

ECOLOGICAL REPORT

BASELINE ECOLOGICAL IMPACT ASSESSMENT OF THE NYANDENI LOCAL MUNICIPALITY WARD: MDINA, MCWILI, MBHOMBHELENI, NDUNGU, MHLANGA, ZINKUMBINI, MARUBENI AND MPHANGANA IN LIBODE, NEAR MTHATA FOR THE PROPOSED RECONSTRUCTION AND DEVELOPMENT PROGRAMME HOUSES IN EASTERN CAPE PROVINCE

Project Number: ECA-REP-094/14_15

Revision: 0.0/ 12 SEPT '14

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ACRONYMS




CR	Critically Endangered
DEA	Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EN	Endangered
EW	Extinct in the Wild
EX	Extinct
IUCN	International Union for Conservation of Nature
LC	Least Concern
LM	Local Municipality
NA	Not Evaluated
NEMA	National Environmental Management Act
NT	Near Threatened
NWA	National Water Act
RDL	Red Data List
ToR	Terms of Reference
VU	Vulnerable

DECLARATION OF INDEPENDENCE

I, **Vuyokazi April**, in my capacity as a specialist consultant, hereby declare that I:-

- ✚ Act as an independent consultant;
- ✚ Do not have any financial interest in the undertaking of this project, other than remuneration for the work performed in terms of the National Environmental Management Act 107 of 1998 as amended;
- ✚ Have and will not have vested interest in the proposed activity nor will I engage myself in any conflicting interest associated with this project
- ✚ As a registered member of the South African Council for Natural Scientific Professions, I will undertake my profession in accordance with the Code of Conduct of the Council as well as other associates to which I am a member;
- ✚ I undertake to disclose and provide to the competent authority any material or information at my disposal regarding this project as required in terms of National Environmental Management Act 107 of 1998;
- ✚ Based on the information provided to me by the client and in addition to information obtained during the course of this study, I have presented the results and conclusion with regard to this project to the best of my professional ability;
- ✚ I reserve the right to modify aspects pertaining to this study should additional information become available through ongoing research and further work on this field;
- ✚ I undertake to have my work peer reviewed on a regular basis by a competent specialist in the field of study.


Vuyokazi April (PrSciNat)

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Introduction

Environmental Assurance (Pty) Ltd (thereafter Envass) an independent environmental consulting company was appointed by WSMLESHIKA Consulting Engineers to undertake an baseline ecological impact assessment for a proposed Reconstruction and Development Programme (RDP) residential houses for the villages under Ward 31 of Nyandeni Local Municipality under OR Tambo District Municipality in Libode near Umtata, Eastern Cape Province.

This assessment aims to determine the baseline ecological status of the proposed project area.

Assessed areas for the proposed project

The study area compromise of eight (8) rural settlements scattered on the inland mountain escarpment. The assessed villages were the following:

- Mdina under Marubeni A.A;
- Mcwili;
- Mbhombheleni;
- Ndungu;
- Mhlanga;
- Zinkumbini;
- Marubeni and
- Mphangana.

The density of settlement within the assessed villages ranged from low to high. The majority of the residential structures observed are self built and each village is surrounded by communal grazing and arable lands. The community of each of the access villages reside in traditional type and there is a little sign of any significant economic activity within these villages.

The objectives were:

- To describe the principal vegetation associations within the project area and their environmental parameters;
- To assess the degree of modification of the vegetation if any, especially from current land use activities; and
- To compile a list of plant species encountered within the project area and particularly to search for threatened species and species with a limited distribution or other special floristic character.

Physical Environment, Vegetation and Flora

The proposed project will take place within existing disturbed areas for residential use (i.e. iza) which are occupied; therefore, the present ecological status of the area is regarded as transformed and degraded. The sites lie on the undulating hills (i.e. emaweni) and mountainous areas (i.e. ezintabeni), as a result vegetation species such as mountain Aloe, common aloe, cabbage tree and quiver trees is found seen in some yards of the residents within the assess villages. Furthermore, it was observed that alien invasive plants such as Black wattle, Bugweed, Lantana camara, Camphor tree were amongst the most common species around the residential yards. The observed flora formed part of visual aesthetic, as some like mountain and common aloes are used as hedges and to surround the edges of the animal kraal, cabbage and quiver trees for shades and as windbreakers. However, unoccupied residential yards that are unkempt were highly invaded by black wattle so are the yards with decapitated housing structure (i.e. amanxiwa).

The baseline ecological impact assessment found that the areas earmarked for the proposed re-developments areas highly transformed and it is concluded that no ecological aspect of the environment would be affected as a result of the project.

1. INTRODUCTION

The diversity of life forms and their interaction with each other and with the rest of the environment has made earth a uniquely habitable place for humans. Biodiversity sustain human livelihood and life itself. The interdependence between people and biodiversity is most apparent for some indigenous people who may lead a subsistence lifestyle and be critically dependent on biodiversity or ecosystem services offered. Some cultures and history are often intimately associated with the natural environment and system. Due to adopted Western cultures, dependence on biodiversity has become less tangible and apparent. However biodiversity remains critically important.

Biodiversity forms the most crucial environmental aspect and as such its status is used to evaluate decisions pertaining to activities with significant environmental impacts. The inclusion of biodiversity in decision making has been aimed to bridge a gap between economic development and land destruction, thus mitigating the environmental effects these developments may pose while still maintaining a functioning biodiversity (Driver et al., 2005). Therefore, as part of the Environmental Impact Assessment guidelines it is important to assess the potential impact of these proposed activities as they can impact directly or indirectly on the receiving environment.

