulting; SIA for Glen Douglas Dolomite Burning Project, Midvaal Gauteng, on behalf of Afrimat Limited; SIA for Lyttelton Dolomite mine Dolomite Burning Project, Marble Hall Limpopo on behalf of Afrimat Limited; Tubatse Strengthening Phase 1 – Senakangwedi B Integration for Eskom Transmission on behalf of Nsovo Environmental Consulting.

Regularly lecture in the Department of Sociology at the University of Johannesburg and collaborated with Prof. Henk Becker of Utrecht University, the Netherlands, in a joint lecture to present the Social Impact Assessment masters course via video link between the Netherlands and South Africa and regularly lecture on this course. Presented papers on

Social Impact Assessments at both national and international seminars. Published on both a national and international level.

Affiliation:

- The South African Affiliation of the International Association for Impact Assessment.
- Registered on the database for scientific peer review of iSimangaliso GEF project outputs.

1.4 STRUCTURE OF THIS REPORT

This specialist study is undertaken in compliance with Regulation 32 of GN 543. **Table 1** and indicates how the requirements of Regulation 32 of GN 543 have been fulfilled in this report.

Table 1: Report content requirements in terms of Regulation 32 of GN 543

Regulatory Requirements in terms of Regulation 32 of GN 543	Section of Report
(a) The person who prepared the report; and the expertise of that person to carry out the specialist study or specialised process.	Chapter 1
(b) a declaration that the person is independent	Page iv
(c) an indication of the scope of, and the purpose for which, the report was prepared	Chapters 1 and 3
(d) a description of the methodology adopted in preparing the report or carrying out the specialised process	Chapter 3
(e) a description of any assumptions made and any uncertainties or gaps in knowledge	Chapter 4
(f) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Chapters 7 & 8
(g) recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority	Chapter 7 &11
(h) a description of any consultation process that was undertaken during the course of carrying out the study	Chapter 6
(i) a summary and copies of any comments that were received during any consultation process	Chapter 6
(j) any other information requested by the competent authority.	Chapter 10

2. PROJECT BACKGROUND SUMMARY

2.1 LOCALITY

The project footprint spreads over three District Municipalities (DMs) namely the Joe Gqabi DM in the north west, the O. R. Tambo DM in the south west and the Alfred Nzo DM in the east and north east.

The proposed Ntabelanga Dam site is located approximately 25 km east of the town of Maclear and north of the R396 Road. The proposed Lalini Dam site is situated approximately 17 km north east of the small town Tsolo. Both are situated on the Tsitsa River.

2.2 MAIN PROJECT COMPONENTS

Water Resource Infrastructure includes:

- A dam at the Ntabelanga site with a storage capacity of 490 million m^3;
- A dam at the Lalini site with a storage capacity of approximately 150 million m^3;
- A pipeline and tunnel and a power house at Lalini Dam site for generating hydropower;
- Five new flow measuring weirs will be required in order to measure the flow that is entering and released from the dams. These flow gauging points will be important for monitoring the implementation of the Reserve and for operation of the dams.
- Wastewater treatment works at the dam sites;
- Accommodation for operations staff at the dam sites; and
- An information centre at each of the two dam sites.

The Ntabelanga Dam will supply potable water to 539 000 people, wich is estimated to rise to 730 000 people by year 2050. The domestic water supply infrastructure will include:

- A river intake structure and associated works;
- A regional water treatment works at Ntabelanga Dam;
- Potable bulk water distribution infrastructure for domestic and industrial water requirements (primary and secondary distribution lines);
- Bulk treated water storage reservoirs strategically located; and
- Pumping stations.

The Ntabelanga Dam will also provide water to irrigate approximately 2 900 ha. This project includes bulk water conveyance infrastructure for raw water supply to edge of field.

About 2 450 ha of the high potential land suitable for irrigated agriculture are in the Tsolo area and the rest near the proposed Ntabelanga Dam and along the river, close to the villages of Machibini, Nxotwe, Culunca, Ntshongweni, Caba, Kwatsha and Luxeni.

There will be a small hydropower plant at the Ntabelanga Dam to generate between 0.75 MW and 5 MW (average 2.1 MW). This will comprise a raw water pipeline from the dam to

a building containing the hydropower turbines and associated equipment, and a discharge pipeline back to the river just below the dam wall. The impact is expected to be similar to that of a pumping station.

The hydropower plant at the proposed Lalini Dam and tunnel (used conjunctively with the Ntabelanga Dam) will generate an average output of 30 MW when operated as a base load power station and up to 150 MW if operated as peaking power station. The power plant will require a pipeline (approximately 4.6 km) and tunnel (approximately 3.2 km) linking the dam to the power plant downstream of the dam and below the gorge.

The power line to link the Lalini power station to the existing Eskom grid will be approximately 18.5 km and the power line linking the Ntabelanga Dam to the Eskom grid will be approximately 13 km. Power lines will be constructed to supply power for construction at the two dam sites and for operating five pumping and booster stations along the bulk distribution infrastructure.

The area to be inundated by the dams will submerge some roads. Approximately 80 km of local roads will therefore be re-aligned. Additional local roads will also be upgraded to support social and economic development in the area. The road design will be very similar to the existing roads as well as be constructed using similar materials.

The project is expected to cost R 12.45 billion and an annual income of R 5.9 billion is expected to be generated by or as a result of the project during construction and R 1.6 billion per annum during operation. It will create 3 880 new skilled employment opportunities and 2 930 un-skilled employment opportunities during construction.

2.3 ALTERNATIVES

The following project level alternatives will be assessed:

- Three hydro power tunnel positions and associated power lines;
- Peak versus Base load power generation;
- Three different dam sizes for the Lalini Dam; and
- The no project option.

For the construction camps, pipeline routes and new roads, the specialist will identify any sensitive areas and deviations to avoid these will be proposed in consultation with the technical team.

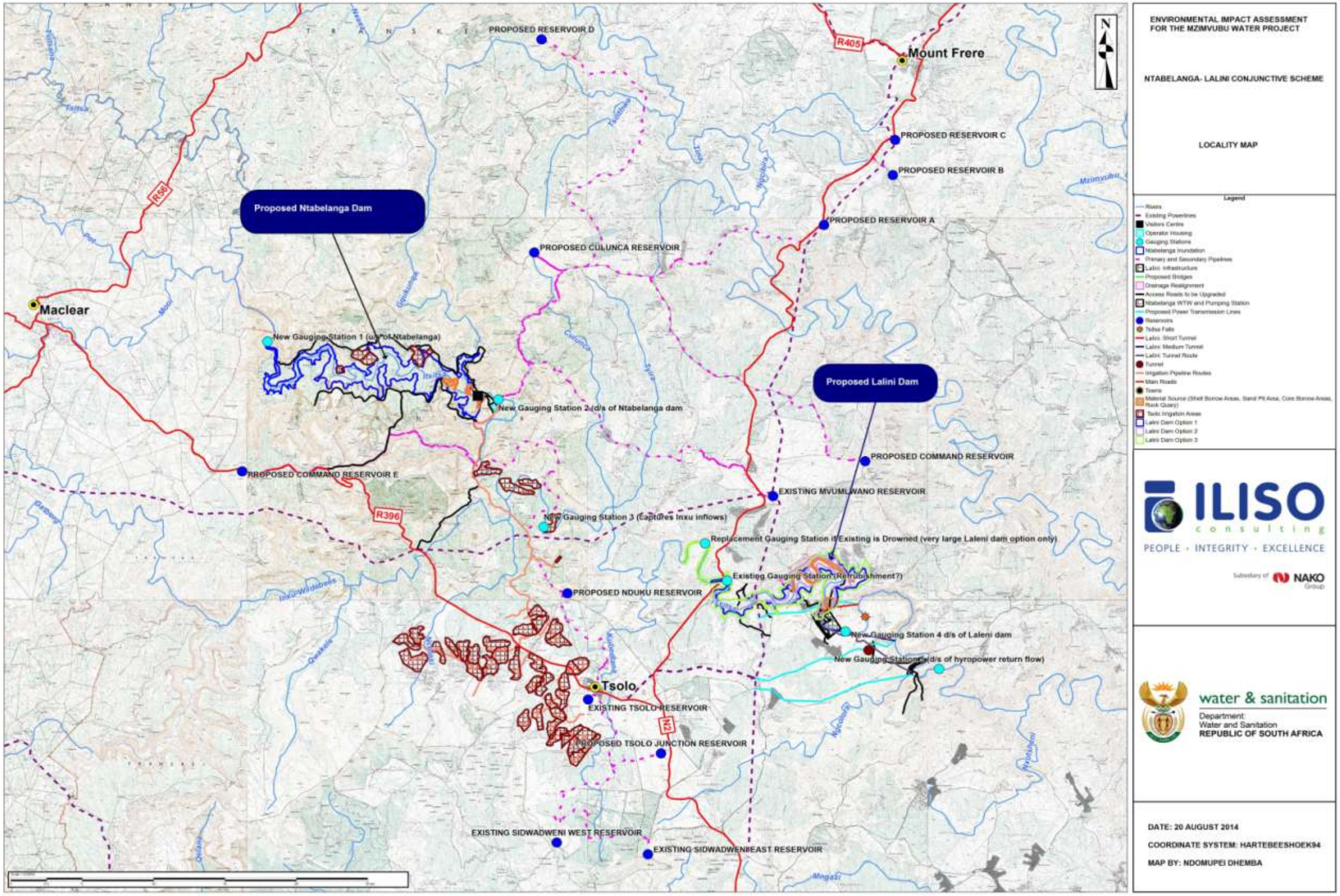


Figure 1: Locality Map

3. TERMS OF REFERENCE

3.1 SCOPE OF THE STUDY

To consider the extent of the proposed project and social environment within which the project will be placed and accordingly identify the potential social impacts that are likely to arise as a result of the project. These impacts are identified on the basis of the issues and concerns raised by the Interested and Affected Parties (I&APs), the findings of other specialists and secondary data sources such as reports and responses generated in response to the project. The final aim of this report is to identify various optimisation and mitigation measures in an effort to compensate for the adverse social impacts of the proposed project.

3.2 METHODOLOGY

Both a quantitative and qualitative methodological approach was applied throughout the study, in a research technique referred to as triangulation. A recognised impact assessment technique was applied in assessing the impacts and is described below in greater detail.

Data was gathered through:

- A scan and analysis of the Draft Scoping Report prepared for the project by ILISO Consulting (Pty) Ltd.
- Statistics South Africa, Census 2011; Quarterly Labour Force Survey First Quarter, 2013.
- A comprehensive scan of the Issues and Response Report generated by ILISO Consulting (Pty) Ltd.
- Site visits and consultations with traditional leaders, the affected communities and other I&APs.
    - This fieldwork was undertaken between 23 June 2014 to 11 July, 2014 and over this period those structures directly and indirectly affected by the project were identified and photographically recorded.
- Discussions with the project proponents and Environmental Impact Assessment Consultants.
    - 03 March 2014, 20 May 2014, 21 July 2014 and 29 July 2014.
- A literature review of various documents such as the relevant municipal Integrated Development Plans (IDPs) and other specialist reports and documents.
- A broader literature scan.

3.3 IMPACT CRITERIA AND RATING SCALE

The social impacts are rated in accordance with the Environmental Impact Assessment Regulations, 2010 and the criteria drawn from the Integrated Environmental Management (IEM) Guidelines Series, Guideline 5: Assessment of Alternatives and Impacts, published by the DEAT, 2006 as well as the Guideline Document on Impact Significance (DEAT, 2002) as listed below.

The key issues identified during the Scoping Phase inform the terms of reference of this specialist study. Each issue consists of components that on their own or in combination with each other give rise to potential impacts, either positive or negative, from the project onto the environment or from the environment onto the project. The significance of the potential impacts is considered before and after identified mitigation is implemented, for direct, indirect, and cumulative impacts, in the short and long term.

A description of the nature of the impact, any specific legal requirements and the stage (construction / decommissioning or operation) is given. Impacts are considered to be the same during construction and decommissioning.

The following criteria have been used to evaluate significance:

- **Nature:** This is an appraisal of the type of effect the activity is likely to have on the affected environment. The description includes what is being affected and how. The nature of the impact will be classified as positive or negative, and direct or indirect.

- **Extent and location:** This indicates the spatial area that may be affected (**Table 2**).

Table 2: Geographical extent of impact

Rating	Extent	Description
1	Site	Impacted area is only at the site – the actual extent of the activity.
2	Local	Impacted area is limited to the site and its immediate surrounding area
3	Regional	Impacted area extends to the surrounding area, the immediate and the neighbouring properties.
4	Provincial	Impact considered of provincial importance
5	National	Impact considered of national importance – will affect entire country.

- **Duration:** This measures the lifetime of the impact (**Table 3)**.

Table 3: Duration of Impact

Rating	Duration	Description
1	Short term	0 – 3 years, or length of construction period
2	Medium term	3 – 10 years
3	Long term	> 10 years, or entire operational life of project.
4	Permanent – mitigated	Mitigation measures of natural process will reduce impact – impact will remain after operational life of project.
5	Permanent – no mitigation	No mitigation measures of natural process will reduce impact after implementation – impact will remain after operational life of project.

- **Intensity/severity:** This is the degree to which the project affects or changes the environment; it includes a measure of the reversibility of impacts (**Table 4**).

Table 4: Intensity of Impact

Rating	Intensity	Description
1	Negligible	Change is slight, often not noticeable, natural functioning of environment not affected.
2	Low	Natural functioning of environment is minimally affected. Natural, cultural and social functions and processes can be reversed to their original state.
3	Medium	Environment remarkably altered, still functions, if in modified way. Negative impacts cannot be fully reversed.
4	High	Cultural and social functions and processes disturbed – potentially ceasing to function temporarily.
5	Very high	Natural, cultural and social functions and processes permanently cease, and valued, important, sensitive or vulnerable systems or communities are substantially affected. Negative impacts cannot be reversed.

- **Potential for irreplaceable loss of resources:** This is the degree to which the project will cause loss of resources that are irreplaceable (**Table 5**).

Table 5: Potential for irreplaceable loss of resources

Rating	Potential for irreplaceable loss of resources	Description
1	Low	No irreplaceable resources will be impacted.
3	Medium	Resources can be replaced, with effort.
5	High	There is no potential for replacing a particular vulnerable resource that will be impacted.

- **Probability:** This is the likelihood or the chances that the impact will occur (**Table 6**).

Table 6: Probability of Impact

Rating	Probability	Description
1	Improbable	Under normal conditions, no impacts expected.
2	Low	The probability of the impact to occur is low due to its design or historic experience.
3	Medium	There is a distinct probability of the impact occurring.
4	High	It is most likely that the impact will occur
5	Definite	The impact will occur regardless of any prevention measures.

- **Confidence:** This is the level of knowledge or information available, the environmental impact practitioner or a specialist had in his/her judgement (**Table 7Error! Reference source not found.**).

