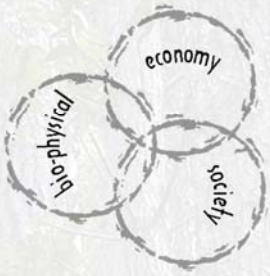
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
REPUBLIC OF SOUTH AFRICA

DRAFT STRATEGIC ENVIRONMENTAL ASSESSMENT REPORT FOR THE FOCUS AREA

29 August 2005

The development of a Strategic Environmental Assessment (SEA) for the Zone of Afforestation Potential in the Eastern Cape



Strategic Environmental Assessment

ACKNOWLEDGMENTS

The development of this Strategic Environmental Assessment has been completed by the Coastal and Environmental Services Joint Venture (JV). The JV includes as its principal partners, Coastal and Environmental Services (CES), Stephen Keet Associates, Rural Urban Consultants (RUC) and Programme Facilitation Team (PFT). Additional specialist consultants have provided input as part of the overall Project Team. The list below identifies the relevant Project Team members and their respective roles.

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TABLE OF CONTENTS

1 INTRODUCTION

1.1 OBJECTIVES AND CONTEXT

This Strategic Environmental Assessment (SEA) of Afforestation in Water Management Area 12, covering the northern and eastern parts of the Eastern Cape Province, was commissioned by the Department of Water Affairs and Forestry (DWAF) to assess the potential for new afforestation and its relative costs and benefits in comparison with other potential land uses. Thus, the SEA is fundamentally concerned about rural livelihoods, social conditions, new employment prospects, skills creation and the 'overall wellness' of people. Above all, any new forestry should bring with it sustainable development which supports and does not conflict with other more beneficial land uses.

A major challenge of the SEA is to assess whether forestry developments can optimize sustainable development opportunities relative to, and perhaps in conjunction with, other land use options, while incorporating the constraints presented by the environment. The ultimate objective is to assess the potential for new afforestation projects in the region and then to determine if these provide the most "sustainable" development option. In doing so, the SEA must reflect on the nature of the forestry industry including the history of existing plantations, and the role which new forestry operations could play in the regional economy. Successful forestry depends on managing and harvesting timber, and establishing markets for the product.

Ultimately, this SEA seeks to identify and support ***sustainable land uses practices*** within the Water Management Area (WMA) 12[1], and in particular, to identify those areas that may be suitable for new commercial and community afforestation projects. It therefore represents a structured, proactive process to strengthen the role of sustainability issues in strategic decision making, and does so through a comprehensive and strategic assessment of social, economic and environmental constraints and opportunities. The specific goals of this SEA are as follows:

i. Identify and respond to the needs of the residents of WMA 12, including the Focus Area, with respect to social, economic and environmental resource needs;
ii. Identify and protect those areas of WMA 12 that are ecologically sensitive, important to the conservation of biodiversity, or contain sensitive river systems;
iii. Identify and protect those sites or areas that are culturally sensitive or have historic value to the nation and/or local population;
iv. Promote co-operative governance and integration with existing local and provincial planning processes;
v. Promote equitable allocation of water;
vi. Offer medium and long-term perspectives on development options;
vii. Identify opportunities for economic empowerment of the local population through a reasoned and integrated assessment of income opportunities from various land use options;

[1] In this SEA, the WMA 12 study area is referred to as the contextual study area, located in the eastern portion of the Eastern Cape Province and including the entire Umzimvubu Water Management Area 12 (WMA 12) together with the Mtamvuna and Mzimkhulu catchments. The Focus Study Area is comprised of specific quaternary catchments within the larger Contextual Study Area. It is predominantly within the O.R. Tambo District Municipality and encompasses five Local Municipalities (see section 1.3 below).

viii. Provide sufficient information on the environment of the study area (economic, social & environmental) to facilitate informed decision-making regarding sustainable land use; and,
ix. Codify this information into a simple decision support system for use by decision making authorities at a national to local level.

This SEA will not provide a blueprint either for forestry or any other land use. It will however explore practical options, with more detail provided for forestry since DWAF, as the commissioning agency, firmly intends to take forward positive findings from the SEA with regard to new afforestation potential (should these materialise) and to formulate a forestry strategy with the help of provincial and municipal authorities. Against this background it is important to point out that the SEA looks at forestry as a commercial land use option, and compares this to other land use options of similar scale. Whilst not explicitly investigating small scale, non-commercial, local use forestry (small community woodlots and the like) this option is not excluded as one of the potential mechanisms for establishing or enhancing forestry in the area, possibly on its own or along side larger scale commercial operations. Such an approach is in line with the multiple land uses practiced in the study area.

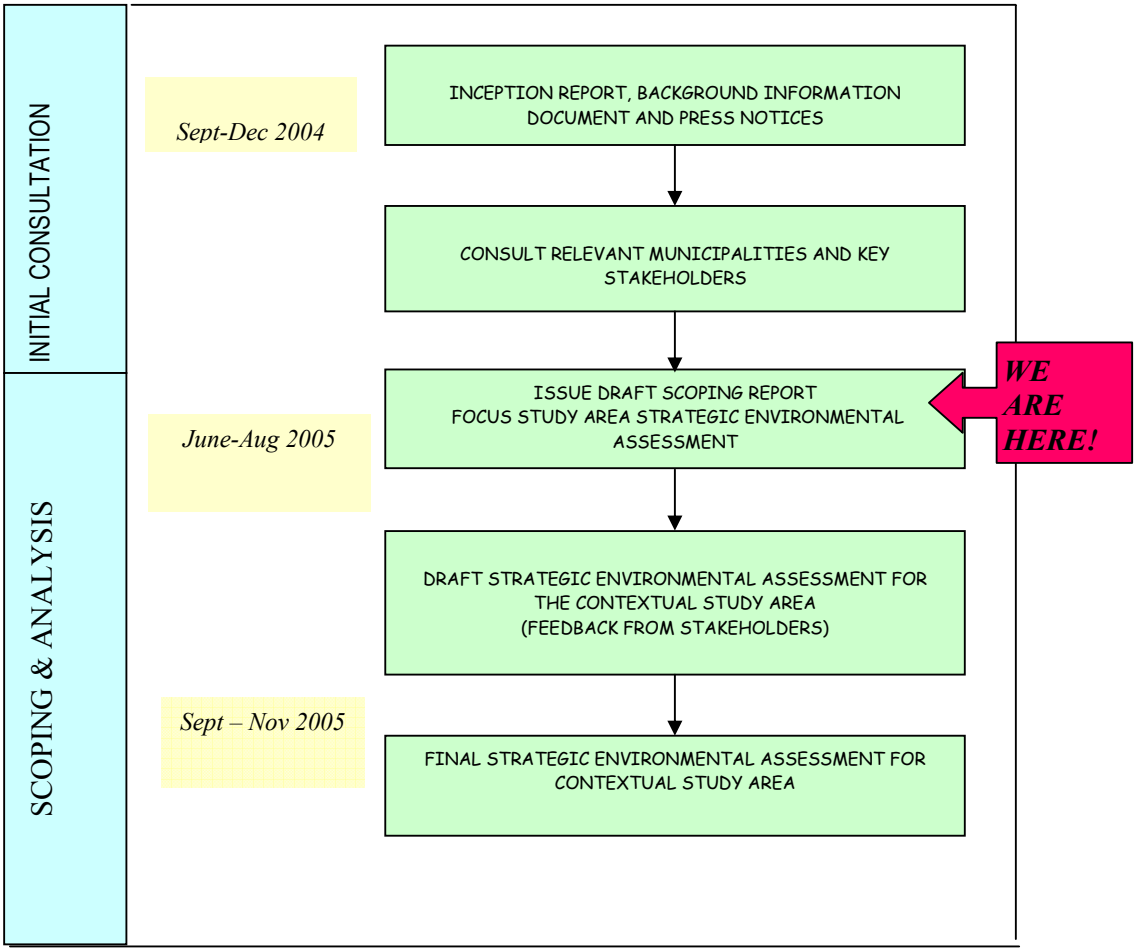
An important part of any SEA is to establish at an early stage the context and identify applicable issues through the publication of a Scoping Report. A Draft Scoping Report has been prepared for the Contextual Study Area and is being circulated for additional comments from identified stakeholders. The Scoping Report of June 2005 sets out the consultant's initial findings and its purpose is to elicit response and guidance from stakeholders and public interest groups. This draft report is not exhaustive and additional inputs **will be** incorporated into a final version.

The critical issues investigated in this Strategic Assessment include (in no particular order of importance):

i. Areas where it may be appropriate to grow trees, establish crops such as maize, tea and sugar, or develop livestock farming and tourism on a sustainable basis;
ii. Whether the necessary skills base to manage commercial afforestation and commercial agricultural developments exists;
iii. The extent to which afforestation, and other possible commercial agriculture and tourism ventures could generate new income earning and employment opportunities in the region;
iv. The extent to which afforestation will compete with existing land uses and other potential commercial land uses, such as agriculture, and livelihood strategies, typified by a multiple land use strategy;
v. The impact afforestation and commercial agriculture and tourism may have on existing livelihoods and commercial land uses;
vi. The impact afforestation may have on water availability and use, as well as biodiversity, as compared to other potential uses such as commercial agriculture which are not stream flow reduction activities[2], but may require water for irrigation.
vii. Whether there is the potential to effectively link afforestation developments with timber processing industries and markets.

[2] Commercial afforestation is identified as a stream flow reduction activity (SFRA) under the National Water Act and is subject to licensing. Although forestry is at the moment the only SFRA, DWAF is currently in the process of identifying other land use activities with a view to declaration as SFRAs. One of the considerations when issuing licences is the efficient use of water (s27(1)(c)).

This Draft SEA for the Focus Area will be circulated for review and comment by various stakeholders. Comments on this document will be accepted during the one month review period in August to September 2005, and a final version for the entire Contextual Study Area is due by November of 2005. Box 1.1 identifies the steps in this SEA process and the current status.



Box 1.1: Diagram showing the SEA Process for the Contextual Study

1.2 VISION STATEMENT

Based on the above objectives, the Department of Water Affairs and Forestry's Vision for this SEA is as follows:

> ***"To assist in the alleviation of poverty in the rural areas of Water Management Area 12 in the Eastern Cape by investigating sustainable land use options that ensure equitable access to natural resources, and most especially water, with an emphasis on forestry development where appropriate and acceptable."***

1.3 DESCRIPTION OF WMA 12 FOCUS AREA

The DWAF sponsored SEA is being completed at two strategic levels. The larger "Contextual Study Area" is located in the eastern portion of the Eastern Cape Province (see Figure 1.3.a) and includes the entire Umzimvubu Water Management Area 12 (WMA 12)

together with the Mtamvuna and Mzimkulu catchments. This extends from the Keiskamma River catchment in the south to the Mtamvuna catchment in the north. The total area of WMA 12 is approximately 71 204 square kilometres and it encompasses all or a part of the following District Municipalities:

- Amatola
- Ukhahlamba
- Chris Hani
- Alfred Nzo
- O.R. Tambo

The second strategic level is being applied to a "Focus Study Area" that is comprised of specific quaternary catchments within the larger Contextual Study Area. The Focus Study Area (approximately 6 633 square kilometres) is predominantly within the O.R. Tambo District Municipality and encompasses all or a part of the following Local Municipalities:

- Mbizana Municipality
- Ingquza Municipality
- Port St Johns Municipality
- Ntabankulu Municipality
- Umzimvubu Municipality (Alfred Nzo D.M.)

The major river systems within the Focus Study Area are (from south to north), the Mzintlava, Msikaba, Mtentu, Mnyameni, Mzamba, and the Mtamvuna (see Figure 1.3.c). Elevations range from approximately 2 250 metres above sea level along the foothills of the Drakensberg to mean sea level along the Indian Ocean coastline within the Focus Area. A number of significant estuaries of conservation importance are also located along the coastline at the mouths of the major river systems.

The total population for WMA 12 was almost five and a half million in 2001. The most densely populated districts are those where the major urban centres are found – those being Amatola (including East London, King William's Town and Bisho) and the OR Tambo district (including Umtata). The African population group make up by far the majority and in two districts (OR Tambo and Alfred Nzo) almost the entire population. The male/female proportions of the population are relatively consistent around 45/55%.

The data on employment and household incomes presents a rather bleak picture of pervading poverty. Unemployment is very high (67%) and regional income (for the O.R. Tambo District) is one of the lowest in South Africa with 37.6% of the population reporting no income. Average annual household incomes are very low with 57% of households receiving somewhere between zero and R4 800 per annum, and another 40% earning between R4 801 and R19 200 per annum which is less than or equal to the household subsistence level of R1 500 per month or R18 000 per annum.

Existing land uses in the Focus Area are mostly rural with a large emphasis on extensive (subsistence) agriculture in the interior and some tourism and commercial agricultural development along the coast. A more detailed analysis of the social and economic setting is provided in Chapter 4 of this report.

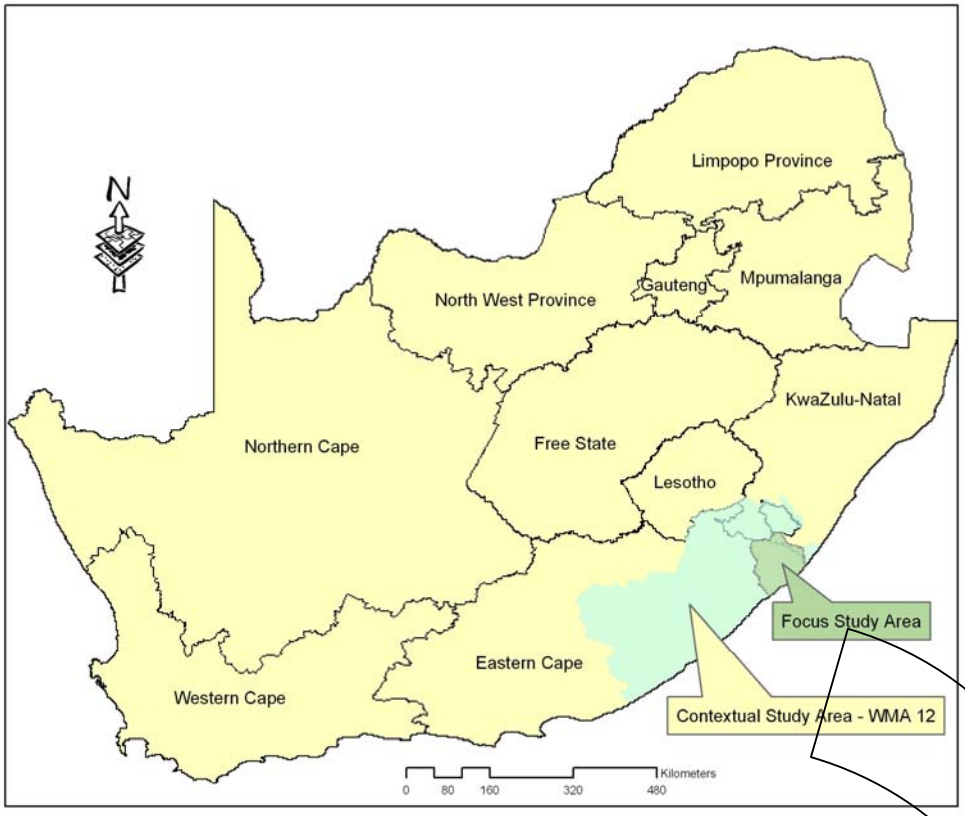


Figure 1.3.a: Location Map of Contextual and Focus Study Areas

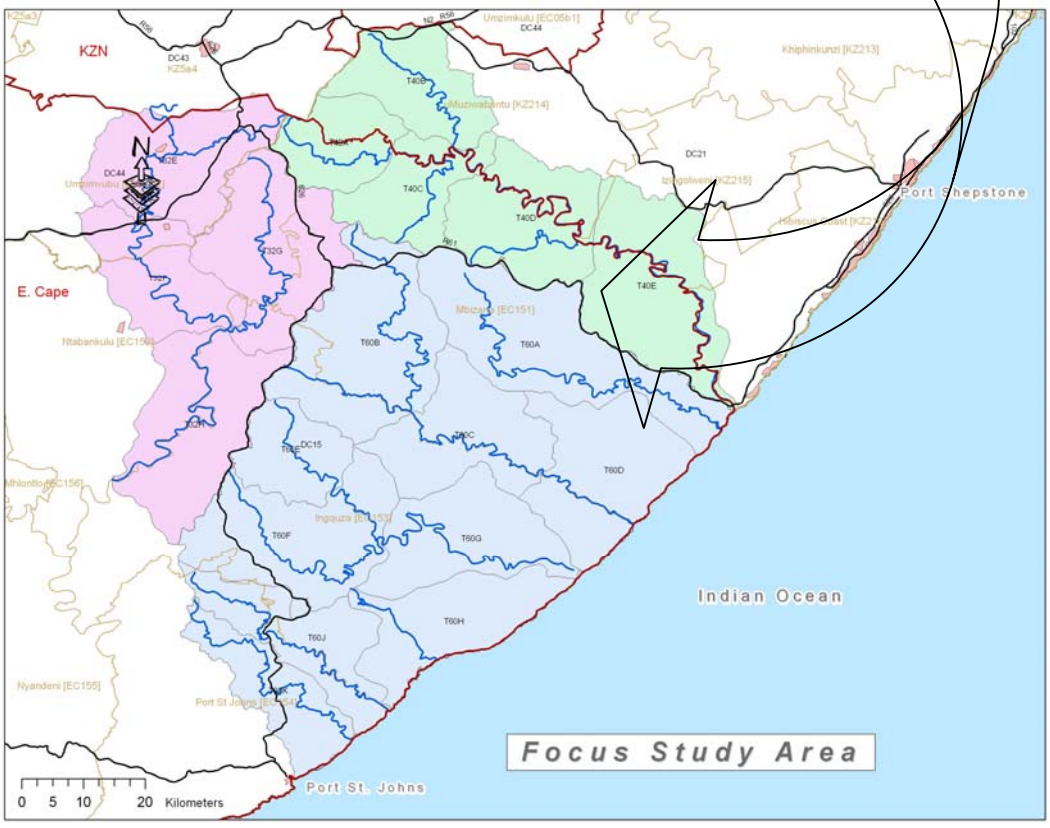


Figure 1.3.b: Focus Study Area

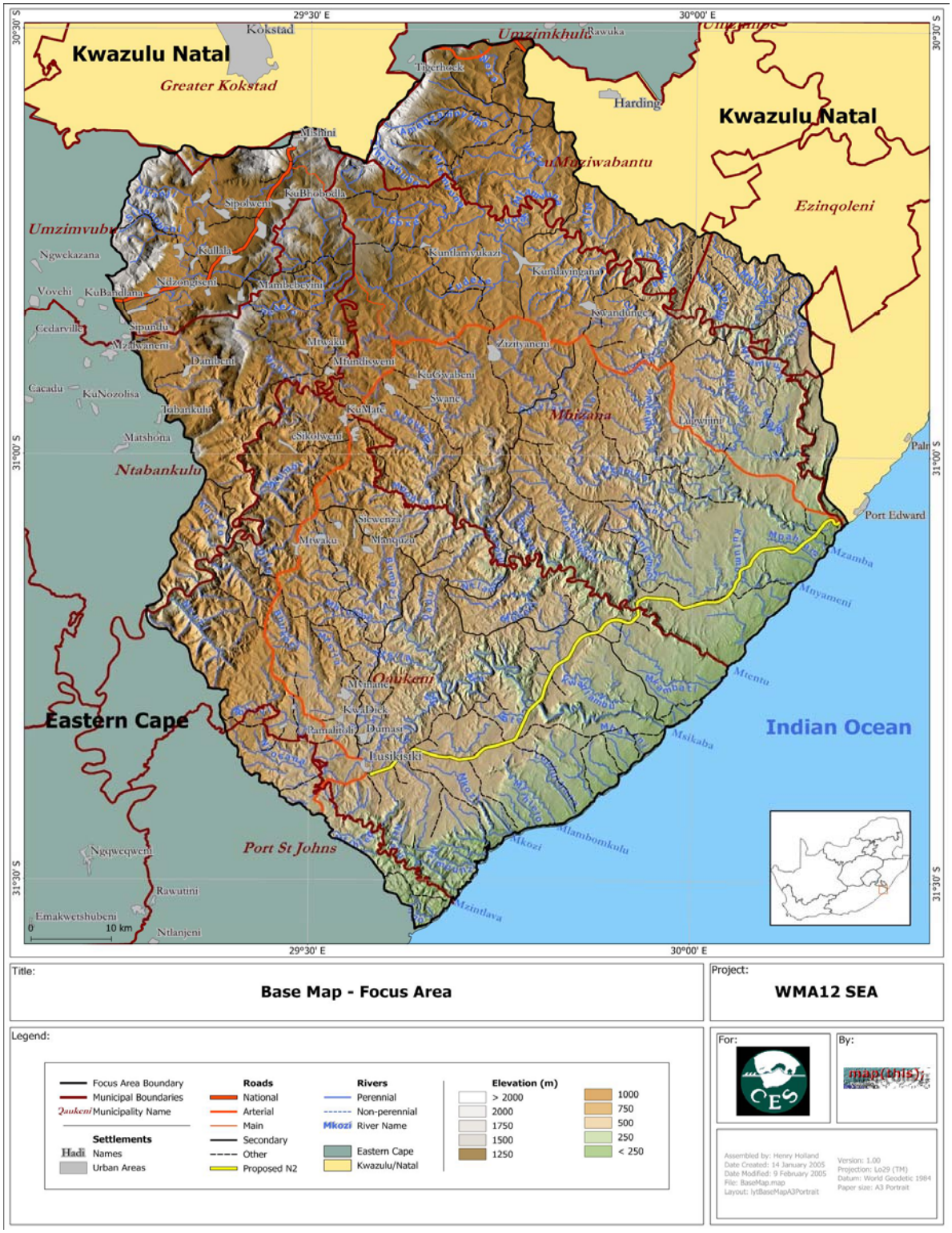


Figure 1.3.b: Base Map of Focus Study Area

2 WMA 12 SEA THEMES AND OBJECTIVES

2.1 GUIDING PRINCIPLES FOR THE SEA

A Strategic Environmental Assessment (SEA) was selected as the appropriate mechanism to investigate the suitability of forestry alongside alternative land uses since it is a structured, proactive process that strengthens the role of environmental issues in strategic decision-making. It is promoted by DWAF for the management of water use in catchments (DWAF, 2001), and is used to develop, refine and appraise programmes and plans in a holistic way by giving equal weight to social, economic and environmental considerations. It is applied to activities that are broader and more complex than individual projects (for which Environmental Impact Assessment (EIA) is the appropriate analysis tool). In this context, SEA is suitable as it can be used to evaluate the likely social, economic and environmental effects of development programmes (and especially forestry), and thus help decision-makers to decide on the best development options.

SEA is able to achieve this as it is based on the concept of sustainable development, which implies giving equal weight to social, economic and environmental issues. There are many definitions of sustainability, with the best known being the Bruntland Commission statement that, *'development should meet the needs of present generations without compromising the rights of future generations'*.

An important role for this SEA will therefore be to develop criteria and indicators that can be used to assess the extent to which land use options are capable of delivering on sustainability principles. This will be achieved by identifying opportunities and constraints that the environment places on development, by analysing the costs and benefits of interventions and by providing guidelines for sustainable development through a decision support system.

SEA is also a suitable mechanism to ensure that the responsibilities placed on DWAF by the National Water Act are followed. These are, to ensure that the nation's water resources are managed fairly and equitably to meet the needs of present and future generations, to redress past racial and gender discrimination, to facilitate social and economic development and to protect the natural environment.

The SEA is guided by sustainability concepts which focus on the need to maintain resources for both present and future generations, making the SEA a suitable mechanism to ensure that the following responsibilities placed on DWAF by the National Water Act (NWA) are followed:

- to ensure that the nation's water resources are managed fairly and equitably to meet the needs of present and future generations,
- to redress past racial and gender discrimination, and
- to facilitate social and economic development and to protect the natural environment.

(Source: Adapted from Chap 1 Para 2 NWA, 1998)

This SEA has been guided by the principles developed by the Department of Environmental Affairs & Tourism, which essentially re-enforce the points raised above (see Box 2.1).

1.	SEA is driven by the concept of sustainability.
2.	SEA identifies the opportunities and constraints that the environment places on the development of policies, plans and programmes.
3.	SEA sets the criteria for levels of environmental quality or limits of acceptable change.
4.	SEA is a flexible process which is adaptable to the policy, planning and sectoral development cycle.
5.	SEA is a strategic process that begins with the conceptualisation of the policy, plan or programme.
6.	SEA is part of a tiered approach to environmental assessment and management.
7.	The scope of a SEA is defined within the wider context of environmental processes.
8.	SEA is a participative process.
9.	SEA is set within the context of alternative scenarios.
10.	SEA is based on the principles of precaution and continuous improvement in achieving sustainability objectives.