1.1. Locality of project

The Reconstruction and Development Programme (RDP) housing construction will occur in the rural villages of Nyandeni Local Municipality Ward 31 which compromises of Mdina, Mcwili, Mbhombheleni, Ndungu, Mhlanga, Zinkumbini, Marubeni and Mphangana in Libode, near Mthata in Eastern Cape Province. The project areas can be accessed through R61 from Mthata to Port St John via Libode. The villages are on the outskirts of Libode.

The villages are built on the undulating hills and mountainous areas with both perennial and non perennial streams running on the edges near the open pastures. The study area falls within the Umzimvubu River Catchment which runs down to the Indian Ocean.

1.2. Proposed activity

The proposed activity involves the construction of 1000 RDP houses in the eight villages identified within Ward 31. This construction venture is initiated by the Nyandeni Local Municipality as part of the social outreach initiative. Each of the eight villages will each receive 125 houses (each house being approximately 40 square meters in surface size). The criteria to receive the house is set and stipulated by the Nyandeni Local Municipality terms and conditions. The proposed project will take place in already existing residential villages with the RDP house replacing the existing informal house within the same footprint.

1.3. Objectives and scope of the baseline ecological impact assessment study

The objectives of the study are:

- To assess the current vegetation and its conservation status;
- To identify the floral species on the proposed site and to recommend steps to be taken should a Red or Orange list, medicinal and protected species be found;
- To identify the fauna species on the proposed site and recommend steps to be taken should a Red or Orange listed and protected species be found;
- To highlight the potential impact the proposed development would have on the ecosystem of the study area; and
- To provide management recommendations to mitigate negative impacts and enhance positive impacts of the proposed activity.

The scope of the study will:-

- List flora and fauna observed and identified;
- Comment on the ecological or conservation status of the flora and fauna observed at the site;
- Recommend preservation of the indigenous and protected plants species observed; and
- Offer recommendation to reduce and minimise environmental impacts associated with the proposed activity.

1.4. Key land-use activity in the proximity of the proposed site

The proposed re-development area is currently used as a rural residential settlement which comprises of one or more than two self-built mud family houses with a rondavel as a common house observed in all the villages. Within one yard (i.e. iziza) there is an area designated for subsistence garden (i.e. isitya), area that is designated for kraal (i.e. Ubuhlanti) and on the far left or right side of the garden an old pit ablution house is erected or the area is used as a burial site for the family and relatives. Surrounding the residential areas are vast undulating open pastures that are used for livestock grazing and un-used, weed infested agricultural lands (i.e. amasimi).

2. LOCALITY

2.1. Proposed activity area

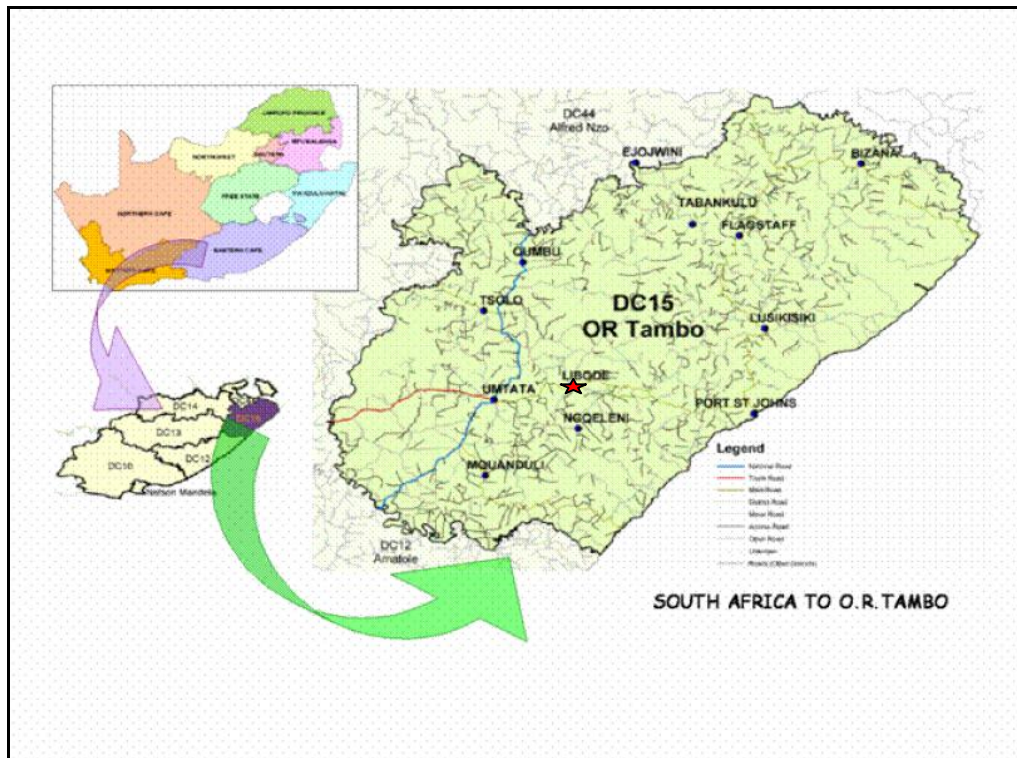


Figure 1: The proposed re-development will take place in Libode (★) rural villages

2.2. Proposed study sites / villages

The re-development will take place in the following villages:

- Dungu
- Marubeni
- Zinkumbini
- Mbombeleni
- Mcwili
- Mdina
- Mhlanga
- Mphangana



Figure 2: Mdina Village under Marubeni Village



Figure 3: Mcwili Village



Figure 4: Mbhombheleni Village



Figure 5: Ndungu Village



Figure 6: Mhlanga Village



Figure 7: Ezinkumbini Village



Figure 8: Marubeni Village



Figure 9: Mphangana Village

3. LEGISLATIVE CONTEXT

3.1. National Acts

3.1.1. The Constitution of the Republic of South Africa Act (Act No. 108 of 1996) – Section 24

The Constitution is South Africa's overarching law. It prescribes minimum standards with which existing and new laws must comply. Chapter 2 of the Constitution contains the Bill of Rights in which basic human rights are enshrined. Government's commitment to give effect to the environmental rights enshrined in the Constitution is evident from the enactment of various pieces of environmental legislation since 1996, including the National Water Act, the National Environmental Management Act, etc.