Table 7: Confidence in level of knowledge or information

Rating	Confidence	Description
1	Low	Judgement based on intuition, not knowledge / information.
2	Medium	Common sense and general knowledge informs decision.
3	High	Scientific / proven information informs decision.

- **Consequence:** This is calculated as extent + duration + intensity + potential impact on irreplaceable resources.

- **Significance:** The significance will be rated by combining the consequence of the impact and the probability of occurrence (i.e. consequence x probability = significance). The maximum value which can be obtained is 100 significance points (**Table 8**).

Table 8: Significance of issues (based on parameters)

Rating	Significance	Description
1-14	Very low	No action required.
15-29	Low	Impacts are within the acceptable range.
30-44	Medium-low	Impacts are within the acceptable range but should be mitigated to lower significance levels wherever possible.
45-59	Medium-high	Impacts are important and require attention; mitigation is required to reduce the negative impacts to acceptable levels.
60-80	High	Impacts are of great importance, mitigation is crucial.
81-100	Very high	Impacts are unacceptable.

- **Cumulative Impacts:** This refers to the combined, incremental effects of the impact. The possible cumulative impacts will also be considered.

- **Mitigation:** Mitigation for significant issues will be incorporated into the EMP.

The relevant legislation and guidelines associated with the project are addressed under the next section.

3.4 LEGISLATION AND GUIDELINES CONSIDERED

The Social Impact Assessment (SIA) forms part of the environmental authorisation process and is guided by the following national legislation.

- **The Constitution of the Republic of South Africa, 1996**
  The Constitution is relevant in that it stipulates a number of basic rights enjoyed by South African citizens which, amongst others, include:
  - Section 24: The right to a healthy environment and to have the environment protected for the benefit of present and future generations.
  - Section 25: The right to property and no law may permit arbitrary deprivation of property, limited in that property may only be expropriated under a law of general application, for a public purpose and subject to compensation.
  - Section 26: The right to adequate housing, including the right to due process with regard to court-ordered eviction and demolition.
  - Section 27: The rights to access to food, water, health care and social assistance, which the state must progressively realise within the limits of its resources.

- Section 32: The right of access to information, including all information held by the government and required for the exercise or protection of any rights.
- Section 33: The right to justice in administrative action by the state.

- **National Environmental Management Act (Act 107 of 1998)**

The preamble of Act 107 of 1998 indicates that;

> "*everyone has the right to an environment that is not harmful to his or her health or well-being;*
>
> *the State must respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities;*
>
> *inequality in the distribution of wealth and resources, and the resultant poverty, are among the important causes as well as the results of environmentally harmful practices;*
>
> *sustainable development requires the integration of social, economic and environmental factors in the planning implementation and evaluation of decisions to ensure that development serves present and future generations".*

The implications of this Act for the project are laid out in the preamble.

- **National Water Act (Act 36 of 1998)**

The preamble of Act 36 of 1998 indicates that the purpose of the Act is in;

> "*Recognising that water is a scarce and unevenly distributed national resource which occurs in many different forms which are all part of a unitary, interdependent cycle;*
>
> *Recognising that while water is a natural resource that belongs to all people, the discriminatory laws and practices of the past have prevented equal access to water, and use of water resources;*
>
> *Acknowledging the National Government's overall responsibility for and authority over the nation's water resources and their use, including the equitable allocation of water for beneficial use, the redistribution of water, and international water matters;*
>
> *Recognising that the ultimate aim of water resource management is to achieve the sustainable use of water for the benefit of all users;*
>
> *Recognising that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users; and*

*Recognising the need for the integrated management of all aspects of water resources and, where appropriate, the delegation of management functions to a regional or catchment level so as to enable everyone to particip*ate".

The implications of this Act for the project are laid out in the preamble.

- **Promotion of Administrative Justice Act (Act 3 of 2000)**
  This Act gives effect to provisions under the Constitution and Bill of Rights that secure for citizens the right to:
  - Fair and reasonable administrative action;
  - Access to the reasons for any administrative actions that affect their rights in a negative manner and
  - The right to challenge decisions which they believe are erroneous.

  The Act has implications in that it requires administrators to act in a fair and respectful manner regarding the rights of citizens as laid out in the Constitution. The powers of government are limited under this Act which indicates how such powers can be exercised and requires that government function in an open, transparent, accountable and participative manner.

- **Traditional Leadership and Governance Framework Amendment Act (Act 23 of 2009)**
  Act 23 of 2009 amends the Traditional Leadership and Governance Framework Act (Act 41 of 2003) and provides for communities to decide for themselves if they want to be regarded as a traditional community in terms of their customs and to observe a system of customary law.

  The implications of this Act are that it describes the roles and powers of traditional leaders and the manner in which communication with traditional communities should occur. The Act also prescribes the power held by the traditional authorities within the project area in terms of acting on behalf of communities within their area of jurisdiction. This is relevant in respect of land acquisition negotiations and granting access to the construction workforce.

- **Water Services Act (Act 108 of 1997)**
  Act 108 of 1997 provides for;
  " …*the rights of access to basic water supply and basic sanitation; …the setting of national standards and of norms and standards for tariffs and water services development plans*".

  The relevance of this Act is that it acknowledges both the duty and role of all spheres of Government in providing water supply services and sanitation services sufficient for subsistence and sustainable economic activity.

- **Development Facilitation Act (Act 67 of 1995)**
  The relevance of this Act is associated with its main purpose which is to prescribe land development procedures in respect of land use that both includes and excludes small scale farming. Different procedures for the two different circumstances are prescribed through the Act. Although the principles in the Act are specifically aimed at land development, the close integration between the use of land and water as resources means that the principles should be applied in the use of water as well. The Act also deals with land tenure matters and promotes both the establishment of viable communities and sustainable environments.

The following strategies and guidelines also apply:

- **National Development Plan (NDP)**
  The NDP serves as a strategic framework for future government planning with the aim of eliminating poverty and reducing inequality across the country by 2030. The focus of the plan is on increasing employment, strengthening the social wage, improving public transport and boosting rural incomes. It is also suggested in the NDP that public infrastructure investment be set at 10 percent of South Africa's gross domestic product (GDP) which, together with an emphasis on raising rural incomes, make it relevant in respect of this project.

- **National Water Resources Strategy (June 2013)**
  This strategy provides a national framework against which water resources across the country will be managed and in this sense aims to;

  " *…ensure that national water resources are protected, used, developed, conserved, managed and controlled in an efficient and sustainable manner towards achieving South Africa's development priorities in an equitable manner over the next five to 10 years. This Strategy responds to priorities set by Government within the National Development Plan (NDP) and National Water Act (NWA) imperatives that support sustainable development. The NWRS2 acknowledges that South Africa is a water-stressed country and is facing a number of water challenges and concerns, which include security of supply, environmental degradation and resource pollution, and the inefficient use of water*" (Department of Water Affairs, 2013a, p. iii).

- **Department of Water Affairs and Forestry (DWAF) Generic Public Participation Guidelines**
  These guidelines were published in September 2001 by what at that time was the Department of Water Affairs and Forestry and lists the following sixteen principles underpinning the public participation process:
  - *Inclusive involvement of stakeholders*: requires all relevant stakeholders have the opportunity to be involved in the initiative.

- *Integration*: emphasizes the inclusion of both public issues and technical assessments in the public participation process that contributes to decision-making.
- *Mutual respect among role players*: this principle stresses that role-players should acknowledge and respect each other's knowledge, abilities and inputs.
- *Continuity in participation*: refers to the participation of role-players throughout the initiative.
- *Consideration of multiple options*: supports stakeholders to consider various alternatives within an initiative.
- *Flexibility*: refers to the need for a public participation process to adapt to different circumstances.
- *Transparency*: to the honest, open and equitable nature of public participation.
- *Accountability and commitment*: stresses that role-players should be encouraged to take responsibility for the process of public participation.
- *Rights and roles*: this principle strengthens role-players' understanding of their own and other role-player's contribution to the success of public participation.
- *Accessibility of information*: enables effective participation by supporting stakeholders to be well-informed and knowledgeable.
- *Awareness creation*: refers to the need to make stakeholders aware of issues affecting them and how they might influence the outcomes of the process.
- *Capacity building and empowerment*: requires that all stakeholders be granted both the opportunity and support to participate meaningfully.
- *Efficiency*: refers to a public participation plan that maintains the momentum of a clear and definite process.
- *Suitability of scale of involvement*: stresses the fact that the intensity of public participation is relative to the impacts of the decision and suitable to the scale and type of initiative

  (Republic of South Africa, Department of Water Affairs and Forestry, 2001, pp. 15-21).

- **Guideline for Involving Social Assessment Specialists in EIA Processes (Barbour, 2007)**

  These guidelines direct the role of social assessments specialists in the Environmental Impact Assessment (EIA) process within the South African context.

- **International Association for Impact Assessment Publications, International Principles for Social Impact Assessment (Vanclay, 2003)**

  This document encapsulates the core values of the international SIA community providing a set of principles to guide SIA practitioners in incorporating the social element into environmental impact assessments.

- **World Commission on Dams: Social Impact Assessment; paper prepared by Vanclay, 2000 for the World Commission on Dams**

This paper provides " …*best practice recommendations and general principles of social impact assessment that are relevant for large dams* (Vanclay, 2000, p. 1)

- **Involuntary Resettlement Source Book: Planning and Implementation in Development Projects** (The World Bank, 2004)
  This document is regarded by the World Bank as a social and environmental safeguard policy and is utilised here as a best practice guideline.

4. ASSUMPTIONS AND LIMITATIONS

Assumptions:

- It is assumed that the information provided by the project proponents was accurate and that the feasibility study for the Mzimvubu Water Project was undertaken with integrity and is an accurate reflection of the situation on the ground.

- It is assumed that all information provided by the independent environmental assessment practitioner was accurate as was the information provided in other specialist studies used in this report.

- It was assumed that the information gathered through the public participation process was a true reflection of the attitude of the public towards the project and as such was accurately recorded.

Limitations:

- The study is based on data obtained by Statistics SA during Census 2011 which, dating back to October, 2011, is becoming somewhat out dated. To compensate for this limitation data was also acquired from other sources such as the Eastern Cape Socio-Economic Consultative Council (ECSECC) as well as the relevant district and local Integrated Development Plans and Spatial Development Frameworks.

- Although an attempt was made within the available time frame and budgetary constraints to gather as wide a range of data as possible there was a limitation to the data that could be gathered.

- The region is administered through the Traditional Authority Structures making it difficult to freely consult with people who are reluctant to participate outside of these structures.

- Information regarding the up- and down-stream situation for both dams was not available at the time of writing and consequently these effects were not assessed.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The project is located within the Eastern Cape (EC) Province of South Africa which consists of the following 2 metropolitan and 6 district municipalities:

- Buffalo City Metropolitan Municipality (BUF);
- Nelson Mandela Bay Metropolitan Municipality (NMA);
- Cacadu District Municipality (DC10)
- Amatole District Municipality (DC12)
- Chris Hani District Municipality (DC13)
- Joe Gqabi District Municipality (DC14)
- O.R. Tambo District Municipality (DC15) and
- Alfred Nzo District Municipality (DC44).

The district and local municipalities directly associated with the project are;

- Joe Gqabi District Municipality (DC14)
  - Elundini Local Municipality (EC141);
- O.R. Tambo District Municipality (DC15)
  - Mhlontlo Local Municipality (EC156);
- Alfred Nzo District Municipality (DC44)
  - Umzimvubu Local Municipality (EC442)
  - Ntabankulu Local Municipality (EC444)
  - Nyandeni Local Municipality (EC155).

The Ntabelanga – Lalini Conjunctive Scheme, as it relates to the district and local municipal areas, is depicted in **Figure 1**.

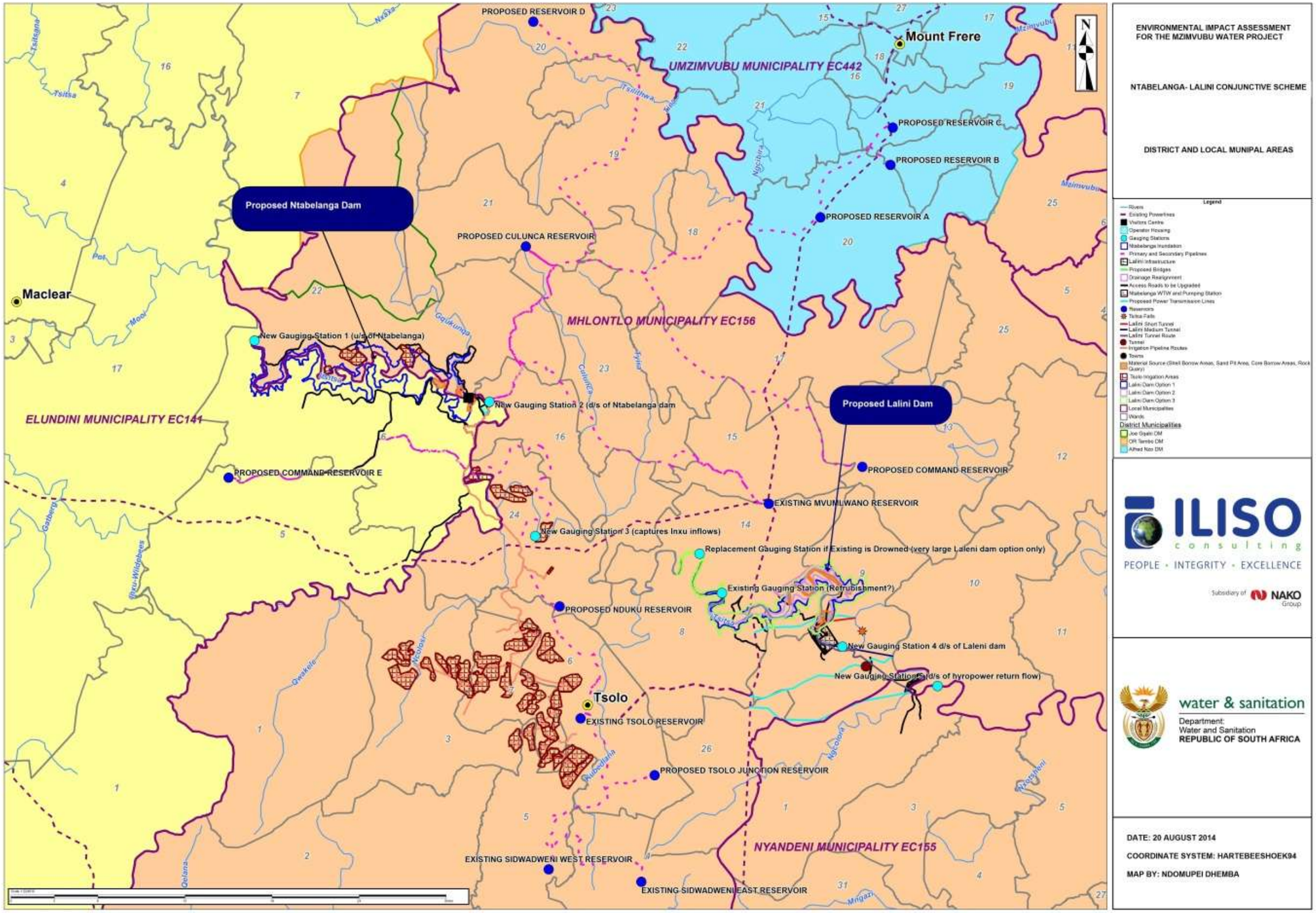
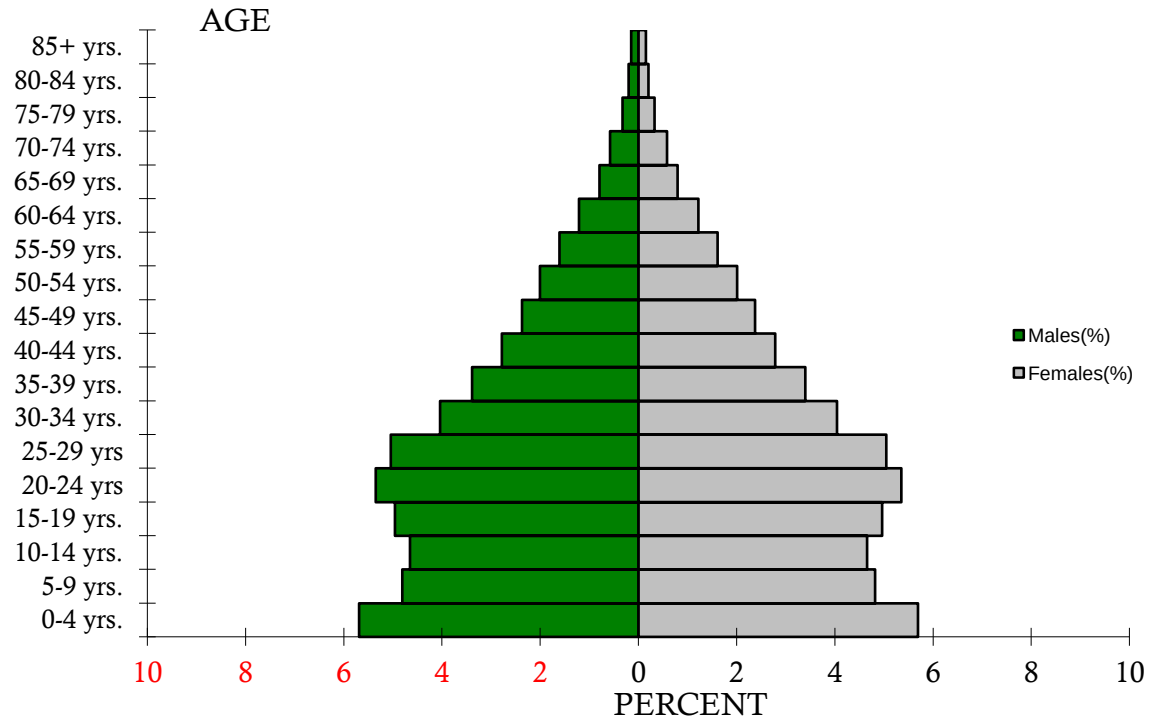