Box 2.1: SEA Principles

Source: SEA Guidelines prepared for the Department of Environmental Affairs and Tourism by the CSIR, 2000.

2.2 SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT

The definitions and principles of sustainability and sustainable development (SD) are discussed here in some detail, as they have underpinned this SEA. The principles of SD have guided recommendations and decisions about which land use options are appropriate and suitable development interventions for the Focus Area.

The definitions of sustainability represent a range of ideas about how humans should best interact with each other and the biosphere. The Mining, Minerals and Sustainable Development (MMSD Southern Africa, 2002) initiative reviewed the role of the mining sector in terms of the level of sustainability it is achieving on a global scale. Much useful and relevant information was developed, and the MMSD report argues that the interaction between humans and the biosphere involves integrating and meeting economic, social and environmental goals. In simple terms this implies that sustainable development (SD) relies on a relationship between natural, economic and social systems (Hounsome and Ahton 2001).

Most importantly, SD must focus on the need to maintain capital resources for both present and future generations. Five types of capital have been identified (see Hounsome & Ashton 2002 and MMSD Southern Africa 2002 for further details):

- ***Natural capital*** - which provides a continuing income of ecosystem benefits, such as biological diversity, mineral resources, and clean air and water;
- ***Manufactured capital*** - such as machinery, buildings, and infrastructure;
- ***Human capital*** - in the form of knowledge, skills, health, and cultural endowment;
- ***Social capital*** - the institutions and structures that allow individuals to develop collectively; and
- ***Financial capital*** - the value of which is simply representative of the other forms of capital.

An important principle with regard to different forms of capital is that current thinking argues that there are some "non-negotiable" types of capital, but deciding what they are presents a challenge. Ideally these decisions should be made in an inclusive and participatory way, but in reality this is not practical, as knowledge levels around sustainability principles in the study area are insufficient to inform this process. Consequently, recommendations from experts in the field need to be followed to decide whether, for example, human rights are any more negotiable than biological diversity.

How different forms of capital are viewed, and how substitutable they are, has led to "***soft***" and "***hard***" views of sustainability. The soft view sees all forms of capital as completely substitutable. So, although it recognises that equivalent or increased amounts of capital are passed on to future generations, it allows the form of this capital to change, so less of one kind of capital might be passed on. In this view natural resources do not occupy a privileged position. Proponents of ***hard*** sustainability argue that the different types of capital are not substitutable, since the loss of some forms of ***critical natural capital*** could threaten the survival of the human race, as the loss of natural capital is irreversible. This hard view of sustainability narrows the range of options by forbidding certain trade-offs. It is the view of sustainability promoted in the National Environment Management Act (NEMA).

The challenge with respect to deciding on sustainable land uses as development interventions in the study area is to decide on the "non-negotiable" types of capital, as these will be of overriding importance. This SEA views it as a balance between human and natural capital, as these two forms of capital cannot survive in isolation. We therefore need to seek land use options that build human capital without compromising natural capital. The selected land use options (LUO) must therefore provide continuing ecosystem benefits whilst building human capital. Manufactured and financial capital is of less importance as they will flow from sound development, and similarly improvements to social capital will flow out of a LUO that builds human and natural capital.

The MMSD suggests using this notion of capital to divide decisions into three groups:

1. ***Win-win decisions*** – Those that advance all the goals of SD: they improve material well-being for the current generation, spread that well-being equitably, enhance the environment, strengthen our ability to manage problems and pass on enhanced stocks of capital to future generations.
2. ***Trade-off decisions*** – Result in gains and losses. If the gains are great enough and the losers can be compensated, then proceed. An agreed mechanism (e.g. the EIA process) is required for reaching this decision. Most situations will fall into this category.
3. ***No-go decisions*** – These are actions which exceed some widely accepted limit, such as destroying natural capital or transgressing human rights.

The MMSD initiative recognised important principles for sustainable development in four sectors, namely environment, social, economic and *governance/institutional*, the latter being added as a result of this initiative. The guiding principles for SD are presented in Box 2.2. These principles are essentially high level aspirations that could equally be applied to other parts of the economy. However, they recognise diversity, the limits of existing levels of knowledge and capacity, and society's continuing need for development. These principles should be applied in an integrated manner in decision-making, and any decisions regarding development should be based on an integrated assessment of environmental, social, economic and institutional aspects.

An overarching principle of SD is to improve human well-being and to sustain those improvements over time. This requires the integration of social, economic, environmental and institutional goals in decision-making, and this needs to be borne in mind when considering land use options in the Focus Area. Put simply, the goal is for children to have as good a life as their parents did, or better. This not only requires minimising harm to the natural environment, but also passing the means of survival on to future generations unimpaired, and building, or at least not diminishing the total stock of capital. Thus SD has brought to the fore the notion of equity in access to opportunities and in the distribution of costs and benefits to society. This issue of equity is important in our assessment of sustainability, since it focuses attention on correcting the large imbalances in political and economic power between rich and poor people, and among corporations and the poor.

Component 1 - Environmental sustainability

- Promote responsible stewardship of natural resources and the environment, including remediation for past damages.
- Minimise waste and environmental damage along the whole of the supply chain.
- Exercise prudence where impacts are unknown or uncertain.
- Operate within ecological limits and protect critical natural capital.

Component 2 - Social sustainability

- Ensure a fair distribution of the costs and benefits of developments for all those alive today.
- Respect and reinforce the fundamental rights of human beings, including civil and political liberties, cultural autonomy, social and economic freedoms, and personal security.
- Seek to sustain improvements over time, ensure that depletion of natural resources will not deprive future generations through replacement with other forms of capital.

Component 3 - Economic sustainability

- Maximise human well-being.
- Ensure efficient use of all resources, natural and otherwise, by maximising income.
- Seek to identify and internalise environmental and social costs.
- Maintain and enhance conditions for viable enterprises.

Component 4 - Governance and institutional sustainability

- Support representative democracy, including participatory decision-making.
- Encourage free enterprise within a system of clear and fair rules and incentives.
- Avoid excessive concentration of power through appropriate checks and balances.
- Ensure transparency through providing all stakeholders with access to relevant and accurate information.
- Ensure accountability for decisions and actions, which are based on comprehensive and reliable analysis.
- Encourage cooperation in order to build trust and shared goals and values.
- Ensure that decisions are made at the appropriate level, adhering to the principles of sustainability where possible.

Box 2.2: MMSD Sustainable Development Principles (from MMSD, 2002)

If we are to decide on land use options (LUO) on the basis of their sustainability, then it follows that measures or criteria for determining sustainability in the context of the present study are required. However, the concept of sustainability differs according to individual perceptions of the relative value of different forms of capital. Depending on how the relationships between different forms of capital are interpreted, Hounsome and Ashton (2001) argue for three levels of sustainability. Since they place more importance on the maintenance

of natural capital, as it is viewed as the basis upon which other forms of capital rely, we have expanded their definitions for use in this SEA. For the purposes of this study, we define sustainability as follows:

- ***Weak sustainability*** – involves maintaining total capital intake without regard to the specific type of capital. Natural capital could continue to be converted into economic capital, with outputs (goods and services) governed only by existing environmental policies, regulations and guidelines that do not need to seriously consider negative effects on human capital.
- ***Moderate sustainability*** – requires that some attention be given to the level of each type of capital as well. Natural capital can be used only up to certain critical limits, so called "thresholds" that are not yet known, and human and social capital must, as a minimum, be maintained. The sensible approach would be to adopt a precautionary principle for the use of natural capital.
- ***Strong sustainability*** – means maintaining natural capital at current levels (no net loss). All resource losses and ecological damages resulting from development must be replaced and offset, and human and social capital must be improved as a result of the intervention. As a result, manufactured and financial capital must improve.

In making any decisions regarding LUO, we therefore need to acknowledge that trade-offs will be made between the different types of capital, and that this will be influenced by the level of sustainability we are striving to obtain. Given the nature of the present situation, we believe that a realistic goal is to achieve land use options that are, as a minimum, *moderately sustainable.* However, LUO that move towards *strong* sustainability are preferred, as they will result in fewer impacts on the natural environment, and are more socially equitable.

In addition, this SEA has developed the following specific objectives for sustainability to guide the assessment of various land use options[3]. These are described below using the *Themes* of Sustainability.

2.3 BIOPHYSICAL THEME

The biophysical theme incorporates those issues related to maintaining, and where possible, improving upon the current integrity of the environment. This relates to assessment and protection of the land, animals, vegetation, water and air resources that support life. For the purpose of this SEA, the following biophysical sustainability objectives are identified.

i. Provide an opportunity for the voice of the biophysical environment to be heard throughout the decision-making process.
ii. Identify sensitive ecological regions and zones of high biodiversity potential within the Focus Area, and recognise these as constraints posed by the environment.
iii. Recognise that South Africa is a water scarce country and that all water resources (surface and groundwater) must be used wisely and efficiently, or conserved and protected.
iv. Ensure that the requirements of all relevant legislation are incorporated into any planning for water resource utilization.
v. Develop a decision support system that is protective of the natural environment and the rights of citizens to use natural resources in a sustainable manner. It must be consistent with all appropriate national and provincial environmental regulations but also recognize

[3] In the context of SEA, these objectives are similar to the sustainability parameters that are called for in the Dept. Environmental Affairs & Tourism SEA guidelines.

the need for social improvement in the region and the role that the natural environment, including water resources, plays in providing economic opportunities as well as constraining development.

2.4 SOCIAL AND ECONOMIC THEME

The social and economic theme identifies issues related to the provision of goods and services to the region. The objectives are designed to increase sustainable development by addressing the following goals.

i. Recognise the rights of local people, including land tenure, fair access to employment and labour representation must be respected.
ii. Provide for increased economic opportunities for all citizens in the region through the identification and evaluation of responsible and sustainable economic development initiatives.
iii. Enable private sector initiated economic activities and enterprises that are market based and entrepreneurial.
iv. Develop a clear and consistent decision support system that assists in identifying the opportunities and constraints of the land use options, where potential economic development will be beneficial to the local population, and where these conflict with other priorities or planned development interventions.

2.5 INSTITUTIONAL THEME

This SEA recognises that public participation and stakeholder engagement are prerequisites for building institutional capacity. Insufficient institutional capacity can be a significant constraint to sustainable development and is therefore being assessed as part of this SEA. All levels of government, industry representatives and non-governmental organisations are being engaged with at a strategic level as part of this SEA. Stakeholder engagement is described more fully in the Scoping Report (Vol. 1) and the theme is repeated throughout the text of this document. In keeping with our commitment to stakeholder engagement, the following sustainability objectives have been developed.

i. To conduct a transparent and inclusive SEA process that identifies and addresses the needs of all identified stakeholders.
ii. To actively engage all stakeholders to the extent practicable to encourage an open exchange of information, ideas and concerns, throughout the process of the SEA, with particular attention in the Focus Area initially and within the wider context of the full WMA 12 as the process unfolds.
iii. To build capacity in local and regional institutions through increased knowledge of sustainability concepts and user-oriented products that guide sound decision-making practices.

3 BIOPHYSICAL ASSESSMENT

3.1 INTRODUCTION AND ISSUES

The biophysical aspects of the Focus Area have been evaluated as part of the SEA process. This section of the SEA describes the method of assessment, the present situation, and the major biophysical features and issues associated with the Focus Area. These include the identification and protection of important sites of biodiversity, water resources and scenic landscapes. A more complete and detailed description is provided in the Technical Reports (Volume 2).

The biophysical assessment is an important part of the overall SEA process as it identifies and documents the environmental integrity of the Focus Area using the most up to date information available supplemented by expert analysis. It defines those portions of the Focus Area where development could significantly impact upon the natural environment. Some of these areas such as provincial parks are already protected by legislation while others (i.e., indigenous forests) are protected but still facing threats of degradation by unsustainable uses. This portion of the SEA identifies those portions of the Focus Area that are important to its biological integrity and their current protection status. If further classifies them into "exclusionary" or "precautionary" zones based on their perceived importance to protecting biodiversity and rural livelihoods. New development within the Focus Area should take cognizance of these zones and develop programmes to effectively protect the sensitive features they contain.

The sections in this chapter deal with issues and concerns raised by stakeholders about the effects of various land use options on the physical environment. These issues were presented in Chapter 4 of the Scoping Report (Volume 1), and the table below provides a summarized list of the issues and where they have been dealt with in this chapter of the SEA.

Table 3.1.a: Issues raised during scoping dealt with in this chapter of the report. (Note TR = Technical Report)

Issue	Where dealt with
MAIN CATEGORY OF ISSUE: Biodiversity	
The lack of a Systematic Conservation Plan for WMA 12 might constrain sustainable development.	Section 3.4 & TR 2
Loss of indigenous plant cover and habitat due to forestry and crop production.	Section 3.3 & TR 2
The results of the Biodiversity Action Plan must be considered.	Section 3.4 & TR 2
Development pressure in conservation worthy areas is of concern, and must not be encouraged in the SEA.	Section 3.3 & 3.4
Areas of conservation value and of high biodiversity must be avoided.	Section 3.4 & TR 2
MAIN CATEGORY OF ISSUE: Cumulative Impacts	
Cumulative impacts and the secondary effects of any interventions must be considered.	Generally as part of the SEA
MAIN CATEGORY OF ISSUE: Decision-Making	
The SEA should identify NO GO areas for forestry as well as possible areas.	Section 3.3, 3.4 & TR 2
MAIN CATEGORY OF ISSUE: Ecological Impacts	
Invasion of wattle and other species into natural areas due to poor	Section 3.3 & TR 2

Issue	Where dealt with
management of plantations.	
Three percent of the Contextual Study Area and 18% of Focus Area are covered by vegetation types sensitive to development.	Section 3.3 & TR 2
The Pondoland Centre of Endemism covers a significant portion of the Focus Area.	Section 3.3, 3.4 & TR 2
Most of the large and medium sized mammal fauna is locally extinct or occurs in fragmented habitats.	Section 3.3, 3.4 & TR 2
Reduced or altered stream flow patterns due to changes in watershed hydrology.	Section 3.5 & TR 3
Impacts on river courses, estuaries and wetlands must be carefully considered, as they serve a vital role in ecosystem function.	Section 3.5 & TR 3
Increased risk of pollution into streams from sediment and other sources of pollution.	Section 3.5 & TR 2
MAIN CATEGORY OF ISSUE: Water Use	
Reduced water to downstream users due to forestry.	Section 3.5 & TR 3
Is the Ecological Reserve being met, if not, to what extent is it not being met (under present use)?	Section 3.5 & TR 3
Is enough water available for forestry?	Section 3.5 & TR 3
Sufficient data may not be available in certain catchments to assess yield availability.	Section 3.5 & TR 3
How will forestry impact on Ecological Water Requirements, particularly at times of low flow?	Section 3.5 & TR 3
Broad overview of available yield and quality issues important.	Section 3.5 & TR 3

Table 3.1.b: Issues raised during scoping that have not been dealt with in this chapter of the report.

Issue	Reason
Compensation for loss of biodiversity should be considered as a form of mitigating impacts.	This needs to form part of the decision-making process when issuing permits.
If new infrastructure (especially roads) is required the impact of these will need to be considered, especially if these roads traverse steep slopes or wilderness areas. This should include impacts of trucks on the road user.	Site specific impacts have not been considered, but the availability of infrastructure (especially roads) has formed an important part of decisions about areas suitable for forestry.
Increased risk of erosion due to agriculture or forestry.	Site specific, but considered to a certain extent as part of the sensitivity analysis.
A change in the frequency of fires due to forestry or commercial grazing may affect fauna & flora.	Noted, but not possible to assess at an SEA level.
Decrease in water quality due to inadequate sanitation and poor solid waste management.	Noted, but not part of this SEA; could be dealt with at a site specific level.
Coastal grasslands and forest habitats serve as important areas for montane bird species in winter.	Noted and considered to a certain extent as part of the sensitivity analysis.
The implications of increased pressure on land and resources (e.g. grazing) as a result of large scale forestry.	Noted and considered to a certain extent as part of the sensitivity analysis.

3.2 BIOPHYSICAL ASSESSMENT METHODOLOGY

A variety of methodologies have been employed in the development of the biophysical assessment of the Focus Area. These can be characterised as:

- Expert driven analysis obtained through consultation, workshops and review;
- Field level reconnaissance within the Focus Area (this does not constitute primary data collection, but rather a landscape level assessment of current conditions);
- Primary data collection of water resources, in particular, Rapid Reserve Determinations of selected streams in the Focus Area;
- Detailed and thorough literature review; and
- Database development through assimilation of various data sets from a variety of sources (as noted).

The following is a brief description of the methodology utilized for the biophysical assessment of the Focus Area.

3.2.1 GEOGRAPHICAL INFORMATION SYSTEM

A spatial database has been developed using the DWAF protocol provided by their Geomatics Directorate. Data layers sourced to date for inclusion in this spatial database are provided in the Technical Reports (Vol. 2) of the SEA. This data has been obtained for the entire Contextual Study Area and the Focus Area where available. The data has been clipped to the boundaries of the Contextual and Focus Area and will be made available as part of the Decision Support System. A more detailed account of the methods and protocols associated with the development of this database is provided in Volume 2.

3.2.2 FIELD RECONNAISSANCE

A field reconnaissance trip was carried out from the 27-31 October 2004. The aim of this site visit was to obtain "expert" input on the biophysical aspects of the landscape in the Focus Area. These field observations have been used to augment existing data available for the area. Site visits of this nature are particularly useful to the identification and assessment of the opportunities and constraints the landscape places on various land use options. A more complete description of the field reconnaissance is provided in the Technical Report (SEA Volume 2).

3.2.3 EXPERT WORKSHOP

A protocol was developed for the compilation of an Environmental Sensitivity Map at a workshop attended by SEA Biophysical Team members on 15 November 2004, in Grahamstown. This protocol determined that the following situations represent a high degree of environmental sensitivity and are deserving of either exclusion from further development activities or a precautionary approach to future land use interventions.

- Gazetted conservation areas (Exclusionary);
- Areas of protected vegetation (including indigenous forests) (Exclusionary);

- Areas of sensitive of vegetation / centres of endemism (Precautionary);
- Integrated Priority Areas for conservation (obtained from the Systematic Conservation Planning exercise completed by the CSIR – Exclusionary);
- Streams and a thirty meter buffer (Exclusionary);
- Highly sensitive estuaries and their catchments (Precautionary);
- Streams with an Ecological Importance and Sensitivity (EIS) rating of Very High and High (Precautionary);
- Streams with a Recommended Ecological Category (REC) of A, A/B, B and B/C (Precautionary); and
- Areas that could be regarded as important scenic and sensitive landscapes (Precautionary).

These situations have been mapped and integrated with those obtained in the socio-economic analysis in order to define the actual area suitable for different development interventions. The results of this integration are presented in Chapters 4 and 7 of this Report.

3.2.4 SYSTEMATIC CONSERVATION PLANNING

Systematic Conservation Planning is a formal approach to assessing land in terms of its biological importance. The most important measure is biological diversity. The natural environment is valued in terms of its biodiversity, how much of that biodiversity has been lost, and the threats to that which remains. Once these values are obtained they are a very useful tool allowing managers to quantify the impacts of any consequent land use change on the environment. At the same time it is possible to see which areas could perhaps be developed without significant impact. A Systematic Conservation Planning process for the Wild Coast Project has been extended by DWAF to cover all of the Focus Area to assist in the completion of this SEA. The results of the preliminary Systematic Conservation Planning exercise prepared by the CSIR for the Focus Area are summarized in Section 3.4 below. The complete draft is contained in the Technical Reports (SEA Volume 2).

3.3 BIOPHYSICAL OVERVIEW OF FOCUS AREA

3.3.1 GEOLOGY AND GEOMORPHOLOGY

Water Management Area 12 is underlain by a variety of lithologies (rock types) representing a considerable time span. As a broad generalization the area is underlain by sedimentary rocks (sandstones and shales), through which magmas have intruded to form dolerite dykes and sills. As a rule of thumb, the sedimentary rocks decrease in age with an increase in height and distance from the coast. Most of the rocks within the Contextual Area belong to the Karoo Sequence, with the Natal Group (eastern equivalent of the Cape Supergroup) prominent in the Pondoland area. Small areas are underlain by Cretaceous sediments along the coast. Very limited areas along the coast of northern Pondoland (Focus Area) are also underlain by Precambrian rocks of the Natal Structural and Metamorphic Province. The latter rocks include granites and gneisses.

The underlying geology and geomorphology of the region are closely tied to the formation of soils. Soils within the Focus Area are generally thin and conform to the following:

- The land types associated with the deepest soils are located on the lower slopes of the valley (e.g. footslopes and valley bottoms). However, many valleys are narrow and steep sided with little arable land potential.
- Eroded areas occur predominantly on the mid and footslopes of valleys.
- Wetland areas are typically located on low-lying areas such as floodplains with occasional seeps at mid-slope. Significant wetlands in the Focus Area are described below.
- Colluvial soils are at a high risk for erosion within the Focus Area.

The most productive agricultural soils are located in the northern portion of the Focus Area between Mount Ayliff and Weza, near Flagstaff and in the south-western portion just below Lusikisiki. Moderately good soils are also located along the coastal plateau extending inland approximately 20km. Figure 3.3.a below identifies the most productive agricultural soils in the Focus Area. As expected, there is considerable congruence between the areas of productive soils and existing commercial agriculture and forestry. For example, the areas of productive soils below Lusikisiki are exploited by existing tea and forestry plantations. The areas of poor to moderate capacity soils are typically utilised for subsistence level agriculture.

Even though the Focus Area is not known for its mineral deposits or associated industry, a number of possible opportunities exist for their exploitation. These include extraction of clays for brick making, hard rock deposits for aggregates and heavy minerals along the coast. The development of potential mineral resources is not likely to conflict with new afforestation or commercial agriculture, but conflicts may exist with other land use alternatives (e.g. tourism) at specific locations.

The topography of the Focus Area is highly variable with elevations running from mean sea level along the coast to over 2 000 metres in the foothills of the Drakensberg in Umzimvubu and uMuziwabantu. Elevations along the coastal escarpment range from sea level to approximately 250m extending inland by 10km +/-. This area is deeply incised by major river valleys with very steep sides and narrow valley bottoms. These gorges are very pronounced, in particularly along the Mtamvuna, Mzamba, Mtentu, Msikaba and Mzimvubu rivers. Elevations in the middle of the Focus Area are sloping to steeply sloping with valley bottoms of 500m +/- rising to 1 250m +/- ridges. Ridges generally have a northeast to southwest orientation but local topography is varied and dependent upon the local geomorphology. Most settlements occur on relatively flat lands along plateaus and eroded ridge tops with the associated side slopes used for farming activities. Steeper lands are typically utilised for grazing and forestry activities or comprised of indigenous vegetation. Floodplains in the valley bottoms are typically narrow in the upper portions of the Focus Area widening slightly in the lower elevation coastal escarpment. Figure 1.3b identifies the elevations of the Focus Area.