3.1.2. National Environmental Management Act (Act No. 107 of 1998) (NEMA), as amended

NEMA replaces a number of the provisions of the Environment Conservation Act, 1989 (Act No. 73 of 1989). The Act provides for cooperative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for coordinating environmental functions. The principles enshrined in NEMA guide the interpretation, administration and implementation of the Act with regards to the protection and / or management of the environment. These principles serve as a framework within which environmental management must be formulated. Section 2(4) specifies that **“sustainable development requires the consideration of all relevant factors including aspects specifically relevant to biodiversity”**:

3.1.3. National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA)

NEMBA provides for the management and conservation of biological diversity and components thereof; the use of indigenous biological resources in a sustainable manner; the fair and equitable sharing of benefits rising from bio-prospecting of biological resources; and cooperative governance in biodiversity management and conservation within the framework of NEMA.

3.1.4. National Environmental Management Protected Areas Act (Act No. 57 of 2003) (NEMPAA), as amended

NEMPAA provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; for the continued existence, governance and functions of South African National Parks; and for matters in connection therewith.

3.1.5. Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA)

South Africa has numerous problematic alien invaders, such as black wattle, lantana and queen of the night. CARA sets out to combat invasive plants. The Act categorizes weeds into three categories, with varying degrees of action required for each category of weeds. CARA is currently in the process of being revised. In addition the drafting of new regulations on alien and invasive species for the National Environmental Management: Biodiversity Act (NEMBA), Act 10 of 2004 is in effect in progress.

3.1.6. National Water Act (Act No. 36 of 1998) (NWA)

The National Water Act (NWA) is a legal framework for the effective and sustainable management of water resources in South Africa. Central to the NWA is recognition that water is a scarce resource in the country which belongs to all the people of South Africa and needs to be managed in a sustainable manner to benefit all members of society. The NWA places a strong emphasis on the protection of water resources in South Africa, especially against its exploitation, and the insurance that there is water for social and economic development in the country for present and future generations.

3.1.7. National Forests Act (Act No. 84 of 1998) (NFA)

The Act protects State Forests, Forest Nature Reserves and Wilderness Areas, and the plant and animal life contained therein. In addition the Act allows for management programmes to be established in order to prevent soil erosion and fire, maintain the natural genetic and species diversity and control plants and animals which are harmful to a particular area. The Act provides for the control and reasonable access to State Forests for the purposes of recreation, education, culture or spiritual fulfilment as well as prohibiting any person from damaging State Forests or contributing to the threat of fire. Forest officers are empowered to arrest any person who has contravened this Act and may seize such person's property.

3.2. Provincial Acts, Plans, Policy and Environmental guidelines

3.2.1. Eastern Cape Biodiversity Conservation Plan

The ECBCP addresses the urgent need to identify and map critical biodiversity areas and priorities for conservation in the Province. It also provides land use planning guidelines, recommending biodiversity-friendly activities in priority areas.

The ECBCP is intended for use by technical users and decision-makers in the spheres of planning, development and environment. Mapped information can be used both reactively and strategically to guide future development away from sensitive and priority biodiversity areas.

3.2.1. Bioregional plans

The Bioregional plans aim to provide maps of biodiversity priorities with accompanying land-use planning and decision making guidelines in order to inform decisions associated with land-use planning, environmental assessment, natural resource management and authorization.

3.2.2. Biodiversity management plans (MBP)

BMP's ensure the long term survival in nature of species; to provide the responsible person or organ of state effective monitoring and reporting on species progress and to be consistent with acts, frameworks and applicable bioregional plans or any plans issued in terms of Chapter 3 of the NEMA or any municipal integrated development plans etc.

3.2.3. National biodiversity strategy and action plans (NBSAP)

NBSAP goal is to conserve and managed terrestrial and aquatic biodiversity to ensure a sustainable and equitable benefits.

3.2.4. National biodiversity assessment (NBA)

Formerly known as National Spatial Biodiversity Assessment (NSBA) which is a systematic biodiversity planning approach that aims to give a comprehensive biodiversity assessment (previously it focused on spatial only) throughout the country. Its focus is to mainstream biodiversity priorities throughout the economy and making links between biodiversity and socio-economic development.

3.2.4. OR Tambo District Municipality Profile: Programme of Support to Local Economic Development 2004

Nyandeni is home to high levels of poverty (89.22%) and unemployment (76.55%), coupled with a very youthful population where 54.73% of the population is aged under 20 years, and the highest dependency rate (5.07) in the District. The depth of poverty is significant, considering that Nyandeni accounts for only 4.53% of the population yet 6.29% of the poverty gap in the Eastern Cape. Almost half (48.56%) of all local households live on up to R3000 per month and the average proportion of total expenditure on food (29.35%) is the highest in the District.