Figure 2: The Ntabelanga – Lalini Conjunctive Scheme as related to the municipalities

5.1 PROVINCIAL DESCRIPTION

The Eastern Cape Province covers an area of 168 966 km^2 making it the second largest province by geographical area, covering 13.8% of South Africa's total land mass. This is only surpassed by the Northern Cape which covers an area of 372 889 km^2 accounting for 30.5% of the total land area of the country. The total population of the province stood at 6 562 053 people in 2011 (Statistics South Africa, 2012) and was estimated at 6 620 100 people in June, 2013 (Statistics South Africa, 2013, p. 3). Consequently, the province is ranked third in respect of population size and has a population density of 39/km^2. This makes it the sixth densely populated province in South Africa. In respect of age structure, 33.0% of the population is under 15 years of age, while 60.2% is between 15 and 64 years with 6.7% being over the age of 65 years. The population pyramid of the province is illustrated in **Figure 3**.



Data source: (Statistics South Africa, 2012)

Figure 3: Population pyramid Eastern Cape Province

In respect of population group 86.3% of the population are black African, 8.3% are coloured, 4.7% are white and 0.4% are Indian or Asian people. Xhosa is spoken by 78.8% of the population followed by Afrikaans, English, and Sotho which are respectively spoken by 10.6%, 5.6% and 2.5% of the population of the Eastern Cape Province.

The dependency ratio of the province, which indicates the burden placed on the population of working age, between 15 and 64 years, who support children under 15 years and people over 65 years, is 66.0. The sex ratio, which measures the proportion of males to females, is

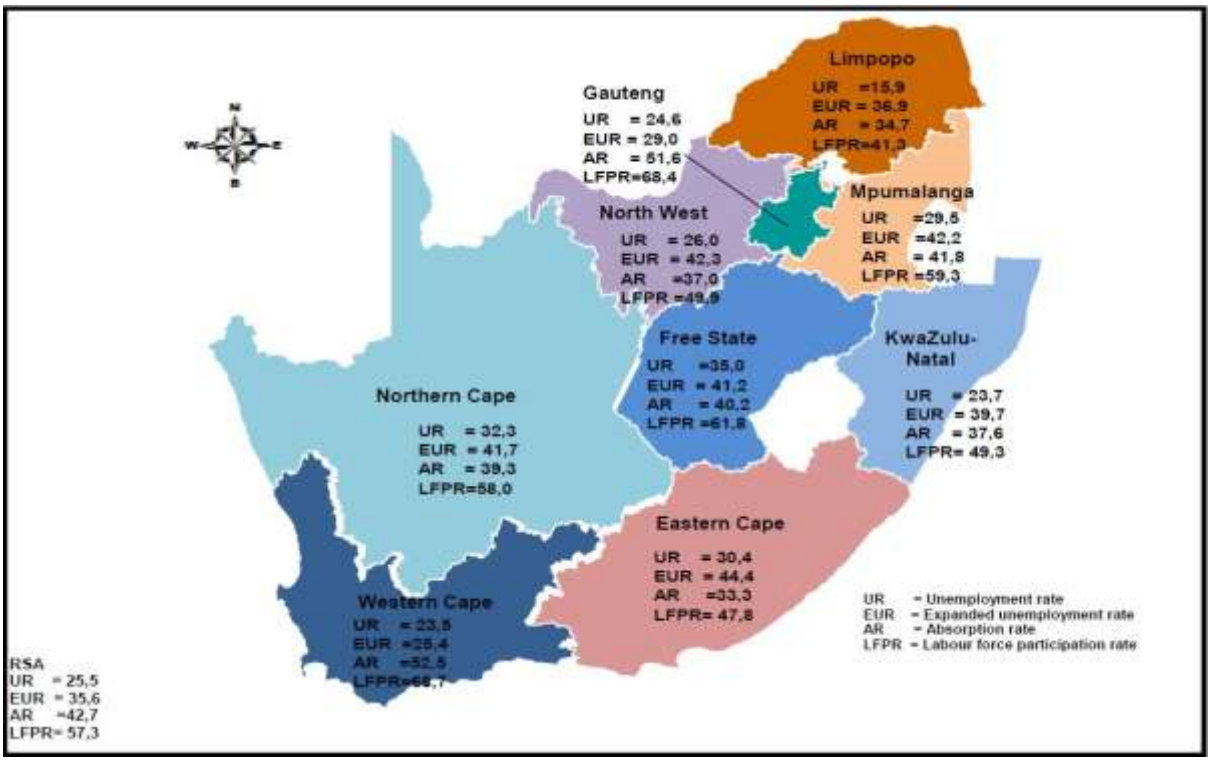
89.0 indicating a higher number of females in the province. Between 1996 and 2001 the population growth rate was 0.46% p.a. while between 2001 and 2011 it was 0.44% p.a.

In 2011 the official unemployment rate in the Eastern Cape was 37.4% with the official unemployment rate amongst the youth, between 15 and 34 years of age, being 47.3%. In the 4th quarter of 2013 the official unemployment rate in the province had dropped to 27.8%. Notwithstanding this, the province had the second highest rate of unemployment in the country, below the Free State which had an official unemployment rate of 33%. This must, however, be considered with caution as the official unemployment rate is defined by Stats SA as follows;

> **"*Unemployed*** *persons are those (aged 15–64 years) who:*
> *a) Were not employed in the reference week* ***and;***
> *b) Actively looked for work or tried to start a business in the four weeks preceding the survey interview* ***and;***
> *c) Were available for work, i.e. would have been able to start work or a business in the reference week* ***or;***
> *d) Had not actively looked for work in the past four weeks but had a job or business to start at a definite date in the future and were available.*" (StatsSA, 2013, p. xviii)

This definition excludes disillusioned work seekers who have given up attempting to find employment.

In the 2nd quarter of 2014 the unemployment rate in the Eastern Cape Province stood at 30.4% while the expanded rate of unemployment, which includes disillusioned work seekers, stood at 44.4%, thus giving the province the highest expanded rate of unemployment in the country. During that period the labour absorption rate in the Eastern Cape was 33.3% while the labour force participation rate was 47.8%. A summary of the labour market indicators illustrated on a comparative basis across South Africa is provided in **Figure 4**.



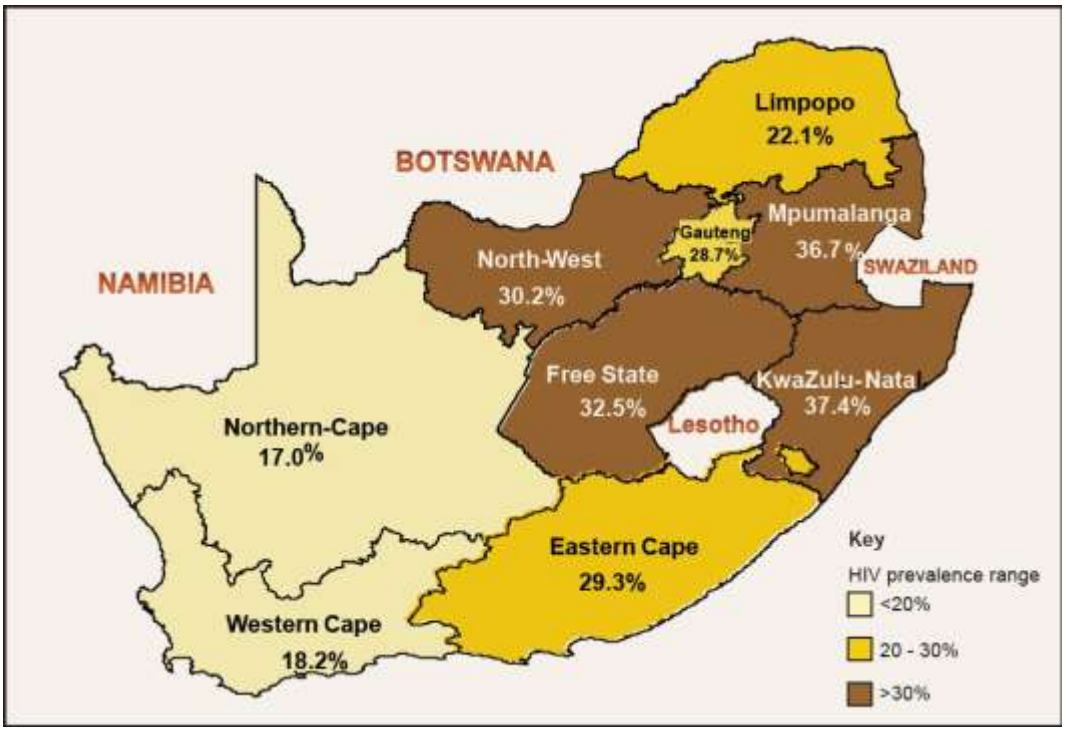
Source: (Statistics South Africa, 2014, p. xvii)

Figure 4: Labour market indicators 4th Quarter 2013

In respect of households, the 2011 Census indicated that there were 1,687,385 households in the province with an average household size of 3.9. Of these households, 49.6% were female headed, 63.2% lived in formal dwellings and 59.6% either owned or were paying off their dwelling.

Regarding household services in 2011, 40.4% of households in the Eastern Cape had flush toilets connected to the sewerage system while 41% had their refuse removed on a weekly basis. Piped water was delivered to 32.8% of households and 75% of Eastern Cape households used electricity as a means of energy for lighting.

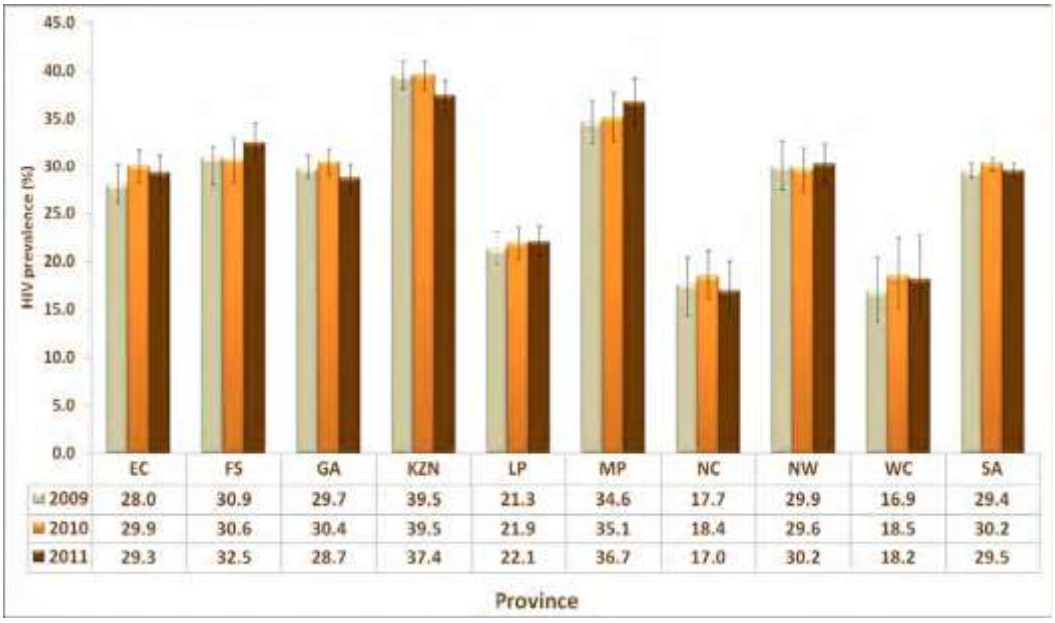
Concerning HIV prevalence amongst prenatal women in the province, in 2011 the Eastern Cape had the fifth highest rate in South Africa at 29.3% compared to that of the Northern Cape at 17.0% and the Western Cape at 18.2%, which had the lowest rates. HIV prevalence amongst antenatal women across South Africa is illustrated in **Figure 5**. At that point the highest level of HIV prevalence amongst antenatal women was in KwaZulu-Natal at 37.4% while the national rate was 29.5%.