3.3.2 CLIMATE

The climate within the region is subtropical, with the areas at higher elevations characterised by a cooler, more temperate climatic regime. The wettest areas within the Contextual Study Area occur below the escarpment and along the coast. In contrast, large river valleys can be hotter and drier than the surrounding landscape. Most areas within the region receive their rainfall in the summer, sometimes accompanied by thunderstorms. Typically, passing cold fronts, which are associated with most rainfall events, will be accompanied by soft soaking rains and a drop in temperature. Mean Annual Precipitation (MAP) in the Focus Area increases as you move towards the coast and ranges from less than 700mm to greater than

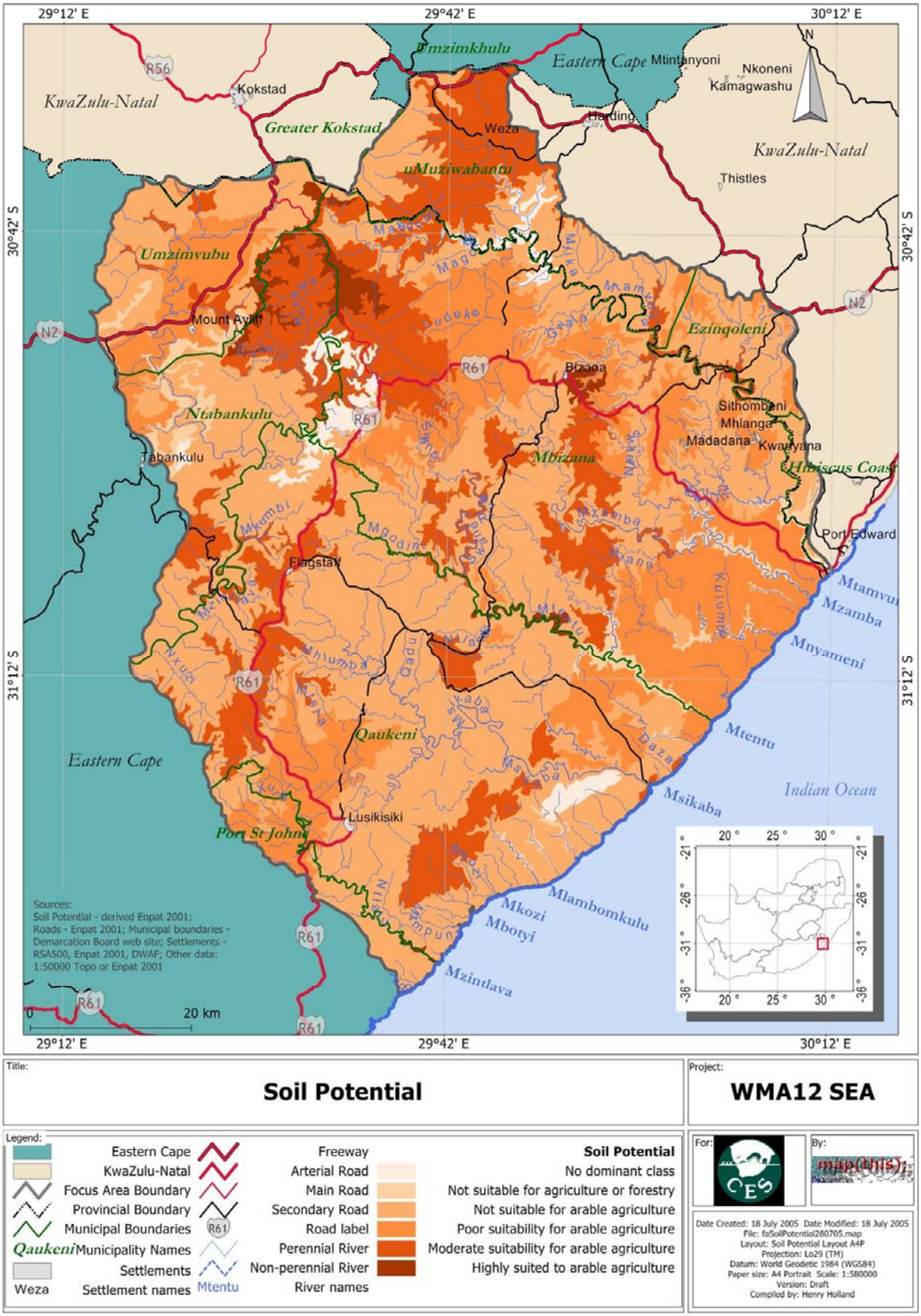


Figure 3.3.a: Soil Agricultural Potential in the Focus Area

1400mm per annum. Precipitation in the largest (central) portion of the Focus Area ranges from 700 to 1100mm per annum. The weather can be highly variable from year to year and within any given season. Fluctuations in seasonal rainfall patterns are common with mid-season dry spells and intense rains within a 24 hour period. Temperatures are generally characterized as mild with frost occurrence mostly in the higher elevations. With respect to agricultural production, precipitation is seen as the primary climatic variable (more so than temperature or other factors) in the Focus Area. Figure 3.3.a below depicts the mean annual precipitation (MAP) for the Focus Area.

3.3.3 FLORA

The terminology developed for the latest vegetation map of South Africa by the National Biodiversity Institute (formerly the National Botanical Institute) has been adopted for this study. The vegetation types found within the Focus Area are listed in Table 3.3.a. Of the 14 vegetation types listed within the Focus Area, 5 are protected by legislation. An additional 3 vegetation types can be classified as either a substrate sensitive to development (viz. Subtropical Dune Thicket and Subtropical Seashore Vegetation) or as a substrate associated with elevated levels of endemism (viz. Pondoland-Natal Sandstone Coastal Sourveld). In the Focus Area vegetation types protected by legislation or that should be regarded as sensitive to development cover approximately 18% of the land area. These areas are therefore likely to provide significant constraints to forestry and other forms of development in the region, and hence a more detailed systematic conservation planning exercised was undertaken. Figure 3.3.c is a Vegetation Map of the Focus Area.

Table 3.3.a identifies the vegetation types found within the Focus Area, their protective status/sensitivity and the percentage of the Focus Area they cover (vegetation types listed in order of decreasing cover). Vegetation types highlighted in **bold type** are protected by legislation, whereas those in *italics* are either likely to be associated with elevated levels of endemism or could be regarded as sensitive to development.

Table 3.3.a: Vegetation Types in the Focus Area

Vegetation type	Distribution	Percentage cover
1. Ngongoni Veld	T32H, T40A-T40E, T60A-T60H, T60J	32.65
2. Midlands Mistbelt Grassland	T32F-T32H, T40A-T40D, T60A-T60C, T60E, T60F, T60J	24.14
3.*Pondoland-Natal Sandstone Coastal Sourveld*	T40E, T60A, T60C, T60D, T60G, T60H, T60J	14.58
4. Eastern Valley Bushveld	T32E-T32H, T40D, T40E, T60A-T60G	14.12
5. East Griqualand Grassland	T32E, T32F	5.19
6. Drakensberg Foothill Moist Grassland	T32E-T32H, T40A, T40B	5.15
7. Scarp Forest	**T40E, T60A, T60C, T60D, T60G, T60H, T60J**	**1.91**
8. Transkei Coastal Belt	T60H, T60J	1.20
9. Southern Mistbelt Forest	**T32E-T32H, T40A-T40D, T60B, T60E, T60F, T60G**	**1.03**
10. Subtropical Coastal Lagoons	**T40E, T60A, T60D, T60G, T60H, T60J**	**0.03**

11. Northern Coastal Forest	**T60A**	**0.01**
12. *Subtropical Seashore Vegetation*	T40E, T60A, T60G	0.00
13. *Subtropical Dune Thicket*	T40E, T60A	0.00
14. Subtropical Estuarine Salt Marshes	**T60A**	**0.00**

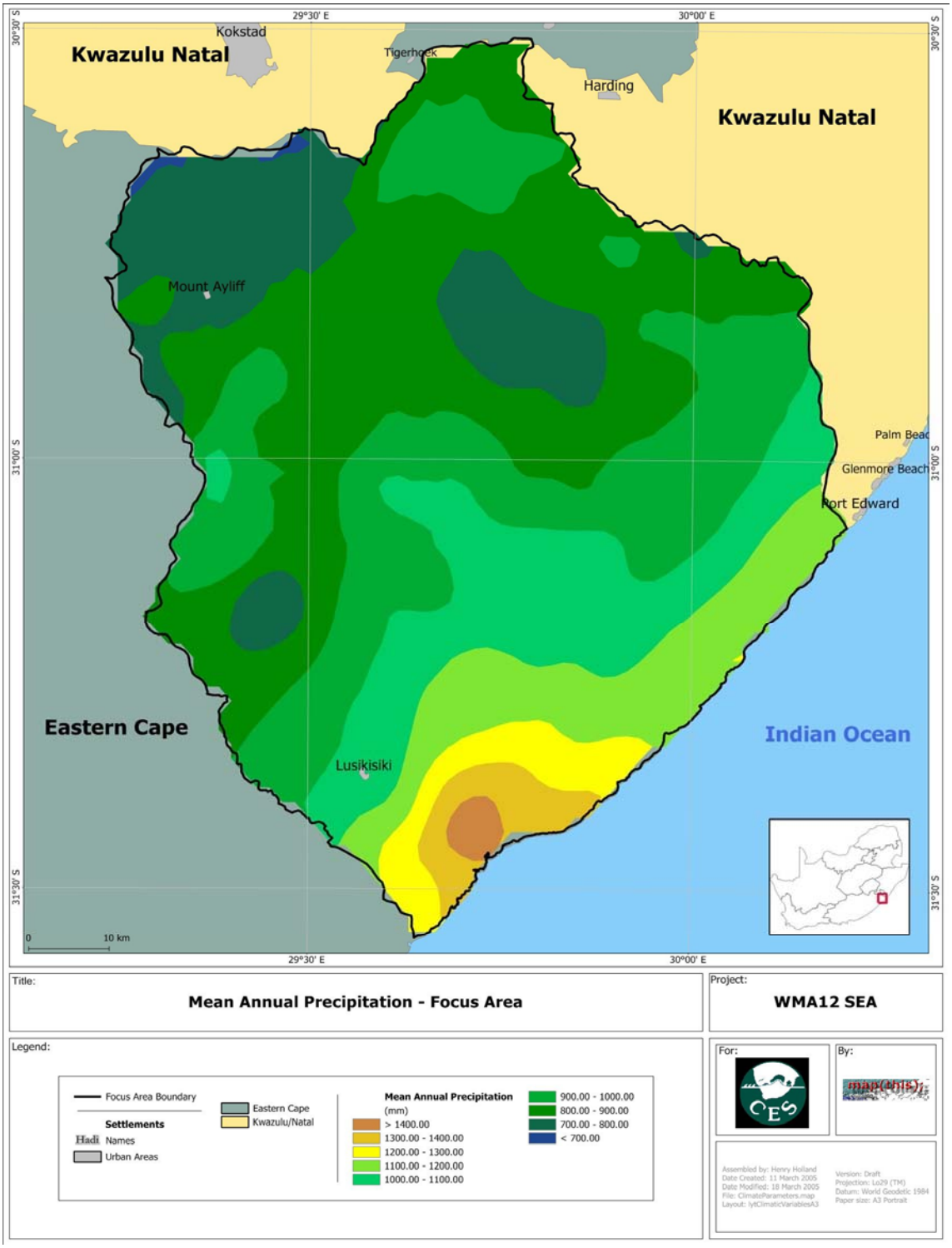


Figure 3.3.b: Mean Annual Precipitation (MAP) for Focus Area

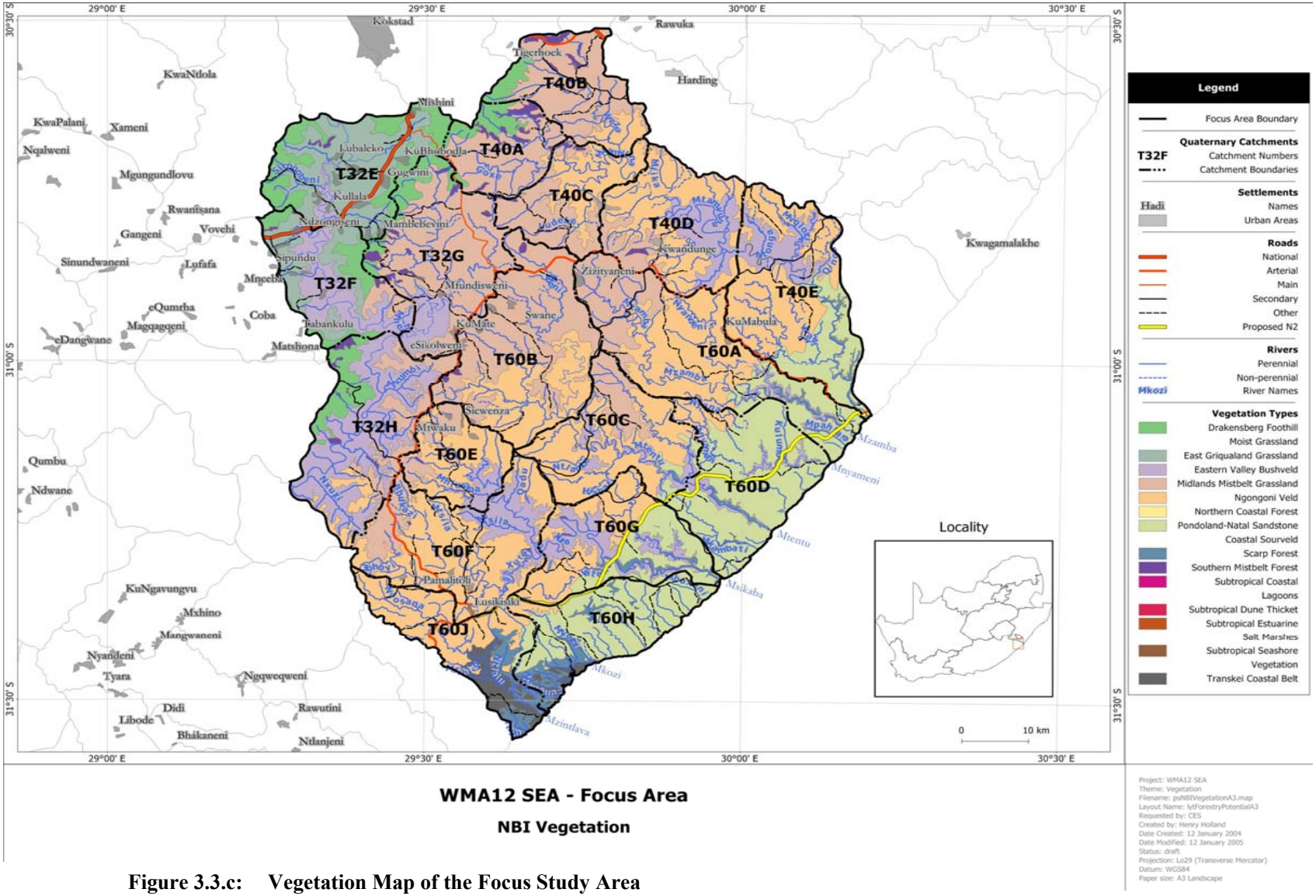


Figure 3.3.c: Vegetation Map of the Focus Study Area

The Focus Area falls within the Maputoland-Pondoland Region (Van Wyk & Smith 2001), an area recognized as an important centre of plant diversity and endemism in Africa (Davis et al. 1994) and in which are nested a number of smaller centres of endemism. Many vegetation types occur in the Maputoland-Pondoland Region, including grassland, forest, savanna, thicket and aquatic communities. The Maputoland-Pondoland Region is the second-most species rich floristic region in southern Africa after the Cape Floristic Region with the following families having high numbers of endemics: Asclepiadaceae, Asteraceae, Fabaceae, Liliaceae, Orchidaceae, Rubiaceae, Acanthaceae, Euphorbiaceae, Iridaceae, Lamiaceae and Scrophulariaceae (van Wyk & Smith 2001). Most endemics in the Maputoland-Pondoland Region are confined to grassland, the most seriously threatened vegetation type in the region (van Wyk & Smith 2001).

One of the smaller centres of endemism within the Maputoland-Pondoland Region is the Pondoland Centre (Van Wyk 1990; Van Wyk & Smith 2001), which comprises almost a third of the Focus Area along the coastal region stretching from Port Edward to Port St. Johns and extending approximately 30 km inland from the coast. The endemicity of this region is probably attributable in large measure to the presence of nutrient-poor soils derived from the Natal Group Sandstones (e.g. *Tephrosia bachmannii* (Pooley, 1998)). It is an edaphically defined area encompassing the outcrops of Msikaba Formation sandstone that extends along the Indian Ocean in this area (SACS 1980; Keyser 1997). The vegetation of the Pondoland Centre consists primarily of grassland (Pondoland-Natal Sandstone Coastal Sourveld) with a few isolated patches of forest confined mostly to protected riverine gorges (Van Wyk & Smith 2001). It should be treated as having high conservation value in light of the high endemism and corresponding high number of threatened species restricted to this vegetation type. The grassland is rich in endemics, but is seriously threatened by overgrazing, agriculture and excessive burning; few well-preserved examples still exist outside conservation areas. Most of the endemics are restricted to forested gorges, some of which are contained in conservation areas, e.g. Oribi Gorge Nature Reserve, Mtamvuna Nature Reserve and Mkambati Nature Reserve. These gorges often share few species from one gorge to another (Meter 1998) and it may therefore be important for the conservation of species in this region that as many as possible of these gorges are protected.

Mount Ngeli is considered to be another minor Centre of Endemism within the Maputoland-Pondoland Region that falls within the Focus Area. Mt. Ngeli forms an important corridor between the Pondoland Centre and the Drakensberg Alpine Centre with relict distributions of a number of taxa occurring here.

A total of 96 previously listed species of special concern occur in the study area (Hilton-Taylor 1996). The distribution of these threatened species is not random. Some areas have high numbers of threatened species and others have low numbers. There are six quarter degree grid squares that have a significantly high number of threatened and rare species (Figure 3.3.d). Four cover the coastal area and include the Transkei Coastal Belt and Scarp Forest (areas of indigenous forest that occur in close proximity to the coast) and Pondoland-Natal Sandstone Coastal Sourveld, some of which occurs within Mkambati Nature Reserve. A further grid square includes the Mtamvuma River valley and one grid square includes the high elevation peaks to the south, south-east and east of Kokstad.

This distribution of threatened species indicates that most rare and threatened species in the study area are found in the following habitats:

1. Where unique coastal geology occurs, namely the Msikaba Formation sandstone, corresponding with Pondoland-Natal Sandstone Coastal Sourveld vegetation type;
2. In incised river valleys that run perpendicularly to the coast, e.g. Mtamvuma, Msikaba, Mkozi, Mzintlava and Mzimvubu River valleys, corresponding with Scarp Forest vegetation type;
3. The peaks and slopes of high altitude mountain ranges, e.g. Ngeli, Ntabankulu, Ntabanyama and Ntsizwa, corresponding with Drakensberg Foothill Moist grassland vegetation type.

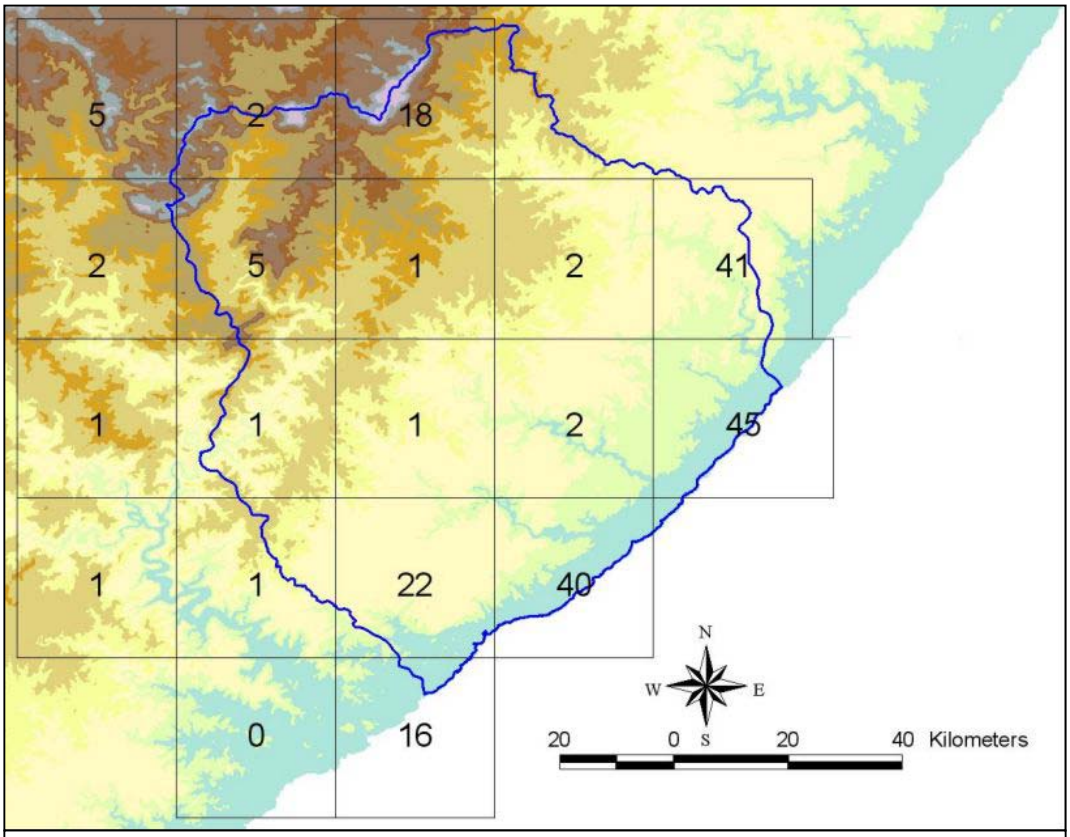


Figure 3.3.d: Number of threatened species (Hilton-Taylor 1996) per quarter degree grid in the Focus Study Area.

The distribution of threatened species corresponds very closely with the distribution of endemic species in the Pondoland and Ngeli Centres, discussed above. The central inland undulating plains of the study area, corresponding to Ngongoni Veld, Eastern Valley Bushveld and Midlands Mistbelt Grassland vegetation types, have a low frequency of occurrence of rare and threatened species.

3.3.4 TERRESTRIAL FAUNA

In general terms, terrestrial fauna are linked to certain vegetation types, i.e. forest, grassland, savanna, etc. However, the particular lifestyle of the animal concerned and/or the physical characteristics of the environment may be more important than the plant species that define the vegetation types. Thus, forest specialists may inhabit various forest types, while waterbirds and amphibians may utilise varied aquatic systems. These aspects determine the distribution and nature of the threats to which animals are exposed. Consequently, they also have an important bearing on the conservation status of the various species found within the study areas. A number of terrestrial vertebrates recorded from within WMA 12 can be regarded as Species of Special Concern. Short descriptions of selected animal groups are given below.

Amphibians

The amphibian fauna of much of the former Transkei has been poorly surveyed. This is unfortunate as the region falls at an important transition zone between a southern temperate amphibian fauna, and a tropical fauna that extends along the coastal littoral in association with the warm waters of the Aghulas Current (Poynton, 1990; Alexander et al, 2003). The known amphibian fauna includes approximately 30 species (Minter et al 2003). New taxa may well still exist in the poorly studied forest patches, river gorges and mistbelt and coastal grasslands.

Reptiles

Approximately 60 species of reptile are recorded or are likely to occur in the region (Branch, 1998). Whilst some are wide-ranging species, e.g. snakes such as boomslang and puff adder, others have relatively restricted distributions. The taxonomy of a number of taxa requires fuller resolution, and may involve hidden undescribed species that could be of conservation concern.

Birds

The former Transkei region has a rich avifauna (Quickelberge, 1989; Harrison et al., 1997), with nearly 500 species recorded from the region (approximately half of the species recorded from the subcontinent). They include numerous sensitive and threatened species. The coastal mosaic of grassland and forest habitats serves as an important area for montane species in winter. Many Intra-African summer migrants also use the region both for breeding and in transit to more southerly areas.

Mammals

The area of interest has a diverse mammal fauna with nearly 80 species recorded from the region, comprising 11 insectivores, 19 bats, 3 primates, 2 lagomorphs, 19 rodents, 15 carnivores, antbear, 2 hyrax, bushpig, and 5-6 small antelope. However, much of the large and medium-sized mammal fauna that previously occurred in the area is now locally extinct or occurs in small fragmented populations, usually in isolated forests. Skead (1987) notes records of five leopards killed in the Mkambati – Ntsimbini region, between 1952 -1962, and it is possible that a few specimens still exist in the more inaccessible forests.

3.3.5 ENVIRONMENTAL SENSITIVITY ATLAS

This SEA has identified the following features as being, "sensitive" to change resulting from development impacts. The following is a brief description of each of these features, their recommended (or prescribed) protection status and where they occur within the Focus Area.

Gazetted Conservation Areas

Formally protected areas including provincial parks and reserves, designated state forests, wilderness areas, natural heritage areas and marine reserves are identified (see Figure 3.3.e). A number of different categories of conservation areas are found in the Focus Area, including Provincial nature reserves and State forests. No National Park presently exists in the area, although there are plans to establish one along the Pondoland coastline. Other notable categories potentially affecting future land-uses include the declaration of a Marine Protected Area along part of the Pondoland coast and the identification of a number of provincial nature reserves as Important Bird Areas. Areas that qualify as *Gazetted Conservation Areas* are considered *Exclusionary* wherein no significant development should be permitted.