All of the aforementioned factors, together with low average annual per capita income, secure Nyandeni the lowest Poverty and Dependency score within the District. The Municipal performance on all other economic measures is more favourable, particularly on Economic Absorption Capacity where buying power is comparatively high and where the area's total disposable income and employment multiplier are approaching the Provincial average. Measure acting against the area's performance on this score is the negative income-expenditure balance.

Nyandeni's low Productivity score results principally from low growth in value creation relative to employment and labour remuneration and a relative shortage of skills available to the economy. Another contributing factor is the relatively low GDP per worker (formal and informal). The Municipality's Formal Economy Performance score is the lowest in O.R. Tambo, reflecting on the high levels of financial grant dependency and concentration of the local economy and low GDP growth performance – GDP has grown, but has experienced a loss in share of the Provincial and District economies.

3.2.5. Nyandeni Local Municipality Integrated Development Plan (IDP 2011/2012)

The Integrated Development Plan is a strategic planning instrument that guides and informs all planning, budgeting, management and decision-making in a municipality. The IDP gives impetus to the implementation of the government programme of action

In line with the requirements of the Local Government Municipal Systems Act (MSA) 32 of 2000 which prescribes for the review of municipal Integrated Development Plan (IDP), The IDP review focused on the following key aspects:

- Updating of the planning baseline information and assumptions based on new ward needs, revised analysis etc;

- Improving readability of the document in order to make it accessible;
- To respond to the comments made on past IDP;
- To make the IDP more credible and design it along the lines suggested by MEC assessment; and
- Implementation of the Municipal Turn Around Strategy model.

3.2.5. National Building Regulations and Building Standards Act, 1977

This Act provide for the promotion of uniformity in the law relating to the erection of buildings in the areas of jurisdiction of local authorities and for the prescribing of building standards

4. TERMS OF REFERENCE

In recent years, increase attention has been focused on the role of biodiversity in sustainable development at a global scale. In spite of the global uptake of sustainable development as a concept, and of the growing recognition of the critical role that biodiversity plays in human wellbeing, most politicians and administrators have failed to make the link between conservation of biodiversity, social and economic development, and human wellbeing.

The purpose of an Environmental Impact Assessment (EIA) is to provide decision-makers with adequate and appropriate information about the potential positive and negative impacts of a proposed development and associated management actions in order to make an informed decision whether or not to approve, proceed with or finance the development.

For EIA processes to retain its role and usefulness in supporting decision-making, a specialist's role in the process could be to assist with any or all of the following:

- Describing the affected environment;
- Describing the legal, policy and planning context;
- Identifying and responding to issues;
- Identifying alternatives;
- Identifying opportunities and constraints;
- Developing specialist terms of reference (TOR);
- Predicting and assessing impacts;
- Recommending management actions and monitoring programmes

Specialists can be involved for different purposes and at different intensities during various stages of the EIA process, regardless of whether the process is initiated before or upon submission of an application for statutory approval. Specialists can, therefore, provide input during pre-application planning or following the submission of an application for statutory approval of the proposed development (i.e. during screening, scoping and/or impact assessment).