Source: (National Department of Health, 2012, p. 14)

Figure 5: Prevalence of HIV amongst antenatal women - 2011

Having increased from 28.0% in 2009 to 29.9% in 2010, the HIV prevalence rate amongst antenatal women in the Eastern Cape decreased marginally to 29.3% in 2011. The fluctuation of these rates, between 2009 and 2011, as they appear across the country is illustrated in **Figure 6**.



Source: (National Department of Health, 2012, p. 14)

Figure 6: HIV prevalence trends: Antenatal women by province 2009 – 2011

A further issue concerning health in the province relates to cancer. It is indicated that "[t]*he rate of cancer in the Eastern Cape is six times the national average*" (Stassen, 2011) and

new research is linking this with the processing of home-grown maize and the silica from the grid stones that may cause throat irritations (Sewram, 2011).

Although on the social and political front the province is currently undergoing major change, this change must be considered against a background of underdevelopment, limited skills and high levels of unemployment and poverty amongst the local people. This scenario has resulted in a migration from the rural to the urban area, as people search for employment opportunities. The inequity in the province is highlighted in a report generated by the Stockholm Resilience Centre which indicates that.

> "*While parts of the Eastern Cape remain poor and underdeveloped without sanitation or electricity, other areas are prospering through large scale growth and development plans, luxury coastal resorts and a burgeoning ecotourism industry. At the same time, land degradation, droughts, a downturn in the livestock sector, and a struggling rural economy are reinforcing human migration patterns to overflowing urban centres and a dependence of rural communities on grants and welfare*" (Hamann, et al., 2012, p. 3).

This description encapsulates the current social situation in the province rather aptly and attention will now be turned towards a more in-depth demographic description of the study area at the municipal levels.

5.2 MUNICIPAL DESCRIPTION

The project impacts the three district municipalities of Joe Gqabi, O. R. Tambo and Alfred Nzo. Of these districts Joe Gqabi covers the greatest land area and has the lowest population density across the region at 14/km^2 while O. R. Tambo has the largest population and the highest population density at 110/km^2. With regard to population group, black African people are the dominant group across all districts at over 90%. Xhosa is the dominant language spoken in the area ranging between 70.5 and 94.2 percent. This data is represented in **Table 9**.

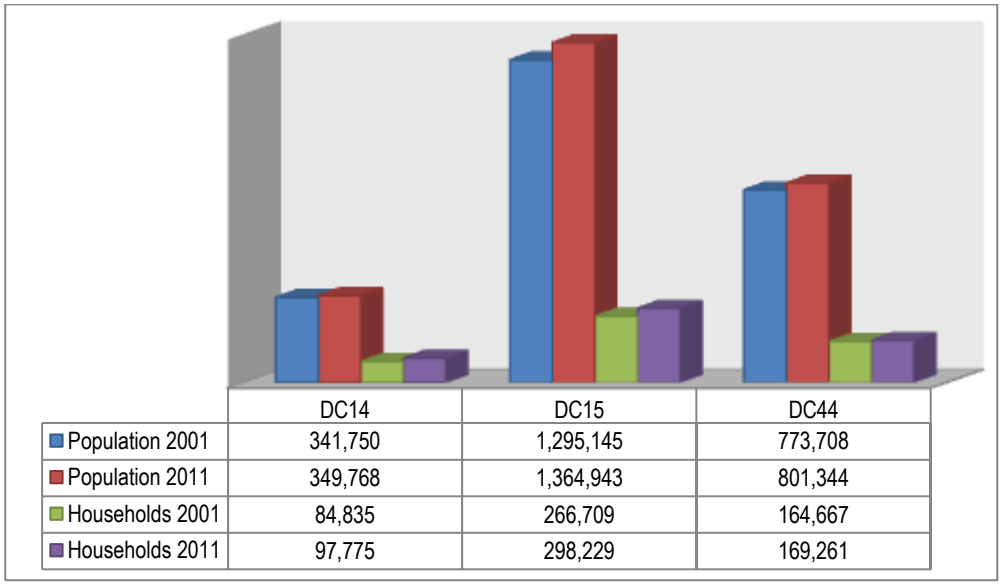
Table 9: Demographic data district level

	Joe Gqabi DC14	O. R. Tambo DC15	Alfred Nzo DC 44
Geographical area	25,663 km^2	12,096 km^2	10,731 km^2
Population	349,768	1,364,943	801,344
Density	14/km^2	110/km^2	75/km^2
Population group			
Black African	93.8%	99.0%	99.1%
Coloured	3.5%	0.5%	0.4%
Indian/Asian	0.2%	0.2%	0.1%
White	2.4%	0.2%	0.2%
Language			
Xhosa	70.5%	94.2%	84.6%
Sotho	20.2%	0.27%	8.8%

English	1.4%	2.7%	2.3%
Afrikaans	5.9%	0.17%	0.84%
Zulu	0.25%	0.49%	1.2%
Other	1.8%	3.1%	3.1%

Data source: (Statistics South Africa, 2012)

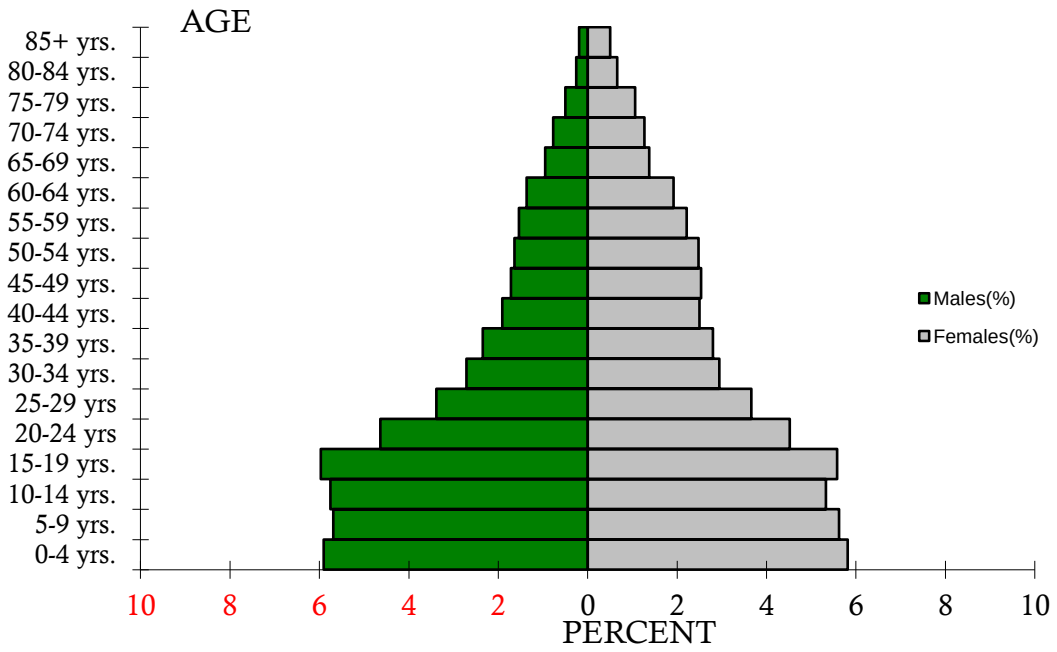
The difference between the populations and households of the districts as they occurred in 2001 and 2011 are compared **Figure 7**.



Data source: (Statistics South Africa, 2012)

Figure 7: Population and households 2001 and 2011 across districts

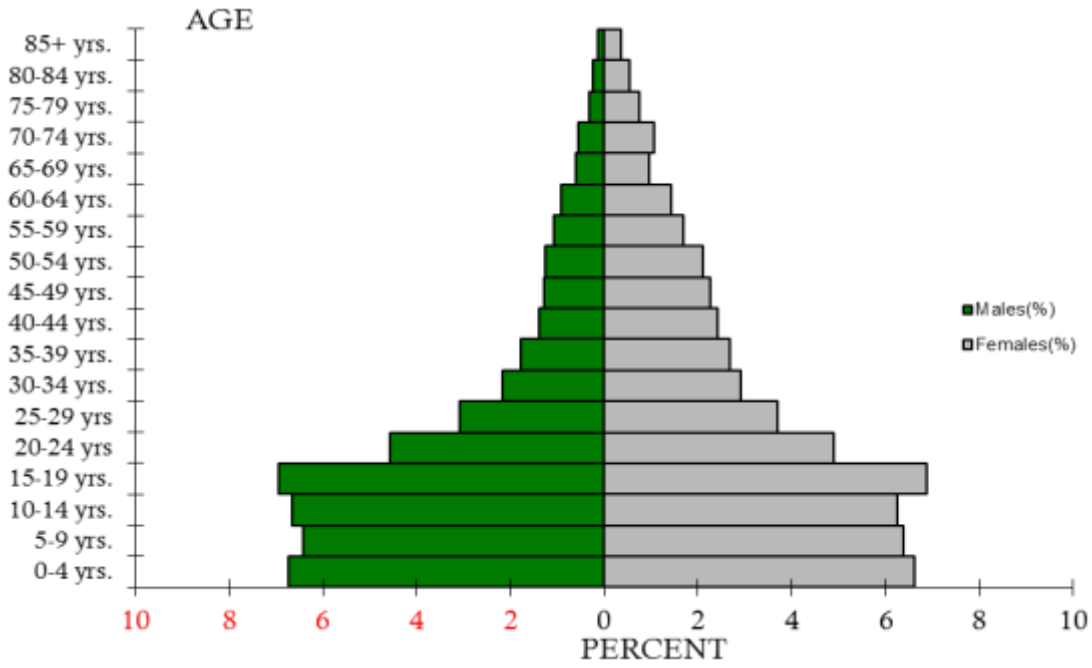
According to Census 2011, in the Joe Gqabi district 34.1% of the population was under 15 years of age while 58.4% was between 15 and 64 years and 7.5% were 65 years or older. The population pyramid for the Joe Gqabi District Municipality is illustrated in **Figure 8**.



Data source: (Statistics South Africa, 2012)

Figure 8: Population pyramid Joe Gqabi District Municipality DC14

In O. R. Tambo 39.0% of the population are under 15 years of age while 55.4% are between 15 and 64 years and 5.6% are over the age of 64. This data is represented in **Figure 9**.

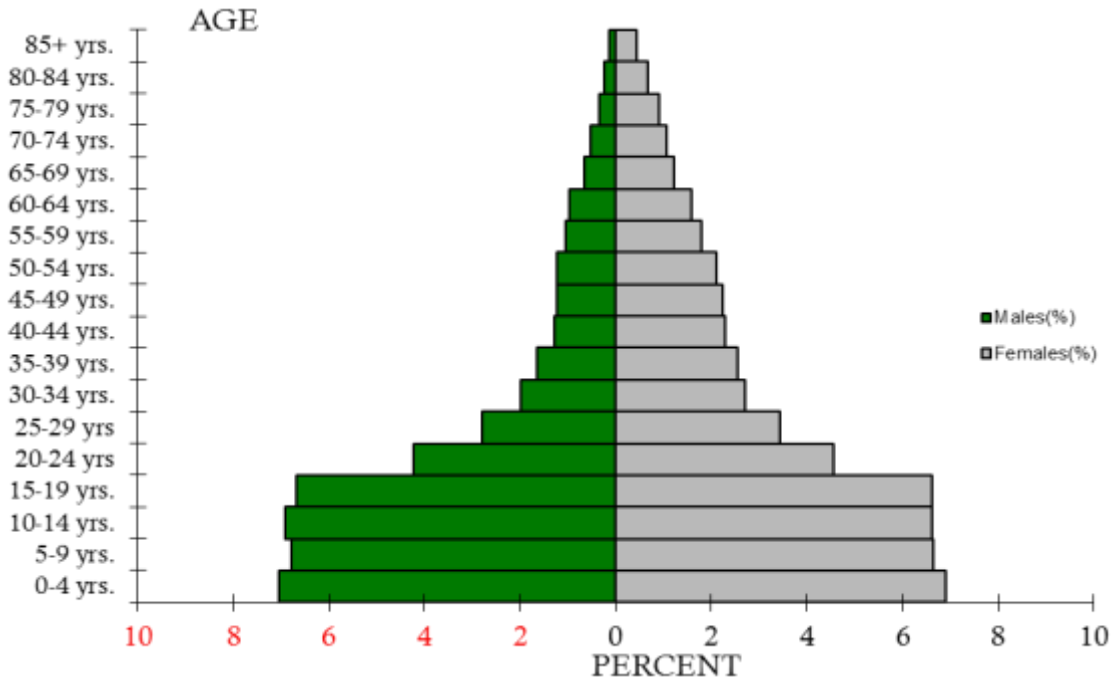


Data source: (Statistics South Africa, 2012)

Figure 9: Population pyramid O. R. Tambo District Municipality DC15

With regard to age structure, 40.9% of the population of Alfred Nzo are under 15 years of age while 52.9% are between 15 and 64 years. That section of the population who are 65

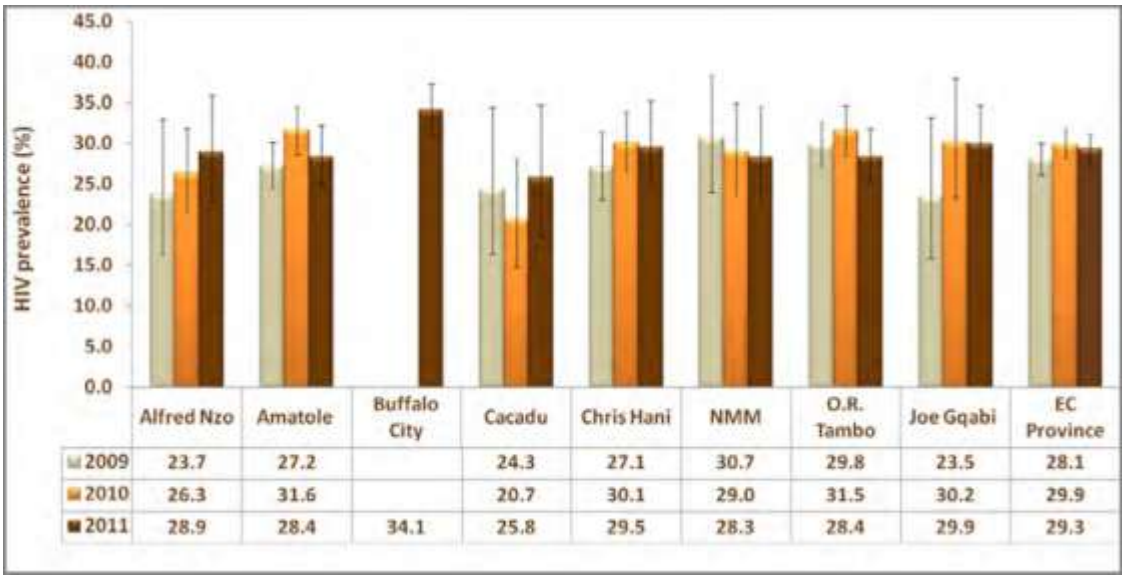
years and older constitute 6.2% of the population of the Alfred Nzo district as illustrated in **Figure 10**.