Protected and Sensitive Vegetation

Areas of *Protected Vegetation* include indigenous forests, such as those identified in the Forest Conservation Act of 1998 and wetlands (as identified on the NBI Vegetation and ENPAT land cover data sets). Within the Focus Area they represent approximately 18% of the land area. Wetlands are reputed to *inter alia* attenuate floods, trap sediments, provide sources of food and building materials for people and provide a habitat for aquatic fauna and flora. Wetlands include rivers, their floodplains, vleis, lakes, estuaries, inter-tidal areas and man-made features such as dams, solar salt extraction works and oxidation ponds. Natural wetlands are relatively well-protected by legislation in South Africa. Depending on the environment and circumstances this legislation includes the Environment Conservation Act (Act No. 73 of 1989), the National Water Act (Act No. 36 of 1998) and the Marine Living Resources Act (Act No. 18 of 1998). The Pondoland Marine Protected Area provides protection for all areas below the high-water mark (including estuaries) between the Mzamba and Mzimvubu rivers. Areas of Protected Vegetation are afforded protected by the Forest Conservation Act and the Environment Conservation Act. For the purposes of this SEA they are considered *Exclusionary* wherein no significant development should be permitted (see Figure 3.3.f).

The sandstones of the Natal Group underlie most of the coast and its immediate hinterland within the Focus Area. The area underlain by these rocks can be equated with the Pondoland Centre of Endemism. The proposed development of a toll road (N2) through this area recently elicited considerable public opposition to the development. It is therefore likely that similar public opposition will occur in response to any other major developments associated with an extensive footprint, such as forestry or large scale commercial agricultural projects. For the purposes of this SEA the defined centres of endemism (Pondoland and Ngeli) are considered *Precautionary,* wherein additional development requires careful consideration, more detailed planning, (as an example, an Environmental Impact Assessment), and a commitment to meet scientifically determined conservation targets (see Section 3.3.d below). Figure 3.3.f identifies sensitive vegetation types within the Focus Area.

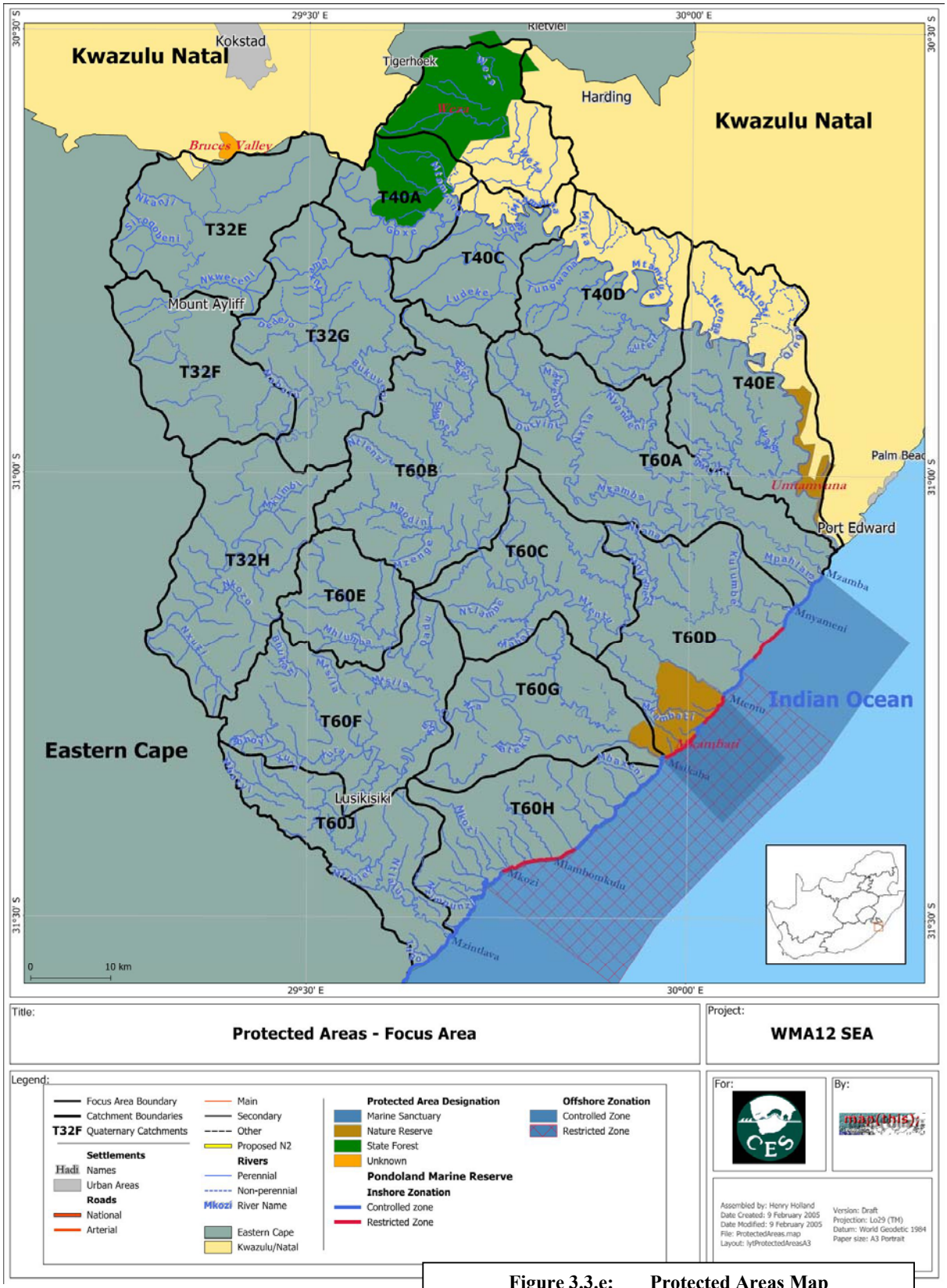


Figure 3.3.e: Protected Areas Map

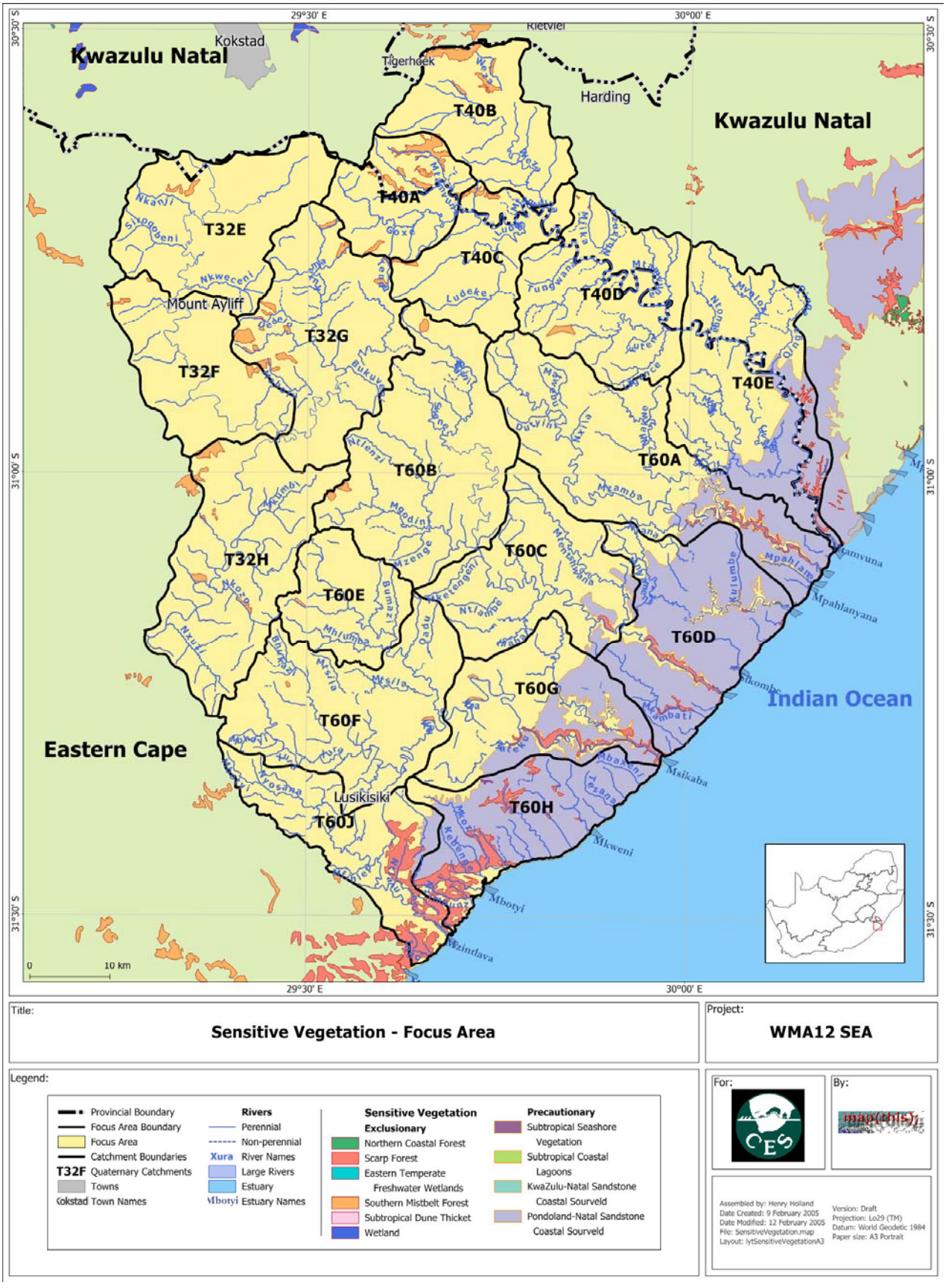


Figure 3.3.f: Sensitive Vegetation

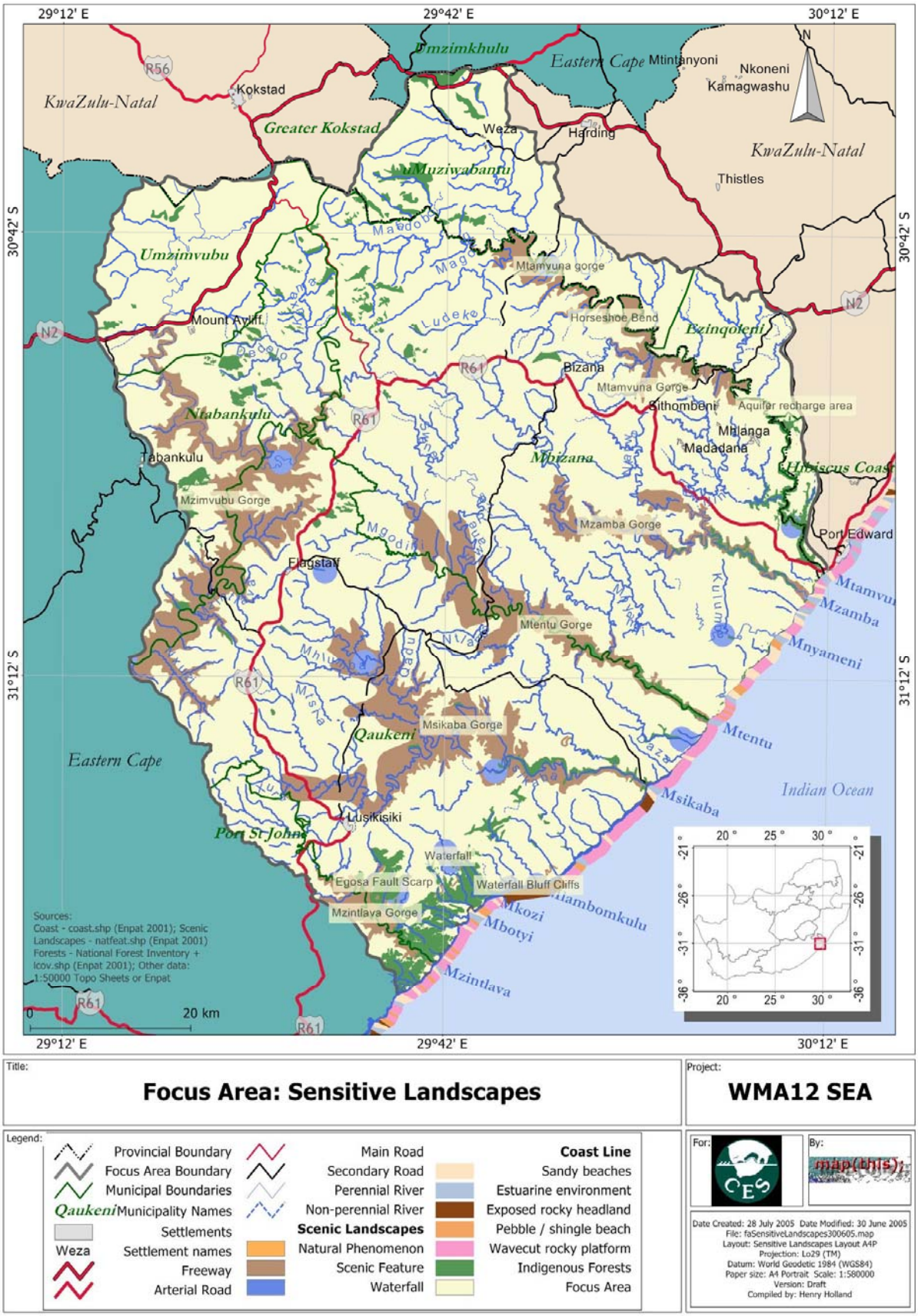


Figure 3.3.g: Scenic and Sensitive Landscapes

Areas of Importance for Faunal Conservation

The areas identified as important for the protection and conservation of faunal species may include sites such as: breeding areas for birds, fly-ways and migratory routes, spawning, nesting or calving areas, important habitat including food-plants and areas of significant animal concentrations. However, this SEA has identified a significant shortage of published research and data on the occurrence of these species within the study area, though somewhat more information is available for the Pondoland Centre of Endemism. The Systematic Conservation Planning work completed as part of this SEA has provided additional insight into areas that require further assessment or are deserving of additional protection measures. For the purposes of this SEA they are considered *Precautionary,* with conditions for development as specified above. However, specific conservation targets have been identified by the Systematic Conservation Planning exercise and these areas are considered *Exclusionary*, as they are described as the minimum area needed for protection to fully represent the biodiversity they contain. They are described and mapped as part of the Integrated Priority Areas (see Figure 3.3.f) in this Chapter.

Areas of Scenic and Sensitive Landscapes

The identification of a "scenic area" is subjective; however, this SEA has identified the following as particularly noteworthy in the Focus Area:

- Areas covered by indigenous forest (afforded protection by the National Forests Act (Act No. 84 of 1998), forestry and nature reserves e.g. Dwesa, Silaka and Mkambati);
- The coastline, with its associated rocky shores, sandy beaches, dunefields and estuaries (Afforded protection by inter alia the proclamation of the Pondoland Marine Protected Area and nature reserves e.g. Dwesa, Silaka and Mkambati).
- The grassland vegetation in Pondoland underlain by the Natal Group sandstones, which is associated with deeply incised valleys and waterfalls (afforded partial protection by the Mkambati Nature Reserve).
- Spectacular natural phenomenon such as, waterfalls, gorges, and caves are also included (see Figure 3.3.g).

Areas of Scenic Landscape could also include such features such as: Coastal Dunes, the Wild Coast Planning Domain, Heritage sites, and potential Ramsar wetland sites. However, these features have not been mapped as part of this SEA but should be considered against future land use changes. Scenic and sensitive landscapes are considered *Precautionary,* with conditions for development as specified by the Decision Support System.

3.4 SYSTEMATIC CONSERVATION PLANNING

DWAF commissioned the Council for Scientific and Industrial Research (CSIR) to develop a systematic conservation assessment of the Focus Area as part of the Strategic Environmental Assessment (SEA) of Water Management Area 12. This conservation assessment highlights areas of exceptional biodiversity value within the Focus Area, and informs the SEA, in order to ensure that forestry and other land use development can be aligned with biodiversity conservation goals in the region. These regions of exceptional biodiversity value include areas with important and conservation worthy vegetation, priority estuaries and rivers, priority indigenous forests, and areas of importance for species level conservation. In addition, catchments linked to estuaries sensitive to flow reduction are also included. Finally, these areas are assessed as to their congruence with areas of high forestry suitability. The final

integrated priority areas identified by the CSIR have been incorporated as an *Exclusionary* zone for the Focus Area.

Systematic conservation planning was applied in this SEA in order to identify priority conservation areas. It is important to note that these priority areas are not synonymous with protected areas, and may therefore not require formal protection, but should be managed in a biodiversity friendly fashion. They are pieces of land or water that contain biodiversity features (e.g. species or habitats) essential for achieving the conservation targets and goals of the Wild Coast, as determined in the National Spatial Biodiversity Assessment and Forest Conservation Plan, modified with expert review. These targets provide an indication of how much of each vegetation type must be conserved to ensure the representation and persistence of biodiversity in a region. The vegetation types identified as under-protected in the Focus Area are shown on the following table along with their conservation targets (Table 3.4.a) based on their percentage of occurrence in South Africa, the Focus Area and within existing protected areas.

Table: 3.4.a: Conservation Status of vegetation types requiring additional protection.

Biome	Vegetation Type	Percentage coverage in the Focus Area	Percentage needed to meet S.A. conservation goals*	Conservation Target %	Gap between area currently protected and conservation target	Status #
Forest	Scarp Forest	2.657	19.17	65-66	15.58%	LT
Forest	Northern Coastal	0.009	0.12	43	0	LT
Forest	Southern Mistbelt	0.663	3.77	30	68.21%	LT
Grasslands	Midlands Mistbelt	21.590	20.55	23	98.14%	E
	Pondoland-Natal Sandstone Coastal Sourveld	16.678	79.79	50	76.52%	V
	Transkei Coastal Belt	2.773	10.61	25	97.06%	V
Savanna	Ngongoni Veld	32.261	20.09	25	98.93%	V

** Percentage of vegetation type required to meet national conservation targets (Driver et al. 2004)*
 # National conservation status expressed as E = Endangered; V = Vulnerable; LT = Least threatened

The systematic conservation planning exercise also utilized expert mapping to capture the knowledge of taxonomic experts on the distribution of species in the area (with a particular focus on species of special concern, i.e. threatened or endemic species). This process concentrated on mapping areas identified by the experts as: centres of endemism, centres of biotic diversity, unique habitats or communities, habitats of rare and endangered species, areas under high threat, regions of conservation opportunity, and areas important to the maintenance of biotic processes (CSIR 2005).

The conservation planning process also looked at the sensitivity and protection status of rivers within the Focus Area. The majority of the Focus Area lies in the Wild Coast sub water management area (sub-WMA) and major and medium-sized rivers that run from this

catchment include the Mntafufu, Mzintlava, Msikaba, Mtentu, Mnyameni and Mzamba rivers. The eastern section of the Focus Area extends into the Coastal Mvoti sub-WMA, the major river being the Mtamvuna River. The inland reaches of the Focus Area fall into the Mzimvubu sub-WMA, and these rivers flow into the greater Mzimvubu River, which borders the Focus Area at its mouth. Numerous minor rivers flow from these catchments as well.

Freshwater aquatic systems have been poorly researched in this region but it is likely that the region is host to important areas of freshwater endemism and diversity. Information gathered in the river component of the National Systematic Biodiversity Assessment (Nel *et al*. 2004) indicate that the WMA has a low percentage of mainstem rivers of critically endangered and endangered status, with most rivers having a status of vulnerable. Many of the quaternary catchments are intact or have potential for rehabilitation, although the Kei sub-WMA has quaternary catchments that are transformed. This national assessment was limited to considering the integrity of the catchment mainstems only. An improvement especially necessary for a finer scale study such as this one is a reassessment of the integrity of quaternary catchments considering both the mainstems and tributaries (CSIR 2005).

Integrity of quaternary catchments was reassessed in the Wild Coast Conservation Assessment (Reyers and Ginsburg 2005) based on the integrity of mainstems and tributaries per catchment. The quaternary catchment units were assessed and placed into the following categories:

- Near natural (Present Ecological State Category - PESC A & B)
- Moderately modified (PESC C)
- Modified (PESC D, E & F)

The results of this assessment closely match the work completed by the CES consultant team and DWAF (Table 3.4.b below) with a few exceptions. The categorization of the following catchments does not agree, and further collaboration is required to correct the differences. The final recommended categories should be confirmed by DWAF.

Table 3.4.b: Catchment Designations

Quaternary	CES Designation	CSIR Designation
T32C	C	Near Natural (A & B)
T32E	C	Near Natural (A & B)
T60A	B	Moderately modified (C)
T60F	B/C	Moderately modified (C)

The Pondoland Focus Area Conservation Assessment completed by CSIR (2005) also includes an assessment of priority rivers and estuaries. The following Focus Area rivers are identified as ***priority rivers*** based on the conservation planning criteria. The CES consultant team and DWAF completed rapid level assessments of the Mzintlava, Mtamvuna, Mnyameni rivers (shown in bold below), as well as other rivers within the Pondoland region (as described below).

- **Mzintlava** (Estuarine Protected Area - EPA)
- Mkosi
- Mtentu
- **Mnyameni** (EPA)
- **Mtamvuna** (EPA)
- Mzimvubu (EPA)
- Xura
- Mntafufu (EPA)

Eleven estuaries within the Focus Area (from a total of 14 within WMA 12) were chosen as Estuarine Protected Areas (EPA) in order to meet national conservation targets by this study for the entire WMA 12. Some of the EPA's also corresponded with the priority rivers in the Focus Area (see list above).

As a final product, the CSIR conservation assessment combined the three priority maps (terrestrial, rivers and estuaries) into a single integrated priority map for the Focus Area. Additional data was then added including a map of the Pondoland biosphere initiative (an important conservation opportunity in the area; DEAET 2004), a map of the priority indigenous forests identified by Berliner and Benn (2004) as forests requiring protection in order to meet national conservation targets, and the expert map considered to be important for biodiversity conservation in the area. These 6 maps were overlaid on one another and an analysis was run to identify areas where 2 or more of these priority areas overlapped or were in close proximity. Based on this analysis broad priority areas for conservation of terrestrial and aquatic biodiversity were identified. It is important to note that this method of overlay does mean that an area only important to one analysis (e.g. an expert mapped polygon of importance to an endemic invertebrate population with no overlap) would not be included in a final integrated priority area. Therefore, single priority areas that do not overlap with any others are also highlighted with a caution for their exclusion from conservation efforts in the region.

Figure 3.4.a illustrates the integrated priority areas (PA) of congruence between priority areas for vegetation, indigenous forest, estuaries, river, and expert areas. There are 19 priority areas identified in this assessment. These areas vary widely in size and content, but all contain features of biodiversity importance for achieving the conservation targets of the region. The priority areas appear to adequately represent the important terrestrial and aquatic biodiversity known to occur in the region, however, gaps identified in terms of data and knowledge of the region must be assessed and addressed. These priority areas should be avoided at all costs in any development plans which threatened biodiversity or reduce flows. Of these 19 priority areas, the Pondoland Priority Area (PA) is the largest, while the Insizwa Mountain Forest PA is the smallest. The priority areas in the interior of the domain are small and tend to cluster around indigenous forests. This part of the domain is densely populated and significantly transformed, making smaller priority areas perhaps easier to implement and manage. The priority areas along the coast represent the important, endemic and globally recognised Pondoland Centre of Endemism. The Mkambati and Mtamvuna Reserves present important opportunities to expand the existing land under conservation and contribute towards the conservation targets of the Pondoland region. The Pondoland priority area is the largest containing the most priority terrestrial grids, estuaries, rivers and forests (CSIR 2005). The full CSIR conservation assessment is contained in the Technical Reports (Volume 2).