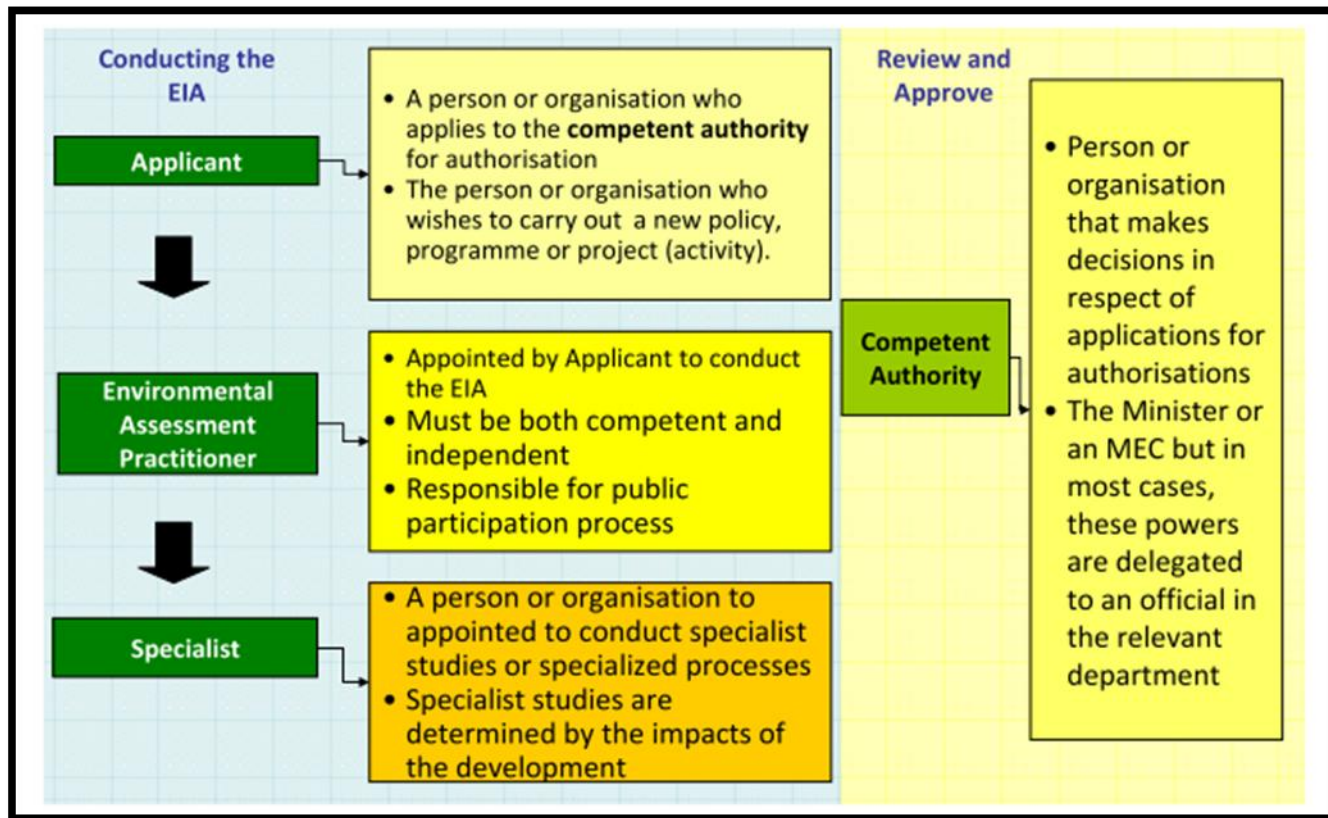


Figure 10: Environmental Impact Management approach towards the authorization application

For an ecological impact assessment the studies are conducted to determine the ecological value of the site based on biodiversity and ecosystem functioning prior to the proposed housing construction development. To comply with the national, provincial, local and regional legislations and guidelines; the assessment is comprised of the two (2) components:

4.1. Desktop research and literature review

The available provincial biodiversity data sets, red listed and protected flora and fauna data were perused and used as references to support the findings of the study. Relevant national, provincial and regional environmental legislations, regulation and policies with regards to this assessment were used as guidelines in conducting this assessment.

Furthermore, previous conducted assessments (if any) of this nature were reviewed and used as reference and maps or any spatial data (where available) on biodiversity of the area were used to determine the occurrence, distribution and conservation status of observed flora and fauna at the site.

The information obtain during desktop research was then used to compile a checklist for field assessment/survey.

4.2. Ground truthing and field sampling

Ground truthing was conducted on the 28 August 2014 in order to understand the magnitude of the proposed project and verify the accuracy of the results yielded during the desktop research. Environmental changes (micro and macro) were assessed especially those that are not yet documented in existing data. This component entails a visual assessment of the area, monitoring of the faunal species activities and documenting other developmental activities within or adjacent to the proposed project area.

The findings from these components were used to compile this report and offer a constructive conclusive decision for the ecological assessment.

5. PRESENT ENVIRONMENTAL STATE

5.1. Topography

The study area is characterised by undulating plains, which become more hilly and broken towards the coast.

5.2. Climate

The study falls within a warm to temperate climatic region, with rainfall occurring mostly in the summer in the form of heavy thunderstorms. Average rainfall varies according to altitude and topography, range from 1 000 to 1 300 mm per annum along the coast, to 700 mm per annum in the inlands and up to 1 500 mm per annum along the escarpment. The area is occasionally affected by tornadoes, a rarity in southern Africa. The temperature is mild along the coastal areas, with a mean annual temperature of 21 °C (ranging from 3 °C to above 30 °C), and a slightly wider range inland with a mean annual temperature of 16 °C (ranging from 3 °C to above 40 °C). Light snowfalls may occur in winter, melting within a day or two.

5.3. Geology

The regional geology of the study area is characterised by sandstones and brownish-red and grey mudstones of the Beaufort Group. From inland towards the coast the profile become dark grey shales with mudstones and sandstones of the Ecca Group. Exposures of Karoo dolerite intrusions are found throughout, but mostly in the higher lying areas.

5.4. Soil

The soils are mainly shallow, rocky and leached Fa land type. The erodibility of the soils is fairly high which results in the formation of the gullies or dongas. The study area falls within the Glenrosa/ Mispah soil form which lacks the lime content. These soils are good for grazing but poorly suitable for arable lands.



Figure 11: Gully erosion (Mdina Village)



Figure 12: Extreme donga erosions (Mcwili Village)

6. METHODOLOGY

6.1. Vegetation assessment

The vegetation surveys were undertaken within vegetation polygons identified by a combination of Mucina and Rutherford vegetation mapping (2006), photograph interpretation and mapping by the Eastern Cape Terrestrial Biodiversity Assessment Plan. Delineation of vegetation patches was based on the type and general condition of the vegetation which is often strongly influenced by land-use practices (e.g. level of grazing, history of disturbance, location of fence lines).

Vegetation surveys were conducted to:

- Assess the presence of an endangered ecological community under the IUCN Red list and
- Determine whether vegetation patches meet the endemic vegetation definition as defined under the NEMBA.

A GPS recording and photographs were taken.

6.2. Habitat resources

Savanna and grasslands biomes are likely to support a diversity of animals, including birds, reptiles, arboreal mammals and invertebrates. In the woodland communities, a structural complexity is created by the presence of tree hollows, fallen timber, trees of different ages, a mid-level shrub layer and a grassy under storey. These areas are considered to have high ecological value as they provide nesting sites, shelter and food resources for a variety of species.

7. STUDY LIMITATIONS

7.1. Vegetation

This study was not intended to provide an inventory of all species present within the study area but instead aimed to provide an overall assessment of the ecological values with particular emphasis on the endemic vegetation status, endangered ecological communities and condition.

Some flora could not be identified to species level due to insufficient diagnostic material (such as flowers and fruits). Some species were subsequently identified to Genus level only. However, in all cases a sufficient level of identification to determine the endemic or exotic status of individuals could be made for an assessment against the indigenous or protected vegetation status of the site.