Data source: (Statistics South Africa, 2012)

Figure 10: Population pyramid Alfred Nzo District Municipality DC44

Concerning the HIV prevalence rate amongst antenatal women, in 2011 as assessed across the affected districts, Joe Gqabi had the highest prevalence rate at 29.9%. This is followed by the Alfred Nzo District Municipality at 28.9% and O. R. Tambo at 28.4%. Across both metropolitan and district municipalities in the Eastern Cape Province, Buffalo City had the highest prevalence rate at 34.1% while Cacadu had the lowest at 25.8%. This is illustrated in **Figure** 11:.



Source: (National Department of Health, 2012, p. 23)

Figure 11: HIV prevalence trends: Antenatal women by district 2009 – 2011

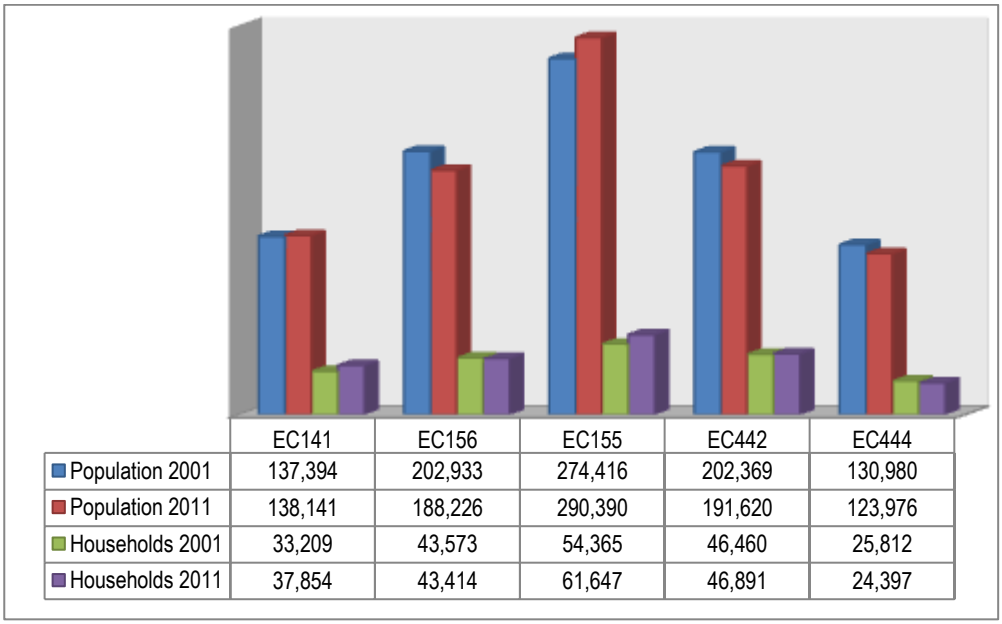
At the local municipal level the project impacts the following 5 local municipalities, Elundini, Mhlontlo, Umzimzubu, Ntabankulu and Nyandeni. Of these municipalities Elundini covers the greatest geographical area at 5,065 km^2 and Ntabankulu the smallest area at 1,385 km^2. With a population of 290,390 people Nyadeni has the highest population and population density at 120/km^2. Umzimvubu has the second highest population with 191 620 people living within the municipal area. At over 98% black African people are the biggest population group across all municipalities and Xhosa is the dominant language spoken. This data is represented in **Table 10** .

Table 10: Demographic data local municipalities

	Elundini EC141	Nyandeni EC155	Mhlontlo EC156	Umzimvubu EC442	Ntabankulu EC444
Geographical area	5,065 km^2	2,474 km^2	2,826 km^2	2,577 km^2	1,385 km^2
Population	138,141	290,390	188,226	191,620	123,976
Density	27/km^2	120/km^2	67/km^2	74/km^2	90/km^2
Population group					
Black African	98.1%	99.4%	99.4%	99.4%	99.4%
Coloured	1.0%	0.3%	0.2%	0.3%	0.4%
Indian/Asian	0.1%	0.1%	0.1%	0.1%	0.1%
White	0.7%	0.1%	0.2%	0.1%	0.1%
Language					
Xhosa	70.1%	95.3%	94.9%	93.1%	95.2%
Sotho	24.8%				
English	1.6%	2.0%	2.3%	2.6%	1.4%
Afrikaans	1.7%				
Other	1.8%	2.7%	2.8%	4.3%	3.4%

Data source: (Statistics South Africa, 2012)

The difference between the populations and households of the local municipalities as they occurred in 2001 and 2011 are compared in **Figure 12.**

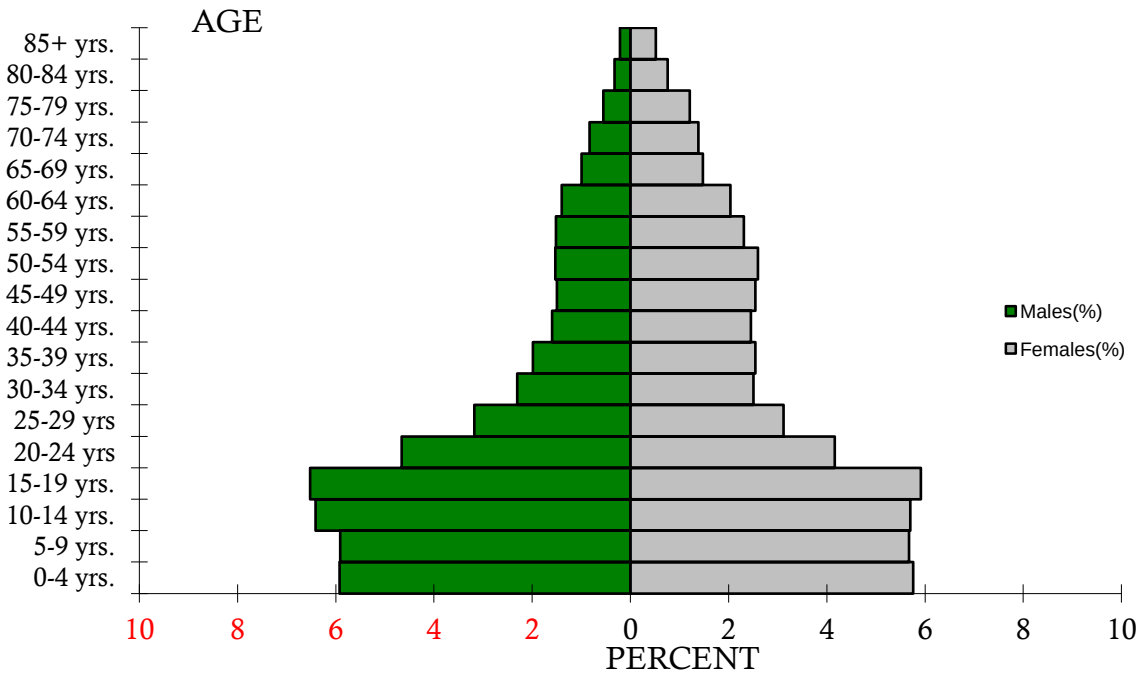


	EC141	EC156	EC155	EC442	EC444
Population 2001	137,394	202,933	274,416	202,369	130,980
Population 2011	138,141	188,226	290,390	191,620	123,976
Households 2001	33,209	43,573	54,365	46,460	25,812
Households 2011	37,854	43,414	61,647	46,891	24,397

Data source: (Statistics South Africa, 2012)

Figure 12: Population and households 2001 and 2011 across municipalities

In the Elundini Local Municipality, 35.4% of the population is under 15 years of age while 56.4% are between 15 and 64 years and 8.3% are 65 years and older. The population pyramid of Elundini is illustrated in **Figure 13**



Data source: (Statistics South Africa, 2012)

Figure 13: Population pyramid Elundini Local Municipality EC141

Regarding the age structure of the population of Nyandeni Local Municipality 40.6% are under 15 years of age, 54.0% are between 15 and 64 years while 5.4% are over 64 year. The population pyramid of Nyandeni is illustrated in **Figure 14**.

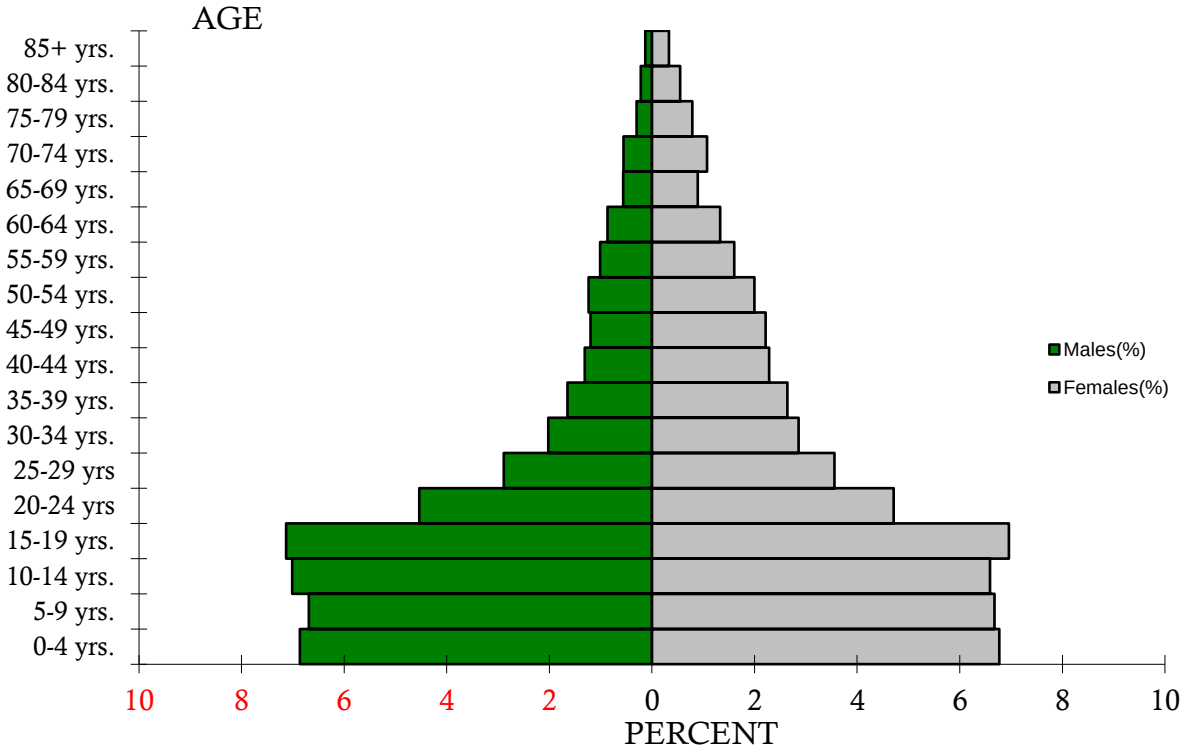
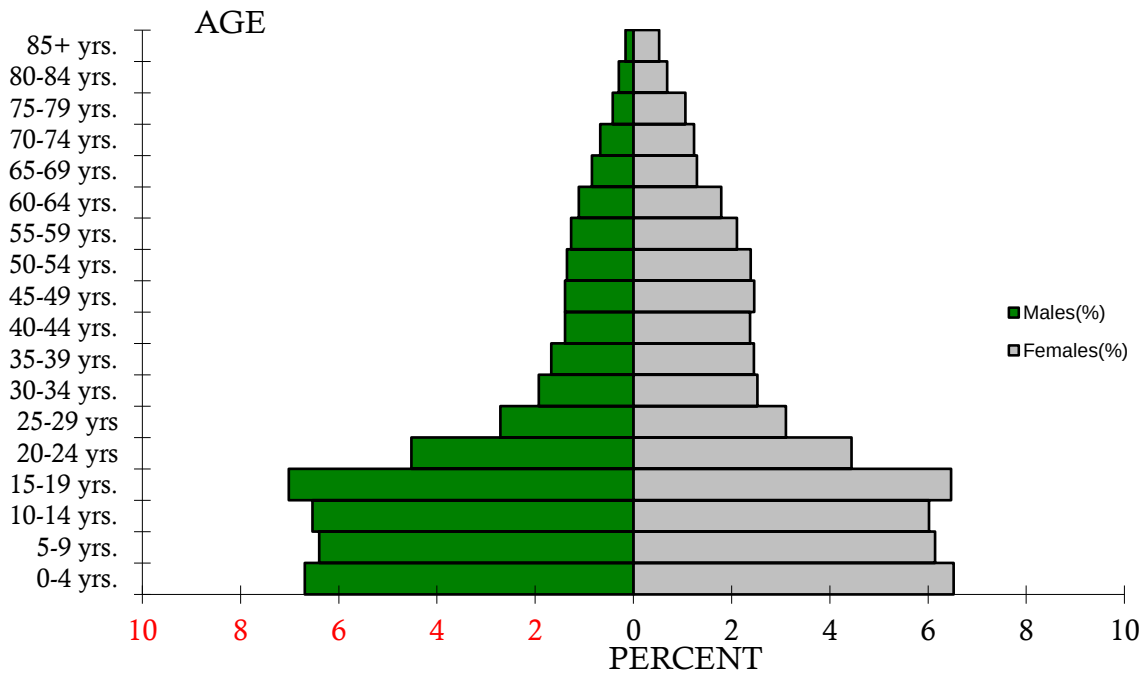


Figure 14: Population pyramid Nyandeni Local Municipality EC155

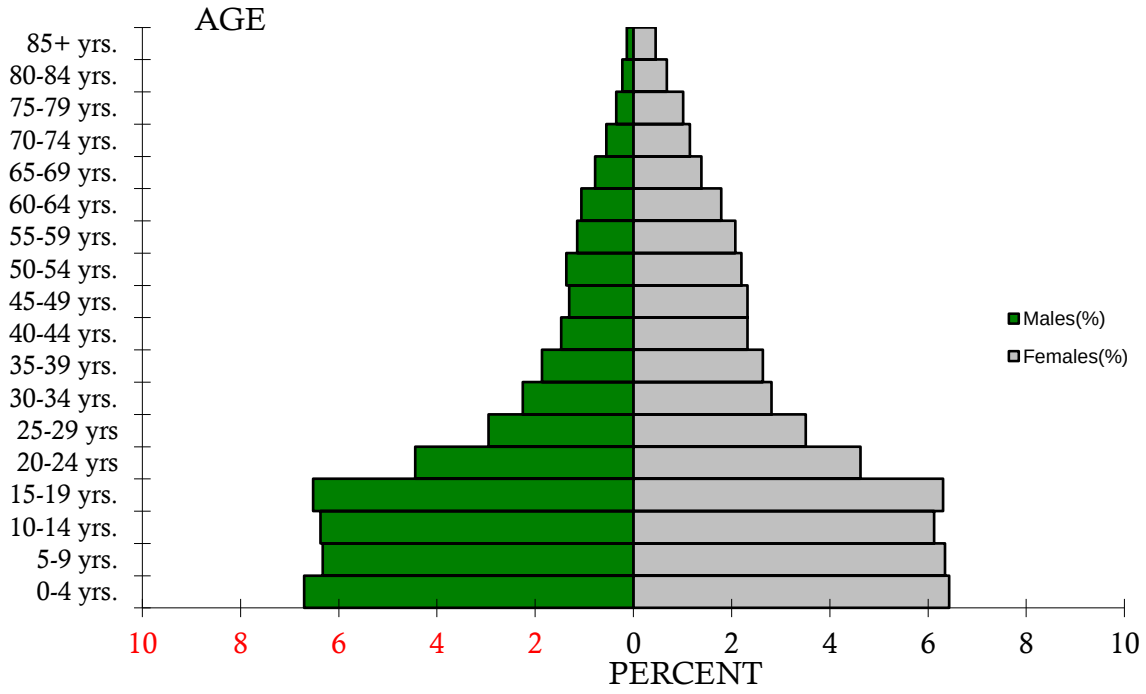
In respect of the age structure of the Mhlontlo Local Municipality 38.3% are under 15 years of age, 54.4% are between 15 and 64 years and 7.2% are 65 years and older. The population pyramid of Mhlontlo is illustrated in **Figure 15**.