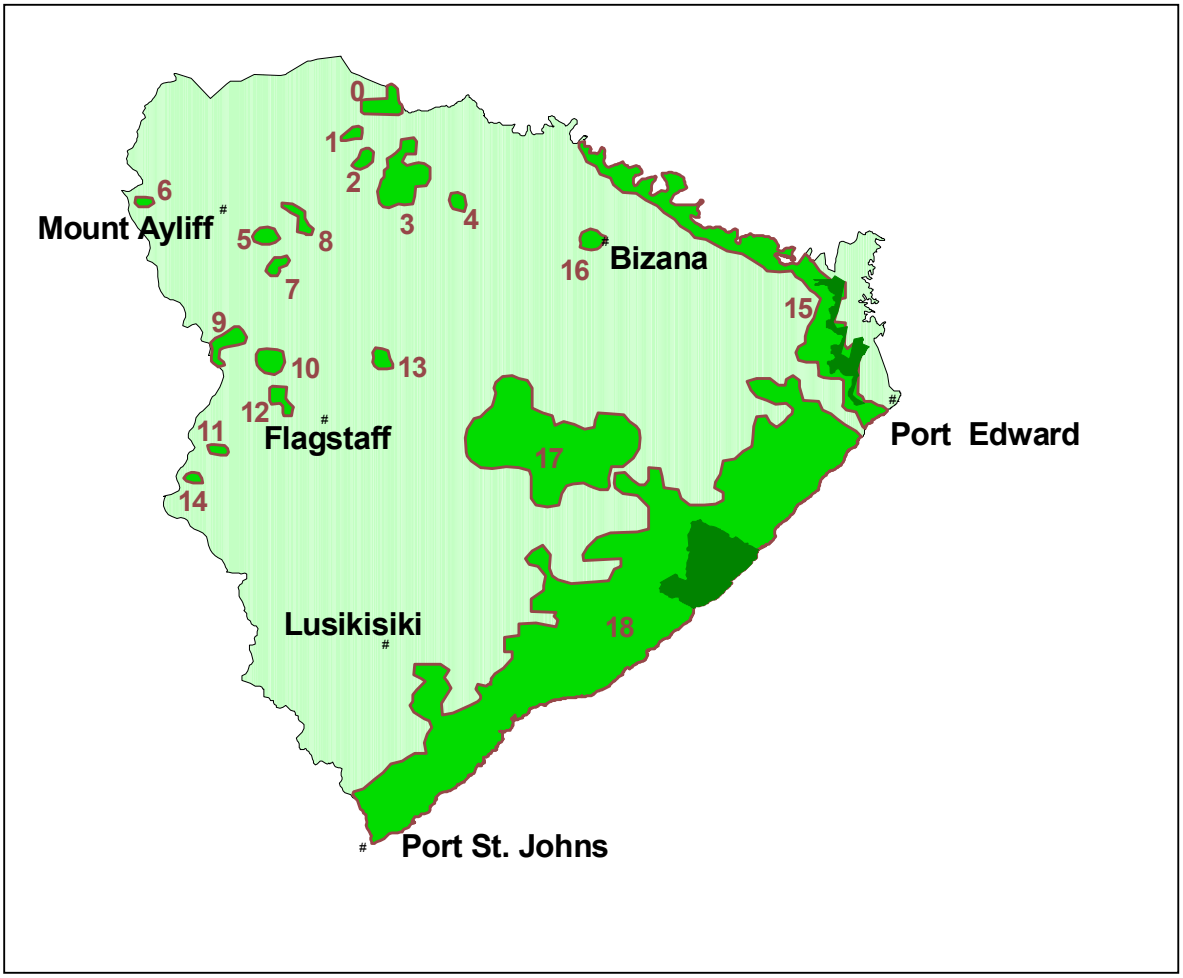


Figure: 3.4.a: From CSIR Conservation Assessment

3.5 WATER RESOURCES ASSESSMENT

3.5.1 APPROACH

The following is a brief description of the water resources assessment that has been carried out for the Focus Area by the CES consultant team. The work has encompassed a variety of methods required to assess available water for alternative land uses and development, including additional forestry development in the Focus Area as one land use option. To assess whether water is available for use, legal rights to water had to be ascertained, i.e. Reserve requirements. This study therefore adopted the following approach:

- A multi-disciplinary water resources team of consultants and DWAF representatives were put together to develop a plan of study, conduct field work, modelling and assessment activities. The results were reviewed in an expert driven workshop and reported to the full SEA team.
- The focus of the water resources study was on Ecological Reserve requirements of rivers in the Focus Area, as Reserve requirements (ecological plus basic human needs) are the only water requirements that must legally be satisfied before water can be used

for other purposes). Impact on Reserve requirements was therefore identified as the primary potentially limiting factor constraining additional development in the area. Issues such as water balances, infrastructure etc. were not covered by this study, as the Integrated Strategic Perspective (ISP) studies conducted for DWAF (DWAF, 2004) adequately covers these issues and should be used as background text to this section of the Report.

- All available information on the Ecological Reserve (or Ecological Water Requirements - EWR) was collated. In the ISP conducted for DWAF for the study area, the Reserve requirements were sourced mostly from the National Water Resource Strategy. This SEA study therefore aims to incorporate the results of all Reserve studies that have been conducted in the Focus Area at any level of detail.
- An assessment of whether EWR are currently being met with present use in the system.
- An assessment of whether yield is available for additional forestry developments with present use in the system and assuming EWR estimates are being met.
- Determine if there are areas suitable for forestry development taking into account the EWR for rivers in the Focus Area.
- Note that this study is concerned with the impact of additional development on the Ecological Reserve only. Impacts on run-of-river yield, rural water supply and the Basic Human Needs Reserve (BHNR) are not specifically assessed.

The study included a review of existing documentation and literature, expert opinion generated at workshops, and additional field investigations carried out by the Resource Directed Measures (RDM) Directorate of DWAF. A full methods description is provided in the SEA Water Specialist Report, (Technical Reports Volume 2).

3.5.2 BACKGROUND

Fundamental to any assessment of water availability for development is an understanding of the Reserve, i.e. the quantity and quality of water needed to sustain *basic human needs* and *ecosystems* (e.g. estuaries, rivers, lakes, groundwater and wetlands) to ensure ecologically sustainable development and utilisation of a water resource. The *Ecological Reserve* pertains specifically to aquatic ecosystems. The National Water Act of 1998 (Chapter 3, Part 3) provides for the protection of significant water resources through the Reserve. This is then the only right to water in the law. As the Department of Water Affairs and Forestry (DWAF) is the custodian of the nation's water resources, it is the Department's responsibility to ensure the adequate protection, effective management and sustainable utilisation of these resources. The Resources Directed Measures Directorate (RDM) is the Directorate within DWAF tasked with the responsibility of ensuring that Reserve requirements, which have priority over other uses in terms of the Act, are determined *before the water allocation process is initiated and licensing applications processed*. Compulsory licensing is the process whereby all existing and new water users will be requested to reapply for their licenses to use or dispose of water.

Reserve determinations can be conducted at a Rapid, Intermediate or Comprehensive level. Each level of determination entails a more detailed (higher confidence) investigation than the previous level. Once Reserve requirements are available, the allocable resource can be determined and water use applications evaluated (CES, 2004).

Ecological Water Requirements (EWR) therefore refer specifically to the quality and quantity of water flowing through a natural stream course that is needed to sustain in-stream functions and ecosystem integrity at an acceptable level as determined during an EWR study. Results of the EWR study, i.e. the Recommended Ecological Category (REC) as determined by the

ecologists per section of river(s) (or Resource Unit) in the study area, are submitted to DWAF in a briefing document. DWAF then decides on the Management Class (MC) to be assigned to each section of river, also taking into consideration factors other than ecological requirements, and in so doing determines how the river will be managed into the future. The Reserve and Resource Quality Objectives (RQO) set for a water resource therefore serve as a set of rules to prevent overuse and exploitation of rivers, estuaries, wetlands and groundwater. *Note that according to the National Water Act of 1998, river condition may not be allowed to deteriorate once a category has been assigned. The EWR process may therefore request an improvement or maintenance of present state, but not a reduction in category.*

The following tools and databases were available for use, and updated in this study:

- *Ecological Importance and Sensitivity (EIS)*

EIS of a river is an expression of its importance to the maintenance of ecological diversity and functioning on local and wider scales. Ecological sensitivity (or fragility) therefore refers to the system's ability to resist disturbance and its capability to recover from disturbance once it has occurred (resilience). Both abiotic and biotic components of the system are taken into consideration in the assessment of EIS. A country-wide assessment was undertaken during 1998 by Kleynhans of Resource Quality Services (RQS), DWAF, to populate the EIS model using available information and expert opinion. The output was a low confidence assessment of the EIS for every quaternary catchment in the country. This information was generated for use in the Water Situation Assessment Model (WSAM), which aimed to identify availability of yield and stressed areas.

- *Present Ecological State (PES)*

PES is an assessment of the river's ecological health and is described in terms of Categories A to F, with A being near natural and F being critically modified. At the same time and for the same purposes as the EIS assessment, a country-wide desktop estimate was made of the PES for each quaternary catchment. This information, and the EIS data, was captured in a national database.

- *In-stream Flow Requirements (IFR) and Ecological Water Requirements (EWR)*

The IFRs represent the flow component of Ecological Water Requirements (EWR). EWR scenarios are generated in order to supply decision-makers with sufficient options and consequences. The outcome of this process is the selection of a preferred option which will become the Reserve. This process is detailed and site-specific. In order to provide estimates of the flow component of the Reserve, a model was developed to provide LOW CONFIDENCE estimates of the Reserve. This Desktop Reserve Model (DRM) was used to estimate the Reserve for every quaternary catchment of the country for all potential categories.

The Desktop Reserve Model (DRM) therefore uses IFR and EWR results generated over the whole country to calibrate (and is therefore dependent on the quality of hydrological data) and to extrapolate results for different Ecological Categories (EC). The DRM will therefore be of higher confidence in areas where Comprehensive level Reserve studies have been undertaken. In the former Transkei area in general, and especially the Pondoland area, the DRM results are of low confidence due to minimal hydrological data, minimal ecological data and understanding, and a lack of any Intermediate / Comprehensive Reserve study results. The

DRM results in these areas are very low confidence due to the above constraints and lack of any suitable calibration for these hydrological regions.

- *Specific Ecological Reserve Assessment Studies*

Ecological Reserve assessments can be conducted at different levels of detail, i.e. the low confidence application of the Desktop Reserve Model, Rapid, Intermediate and Comprehensive levels. No Comprehensive (high confidence) Reserve studies have been undertaken in the Focus Area, although a number of Rapid Level III studies have been undertaken, including the field surveys undertaken in the Pondoland area in November 2004 by the RDM team of DWAF (3.5.3). The results of these studies produced updated IES, PES and EWR results.

The approach followed in this study was to include all Reserve information for the Focus Area, and identify any areas where the PES has changed due to the availability of higher confidence information. For the changed PES, the Desktop Reserve Model was then run to update the Reserve input for these categories. In areas where higher confidence reserves were generated, these were used instead of the Desktop Reserve generated estimates. It must be noted that no similar method (as the Desktop Reserve Model) exists for estuaries and no estimates of the estuary Reserves could therefore be made.

3.5.3 RAPID RESERVE SURVEY IN PONDOLAND

Due to the dearth of information for Pondoland in the Focus Area, a team from the RDM Directorate conducted Rapid III Reserve assessments on selected sites. The survey was undertaken the week before an expert workshop (November 2004), and as all the data was not yet available to the workshop, the focus was on drought flows and the impact additional development will have on meeting Reserve requirements under drought conditions. The following sites were assessed during the field survey and the Reserve results based on the DRM were updated as needed:

- T40B – Weza River, tributary of the Mtamvuna River: no biological sampling, EIS assessment only
- T40A, C, D – tributaries of the Mtamvuna River: no biological sampling, EIS assessment only
- T40E – Mtamvuna River: biological sampling undertaken
- T60A - Mzamba River: biological sampling undertaken
- T60K - Ntafufu River: biological sampling undertaken
- T60D – Nyameni River: no biological sampling, EIS assessment only
- T32D – Droewig River
- T32H – Mzintlava River

The results from this survey were therefore included in the EIS and REC maps (see Figures 3.5.a and 3.5.b) produced for the study.

A Rapid groundwater evaluation of the Pondoland area was also conducted by Mr J Wentzel of the RDM Directorate, DWAF, as part of the Rapid Reserve survey in November 2004. The study specifically encompassed the T40, T30, T32, T33G, T33H, T36 and T60K catchments in the Focus Area.

The results from the above referenced surveys and workshops were used to produce the EIS and REC maps (see Figures 3.5.a and 3.5.b) for the study.

3.5.4 WATER RESOURCES MODELLING

Although the SEA is considering a number of land-uses, the water resources modelling focused on forestry as the most likely land use option for the reasons listed below. The water resource modelling conducted for this study was carried out using the Rapid Simulation Model (Mallory, 2003) which was set up for the Umzimvubu to Keiskamma Water Management Area. The water use in the model was derived mostly from the Water Resources Situation Assessments, while the reduction in runoff due to forestry was determined for each quaternary catchment using the Scott curves (CSIR, 1995). The ecological requirements were recalculated by Prof Denis Hughes using his Desktop Reserve Model (Hughes and Hannart, 2003). In the reconciliation of available water resources with water requirements, the following assumptions were made.

- Reduction in runoff for forestry takes precedence over all users (100% assurance) and is therefore subtracted from the natural flow before it is assumed to be available in the river as streamflow.
- Ecological Water Requirements were determined at the outlet of each quaternary catchment and received the highest priority of supply from the available streamflow (which has been reduced by forestry).
- Other uses were prioritised as follows: industrial use, domestic use and finally irrigation.

Findings

The following summarized review assesses the main concerns with the allocation of water for new afforestation or other development projects. It focuses on the concern for maintaining the present Ecological Reserve determination for the selected catchments while simultaneously providing sufficient water to support new allocations.

Water Quantity and Quality in the Focus Area

A large number of small coastal rivers and streams which drain directly to the ocean are found in the Focus Area, many include estuaries of high conservation importance and health status. Some of the rivers are deeply incised near the coast. Basson and Rossouw (2003) divided WMA12 into six sub-areas to facilitate the presentation and management of key issues in the WMA. The sub-area encompassing the Focus Area is the Wild Coast sub-area, which includes all the rivers in the WMA to the east of the Mzimvubu.

The Mzimvubu to Keiskamma WMA is one of the areas with the lowest total requirements for water in the country, due to the relatively high rainfall and low level of economic activity. The mean annual runoff (MAR) is the highest in South Africa, representing nearly 15% of the total river flow in the country. About 40% of the total surface runoff from the WMA is from the Mzimvubu River catchment, and about 14% each from both the Kei and Mbashe River catchments (excluding the small coastal rivers between). The remainder of the runoff is from rivers such as the Keiskamma and Mtata together with smaller coastal rivers. About 50% of the total water requirement in the area is for irrigation, 30% for urban and industrial use and the remainder for rural water supplies (domestic and stock watering) and afforestation (Basson and Rossouw, 2003). Water resources in the Wild Coast sub-area have very limited utilisable yield due to the high ecological importance of the area, high EWR needed to sustain ecosystem health (DWAF, 2004b), little storage of water and a high dependence of run-of-river yield for basic human needs. The natural mean annual runoff (MAR) for the Wild Coast

sub-area is 796 (million m³/a) with the Ecological Reserve[1] estimate being 148 million m³/a. Note that more detailed studies have since been conducted or are under way, from which updated information should be extracted (Basson and Rossouw, 2003).

Activities impacting on water quality include the following:

- Discharge of industrial wastewaters
- Non-point source discharge of diffuse agricultural waste and sediment
- Inefficient wastewater treatment works and inadequate sewerage facilities
- Location and poor management of solid waste disposal sites
- Informal settlements

A major water quality impact in large parts of the Focus Area is excessive sediment runoff as a result of over-grazing. In fact, a large part of the upper and central parts of the former Transkei can be classified as degraded, mainly due to overgrazing which results in severe erosion (DWAF, 2004). The quality of surface water is relatively good for large sections of WMA12, except for high turbidities during flood flows (Basson and Rossouw, 2003). In many of the densely populated rural areas, bacteriological pollution of streams occurs as a result of poor sanitation services. Blockages in sewerage systems, inadequate treatment capacity and poor management result in the discharge of partially treated or untreated sewage into rivers and dams (Basson and Rossouw, 2003).

Ecological Importance and Sensitivity and Recommended Ecological Category

The Ecological Importance and Sensitivity (EIS) results are illustrated on Figure 3.5a. Although the map shows the entire WMA, note the outlined Focus Area. The EIS and PES/REC databases, updated with information from Ecological Reserve studies conducted in the Focus Area (including data from the water quality assessment), were used to produce the EIS and Recommended Ecological Category (REC) maps (Figures 3.5.a and 3.5.b). The detailed databases are provided in the SEA Water Specialist Report, (SEA Volume 2).

The low confidence national database that exists for the EIS and derived PES was used to derive the REC. The EIS and PES categories were then updated for each quaternary catchment where Ecological Reserve studies have been undertaken. In most cases the PES is maintained, i.e. the PES becomes the REC. ***In quaternary catchments with estuaries in Excellent or Good condition, or where estuaries were categorised as one of the 50 most important estuaries, the river category was improved in an attempt to accommodate the potential higher requirements of estuaries. This approach was adopted for quaternary catchment T60A (Mzamba estuary), T60D (Mtentu estuary) and T60J (Mzintlava estuary). Detail is shown in the EIS and PES/REC databases.*** Areas of high EIS are therefore most of the quaternary catchments of the Wild Coast sub-area (due mostly to estuaries of high importance and excellent health status).

The REC map (Figure 3.5.b) has been colour-coded to illustrate the different Ecological Categories for each quaternary catchment. For the REC to become the Reserve, a decision-making process has to be undertaken by the RDM Directorate of DWAF, and the Reserve category must be approved. The acceptance or rejection of the REC based on the confidence of the data and assessment (e.g. the validity of using a Desktop or Rapid assessment for

[1] All quantities relate to a particular sub-area only, i.e. water that originates or is required in that particular sub-area. Figures listed here are preliminary and based on the national average of about 20% of total river flow being required for the Ecological Reserve.

important or stressed catchments), is a decision to be made by the RDM Directorate. They may therefore request more detailed information (e.g. an Intermediate or Comprehensive Reserve assessment) for a particular catchment before 'signing-off' on the preliminary Reserve. (Note: All Reserves are legally considered *preliminary* until the Classification System [i.e. a system for classifying water resources of the country] is in place). It is also important to bear in mind that the REC is summarizing the ecological requirements for that quaternary catchment, which is particularly useful for planning purposes. However, within a particular quaternary catchment, various rivers, streams or tributaries may have different flow and quality requirements.

Note that it has been provisionally assumed that meeting the Ecological Water Requirements (EWR) or Ecological Reserve in the lowest reaches of the rivers will be sufficient to meet estuarine requirements (Basson and Rossouw, 2003). Estuary documents sourced during the SEA for WMA12 have shown that the above assumption may not always be true, and that due to the high importance and health status of some of the Pondoland estuaries, estuarine requirements may drive the EWR for some rivers.

According to the ISP produced for DWAF in 2004, available yield in the Wild Coast sub-area is limited to run-of-river yield, and it was assumed that once EWR requirements had been met, no surplus water would be available for use.

Despite the availability of water in WMA12, the following points pertinent to the Wild Coast sub-area must be noted:

- Due to many of the rural water requirements being met by run-of-river yield, deficits occurring during the dry season may impact on the Reserve (Basson and Rossouw, 2003). This situation will obviously be exacerbated by developments in the area, particularly land-uses requiring 100% assurance of supply.
- Hydrological monitoring and information available for this area is very poor. Improved hydrological observations and an expanded database are critical.
- Water quality data collection is also severely limited due to infrastructure constraints and human resource limitations, e.g. there is no routine faecal coliform testing at springs. There is little or no monitoring capacity outside of larger towns and limited to no data validation. Relevant information arising from available projects and contracts is not input into regional or national data systems (DWAF, 2004).
- Although areas suitable for afforestation are available in many of the sub-areas, expansion of afforestation will result in a reduction in run-off, which will impact run-of-river users as well as Ecological Water Requirements (Basson and Rossouw, 2003).
- Development in the Wild Coast sub-area (which has little utilisable yield at present) will require augmentation of run-of-river supply from groundwater supplies, regulation of rivers, or the conjunctive use of surface and groundwater (DWAF, 2004).
- Basson and Rossouw (2003) clearly state their concerns regarding allowances to meet the Ecological Reserve. *"Improved estimates of the water requirements for the ecological component of the Reserve is essential to the evaluation of water use allowances and to determine possible compensatory measures. A programme should therefore be developed for determination of the Reserve in order to support initiatives for development in the water management area. A programme is also required for improvement of the hydrological database."*

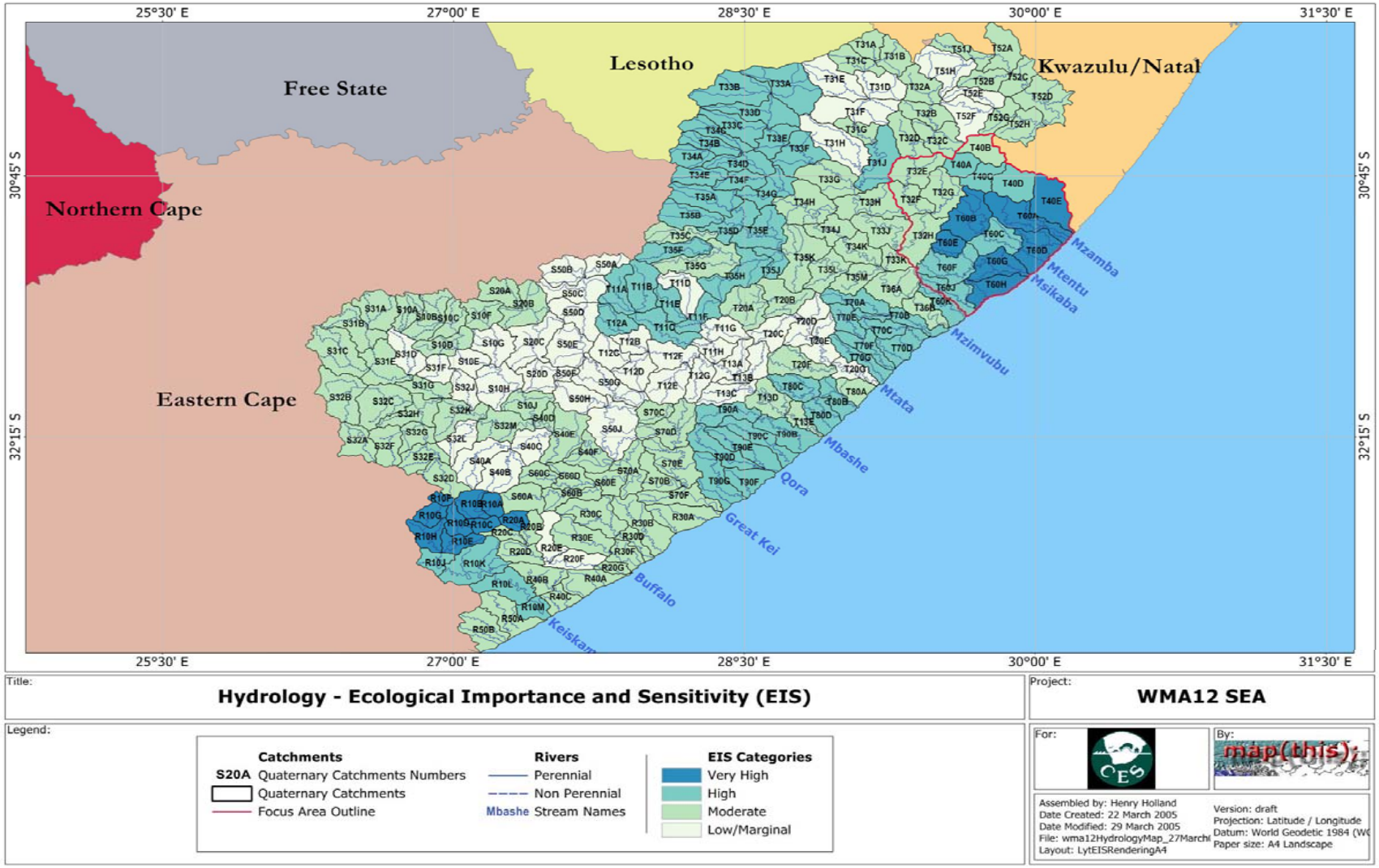


Figure 3.5.a: Ecological Importance and Sensitivity Map

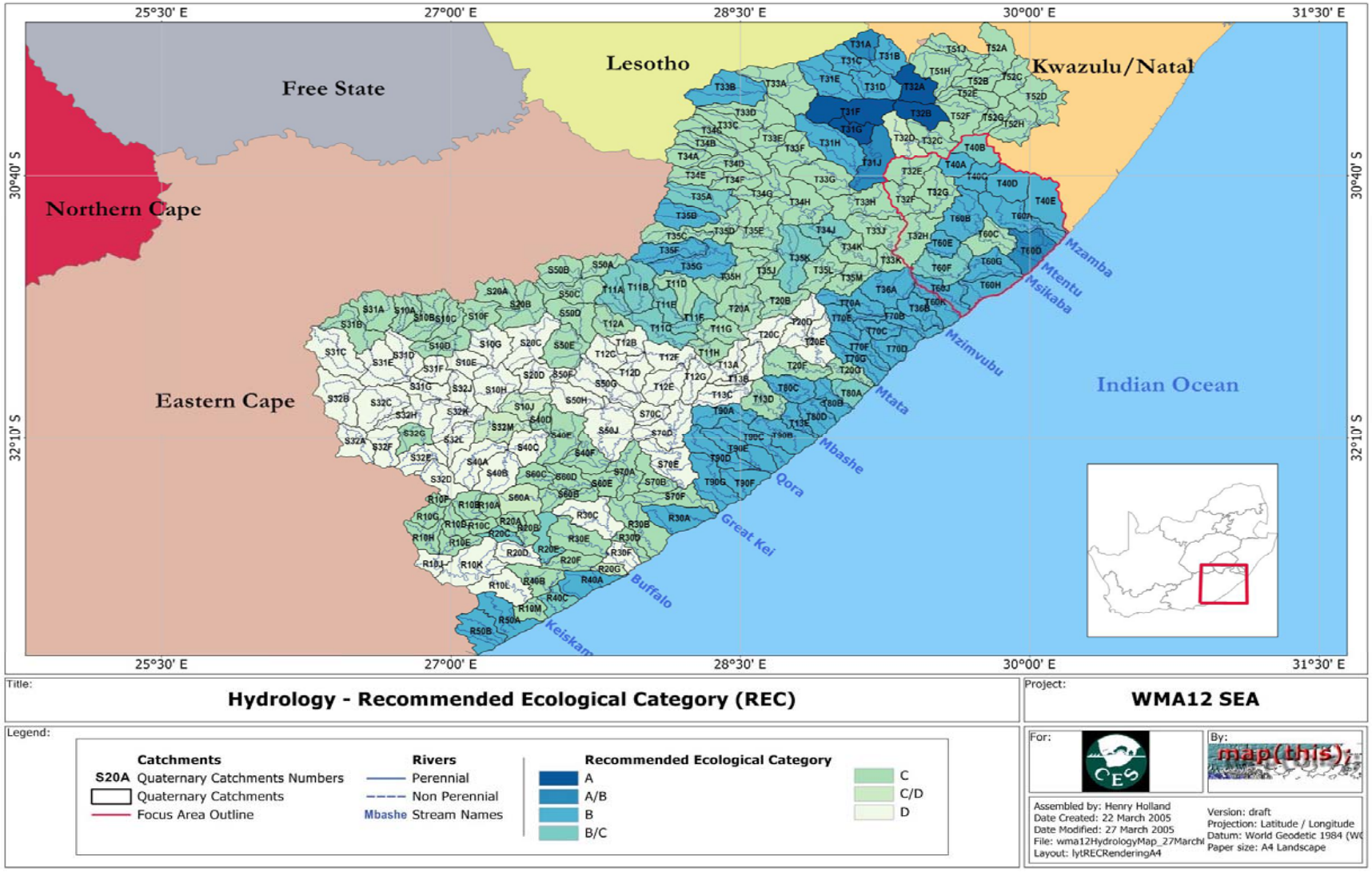


Figure 3.5.b: The Recommended Ecological Category (REC) Map

Estuaries

A number of assessment tables were selected to report on the status of estuaries in WMA12. A wide range of estuarine assessments are available, each using indicators ranging from botanical importance, water quality and fish populations to aesthetics. Turpie and colleagues (2002) assessment of the top 50 estuaries in the country, based on Conservation Importance, was also used.