8. RESULTS AND DISCUSSION

8.1. Biome

Nyandeni Local Municipality falls within the Grassland and Savanna biomes. However, the project site is with the Sub-Escarpment Grassland, and grassland biome is the second largest in the country (Mucina & Rutherford, 2006). The Grassland Biome is very important from a Red Data perspective, as it is the preferred habitat of several grassland birds. Grasslands are critically important water production landscapes that provide the natural resources and ecological infrastructure that supports important economic activities, and millions of rural livelihoods within the country. The study area however, has been transformed to a large degree by residential settlement, livestock grazing and subsistence farming especially near the residence which has placed biome under severe environmental pressures such as vegetation fragmentation and degradation.

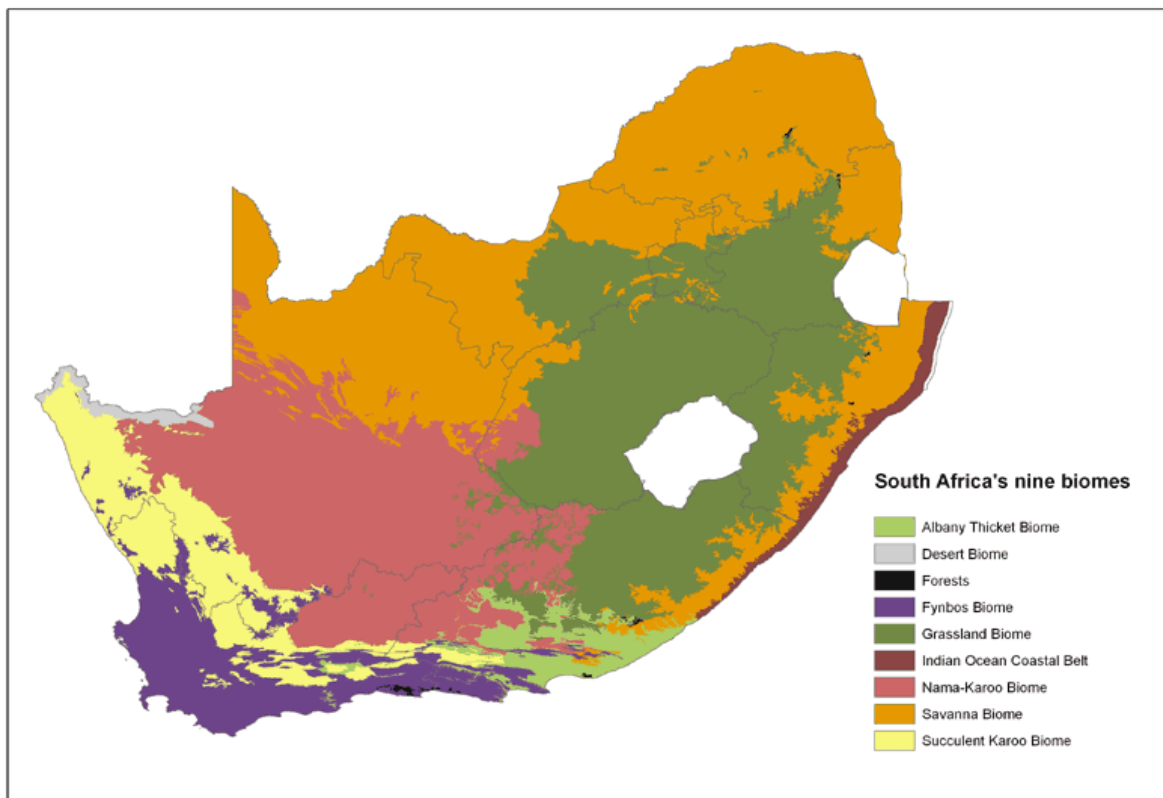


Figure 13: Biomes of South Africa

8.2. Vegetation

The project developmental site falls within the Mthatha Moist Grassland (Gs 14) vegetation unit. The Mthatha Moist Grassland vegetation unit is considered vulnerable as a result of irreversible loss of natural habitat, this can further escalate

to view this vegetation unit ecosystem as endangered in the near future (National Gazette #34809 Threaten Ecosystem Listing and Mapping, 2011). The vegetation occupies 528 000 hectares with only 53% remaining and less than one percent (1%) protected. This vegetation unit is characterised by grass species such as *Eragrostis plana*, *Sporobolus africana* and *Themeda triandra* and occurs on undulating plains and hills between Butterworth and Umtata (Mucina et al., 2006).

However, the area assessed for the project development within the vegetation unit has been transformed as a result of a range of scattered and clustered village settlements. Therefore, the observed vegetation species showed a variation between natural occurring plant species and alien invasive plant species that occur within the residential yards and on the open spaces in-between the settlements. It has to be noted that the majority of the plant species observed were uniform throughout the assessed eight villages falling under Nyandeni Local Municipality with few different plant species encountered randomly among the study areas.



Figure 14: Gramnioids are used for livestock grazing



Figure 15: The wild tobacco plant and scattered stands of Black wattle



Figure 16: Cleared areas where mud bricks are created; these would be used to build a house or a rondavel

The list of plant species which were observed during the assessment are listed under Table 1 below. Conversely, the limitations identified under Section 7 page 23 should be considered should a natural occurring plant species got eliminated from the observed list.