Data source: (Statistics South Africa, 2012)

Figure 15: Population pyramid Mhlontlo Local Municipality EC156

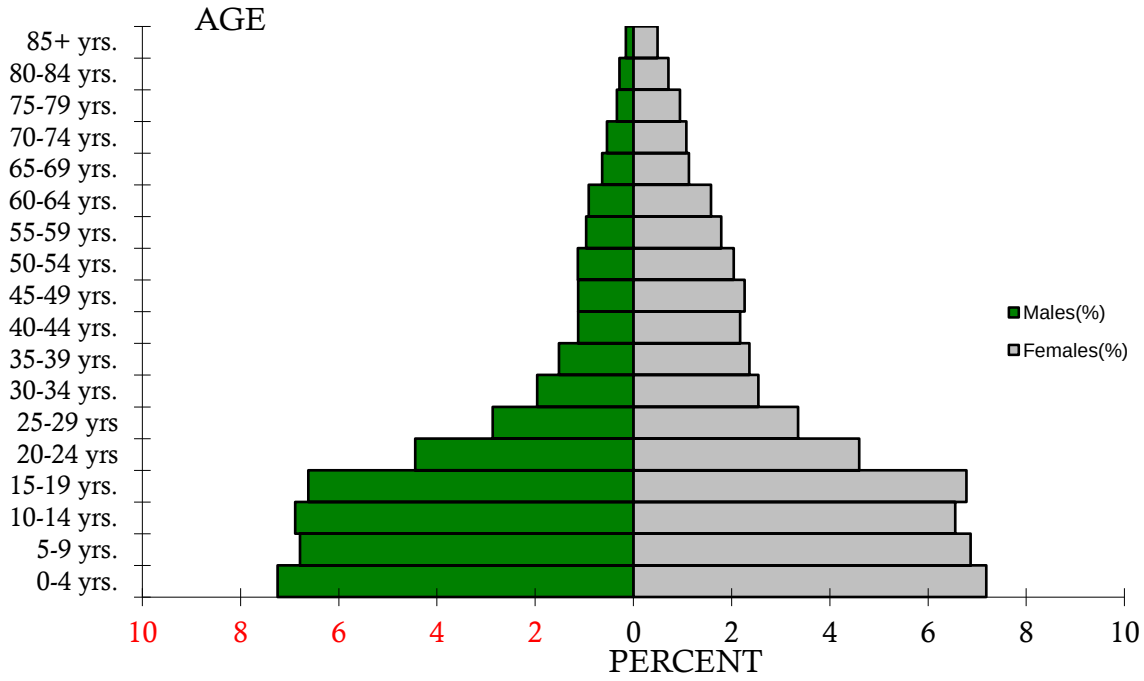
As far as the population of the Umzimvubu Local Municipality is concerned, 38.3% are younger than 15 years, 55% are between 15 and 65 and 6.7% are 65 and older. The population pyramid of Umzimvubu is illustrated in **Figure 16**.



Data source: (Statistics South Africa, 2012)

Figure 16: Population pyramid Umzimvubu Local Municipality EC442

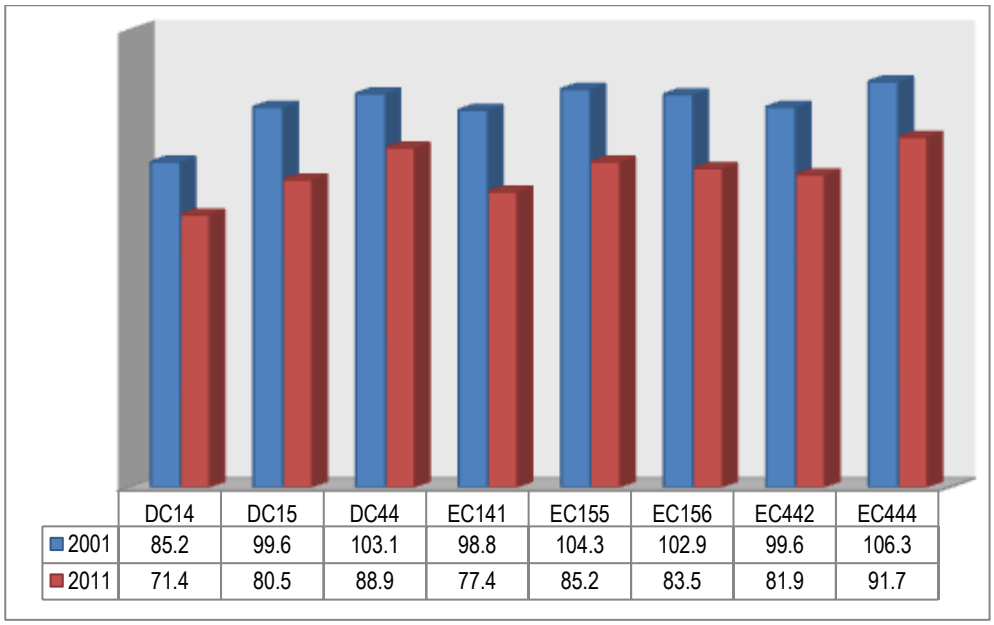
Ntabankulu has the youngest population across all municipalities with 41.5% being under 15 years of age and 52.2% falling between the ages of 15 and 64 years and 6.3% being 65 years and older. The age and gender distribution in the Ntabankulu municipality is illustrated through the population pyramid in **Figure 17**.



Data source: (Statistics South Africa, 2012)

Figure 17: Population pyramid Ntabankulu Municipality EC444

Attention is now given to a comparison of the population characteristics of the study area with emphasis on the district and local municipalities. The study area is characterised by a high dependency ratio which indicates the burden of supporting children under 15 years and people over 65 years placed on the working population aged 15–64 years. Although there has been some improvement across all areas, between 2001 and 2011, the burden still remains heavy, with it being greatest in Ntabankulu at 91.7 and lowest across the Joe Gqabi District Municipality at 71.4. This data is illustrated in **Figure 18**.

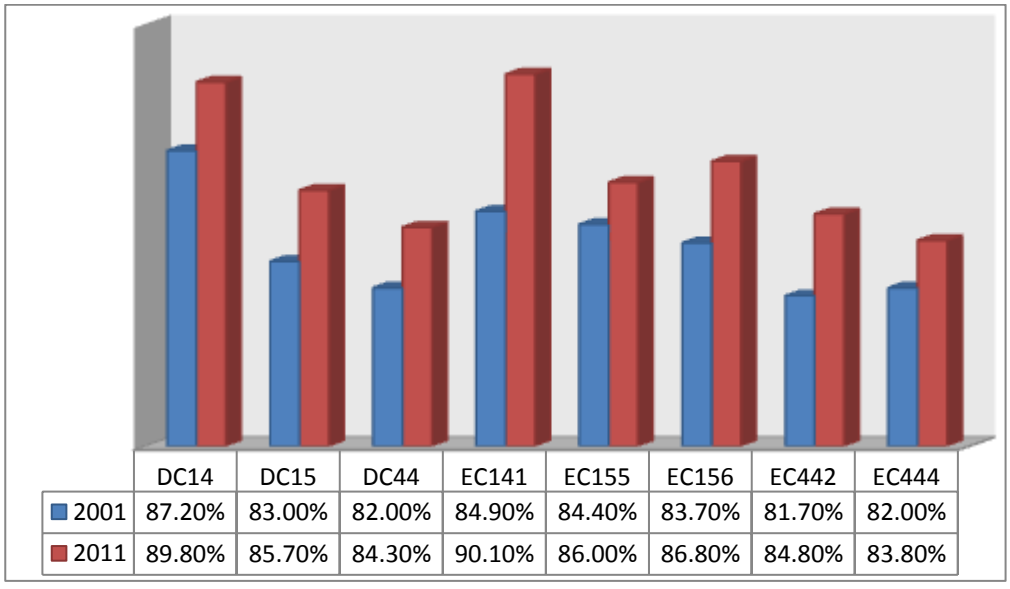


	DC14	DC15	DC44	EC141	EC155	EC156	EC442	EC444
2001	85.2	99.6	103.1	98.8	104.3	102.9	99.6	106.3
2011	71.4	80.5	88.9	77.4	85.2	83.5	81.9	91.7

Data source: (Statistics South Africa, 2012)

Figure 18: Dependency ratio

The sex ratio across all areas indicates a higher number of females compared to males with Ntabankulu having the highest proportion of females to males at 83.8% and Elundini the lowest at 90.1% as illustrated in **Figure 19**.

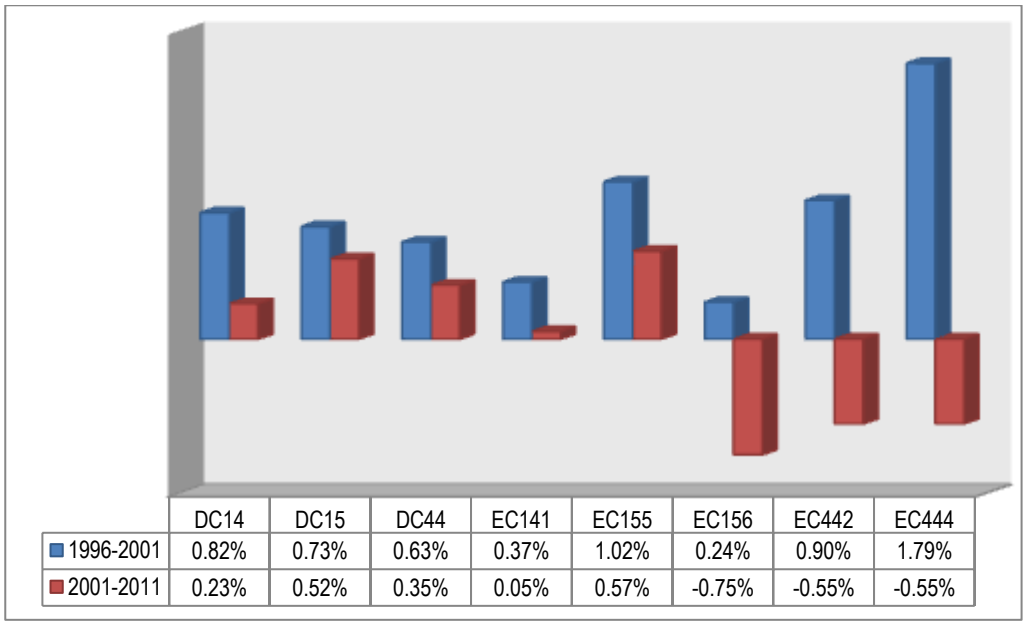


	DC14	DC15	DC44	EC141	EC155	EC156	EC442	EC444
2001	87.20%	83.00%	82.00%	84.90%	84.40%	83.70%	81.70%	82.00%
2011	89.80%	85.70%	84.30%	90.10%	86.00%	86.80%	84.80%	83.80%

Data source: (Statistics South Africa, 2012)

Figure 19: Sex ratio

Between 2001 and 2011 Mhlontlo, Umzimvubu and Ntabankulu all showed a negative population growth with the O. R. Tambo district having the highest population growth at 0.52%. This is illustrated in **Figure 20**.

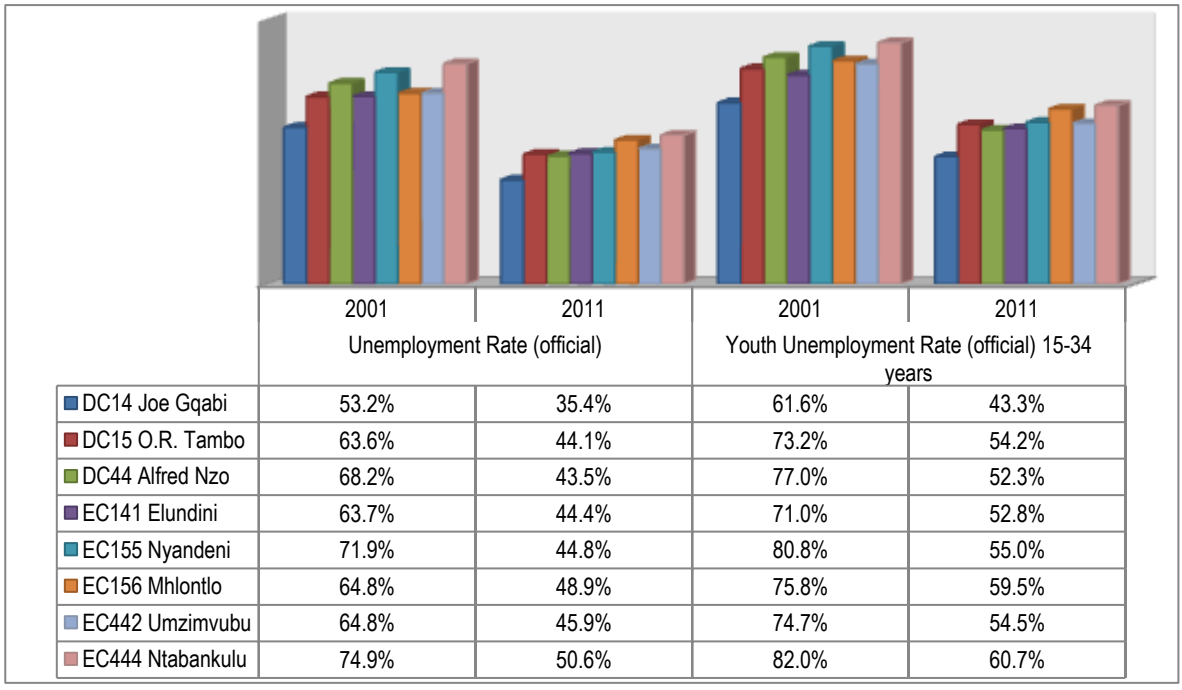


	DC14	DC15	DC44	EC141	EC155	EC156	EC442	EC444
1996-2001	0.82%	0.73%	0.63%	0.37%	1.02%	0.24%	0.90%	1.79%
2001-2011	0.23%	0.52%	0.35%	0.05%	0.57%	-0.75%	-0.55%	-0.55%

Data source: (Statistics South Africa, 2012)

Figure 20: Population growth rate % p.a.