Of the 50 top estuaries in the country, 8 are located within WMA 12, and of these, two are located within the Focus Area, (Mtentu and Mzamba Rivers). Note that the focus of the Water Studies section is on rivers, and excludes a quantitative assessment of estuaries and links between rivers and estuaries. However, it is anticipated that Ecological Water Requirements (EWR) for rivers may be determined by estuarine requirements as they will probably exceed river flow requirements.

Groundwater Quantity and Quality

Due to the high volumes of surface water available in this WMA, groundwater utilisation is generally low, although widely used by the rural communities of the Wild Coast (DWAF, 2004). Due to the relatively low average borehole yields, and the high salinity and hardness of the water especially towards the coast, the groundwater resource is only suitable for and used for providing domestic supplies to smaller settlements and coastal resorts (DWAF, 2004). Although the potential for groundwater use is high, the strong inter-dependence between ground and surface water suggests that large-scale abstraction of groundwater will impact negatively on surface water availability (Basson and Rossouw, 2003). There is an abundance of springs throughout the area which are used extensively for household and stock watering purposes. Existing groundwater use is therefore negligible in terms of the Reserve and an overall water balance. However, groundwater contribution to baseflow is significant in the study area and baseflow in the dry months depends almost solely on groundwater.

According to Basson and Rossouw (2003) groundwater quality is high, with little groundwater pollution recorded. High salinities are found in low rainfall areas and along the coast as expected due to the local geology. Sewerage works and improper implementation of sanitation programmes pose a threat to groundwater quality. Where wastewater treatment is inadequate, wastewater flows directly into the surface water streams and pollutes surface water and indirectly the groundwater via recharge from the rivers (DWAF, 2004).

Modelling Results

The main concern of this evaluation is whether Ecological Reserve (ER) requirements are currently being met, and if not, to what extent they are not being met under current conditions. This was determined by carrying out a water resources modelling simulation for the whole study area, and determining the assurance at which the Ecological Reserve could be met. Within the Focus Area, ER requirements are met at least 98% of the time in all but three catchments with the lowest being T40B at 83%. The next step identifies the impact of additional forestry as a potential land use, and therefore water usage, on Ecological Reserve requirements.

In most developed catchments, the drought flows are the critical component of the Ecological Reserve, since the yield obtainable from a river and to a lesser extent, a dam, is dependent on the low flows. Water users in the catchment therefore compete directly with the drought flow component of the Reserve. Floods, on the other hand, unless intercepted by large dams, flow

largely unhindered to the sea and man's activities interfere less with the high flows than the drought flows. In the case of large dams, however, the small floods or freshets are intercepted and this can have significant ecological impacts. For this reason, a flood flow is specified in the Ecological Reserve in order that small floods or freshets can be released from dams at the appropriate time in order to sustain the ecology, which is dependent on these events.

Forestry is dealt with slightly differently to other users in that it intercepts and uses water before it appears in the river as surface flow. Hence forestry is the first user of water and cannot be controlled or restricted during droughts. The water use by forestry, usually referred to as a reduction in runoff rather than a use is not constant, but varies with the soil moisture content and the type and age of the plantation trees. The question which arises, given the relatively undeveloped nature of the T catchments in the Focus Area, is why the Ecological Reserve requirements cannot be more completely met. Additional forestry and the impact on meeting Ecological Reserve requirements was conducted for selected catchments in the Focus Area, i.e. T32E, T32F, T32G, T32H, and T60C, T60E, T60H and T60J in the Eastern Pondoland coastal section of the Wild Coast sub-area. These quaternary catchments were selected as follows:

The Focus Area was assessed and catchments containing the following were not selected for modelling:

- Protected conservation areas
- Indigenous forests
- Areas of high endemism and high biodiversity potential
- Scenic areas, including the coastline

Quaternary catchments with potential for excess water and locations designated as Good or Very Good for forestry potential (using the Forestry Potential Map provided by Fractal Forests Africa), were then selected for modelling. Note that modelling was not conducted for the T40 catchments as these catchments have been included in the study for context only, as they do not lie completely within the Eastern Cape. The catchments selected for modelling, and their current status, are shown in Table 3.5.a below.

Table 3.5.a: Present status and position of quaternary catchments selected for modelling

Quaternary catchments	EIS	REC
T32E	Moderate	C
T32F	Moderate	C
T32G	Moderate	C
T32H	Moderate	C
T60C	High	C
T60E	Very high	B
T60H	Very high	B
T60J	High	B

Total forestry modelled includes existing plantations plus an additional 10,000 ha per catchment. It should be noted there is a discrepancy in the amount of existing plantation forestry with the Focus Area between data sources however this SEA has chosen to use the most conservative estimates where appropriate in order to ensure the principles of sustainability are met. Further investigation is warranted and recommended to clarify the exact amount of existing plantation forestry in the region on a quaternary catchment basis.

Table 3.5.b: Modelled forestry per catchment

Catchment	Total Afforestation included in Models
T32E	10 000
T32F	14 800
T32G	18 000
T32H	15 900
T60C	10 000
T60E	12 900
T60H	29 600
T60J	11 200
Totals	**122 400**

This modelling exercise indicates that sufficient water is available in each of the above catchments to support approximately 10 000 ha of new afforestation plus the existing forestry already in place whilst still maintaining the ER requirements during low flows. These results contradict statements made in the ISP concerning the potential availability of water but are consistent with other documents that demonstrate an under utilised potential. The detailed modelling results and duration curves are available in the SEA Water Specialist Report (Volume 2) and are based on the revised ER requirements specifically for low flows and the additional afforestation.

As the Desktop Reserve Model provides results either as total flows (i.e. low and high flows) or only low flows, and forestry will mostly impact on low flows, forestry potential was tested only against low flows. It is assumed that exact locations and the intended extent of additional forestry will be determined by the client at the conclusion of the SEA. Site and/or stream specific constraints may alter these findings and issues such as drought conditions still need to be assessed. However, this modelling exercise serves to demonstrate how the impact of additional forestry on Ecological Reserve (ER) flows can be evaluated and managed in conjunction with other priorities.

3.6 OPPORTUNITIES AND CONSTRAINTS TABLE

An analysis and interpretation of the biophysical information presented in this chapter, as well as the specialist reports, reveals the following opportunities and constraints for various land use options. Interpretation of opportunities and constraints is often context specific, and is influenced by the land use option under consideration. For example, what might be an

opportunity for forestry could also be a constraint for tourism, and visa versa. In order to accommodate for this, many of the opportunities and constraints are fairly generic. However, the sensitivity of the landscape (both ecological and physical aspects) is seen as an important indicator of opportunities and constraints, and for this reason it has been addressed in more detail in sections 3.3-3.5 above.

Table 3.6 Opportunities and Constraints Table

Discussion	Opportunities	Constraints
The coastline of the Focus Area is considered to represent one of the most pristine sections of coast in the Country. The "Wild Coast" is of National importance to South Africa.	The coastal biophysical landscape presents numerous opportunities for development, including tourism, coastal resorts, mining, commercial agriculture and forestry.	The entire coastline is a controlled zone for development with certain sections listed as restricted. The sensitive nature of the coast and unique landforms limit the types of development that will be seen as appropriate to the region.
The Pondoland Centre of Endemism is associated with the sandstones of the Natal Group within the Focus Area. This centre of endemism contains 96 plant species of special concern.	The unique landform and flora of the Pondoland area presents an opportunity for conservation and nature based tourism.	Rare plants and habitats and the need to meet conservation targets constrain the areas available to spatially demanding land uses, especially forestry and commercial agriculture.
Drakensberg footslopes	The unique landform and flora of this area also presents an opportunity for conservation and nature-based tourism, and the more favourable climate presents an opportunity for agriculture.	The rugged topography and lack of road infrastructure is a constraint for most land use options.
The climate within the Focus Area is subtropical, with the areas at higher elevations characterised by a cooler, more temperate regime. Large river valleys can be hotter and drier than the surrounding landscape.	A variety of crops are suitable to the climatic conditions of the Focus Study Area. The combination of climate and geology also lead to the unique landscapes and flora of the region.	Not all portions of the Focus Study Area are suitable for commercial dry-land farming and forestry due to the limited precipitation. Irrigation schemes will be required to support commercial farming in marginal areas.
Arable soils are located in much of the Focus Area but are most productive on river floodplains and in valley bottoms. The Pondoland Centre of Endemism contains mostly nutrient poor soils that are not suitable for commercial crop production.	Climate is generally suitable and a range of crops can be grown under rain fed conditions, most notably maize, but more specific studies will be required to determine which species are most suited to specific areas.	Whilst climate is generally favourable, poor soils and a rugged, undulating topography represent major constraints to large scale commercial agriculture, and to a lesser extent forestry.
Two of the top fifty estuaries are located within the Focus Area.	Estuaries provide unique habitat for a variety of terrestrial and aquatic species. They are also a fisheries resource and offer	The ecological flow requirements of estuaries may be greater than for rivers. They are also more sensitive to

Discussion	Opportunities	Constraints
	recreational and tourism benefits.	pollution than many other aquatic resources. Development of estuaries is restricted by a variety of South African laws and regulations.
Streams and rivers in the Focus Area are generally of high quality due to little existing development.	Pristine streams and rivers offer a variety of ecological and human benefits. The excess water that can be captured above the Reserve requirement can be utilised for development.	The Reserve and REC must be maintained for all river and stream systems. This will ultimately limit the type and amount of development that can be accommodated.
Wetlands are not well mapped in the Focus Area with the exception of the coastal land types. They provide valuable ecological and landscape benefits.	Certain highly significant wetlands may qualify for listing as a Ramsar site. This can have nature-based tourism benefits. All wetlands should be identified and protected to the extent possible in the development process. Site specific identification is beyond the scope of this SEA.	Wetlands are protected under South African legislation and should not be disturbed unless no practicable alternative exist. This may pose a constraint to certain development activities. Site specific surveys for wetlands are warranted prior to any proposed land use change.
A tentative identification of floodplains is provided in the Biophysical Assessment. The identification of an area as a floodplain will impact upon the type of development that may be appropriate.	Floodplains are a valuable component of ecosystems and for maintaining healthy streams. They are a dynamic environment and should be protected from activities that permanently change their cross-section or profile.	Floodplains present a potential hazard to many development activities. Damage to property, crops and loss of life is highly possible given the frequency and magnitude of storm events in the region.
Groundwater use in the Focus Area is generally low and very little data exists on the quantity and quality of the resource.	Groundwater abstraction may provide benefits for small residential settlements and small coastal resorts (potable water supply).	Groundwater supplies along the coast are subject to high salinity and borehole yields are generally low and water quality poor. Localized contamination has been reported in areas such as Lusikisiki and in the Komga area.
Introduction of alien species into the environment occurs with commercial forest plantations and agriculture. Extensive portions of the Focus Area have already been impacted by alien species introduction.	Reduction of alien species, such as clearing of Black Wattle can release more runoff into streams and create employment opportunities (i.e., Working for Water Programme).	Release of alien species into the natural environment can lead to reduction in stream flows, uncontrolled invasive plant growth, loss of indigenous plant cover and fauna, and loss of biodiversity and reduced ecosystem function.
Loss of indigenous plant cover and habitat due to destruction of vegetation through direct activities (i.e., clearing for development) or through over-grazing and frequent burning of the veld has occurred extensively throughout the Focus Area.	The O.R. Tambo District Municipality is undertaking the development of a Spatial Development Framework (SDF). This process offers an opportunity to identify those areas suitable for development and to target interventions with more appropriate veld management techniques.	Habitat destruction is often the unavoidable impact of development activities, including agriculture, mining, forestry, industry, and residential development. However, impacts may be minimized through proper land use and project planning, primarily by avoiding

Discussion	Opportunities	Constraints
		ecologically sensitive areas.
The loss or extinction of sensitive species due to destruction or alteration of habitat has occurred to a limited extent in the Focus Area due to the uncontrolled harvesting of natural resources, i.e., medicinal plants and fuel wood.	While this impact is not considered extensive in the Focus Area, there is still an opportunity to introduce alternative energy sources, increase education and incorporate Community Based Natural Resource Management (CBNRM) measures.	The prevalence of poverty in the Focus Area is a major constraint to reducing the uncontrolled harvesting of natural resources. Sustainable livelihood strategies are needed to provide viable alternatives to resource exploitation.
Erosion of topsoil and sedimentation of streams as a result of poor agricultural and soil management practices has been identified throughout the Focus Area.	Erosion control measures and better veld management techniques are needed in many locations throughout the Focus Study Area. NGO and government programmes should target these opportunities for job creation	Lack of institutional capacity (especially in the agricultural field) is a major constraint to improving veld management. Agricultural extension services are poorly developed in the region.
Fire is used as a method of clearing vegetation, including cultivated lands, and increasing carrying capacity of the veld in the short term. This can lead to wild fires, sterilized soils, alien plant infestation and erosion due to loss of plant cover and changes in species composition with resultant loss of biodiversity.	Fire ecology is poorly understood in the region. More scientific study is needed to better understand the appropriateness of using fire in veld or ecosystem management, and to better assess the carrying capacity of the grasslands in the area.	Changing the timing, frequency and intensity of burns alters the ecological functioning of an area. The use of fire as a veld management tool is also incompatible with many other land uses, i.e., forestry, residential and tourism. The implementation of any recommendations in the context of commonage land use presents a major challenge.
Feasibility studies are planned for two dams in the OR Tambo DM (IDP 2002). One of these dams is to be constructed at the "junction" of the Tsitsa, Tina and Umzimvubu rivers (IDP, 2002). The second dam is to supply water to the Lusikisiki and "Inquza Hill communities" (IDP, 2002). Large dams already present within the contextual study area, include inter alia the Xonxa, Lubisi, Ncora and Mtata dams.	Removing illegal dams will create employment and restore the natural flow regime and ecology of stream systems. However, properly sited and controlled impoundments may also improve low flow conditions and provide storage of water for irrigation and domestic purposes.	The construction of dams (both legal and illegal) is seen as a threat as it alters the natural stream hydrology and ecosystems. New dam construction should not be permitted without a full Environmental Impact Assessment, including hydrologic, hydraulic and ecological assessment of downstream impacts.
Indigenous timber utilization is currently occurring within the Focus Area and is supposedly controlled through legislation.	The controlled use of indigenous timber for furniture making and crafts is seen as a way of providing employment. The Mbizana carpentry project is listed in the O.R. Tambo IDP.	Care needs to be exercised as some of the timber suitable for harvesting may provide a habitat for species of special concern (e.g. Cape Parrot, *Poicephalus robustus*). Sustainable harvesting levels need to be set and enforced.

Discussion	Opportunities	Constraints
The Focus Study Area has been identified as having a high incidence of and potential for slope failures. These may lead to loss of life and property damage (including infrastructure).	The identification of areas prone to slope failure provides an opportunity for informed land and project planning in the region. Areas of potential slope failure where development current exists should be actively monitored for indications of hazardous conditions.	Areas prone to slope failure are not suitable for certain types of development, such as residential, commercial and industrial projects without significant mitigation. Other infrastructure improvements should also be assessed against potential impacts.

3.7 CONCLUSIONS

The biophysical and conservation planning assessment of the Focus Area completed as part of this SEA has identified those areas that should be excluded from land uses that have significant impacts upon biodiversity and water resources. These areas are listed below and presented in Figure 3.7a Exclusionary Zones and include the following features:

- Formally Protected Areas
- Vegetation Types Protected by Legislation
- Perennial streams and a 100m buffer, intermittent streams with a 30m buffer
- Urban areas and settlements and a 100m buffer
- Priority Areas per the Systematic Conservation Plan

The incorporation of these areas into a combined "Exclusionary" layer represents approximately 298,490 hectares or 45 percent of the Focus Area (see Figure 3.7.a). New development that is proposed within these areas should be subjected to the Decision Support System (as presented in Appendix 1) and will most likely be rejected if it entails substantial changes to biodiversity or reductions in stream flow. It is envisaged that only new development that is compatible with the protection of biodiversity and conservation and sustainable is appropriate. As an example, concessions to operate within protected areas and eco-tourism type projects may be suitable. New commercial forestry and/or agriculture are not suitable and should not be permitted within these areas.

This SEA has also identified the following areas as "Precautionary" due to their overall sensitivity to development activities. These include:

- Sensitive Vegetation types (Subtropical Dune Thicket, Subtropical Seashore Vegetation, and Pondoland-Natal Sandstone Coastal Sourveld).
- Highly Sensitive Estuaries and their Catchments
- Catchments with an EIS rating of Very High and High
- Catchments with a REC of A, A/B, B and B/C
- Areas identified as Scenic and Sensitive Landscapes

The incorporation of these areas into a combined "Precautionary" layer represents approximately 534,891hectares or 81 percent of the Focus Area (see Figure 3.7b). New development that is proposed within these areas should be subjected to the Decision Support System and will most likely require a thorough analysis of the existing features and proposed impacts. It is envisaged that a full Environmental Impact Assessment (EIA) will be required for most new major land use changes, or at a minimum, site specific surveys and water use modelling. New commercial forestry and/or agriculture may be suitable within these areas

but only after a careful consideration of the potential positive and negative impacts has been completed.

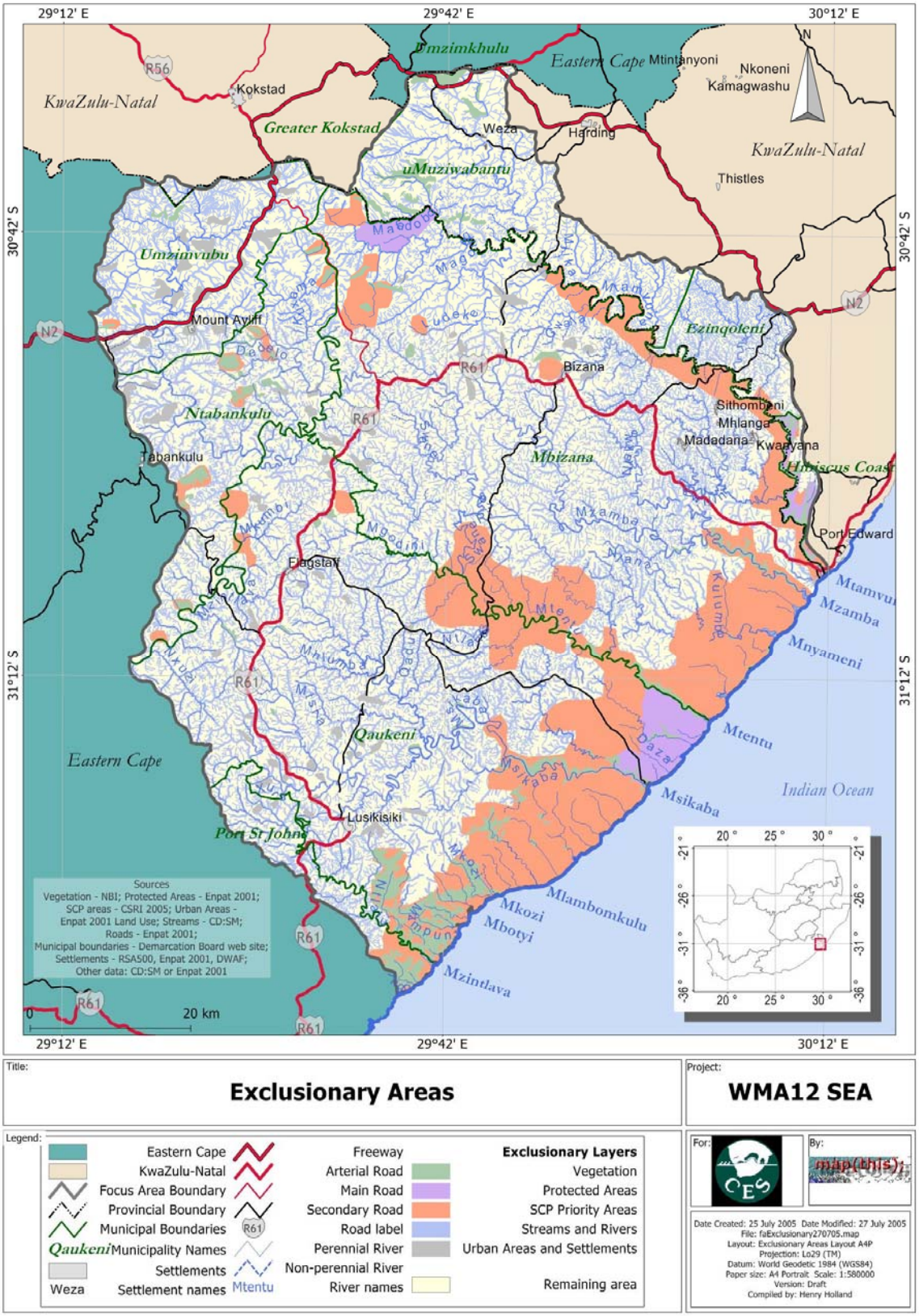


Figure 3.7.a: Exclusionary Areas

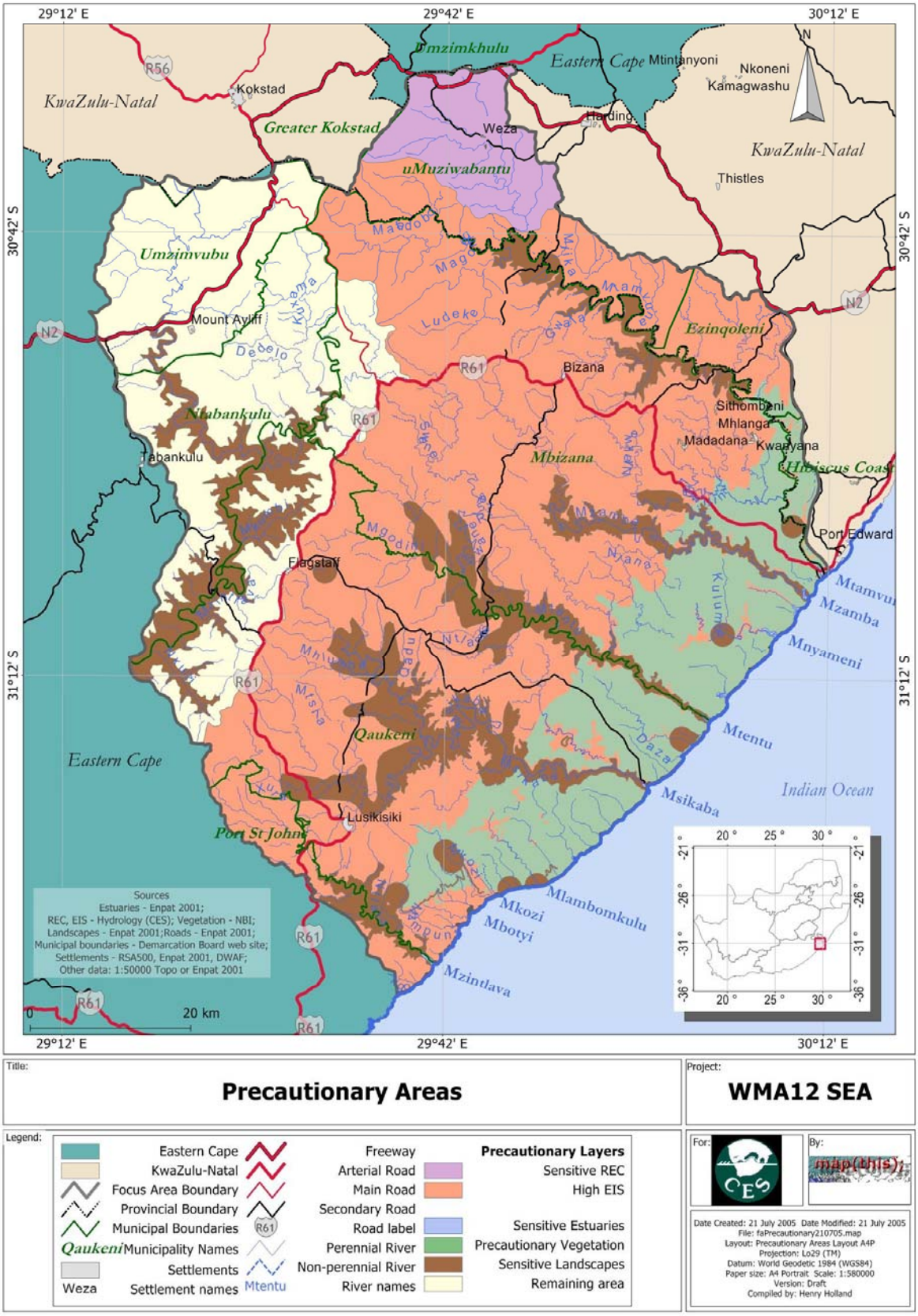


Figure 3.7.b: Precautionary Areas

4 SOCIAL, ECONOMIC & INSTITUTIONAL ASSESSMENT

4.1 INTRODUCTION AND ISSUES

This chapter of the Focus Area SEA describes the social and economic setting of the study area. The chapter begins with a description of the historical context of the area, which is important in order to understand and appreciate the current socio-economic circumstances of the population. The socio-economic characteristics and demographics of the area are described, including information on levels of education and employment, service provision, livelihood strategies and existing land use developments. The chapter then focuses briefly on the institutional characteristics of the key local municipalities. The final section provides a detailed analysis of the opportunities and constraints presented by the socio-economic environment.