Table 1: List of flora species observed and likely to occur at the study site

Family	Species Name	Common Name	Vernacular name (isiXhosa)	Growth form	Conservation Status
Xanthorrhoeaceae	<i>Aloe ferox</i>	Bitter Aloe	Ikhala/ ingxalaba	Multistem shrub	Indigenous
Araliaceae	<i>Cussonia paniculata</i>	Cabbage Tree	Umsenge/ ingcokhwe	Tree	Indigenous
Xanthorrhoeaceae	<i>Aloe dichotoma</i>	Quiver Tree	-	Tree	Indigenous
Myrtaceae	<i>Eucalyptus camaldulensis</i>	Red Gum tree	-	Tree	Invasive
Agavaceae	<i>Agave attenuata</i>	Agave	-	shrub	Invasive/ornamental
Fabaceae	<i>Sesbania puniceae</i>	Sesbania	-	Shrub	Invasive
Fabaceae	<i>Acacia mearnsii</i>	Black wattle	idywabasi	Tree	Invasive
Verbenaceae	<i>Lantana camara</i>	Lantana	Utywala-bentaka	Shrub	Invasive
Asteraceae	<i>Xanthium strumarium</i>	cocklebur	Ukhakhakha	Shrub	Invasive
Solanaceae	<i>Solanum mauritianum</i>	Wild tobacco	umbangabanga	Shrub	Invasive
Rosaceae	<i>Prunus persica</i>	Peach tree	ipesika	Tree	Naturalized exotic species
Xanthorrhoeaceae	<i>Aloe arborescens</i>	Kranz aloe	Ingcelwane/ukrakrayo	Dwarf shrub	Indigenous
Poaceae	<i>Themeda triandra</i>	Red grass	umsithi	grass	least concern
Poaceae	<i>Eragrostis plana</i>		umtshiki	grass	Least concern
Solanaceae	<i>Solanum giganteum</i>	Bitter apple tree	Icuba lasendle	shrub	Least concern
Cactaceae	<i>Opuntia ficus indica*</i>	Prickly pear	Itolofiya	shrub	naturalized exotic species
Anacardiaceae	<i>Searsia lancea</i>	karee	Iqwela/ umhlokotshane	shrub	Indigenous
Euphorbiaceae	<i>Euphorbia tetragona</i>	Honey euphorbia	umhlontlo	Tree	Indigenous
Caesalpinioideae	<i>Schotia afra</i>	Boer bean	Umgxam	Shrub	Indigenous
Poaceae	<i>Sporobolus africanus</i>	Rat tail dropseed	umsingizane	grass	Least concern

8.3. Exotic species

Exotic species invasion were observed. Black wattle was found to occur in the area. In some residences the species has been planted around the yard as a form of wind breaker. Random exotic species such as gum tree, lantana, cocklebur,

sesbania and prickly pear were observed in some of the yards or in the open spaces within the settlements in some of the villages (see Table 1).

8.4. Medicinal and cultural used plant species

Most of the plant species that were observed in residential areas such as *Schotia afra*, *Opuntia ficus-indica* and *Aloe ferox* are used in some form of unconventional medicine for minor ailments such as stomach-aches, treatment of boils and wounds. Furthermore, fruits of *Opuntia ficus-indica* and *Prunus persica* are edible and consumed by locals; whereas the hollow stems of Quiver trees has been culturally used as a refrigerator alternative to store water and meat before electricity was introduced (see Table 1). It is important to note, that traditional plant use in rural areas and its economic value, although difficult to estimate, is significant and entirely dependent on natural biodiversity. Many plants used in traditional medicine are slow growing and, once lost, are unlikely to return to an area.

8.5. Fauna

The project areas are an existing rural settlement and the majority of residents are small farmers owning cattle, sheep, goats, chickens, dogs and cats which are considered as domesticated pets. Therefore, no fauna of biodiversity concern was encountered or observed during the assessment.

8.6. Sensitive areas

Environmentally Sensitive Areas (ESAs) are land and water areas containing natural features or ecological functions of such significance as to warrant their protection in the best long-term interest of the people and environment.

The areas that could be considered sensitive in the study area are the perennial and non-perennial rivers that run below and adjacent to the residential areas assessed. The observed watercourses or rivers would not be impacted by the proposed development as it will occur within the existing residential yards. The villages are constructed at more than 100 - 500 meters away from the rivers, this is based on the calculation made at Mdina Village where the first house yard is 106 m away from the perennial Mdina River's banks.

9. IMPACT ASSESSMENT

During the assessment, it was established that the RDP houses would be constructed on areas already disturbed and designated for residential use. Therefore, it is anticipated that there will be no removal of pristine natural vegetation. Furthermore, in areas where tree species occurs, construction could be designed and implemented such that they form an integral part of the new house to create a scenic view and to maintain soil stability.

The proposed development is considered to have **very insignificant impact** on the ecological aspects of the environment as the area is already transformed and **no significant vegetation of biodiversity concern would be affected**.

However, the disturbance during construction will induce the opportunist alien species invasion. Such invasion could be control by minimizing the area of disturbance. This impact is considered be minimal as it is envisage that most exotic plants establishment would be based on their seasonal availability and measures such as mechanical control could be implemented.

10. CONCLUSION

The study areas are considered to be transformed and the proposed development will take place in areas already designated for residence. Therefore, should the project be authorised, it will have insignificant impact on the ecological aspects of the environment.

However, it is envisage that the disturbance during construction would allow opportunistic invasion by exotics that could be controlled by implementing measures such as mechanical control to clear the areas from further invasion.

Plant species such as trees observed in the areas could easily be integrated in the architectural design and doesn't need to be destroyed as they create lovely scenery and most importantly soil stability.