In respect of the labour market, at 50.6% the highest level of official unemployment is found in Ntabankulu with the lowest level being found in in the Joe Gqabi district at 35.4%. Amongst the youth between 15 and 34 years of age Ntabankulu also has the highest rate of unemployment at 60.7% with Joe Gqabi again having the lowest at 43.3%, as illustrated in **Figure 21**.

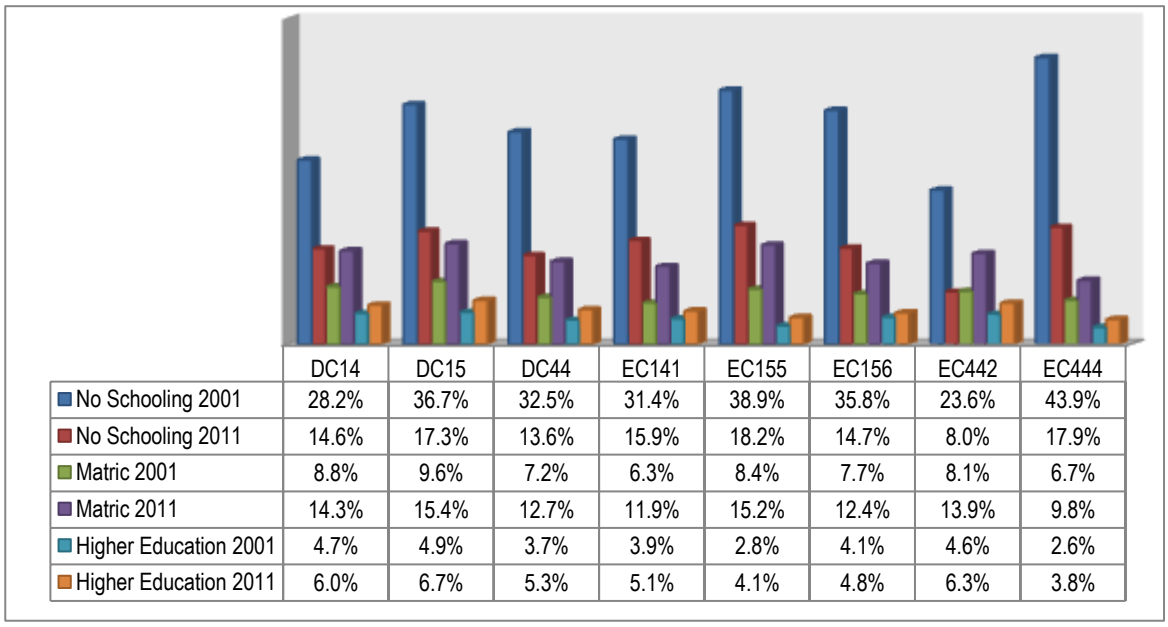


	2001 Unemployment Rate (official)	2011 Unemployment Rate (official)	2001 Youth Unemployment Rate (official) 15-34 years	2011 Youth Unemployment Rate (official) 15-34 years
DC14 Joe Gqabi	53.2%	35.4%	61.6%	43.3%
DC15 O.R. Tambo	63.6%	44.1%	73.2%	54.2%
DC44 Alfred Nzo	68.2%	43.5%	77.0%	52.3%
EC141 Elundini	63.7%	44.4%	71.0%	52.8%
EC155 Nyandeni	71.9%	44.8%	80.8%	55.0%
EC156 Mhlontlo	64.8%	48.9%	75.8%	59.5%
EC442 Umzimvubu	64.8%	45.9%	74.7%	54.5%
EC444 Ntabankulu	74.9%	50.6%	82.0%	60.7%

Data source: (Statistics South Africa, 2012)

Figure 21: Official unemployment and youth unemployment rate

The situation regarding schooling in the area improved somewhat between 2001 and 2011. Notwithstanding this, however, there is still a need to improve the situation even further with areas such as Ntabankulu, Nyandeni and the O. R. Tambo district still having over 17% of the population over 20 years of age not having attended school. At a provincial level, 10.5% of the population aged 20+ has had no schooling, 19.8% have a matric and 8.7% have a higher education. All the district and local municipalities, apart from Umzimvubu, have a higher percentage of the population having not attended school than is the situation across the province. In Umzimvubu the situation is reversed with 8% of the population having no schooling compared to the 10.5% across the Eastern Cape. Education across the area is illustrated in **Figure 22**.

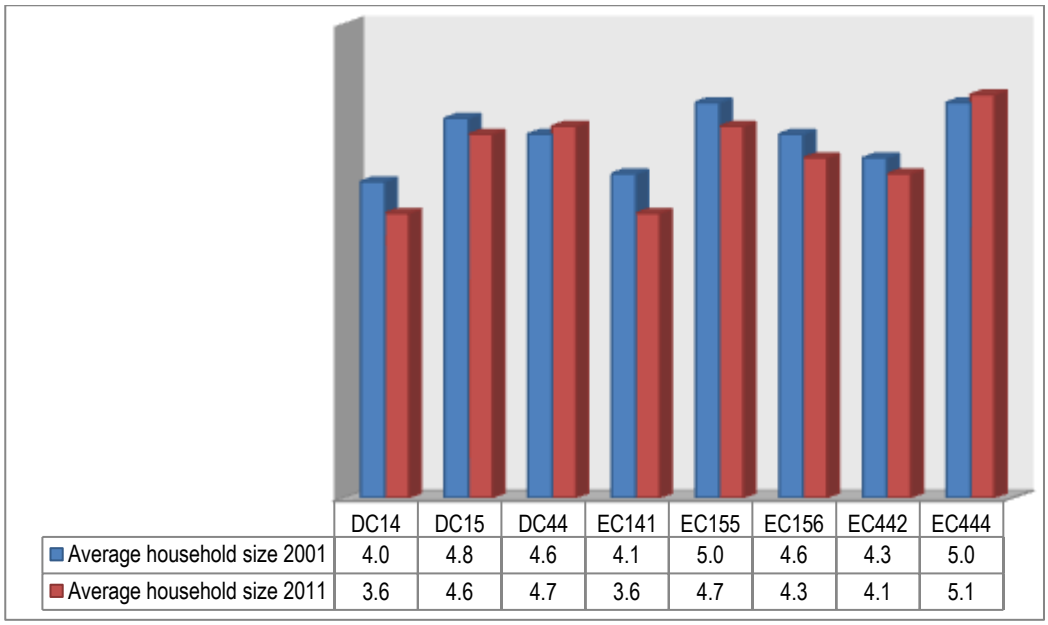


	DC14	DC15	DC44	EC141	EC155	EC156	EC442	EC444
No Schooling 2001	28.2%	36.7%	32.5%	31.4%	38.9%	35.8%	23.6%	43.9%
No Schooling 2011	14.6%	17.3%	13.6%	15.9%	18.2%	14.7%	8.0%	17.9%
Matric 2001	8.8%	9.6%	7.2%	6.3%	8.4%	7.7%	8.1%	6.7%
Matric 2011	14.3%	15.4%	12.7%	11.9%	15.2%	12.4%	13.9%	9.8%
Higher Education 2001	4.7%	4.9%	3.7%	3.9%	2.8%	4.1%	4.6%	2.6%
Higher Education 2011	6.0%	6.7%	5.3%	5.1%	4.1%	4.8%	6.3%	3.8%

Data source: (Statistics South Africa, 2012)

Figure 22: Education over 20 years of age

The average size of households in the area ranges between 3.6 in Elundini and 5.1 in Ntabankulu and is illustrated in **Figure 23**.

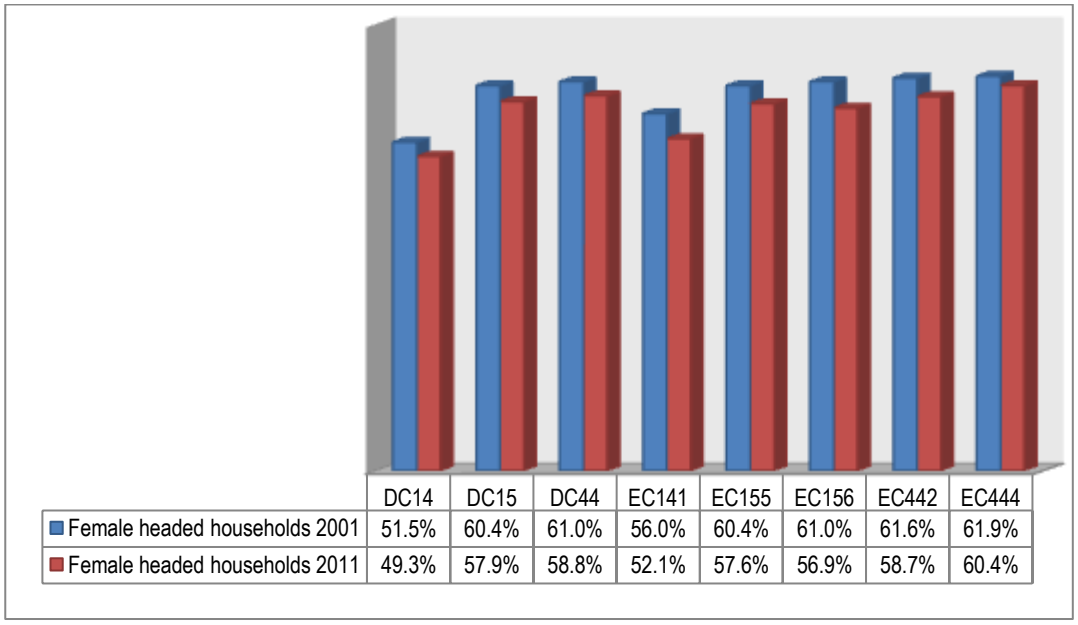


	DC14	DC15	DC44	EC141	EC155	EC156	EC442	EC444
Average household size 2001	4.0	4.8	4.6	4.1	5.0	4.6	4.3	5.0
Average household size 2011	3.6	4.6	4.7	3.6	4.7	4.3	4.1	5.1

Data source: (Statistics South Africa, 2012)

Figure 23: Average household size

Apart from the Joe Gqabi district, where 49.3% of the households are female headed, all other areas have a higher percentage of female than male headed households, with the greatest percentage of female headed households, at 60.4%, being found in Ntabankulu. Most formal dwellings are found in the Joe Gqabi district with the lowest percentage of formal dwellings, at 24.3%, being found in Ntabankulu. At 64.4% the local municipality of Ntabankulu has the highest percentage of housing being owned or being paid off with the lowest percentage, 53.9%, being found in Mhlontlo. This data is illustrated in **Figure 24**.

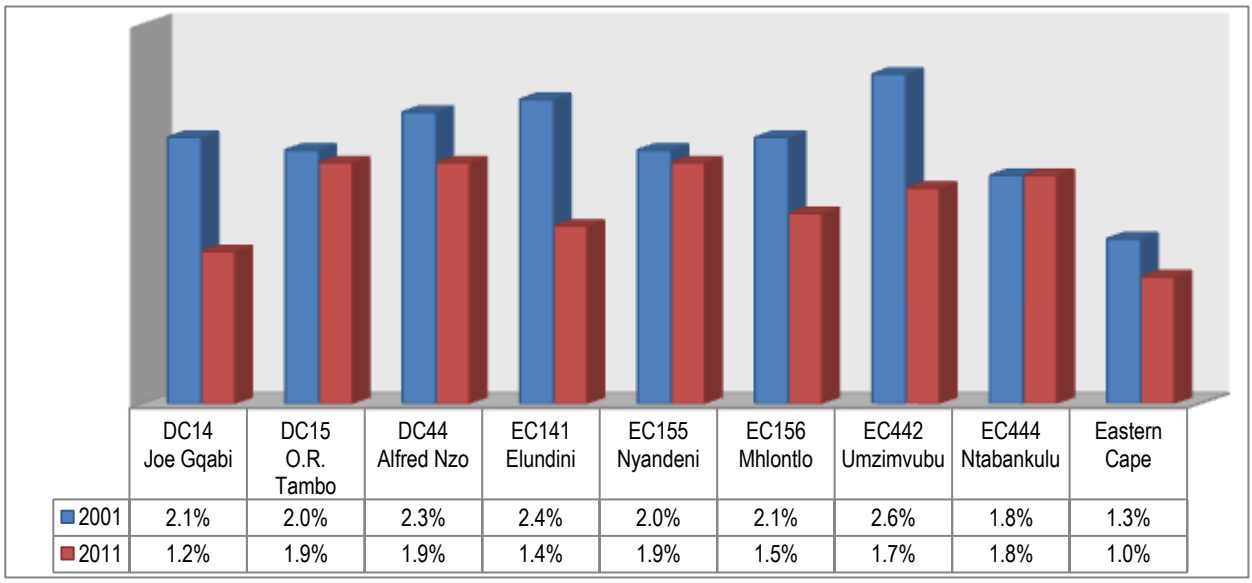


	DC14	DC15	DC44	EC141	EC155	EC156	EC442	EC444
Female headed households 2001	51.5%	60.4%	61.0%	56.0%	60.4%	61.0%	61.6%	61.9%
Female headed households 2011	49.3%	57.9%	58.8%	52.1%	57.6%	56.9%	58.7%	60.4%

Data source: (Statistics South Africa, 2012)

Figure 24: Household dynamics

When compared on a provincial level with the Eastern Cape Province at 1.0%, the study area has a relatively high percentage of child headed households. In the O.R. Tambo and Alfred Nzo districts 1.9% of households are headed by children under 18 years of age while in the Joe Gqabi district the figure is 1.2%. Apart from in Nyandeni were it is at 1.9%, the percentage of child headed households is marginally lower across the local municipalities, ranging between 1.4 and 1.8 percent, as is indicated in **Figure 25**.