The sections in this chapter deal with issues and concerns raised by stakeholders about the effects of various land use options on the socio-economic environment, and how this might affect development interventions. These issues were presented in Chapter 4 of the Scoping Report (Volume 1), and the table below (4.1.a) provides a list of the issues and where they have been dealt with in this chapter of the SEA.

Table 4.1.a: Issues raised during scoping dealt with in this chapter of the report. (Note TR = Technical Report)

Issue	**Where dealt with**
MAIN CATEGORY OF ISSUE: Economic	
Public Private Partnerships are important to ensure success of projects.	Section 4.5 & TR 2
There is poverty in the area resulting in a demand for development	Section 4.3.4 & TR2
MAIN CATEGORY OF ISSUE: Forestry Development	
Facilitate access to SLAG funds for local communities.	Section 4.4.2 & TR 2
Insufficient investment in addressing issue of finding and accessing markets	Section 4.4.2 & TR 2
Forestry will only be implemented if communities are willing to participate.	Section 4.5 & TR 2
Ownership and management issues are important considerations, and should look at more community involvement and participation.	Section 4.4.2, 4.5 & TR 2
Community ownership, in line with the Broad-based Black Economic Empowerment Act, and Public Private Partnerships requires consideration	Section 4.4.2, 4.5 & TR 2
A project such as this, with benefits to the local community, could be highly politicised, and this must be managed.	Section 4.5 & TR 2
MAIN CATEGORY OF ISSUE: Infrastructure	
Need to upgrade road and transport infrastructure.	Section 4.5 & TR 2
MAIN CATEGORY OF ISSUE: Institutional	
Concerns regarding unexplained policy decisions by local authorities to support short term poverty alleviation projects rather than long term projects.	Section 4.5 & TR 2
Local Municipalities need to consult with communities concerning land use decisions, due to their influence at community level and ex-officio status on Municipal Councils.	Section 4.4.3 & 4.5, & TR 2
In places there are tensions between tribal authorities and Local Municipalities.	Section 4.4.3 & 4.5, & TR 2
Concerns about institutional and capacity constraints	Section 4.4.3 & 4.5, & TR 2
MAIN CATEGORY OF ISSUE: Land Tenure and Land Use Issues	

Issue	**Where dealt with**
Private sector willingness to work with the DLA framework for land use change and community engagement.	Section 4.4.2; 4.5 & TR 2
Conflicts over land use within state land and where land claims remain unresolved.	Section 4.5 & TR 2
Tension between groups wishing to use land for subsistence agriculture and those wanting land for commercial (forestry) ventures.	Section 4.3.8; 4.4.1; 4.5 & TR 2
Support for land use developments, including forest initiatives.	Scoping Report, Section 4.5-.6 & TR 2
Communities not willing to give up the bulk of their land to forestry, as it is seen as a supplementary activity.	Section 4.5 & TR 2
Unresolved land claims delay developments on former agricultural parastatal lands.	Section 4.5 & TR 2
Competition for land for other projects (e.g. sugar and tea) exist in TRACOR and Magwa Estates.	Section 4.5 and TR 2
Concerns about the potential negative impacts of forestry on existing land uses and rural livelihoods and doubts about the scale of benefits	Sections 4.3.8; 4.5
Are there any legal, land tenure and use issues in the EC province that would inhibit the development of small grower programmes such as those in KZN?	Sections 4.4.1-2; 4.5 & TR 2
What village level institutional models for commercial land use developments would be most appropriate for residents of communal areas in WMA 12?	Sections 4.5 & 4.6 & TR 2
MAIN CATEGORY OF ISSUE: Management Skills and Capacity	
Issue	**Stakeholder**
Lack of experience in marketing and making business decisions.	Section 4.5 & TR 2
Training and capacity building will be required to make any development intervention work.	Section 4.5 & TR 2
The issue of skills development and local beneficiation must be considered.	Section 4.5 & TR 2
MAIN CATEGORY OF ISSUE: Public Participation	
Municipalities are being subject to a range of related studies, resulting in the SEA being confused with these studies.	Section 4.5 & TR 2
Traditional Authorities are seen as important stakeholders.	Section 4.4.3 & SEA Scoping Report
Continuous and ongoing community involvement is needed, and this will require community empowerment.	Section 4.6, Chapter 7
The process must consider the issues, needs and desires of people in the OR Tambo area	Section 4.6, Chapter 7
MAIN CATEGORY OF ISSUE: SEA Process	
There is a need to explain the forestry aspect of the SEA, as well as socio-economic implications and benefits to municipalities.	Section 4.5
MAIN CATEGORY OF ISSUE: Social	
Issue	**Stakeholder**
Concerns about the extent to which commercial land use developments can coexist and complement existing land uses without undermining food production and household security.	Section 4.5 & Chap. 5
Sustainable livelihood options must be considered	Section 4.5 & Chap. 5
Facilitating development within rural areas must be a focus of the SEA, and it must look at areas where forestry can occur, but also look at other development initiative, with an emphasis on poverty alleviation.	Section 4.4 & Chaps. 5 & 6
Labour must be drawn from local communities.	Section 4.5

Table 4.1.b: Issues raised during scoping process that have not been dealt with in this SEA, or are addressed in other sections are listed below.

Issue	**Reason**
MAIN CATEGORY OF ISSUE: Planning	
In the past, land use planning by District municipalities and Local municipalities has not involved sufficient stakeholder engagement.	Beyond the scope of this SEA.
Spatial development frameworks are seen as a guideline and many people are not aware of them.	Beyond the scope of this SEA.
Integrated Development Plans (IDP) need to recognise forestry as a potential land use.	Chapter 2 describes the objectives of this SEA.
Integration of rural and urban communities is important.	Unclear as to the intent of the comment but is likely beyond the scope of this SEA.
MAIN CATEGORY OF ISSUE: Public Participation	
It is important to share the results of the studies with all stakeholders.	SEA and Scoping Report
The role that IAPs are expected to play must be clarified.	Scoping Report
An opportunity and sufficient time to comment on the Scoping Report must be given	SEA Scoping Report
Geographical spread and times of meetings must be appropriate.	SEA Scoping Report
MAIN CATEGORY OF ISSUE: Management Skills & Capacity	
An ongoing awareness campaign to present a well balanced view of risks, costs and benefits of forestry is required.	Not in scope of the SEA but informs DSS.
MAIN CATEGORY OF ISSUE: SEA Process	
There is a level of confusion around the SEA process and its relationship with the forestry privatisation process.	SEA Scoping Report
Engagement with other projects (Wild Coast SEA) is required.	SEA Scoping Report
Clarification of the scope of the SEA and what it will focus on (i.e. forestry or other land uses)is required.	SEA Scoping Report

4.2 HISTORICAL CONTEXT

The Focus Area forms a large section of the OR Tambo District Municipality and very small southern portions of the Alfred Nzo Municipality. Historically, this area formed the eastern border of the former Transkei and in the colonial period was known as Mpondoland. The Mpondos were the last of the African chiefdoms to be annexed by the British and brought into the Cape Colony. The area is known for its conservative and traditional ways, being much less influenced by western ways than other African societies. In the 1930's Mpondo households were heavily engaged in livestock farming, but also in cultivation, and the harvesting of natural resources. They practiced a shifting form of cultivation, clearing bushveld for cultivation for a few years then abandoning this land and moving on to another patch. Even at this time arable land was becoming scarce, and more and more people began to engage in temporary periods of labour migration to the mines. Attempts by the State in the 1960s to introduce betterment planning that would concentrate settlements in urban type villages, change and reduce the area of arable land and introduce stock reductions and rotational grazing systems, were fiercely resisted in this area (the episode becoming known as the Mpondo Revolt) (Beinart, 1982) and as a result, this region has one of the lowest levels of implementation for betterment planning in the former Transkei (Figure 4.2.a).

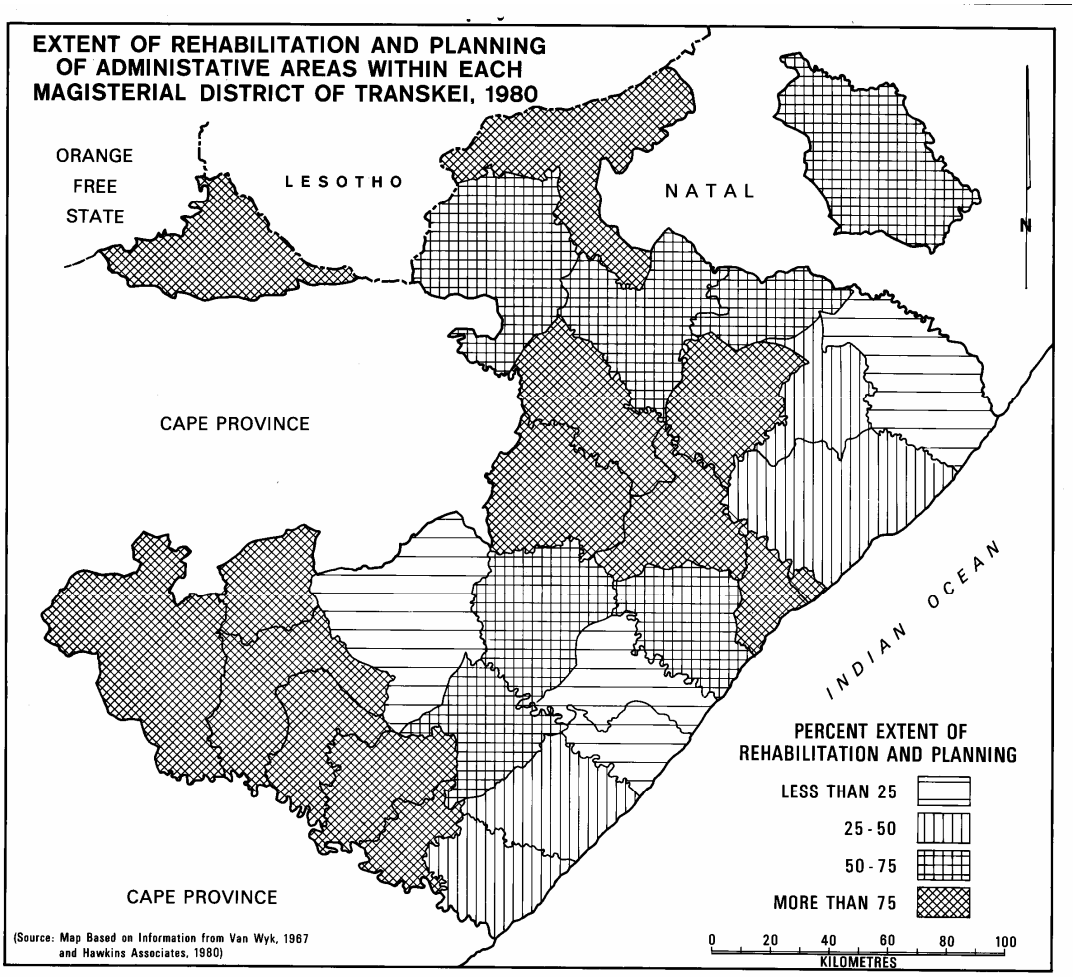


Figure 4.2.a: Extent of Betterment Planning in the former Transkei by 1980.

The Mpondo were productive farmers, investing in sheep and cattle and selling livestock and their products to traders. The agricultural incomes earned were reinvested in farming, as were incomes from temporary migrant work. The result was a period of economic growth and development in Mpondoland based largely on peasant farming but also on migrant earnings. However, from the 1930s onwards agriculture began to decline in importance while incomes from migrant earnings became more important and permanent, as racist colonial polices and State investments, and the intensification of white commercial farming began to exclude peasant farmers from agricultural markets (Bundy, 1979; Beinart, 1982). During the apartheid period, policies aimed at supporting and subsidising white farmers, intensifying labour recruitment processes in theHomelands, restricting urbanisation, relocating Africans into 'black' areas, betterment and rehabilitation planning and the creation of independent homelands, intensified the process of agricultural and economic decline and isolation for areas like the OR Tambo District.

These economic hardships have intensified over the last 20 years due to the large scale retrenchment of mine workers that sent many migrants back home with little hope of obtaining alternative employment. The only compensation has been the growth in the number of persons accessing social welfare grants. Political unrest and criminal attacks on tourists along the Transkei coast during the 1980s and early 90s also brought the tourist facilities in these areas to the brink of collapse with the loss of many local jobs and income earning opportunities. These setbacks were further exacerbated by the liquidation of the former

Transkeian agricultural parastatals that resulted in the loss of many jobs associated with these estates.

4.3 DEMOGRAPHICS AND SOCIO-ECONOMIC SETTING

4.3.1 POPULATION SIZE, GROWTH AND STRUCTURE

According to the 2002 census the population of the OR Tambo DM was 1 676 480 which represents only a very marginal 4,49% increase over the 1996 figure (Demarcation Board, 2004). The number of households was 343 709, which represents an average household size of 4.9 persons. (The number of persons living in the Eastern Cape portions of the Focus Area is estimated to be 614 137 persons and 125 334 households. These are estimates because the catchment boundaries which define the Focus Area do not correspond to ward and municipal boundaries used to enumerate population).

In terms of the make up of the population, certain key features to note are:

- 99.5% of the population are African, all other race groups combined account for 0,5% of the population or 8332 people.
- In terms of age distribution, the population is clearly a youthful one with a significant majority of the population (63,4%) being between 15-34 years of age (see Table 1). There has been a decline in the size of the under 5 age group, which probably reflects on changing social standards and AIDS. The youthful nature of the population, with 750 000 people under the age of 15 will and is placing pressure on education provision and the need for future employment opportunities.
- In terms of gender differences, there is a striking dissimilarity between the two genders. In 2001, there were 757 996 males in the district and 918 488 females. This extreme difference reflects on the continuance of male migrancy from the area in search of employment in the distant urban areas and the weakening of the family unit and potential labour power in the rural areas (Demarcation Board, 2004).
- In 1991, only 7,8% of the population of Transkei was urbanised and though the figure would now have altered, the extremely high rural population does create enormous challenges in terms or accessibility and isolation from services (DBSA, 1991).

4.3.2 EDUCATION

The area clearly has very low educational skills levels, with only 94 136 people (just over 5%) having attained Grade 12 or higher. Large numbers have no schooling (267 192) or have completed either primary or parts of secondary school education (340 135). Low skills levels clearly have been and will be a barrier to economic advancement and the ability to attain higher paying jobs (Demarcation Board, 2004).

4.3.3 SOCIO-ECONOMIC CHARACTERISTICS OF THE OR TAMBO DM

The eastern part of Transkei in which the Focus Area is located is one of the poorest areas in the country, as reflected in a range of indices. This reality justifies concerted efforts to try and improve socio-economic interventions in order to improve the overall well-being of the residents of the area. In this section, the key socio-economic features of the OR Tambo DM are outlined and commented on. The key socio-economic features of some of its local municipalities, where there is some potential for afforestation, are presented in the following section.

4.3.4 EMPLOYMENT

Of a total potential labour force of approximately one million in 2001, 67% were not employed in 2001. A staggering reflection of just how limited employment opportunities are, is the fact that only 94 296 people are in recognized employment. This results in a high dependency ratio (estimated at 17,7 dependents for every person in recognized employment, though calculated at 5:1 if all forms of formal and informal employment are considered (Gaffeny, 2003), and indicates the degree to which people must be relying on state welfare, informal opportunities and subsistence farming to make ends meet.

In terms of employment, the dominant sector is civil services, accounting for approximately one third of all formal sector jobs. The agriculture, fishing and forestry sector declined from 5 571 to 4 275 jobs between 1996 and 2001.

4.3.5 THE ECONOMY

In parallel with employment levels, the economy of the area shows a major dependence on community services. In 1991, the DBSA identified this as a 'structural problem' in the regional economy and they commented: 'the relative importance of the manufacturing sector has decreased sharply (and), the economy of the region is still rather concentrated and is therefore relatively vulnerable' (DBSA, 1991, p. S-5). Subsistence farming levels have been maintained and account for approximately 22% of the land area. Commercial farming levels have remained low since 1991 with only 4,65% of the former Transkei cultivated in 1991 and less than 2% of the Focus Area as recently as 2001. In 1991 over 92% of the former Transkei was natural pasture land while approximately 73% of the Focus Area is currently used for grazing or is too steep or under indigenous forests or wetlands. These rates represent low levels of intensive land use given the large rural population.

During the 1970s and 80s there was a worrying decline in the economic contribution of what should be the lead productive sectors. Contributions to GDP from mining fell by 11%, manufacturing by 14% and agriculture by 73% in the eastern parts of Transkei. Correspondingly, community services grew by 30% (DBSA, 1991). This large decline in agriculture is at least partially the result of the collapse of the agricultural parastatals.

4.3.6 INCOME LEVELS

According to the 2001 census data, income levels are depressingly low. In 2001, 81% of the population were receiving no income, with 15% earning less than R 800 per month. The remaining 4% earned above R 800 per month, with most of the number earning between R800 and R6400 per month (Demarcation Board, 2004). Such low income levels translate directly into abject poverty and dependence, and severely constrained economical multipliers.

4.3.7 SERVICE PROVISION

The positive impacts of government social interventions are slowly becoming evident, despite the fact that a huge backlog remains. There has been an increase in the number of formal houses from 81 747 to 98 108, while some 60% of houses remain as traditional / informal. There are also improvements in services such as electricity (which is now available to some one-third of households), water supply, sanitation and telephone access (Demarcation Board, 2004).

Key Government interventions in OR Tambo DM include the provision of some 24 000 houses in the period 2002-06, significant investments in electricity and water supply projects between 2002-06, an investment of nearly R100 million in clinics and health services between 2002-06, and a range of community projects including farming support, community halls, schools upgrading and business facilities, worth some R350 million, including a forestry project worth R5,15 million (Gaffney's, 2003).

4.3.8 LAND USES

Because the boundaries of Water Management Area 12 and the Focus Area are defined on a catchment basis, it encompasses a number of different socio-political regions with their own history, socio-economic characteristics and land uses. These regions include most of the former Transkei, some south-western portions of the former Ciskei, the former Border Corridor (between Ciskei and Transkei) and a few small portions of KwaZulu-Natal (KZN) around Mzimkhulu and Port Edward. It is important to understand this socio-political context to appreciate existing land use patterns and to be able to interpret and understand the issues around current and alternative commercial forms of land use.

Portions of KZN around Mzimkhulu and Port Edward were, during the apartheid era, part of the white RSA. Most of the land in these areas is owned and used by commercial farmers (mostly white), with some small commercial service towns interspersed. There is considerable commercial farming of sugarcane and forestry, and the portions along the coast are also intensively used for private residential, urban and tourism purposes. Within these privately owned commercial farming areas there are some small parcels of rural land used by Black South Africans for residential and agricultural purposes under communal forms of tenure. These and other communal areas experienced exceptionally rapid population growth during the colonial and apartheid periods due to the widespread and prolonged process of commercial farmers evicting surplus labour, which was further exacerbated by State driven forced removals from white areas under the Apartheid government.

Table 5.1 presents the land uses defined within the Focus Area per their extent and percentage of cover.

Table 5.1: Land Uses in the Focus Area

Land Use	Cover in Focus Area (ha)	Percent of Focus Area
Subsistence Farming	147,873.44	22.29
Cultivated Land	7,634.84	1.15
Mining	8.10	0.00
Residential	8,516.65	1.28
Forestry	14,948.29	2.25
Commercial / Industrial	0.00	0.00
Other (mostly lands used for stock grazing or unused due to the presence of steep slopes, wetlands, indigenous forests or other constraints)	484,352.91	73.02

Figure 4.3.a is a map of current land uses within the Focus Area and includes intensive and extensive (subsistence) agriculture, commercial/industrial, forestry, mining, residential and other types.