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12. APPENDICES

12.1. Photos

12.1.1. MDINA LOCATION



Figure 17: A black wattle which is a category 1 alien invasive plant



Figure 18: *Aloe ferox* stands used as part of fencing (i.e. hedge) around the garden



Figure 19: Aloe species such as the ferox species grows naturally in the area



Figure 20: uMdina river (200m from the first house yard boundary)

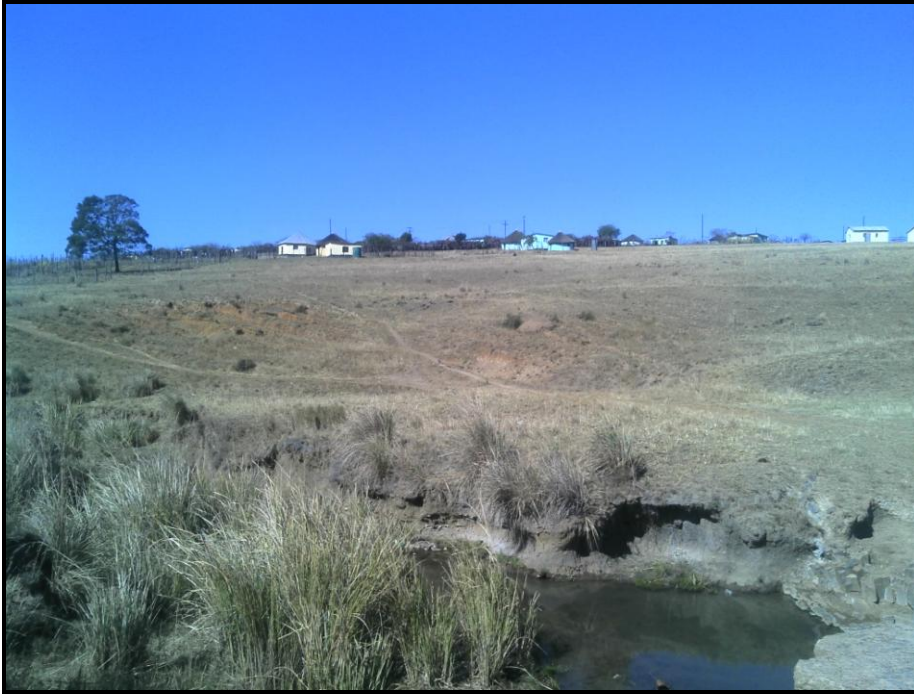


Figure 21: Umdina River banks(foot of the village). No intersection with residential area

12.1.2. MCWILI LOCATION



Figure 22: Mcwili village gully formations



Figure 23: Black wattle stands

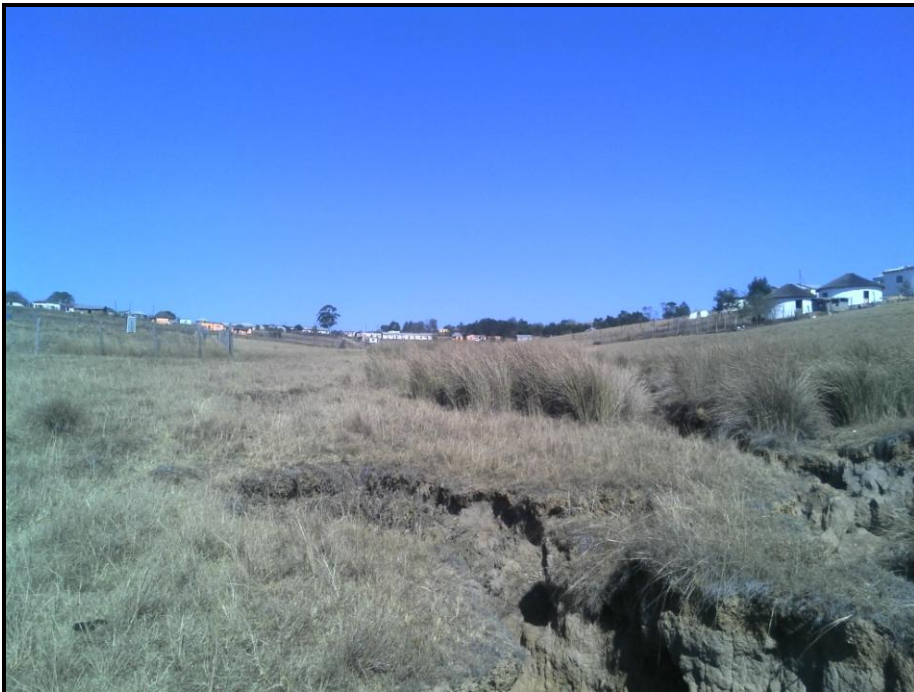


Figure 24: Soil erosion

12.1.3. MBHOMBHELENI LOCATION



Figure 25: Solanum infestation at the entrance of Mbhombeleni village



Figure 26: Alien plants in one of the un-occupied residential yards



Figure 27: A quiver tree



Figure 28: Agave plant, these are used as ornamental plants however they are listed Alien Invasive Plants



Figure 29: A tall stands of Eucalyptus species, these provide shelter during scorching summer months

12.1.4. NDUNGU



Figure 30: Livestock grazing fields

12.1.5. MHLANGA



Figure 31: Eucalyptus stand and black wattle stands



Figure 32: A man made dam that is used for livestock drinking



Figure 33: A Kiepersol or Cabbage tree stand

12.1.6. ZINKUMBINI



Figure 34: Plants observed in residential areas Agave (forefront), Eucalyptus and Blackwattle



Figure 35: Aloe ferox



Figure 36: The Middle Zinkumbini village scene from the Upper Zinkumbini road

12.1.7. EMARUBENI



Figure 37: Black wattle



Figure 38: Existing houses and rondawels



Figure 39: Results of heavy summer rainfall or thunderstorms



Figure 40: Area prone to AIP infestation

12.1.8. MPHANGANA



Figure 41: Village topography



Figure 42: Access footpaths



Figure 43: Fencing in villages



Figure 44: Erosion