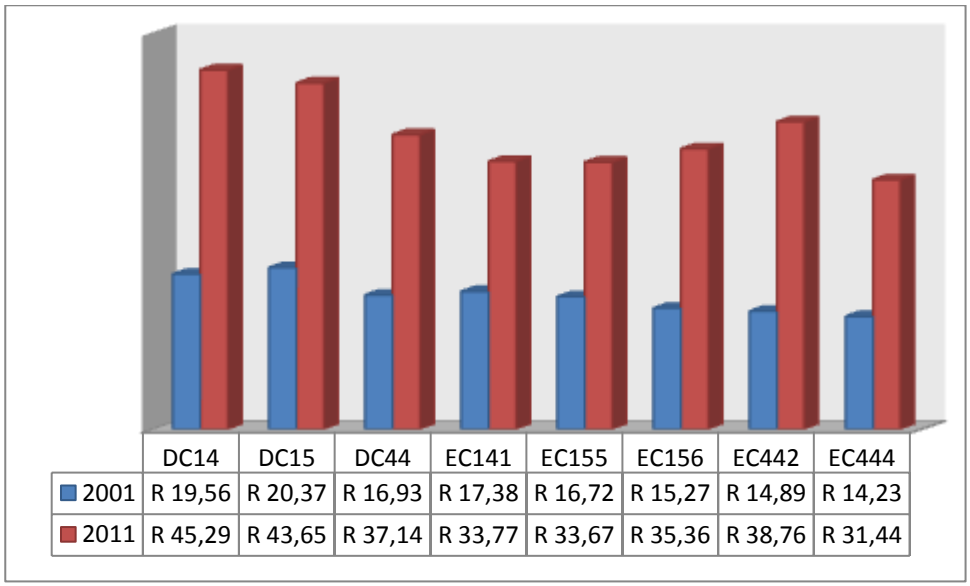


	DC14 Joe Gqabi	DC15 O.R. Tambo	DC44 Alfred Nzo	EC141 Elundini	EC155 Nyandeni	EC156 Mhlontlo	EC442 Umzimvubu	EC444 Ntabankulu	Eastern Cape
2001	2.1%	2.0%	2.3%	2.4%	2.0%	2.1%	2.6%	1.8%	1.3%
2011	1.2%	1.9%	1.9%	1.4%	1.9%	1.5%	1.7%	1.8%	1.0%

Data source: (Statistics South Africa, 2012)

Figure 25: Child headed households

Regarding household income, with an average household income of R37 147 per annum Alfred Nzo has the lowest average household income in respect of all district municipalities. Amongst the local municipalities Ntabankulu has an average household income of R31 446 making it the municipality with the lowest average income overall. The highest average income, at R45 295, is found in the Joe Gqabi district as illustrated in **Figure 26**.

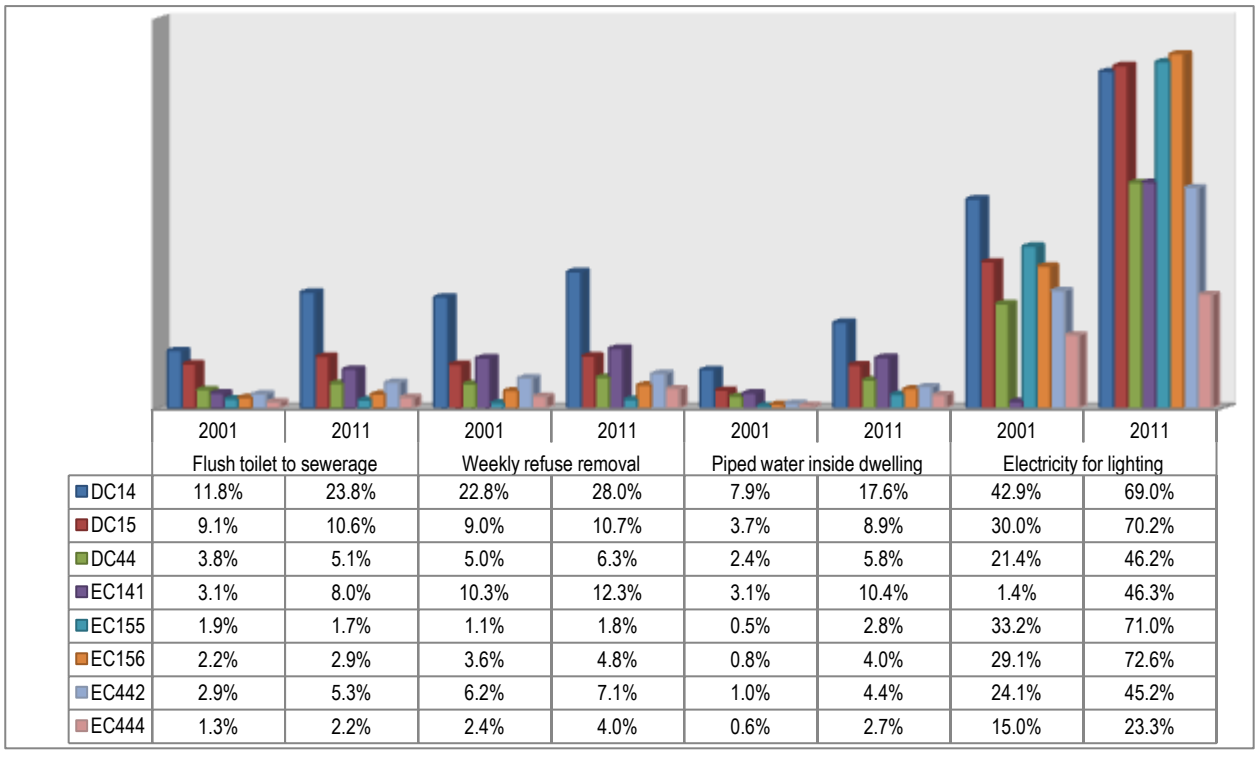


	DC14	DC15	DC44	EC141	EC155	EC156	EC442	EC444
2001	R 19,56	R 20,37	R 16,93	R 17,38	R 16,72	R 15,27	R 14,89	R 14,23
2011	R 45,29	R 43,65	R 37,14	R 33,77	R 33,67	R 35,36	R 38,76	R 31,44

Data source: (Statistics South Africa, 2012)

Figure 26: Average household income

In respect of household services, apart from electricity as a source of lighting, where it is surpassed by both the Mhlontlo local and O. R. Tambo district municipalities, on a general basis the Joe Gqabi Local Municipality has the highest level of service delivery. Ntabankulu has the lowest level of service delivery across all indicators. The indicators of household services are illustrated in **Figure 27**.

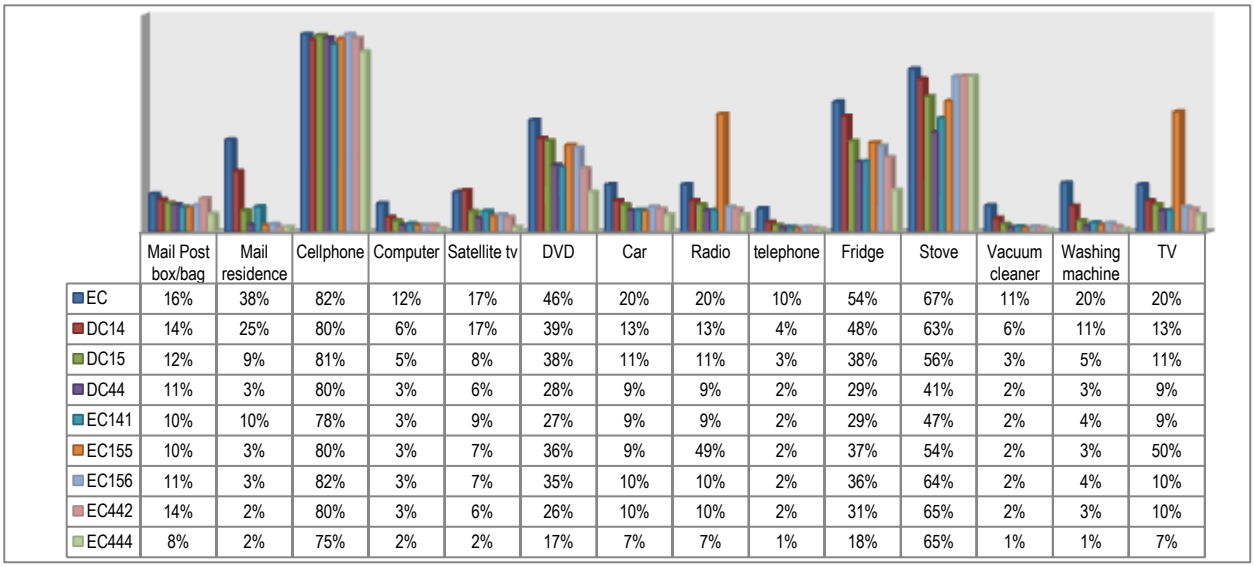


	2001	2011	2001	2011	2001	2011	2001	2011
	Flush toilet to sewerage		Weekly refuse removal		Piped water inside dwelling		Electricity for lighting	
DC14	11.8%	23.8%	22.8%	28.0%	7.9%	17.6%	42.9%	69.0%
DC15	9.1%	10.6%	9.0%	10.7%	3.7%	8.9%	30.0%	70.2%
DC44	3.8%	5.1%	5.0%	6.3%	2.4%	5.8%	21.4%	46.2%
EC141	3.1%	8.0%	10.3%	12.3%	3.1%	10.4%	1.4%	46.3%
EC155	1.9%	1.7%	1.1%	1.8%	0.5%	2.8%	33.2%	71.0%
EC156	2.2%	2.9%	3.6%	4.8%	0.8%	4.0%	29.1%	72.6%
EC442	2.9%	5.3%	6.2%	7.1%	1.0%	4.4%	24.1%	45.2%
EC444	1.3%	2.2%	2.4%	4.0%	0.6%	2.7%	15.0%	23.3%

Data source: (Statistics South Africa, 2012)

Figure 27: Household services

The proportion of households owning household goods across the area is lower than that of the province. On a general basis, households in the Joe Gqabi municipality own a greater proportion of household goods than do those across the other municipalities with households in Ntabankulu owning the lowest proportion of household goods. The distribution of household goods across the study area is illustrated in **Figure 28**.



	Mail Post box/bag	Mail residence	Cellphone	Computer	Satellite tv	DVD	Car	Radio	telephone	Fridge	Stove	Vacuum cleaner	Washing machine	TV
EC	16%	38%	82%	12%	17%	46%	20%	20%	10%	54%	67%	11%	20%	20%
DC14	14%	25%	80%	6%	17%	39%	13%	13%	4%	48%	63%	6%	11%	13%
DC15	12%	9%	81%	5%	8%	38%	11%	11%	3%	38%	56%	3%	5%	11%
DC44	11%	3%	80%	3%	6%	28%	9%	9%	2%	29%	41%	2%	3%	9%
EC141	10%	10%	78%	3%	9%	27%	9%	9%	2%	29%	47%	2%	4%	9%
EC155	10%	3%	80%	3%	7%	36%	9%	49%	2%	37%	54%	2%	3%	50%
EC156	11%	3%	82%	3%	7%	35%	10%	10%	2%	36%	64%	2%	4%	10%
EC442	14%	2%	80%	3%	6%	26%	10%	10%	2%	31%	65%	2%	3%	10%
EC444	8%	2%	75%	2%	2%	17%	7%	7%	1%	18%	65%	1%	1%	7%

Data source: (Statistics South Africa, 2012)

Figure 28: Distribution of household goods

Although there have been some improvements across the region, the area remains one of the poorest parts of the country, characterised by high poverty and out-migration resulting in sex ratio imbalances, a high proportion of female headed households and a low population growth rate. At large the population lacks basic amenities and relies heavily on subsistence farming, illustrated in **Figure 29**, which is not really successful.

Figure 29: Typical midrange housing structures and crop planting activities

This situation is somewhat similar to that across the province which reflects that;
"*The province is one of the poorest parts of the country. This is evident in all poverty indices and labour market statistics that are currently available. …*

The prevailing population profile in the province is to a large extent, a product of complex demographic reactions to the crisis of poverty, especially among the historically disadvantaged population groups" (Ed. Makiwane & Chimere-Dan, 2010, p. 21). The poverty level of the Eastern Cape is 70.6% with only the Limpopo Province having a higher poverty level at 78.9%. The poverty level of Mpumalanga is just below that of the Eastern Cape at 67.1%.

Regarding agriculture, on a provincial basis 37.7% of households in the Eastern Cape engaged in agricultural activities over the period June 2011 – June 2012. Of these households 24.8% were involved with poultry production, 20.5% with livestock production, 19% with grains and food crops, 19.9% with fruit and vegetables and only 0.2% with industrial crops (Statistics South Africa, 2012, pp. 2-3). Examples of the type agricultural activities found in the study area are illustrated in **Figure 29** and **Figure 30.**

Figure 30: Upper level housing structures and crop planting activities

Of the households in the Eastern Cape involved with different crop planting activities, 23.8% were in backyard gardens, 0.2% in communal gardens and 0.1 in school gardens with the other 75% being on a somewhat larger scale.

The percentage of households classified as food access adequate was 72% while 19.4% were food access inadequate and 8.8% of households in the province were food access severely inadequate. Although in this respect there are no statistics specific to the study area, it is unlikely that the situation in the study area will be significantly different. This is probably also applicable in respect of health in the area and the high rate of cancer across the province. Consideration is now turned towards the project footprint and those elements under direct threat and at risk as a result of the project.

The study area is characterised by a high dependency ratio with a high percentage of female headed households at an average of 56.9%. The population growth rate is low with the local municipalities of Mhlontlo (-0.75%), Umzimvubu (-0.55%) and Ntabankulu (-0.55%) all showing negative growth rates. The population is also very young with close to 40% being under 15 years. The unemployment rate is high and youth unemployment even higher ranging between 43.3% in Joe Gqabi and 60.7% in Ntabankulu. The average household income of the area is low with a weighted average household income for the three district municipalities of R41 800 per annum. In the mid-60s the study area changed from scattered rural homesteads to nuclear villages with agricultural land being apportioned, through the traditional authorities, to heads of household. Although a system of communal land ownership and land management was introduced at the time this has since fallen into disuse. Nevertheless, allocated fields still retain a value through folk memory and this needs to be carefully considered and addressed through the traditional

authority structures to ensure equitable compensation. In this respect refer to the Heritage Report and Relocation Action Plan (RAP).

Turning towards the areas directly affected by the project, it has been identified by means of a field survey that, with regard to the Ntabelanga Dam Basin, 62 structures and 19.9136 km^2 of cultivated land will be lost. The Lalini Dam Basin, technically preferred Option 1 will result in the loss of 12 dwellings, 2 being abandoned, and 7.59 km^2 of cultivated land. In total, it has been established that 160 structures and 0.69 km^2 of cultivated land could be lost as a result of the linear infrastructure components of the project.

Apart from the structures and cultivated areas that will be lost as a result of the project 124 structures have also been identified as being within 5 m of the project and therefore are at risk. The facilities at risk are largely associated with the linear components of the project which include access roads, pipelines and power lines and, as a relatively wide servitude is currently being used for the purpose of identifying these components, it is possible to re-align the routes to avoid the majority, if not all of these structures at risk. The primary mitigation measures applied in these instances is avoidance and considering that the pipeline will be buried it is possible that the servitudes can be restored to their original condition after construction. The facilities within the project servitude/footprint, and those at risk, will be addressed more specifically below as associated with each of the various components of the project.