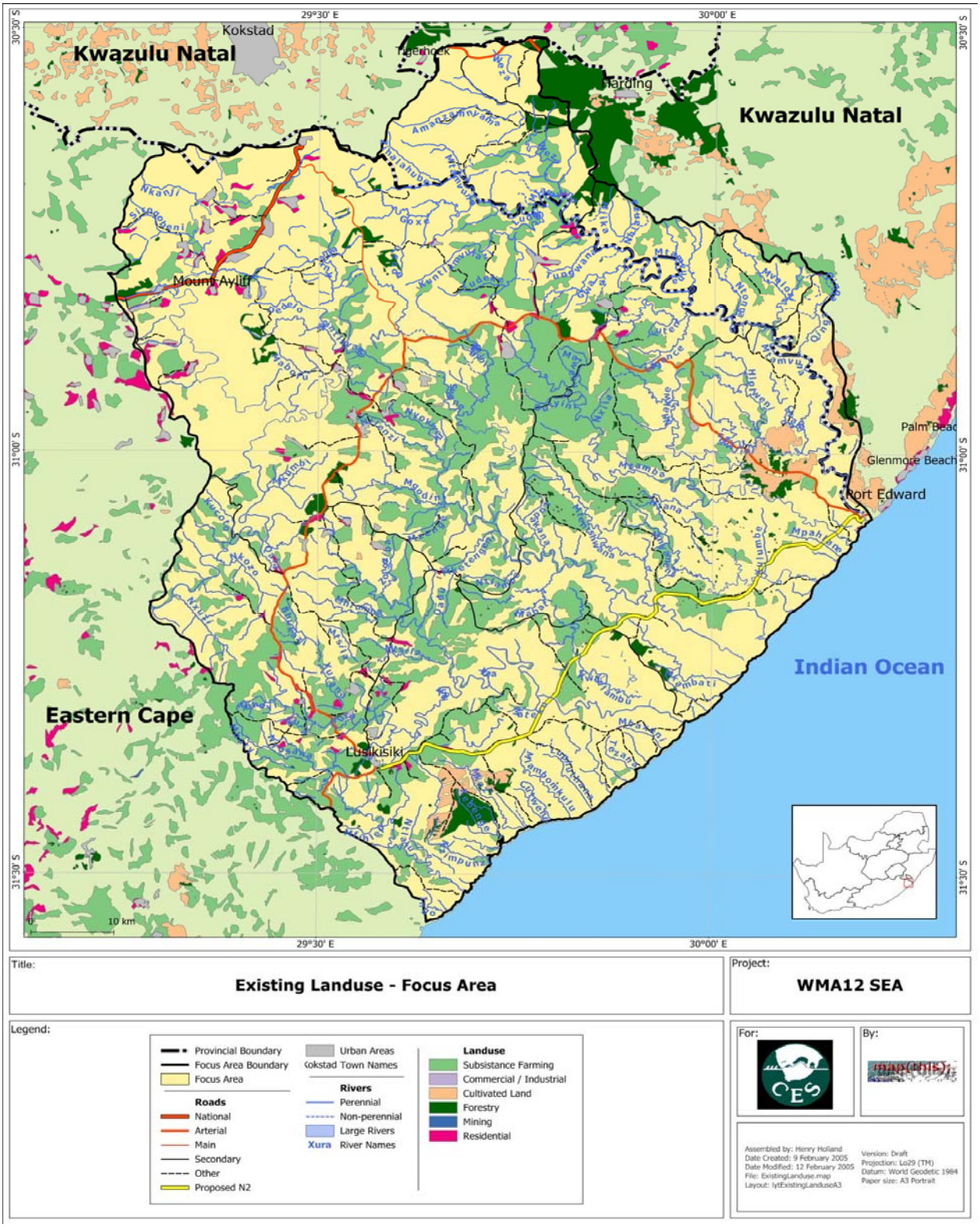


Figure 4.3.a: Existing land uses in the Focus Area.

The former Transkei, on the other hand, is a former Independent Homeland where most land is held under a variety of informal (by western standards) land tenure arrangements known more commonly as communal tenure. Aerial photographs, field observations, and household surveys in rural villages in the Focus Area indicate that the current land based livelihoods (on-farm) are a diversified strategy involving cultivation, livestock farming and the harvesting of natural resources (including wood, thatching grasses, wild food plants, medicinal plant parts, and shellfish/fish). The three sections which follow will examine each of these existing land uses in turn.

CULTIVATION

According to the traditions of land use and land administration practice, each rural household is entitled to a residential site and an arable field on which they can grow food crops. The residential sites are commonly used for dwellings, livestock enclosures and food gardens. The food gardens next to the household's dwellings are usually fenced and planted with maize intercropped with other vegetables such as beans, pumpkins, cabbage, sweet potatoes, potatoes, spinach, tomatoes, onions and melons. The size of these residential sites and gardens vary depending on the history of the settlement. In areas that have undergone "betterment" planning the size of these residential plots is around 0.25 ha, with the gardens taking up around two thirds of this space (0.16ha). In more traditional non-betterment areas the size of these gardens is likely to be larger.

In addition to these residential sites, some rural households have inheritable use rights over arable fields located some distance from the dwellings. These are often located on the alluvial soils along the river banks and on the adjacent slopes. However, due to population growth and land administration policies (including betterment planning), the area of land cultivated by each household has decreased since the 1930s and many households have no access to arable fields.

The extent to which rural households cultivate these fields seems to vary from household to household and from place to place. However, Andrew's (1992, 2004) research provides some insights into historical changes in land use practices and indicates that there has been a considerable reduction in the area of arable land being cultivated since the 1940s due to a number of key factors. These include: population growth, declining per capital livestock holdings (and the negative impact this had on capacity to plough), loss of access to agricultural markets (for inputs and outputs), increasing involvement in migrant labour and consequent labour shortages at home, increasing impoverishment, declining soil infertility and increasing risks of crop theft and damage from livestock (due to the absence of herders). As a result of these changes rural households have found it increasingly difficult to maintain field cultivation and have found homestead garden cultivation more productive, less risky, and more viable given their resource constraints. They are better able to invest the necessary labour, time and physical inputs into garden cultivation than fields. The location of gardens close to livestock enclosures and the adoption of intercropping practices also helps to maintain productivity levels in gardens. Garden cultivation appears therefore to have become a more viable and sustainable cultivation option in this context.

The analysis discussed above points to key constraints that may exist to any potential agricultural land use developments in the rural communal areas of the Focus Area. Extensive historical and anthropological research in the Shixini location (Mbashe Municipal area) indicates that rural household encounter considerable constraints that undermine their ability to engage in cultivation. Firstly, very few households have access to labour saving draught ploughing resources due to low per/capita livestock numbers and considerable inequalities in access to oxen. Tractor hire services are also scarce. This lack of labour saving technologies

and a severe household labour constraint has forced many households to abandon the cultivation of distant fields and focus on the more intensive cultivation of smaller household garden plots that are closer and consequently more compatible with the heavy domestic responsibilities of adult women and mothers. Some households have abandoned cultivation altogether and rely on assistance from neighbours, cooperative labour exchange relations and the purchase of food to meet their subsistence needs. This labour constraint, linked to the urbanisation, the migrant labour system, commuting and the increasing unavailability of child labour (due to schooling), has undermined agricultural production in the communal areas for over 100 years. Increasing poverty has made it more and more difficult for households to overcome these constraints by purchasing labour or labour saving technologies. The only way people have managed to secure adequate amounts of labour at the right time is to participate in cooperative/reciprocal work parties and ploughing companies with their kin and neighbours. These institutions have allowed households to maintain some level of production, but for most it is well below subsistence levels.

LIVESTOCK

The following description of livestock and natural resource utilisation is taken from Andrew, Ainslie and Shacklton (2003). Livestock have long been a key land based livelihood in the Ngqushwa LM dating back to pre-colonial political times. The range of livestock farmed includes: cattle, sheep, goats, horses, donkeys, pigs, chickens, geese, turkeys, pigeons, rabbits and ducks. Historically, the larger forms of livestock have traditionally been the property and responsibility of the men of the household, while the small livestock is tended by the women. There are a wide range of reasons people have for holding different types of animals and these reasons also change over time. They include: cash from sales, employment, milk for home consumption, for funeral purposes, as a form of investment, slaughter for feasts/home consumption, for paying bride-wealth, for hides and skins (sale of), have land suitable for cattle farming, to help others, for cow dung and for draught/transport purposes. The relative ranking of these varies from place to place and between households.

The historical records of livestock numbers indicate that absolute numbers have remained stable, but per capita numbers of cattle, sheep and goats have fallen by almost two thirds between 1924 and 1974 as the human population has grown. The ownership of livestock is also not equally distributed and has become increasingly unequal over time. So much so, that the proportion of cattle-owning households has been virtually inverted from around 71% in 1948 to 30% in 2000. The national livestock statistics for 1995 and 1999 indicate that the total number of animals in the communal areas are large but tend to fluctuate with dry and wet cycles.

USE OF NATURAL RESOURCES

Most rural households in South Africa's communal areas are using, buying or selling natural resources to supplement their livelihoods. Nearly all rural households use wild spinaches, fuelwood, wooden utensils, grass/twig hand-brushes, and edible fruits and a large proportion make use of edible insects, wood for fences or kraals, medicinal plants, bushmeat, wild honey, and reeds for weaving. These resources are harvested from different parts of the landscape. Some are maintained within the residential/cultivated sites, while others, such as fuelwood are extracted from the surrounding lands. More specialised resources, such as some medicinal plants are harvested from areas further afield. Some resources are only harvested at particular times of the year whereas others are available all year round (e.g. fuelwood). There are significant differences in the use and dependency on natural resources between wealthy and poor households. The poor are more dependent upon natural resources in their surrounding

environment for their own subsistence needs but also as a source of income from sales. For some the sale of natural resources and products has become a full-time occupation. For others it provides supplementary income.

4.3.9 THE VALUE OF LAND BASED LIVELIHOODS

The vast majority of the poor rural residents in the Focus Area derive their livelihoods from a number of diverse on-farm and off-farm sources. The off-farm sources include wages, remittances from migrants and commuters, income from informal economic activities and from state welfare grants. Most rural surveys indicate that off-farm incomes are the most significant and substantial sources of income available to rural households. On-farm sources of income, such as incomes earned from the sale of crops, livestock and other natural resources, are generally believed to provide very small proportions of household income on a seasonal basis. However, this perception has recently been criticised as it is very difficult to attribute a monetary value to these benefits. This underestimation of the value of agricultural production and the harvesting and processing of natural resources has led many to conclude that most rural households are not rural producers but displaced urban residents. However, Andrew et al (2003) have shown that while this interpretation may be valid for many dense peri-urban settlements, it is not true of many rural communities. Land-based livelihoods are critical to the survival and health of most rural households and provide for basic needs, thus reducing their vulnerability to risks such as the loss of a job or a pension, drought, floods, disease and death. The ability to generate livelihoods from a diversity of key ecological resource areas is a crucial aspect of this risk minimizing strategy, as is access to diverse ecological resources.

An analysis of the 2002 census data for off-farm incomes reveals that 49% of households rely entirely or largely on agriculture for their livelihoods, while another 38% of households rely on agriculture for a quarter to a third of their livelihood. It is not possible to provide accurate data on incomes earned from land-based livelihoods such as cultivation, livestock farming and the use of natural resources. It is also clear from Shackleton et al (2001) and Andrew et al. (2003) that previous attempts to estimate the value of land-based livelihoods were seriously flawed and resulted in significant underestimations of the value of these livelihoods.

Estimates of the values of existing land-based livelihoods for the rural parts of the Focus Area were derived using the estimates developed by Adams *et al* (2000) using yield data based on McAllister's 2000 measurement of maize yields in the Shixini location in the Mbashe Municipal area, based on actual measurements. Estimates of the value of livestock production were based on recognition of uneven ownership patterns, with an average of only 24-30% of households owning livestock (cattle, goats, sheep). Valuations are by Shackleton et al (1999b), as are the estimates of the value of natural resources. This analysis reveals that land resources provide between R 4,763 to R 5,535 per household per annum from cropping, livestock production and natural resource harvesting. This equates to a total value for the 116 561 rural households in the Eastern Cape portions of the Focus Area of R 555,238,323 to R 645,165,135 from land and resource use. As the Focus Area is located in one of the highest rainfall areas in South Africa, it is very likely that even the high estimates are a considerable underestimate of the real value of land-based livelihoods in this region. These values need careful consideration when evaluating development interventions.

4.4 EXISTING LAND USE DEVELOPMENTS

The existing commercially orientated land use developments in the Focus Area include massive maize projects, vegetable projects, tea, sugar, forestry and eco-tourism developments

along the coast. There are a large number of commercial tourist resorts and businesses operating along the coastline at Mtamvuma, Mkambati, Mboyti, and Port St Johns. However, these have been largely omitted from this assessment because they are too numerous to discuss in detail and because the coastal area is not viewed as suitable for new afforestation due to biodiversity/ecological constraints. The sections which follow provide a brief description of the non-tourist land use developments and their track record. Only two tourism type developments involving rural communities along the coast are discussed below due to their relevance in highlighting issues related to business partnerships between communities and the private sector.

4.4.1 MASSIVE MAIZE PRODUCTION PROJECTS

The most common and extensive land use development taking place in the rural parts of the Focus Area are the "Massive Maize Production Projects". This programme was started by the Department of Agriculture in 2003 but appears to have been taken over by the District and Local Municipalities in many parts of the Focus Area. There are a fairly large number of these projects. For example there are 36 massive maize projects in Mbizana municipality. The initial proposal was to encourage the production of maize in high agro-potential areas in communal areas of the Eastern Cape by providing farmers with subsidized access to services (ploughing, etc) and inputs (fertilisers, seeds, etc). Interested farmers were required to participate in the project for 5 years initially (later reduced to 3). Blocks of at least 50 ha each needed to be made available for each project (in some cases this is larger i.e. 70 ha). The farmers on whose land the maize is to be cultivated organise themselves and elect a committee to represent them and manage the project. The government, through the use of service providers provide the farmers with services and inputs. The farmers are required to make their labour available for cultivation work and are required to sell some of their maize each year to repay a portion of the costs of the inputs and services. The money paid by the farmers is then returned to them at the end of the project so that they have the necessary capital/savings to continue on their own.

The interest of rural residents/farmers in participating in these projects appears to have been considerable. In most cases there have been far more interested participants than can be accommodated in the projects (given the available government resources). However, it also appears that there was some initial reticence to participate on the part of some communities.

Problems encountered:

- Some people had to be excluded from participation due to a lack of resources;
- Many projects started late and as a result were not able to harvest in the first year;
- There is a lack of storage facilities needed in order to make maize available for sale;
- The markets are underdeveloped and do not permit profitable sale of the product; and
- There have been disputes over the selling/purchasing price of maize.

Outcome: In most cases there has been an inability to sell maize and generate enough funds to pay back loans and for savings. Without considerable institutional intervention, it is unlikely that many of these projects will be sustainable beyond the period of government subsidisation.

4.4.2 VEGETABLE PROJECTS

There many small vegetable projects that have been initiated in the Focus Area. Most of these are poverty alleviation projects aimed at improving household food security and supported by the local municipalities. However, there are some that have a more commercial orientation. One of these was visited in the Port St John's area and provides some insights into the issues of concern around these projects. This Thandanani project was initiated by ten women but

grew to 18 by the time they started planting. Due to a number of different factors this number has declined to ten again. The members collected money amongst themselves and opened a bank account. After the first year the group approached the municipality for support and were given R18 000 funding for the project. As a result of this cash injection the women decided to lease arable lands from people who did not use them. They agreed to pay R500.00 per year to the owners but are giving an extra R500.00 as Christmas presents to the people owning the plots. They now have 19 hectares for the project. They consider their project successful except for some minor problems like the water pump breaking. This hampers the success of the project as they do not get a good harvest when they do not irrigate. Mrs. Quist from the municipality is monitoring the progress of the project regularly. Most of the harvest is sold locally but they do get many customers, some from as far as Mthatha and Lusikisiki. However, when demand is low they go and sell in the streets. The project members never considered other options as this was the only idea they had. A number of people want to join the project, and one of these was accommodated when one of the initial members left for a job in Mtata. The members feel that the group should not be big as it will be difficult to manage. They are also willing to get involved in other projects as they feel that they are not getting enough money to sustain themselves. This is more dependent on opportunities presenting themselves.

4.4.3 LIVESTOCK PROJECTS

There are not many livestock projects in the area. While in some areas the idea has been mentioned, however, projects never materialised. There is a wool project at Bizana which is being assisted by the department of Agriculture. There is also a goat project which is managed by Ntinga O.R. Tambo. These projects are aimed at improving the quality and marketing of the animals or their products. In the Lambasi area there was at some stage during the last 10 years a proposal for a dairy project. However, this project does not appear to exist beyond a concept proposal (Hoskins, 2004).

4.4.4 SUGAR GROWERS (GREENVILLE-NORTH PONDO SUGAR)

This project is located close to Port Edward on both sides of the main road between Port Edward and Mbizana town and was initiated in 1976 when 10 000 ha of land was expropriated by the government. Of the initial 10 000 ha, 3500 ha have been planted to sugar, 1000 ha planted to timber (gum and pine) and the rest (5500ha) remains undeveloped but is used by neighbouring communities for grazing and some settlement. Of this remainder (5500ha) 4500 ha is suitable for sugarcane production and the rest for forestry. According to Mr Chagi, Managing Director of NPS, there is a high demand for the sugar produced on this estate as it has been found to have a higher sucrose content than that produced by many growers in KZN.

The Transkei agricultural parastatals TRACOR and Magwa were initially responsible for creating and managing the project. They set up the North Pondo Sugar (NPS) Company (which officially came into operation in 1983) as a development agency responsible for managing the project and facilitating the participation of small sugar growers from amongst the residents who were removed from the land. When Tracor and Magwa were liquidated in the mid 1990s, the substantial financial support that the company received from them was removed and attempts were made to secure financial support from AgriBank, and then from Vimba Bank. In an attempt to maintain its operations the NPS company has also been using revenue generated from the sale of its timber to Sappi to finance its running costs.

There are currently 300 farmers involved in the project – cultivating around 10ha each. They have a similar type of contract to that offered by the sugar mills (Illovo in this case) to

growers in KZN. It seems that these farmers have generated income for themselves from the sugar particularly in the early years. However, they have reached the stage now when incomes are declining because the crop is too old and a new crop needs to be planted. This will require considerable financial investments in land preparation and planting that will need to be sourced externally. However, such financing cannot be secured until the conflicts and disputes around land claims are resolved.

Some claims have been lodged by neighbouring residents who were removed from the land to make way for the project, but who were initially sceptical about the project and remained out of it. There have also been some difficulties with fires on the estate and allegations of arson linked to the land claims. The land claims commission has been investigating this case and has tried to negotiate a settlement without success. The case has now been referred to the Land Claims Court and will be heard in February 2005. It is clear however that some of these claimants and people living around the project are now interested in joining the scheme and acquiring access to the remaining land. These people have formed their own committee, but their participation has been delayed until the land claim is resolved and funding is secured. There are also indications that the government will insist that the sugar project continues irrespective of the outcome of the land claim.

The future of the project is hampered by the following problems:

- Conflicts and disputes around the land that have resulted in the land claim and in arson attacks;
- The unresolved land claims made by those who were removed but remain outside the project;
- The need to acquire capital funding to finance the planting of a new crop of sugarcane (plus land preparation) but the inability to secure funding until the land claim is resolved;
- The rapid removal of funding from the former Transkei parastatals in the 1990s and a lack of government support since then. The Bisho government appears to the farmers to be uninterested and the KZN government will not assist them because they are outside of the Province, despite the fact that they sell to the sugar industry in KZN.
- Long-haulage costs to transport the sugar to the Illovo mill in Mzimkhulu are high and plans to build a local mill have not materialised; and
- Fire risks are increasing as the fire breaks are currently not well maintained. This responsibility was recently transferred from NPS to the farmers but has not been effectively undertaken since then.

With regard to the timber issues, the farmers do not have access to the timber resources on the land or the timber harvesting equipment. These are used and managed by NPS to fund operating expenses. The recent fires caused considerable damage to large portions of the forest plantations, so much so that NPS is concerned that they will have a gap of 3 years of income from lost timber. The farmers also expressed some concerns about the perceived spread of the forests onto sugar fields and river courses, but also on the negative impacts the trees have on sugar growing next to it. They also mentioned that the Port Edward Water Board had expressed concern about the impact these and the Mazizi/Sappi trees have on downstream users and stream flow. NPS management indicated that they have now initiated a clearing programme in some river courses and from sugar fields.

4.4.5 TEA PLANTATION (MAGWA)

This estate is considered the best tea growing area in South Africa because it is a totally rain-fed crop. It has the potential to produce 3.5 million kg of tea per year but needs to produce

about 2.4 million kgs to cover costs (Wray, 2002). The fact that the crop is handpicked also ensures that it is the best quality tea and could potentially fill a niche market. However, Kepe (2001) mentions that according to Porter and Phillips-Howard (1996) the low temperatures in this area in the winter months means that the tea can only be harvested seasonally, and that this negatively affects the profitability of any tea venture.

The Magwa tea estate is located on 2500 ha (Sisika, 2000) (or 1750 ha – Kepe, 2001) of land in the Lambasi area of the Qawukeni LM. The estate was first created in the 1960s with the approval of the Paramount Chief and in association with the introduction of betterment planning that forcibly removed local residents from the area where the estate is now located into concentrated villages in the Lambasi administrative area. This betterment planning and the tea proposal were violently resisted but eventually implemented. Those removed were supposedly compensated financially but the amounts were less than R20 per hut (Kepe, 2001 citing Harrison 1988). Further compensation was provided in the form of employment opportunities on the estate and in 1983, 100 ha of tea were allocated to 100 local households (1 ha each) to manage on an out-grower basis. Unfortunately, the smallholder scheme did not meet its goals, producing low quality tea and failing to contribute to economic development. Kepe (2001) cites a lack of clarity over land ownership/tenure issues and a lack of commitment from management as reasons for this failure.

This estate was initially developed as an employment generating project, was heavily subsidised by the state and never expected to make a profit (Hoskins, 2004, Kepe, 2001). After the political transition to democracy in 1994, funding for parastatals like Magwa was removed and the estate was liquidated in 1997. Thereafter attempts were made to turn the company into a workers cooperative which culminated in the creation of the Magwa Tea Company in 1998 using DLA's SLAG grants to fund the purchase of the original company (Wray, 1998, Hoskins, 2004). Unfortunately, the project has been in financial trouble ever since 1998 due to market factors related to the deregulation of the tea industry, a serious shortage of capital, "chronic labour unrest", ineffective and absent management, and outdated equipment in need of repair or replacement (Hoskins, 2004). Consequently, the company is facing liquidation again and workers have not been paid over the last year and have suffered considerable hardship as a result. However, a Kenyon investor has recently been found and the land claim is in the process of being resolved (no problems are anticipated with this process). The DLA is in the process of surveying the boundary of the estate and negotiating with the community to lease the estate to the Company.

4.4.6 FORESTRY PROJECTS

State Forest Plantations

Since 1994 the Department of Water Affairs and Forestry (DWAF) has undergone major policy and structural changes. Community forestry has become an important component of its activities and has been completely redefined. Prior to the political transition to democracy in South Africa, forestry policy in black rural areas focused on the protection of indigenous forests and the alleviation of fuel and building wood shortages through the growing of exotic trees in woodlots and plantations. DWAF's new community forestry policy focuses on using forestry as "a vehicle for economic upliftment and improvement of livelihoods in impoverished areas" (DWAF, 1997). These new forestry policies have consequently introduced significant shifts in how forests resources are to be managed and in the relationship between the State and local communities. The State is in the process of withdrawing from the ownership and management of forest plantations and has redefined its role. It is now taking on the role of creating an enabling environment that encourages private investment, and begun to act as a broker facilitating partnerships between communities and

the private sector that promote rural development. Another central component of the State's role is regulating the forestry sector.

In the Eastern Cape Province three categories of state plantations were initially defined according to size and commercial potential. Different processes and objectives of the restructuring process were envisaged for each category of forests. The Category A plantations were packaged for commercial exploitation and development by large companies; Lease revenue will flow to historical land-rights holders.
A range of options are being explored for the remaining plantations which may result in a re-categorisation of the plantations. Future scenarios will accommodate a high degree of community ownership and participation.

These plantations are described in some detail in the section dealing with Forestry.

Working for Water (WfW) Programme

The Working for Water Programme in this area sees itself working for the environment rather than for water. Its activities are focused on clearing alien trees on the fringes of the indigenous forests in the coastal areas of the Port St John's and Qaukeni local municipalities. In some cases they may clear aliens growing within the indigenous forests but only where this is really necessary. They are working according to a 5 year plan and have consequently not started working in villages further inland where there are many cases where aliens have invading areas beyond the woodlot boundaries.

The response of local residents to this programme so far has generally been very positive. In the area in which the programme is currently operating there is no shortage of local wood supplies so the clearing of these aliens does not pose a threat to local fuel and building wood needs. However, they have encountered some resistance to the clearing of guava trees as these are viewed as an important food source by local residents. In this case they have negotiated a deal in which they only clear guava trees that are growing outside of household plots and within 100m of the roads. Guava trees growing in the indigenous forests are not cleared. There has also been resistance amongst some residents to the clearing of aliens that have been used to create hedges around homesteads.

Private Sector Forestry Initiatives

There have been a number of private sector forestry initiatives in the Focus Area and in the neighbouring Alfred Nzo District Municipality (including Mzimkhulu). Each of these are described briefly below.

Tando Project – Outside Mbizana town
In this case, Sappi has a contract with 11 farmers who are using their old pre-betterment residential sites (that were being used as communal grazing land) to plant trees. Forty hectares have been allocated by the headman for these farmers to plant trees on but only 13 ha have been planted so far, as the project is still in its early stages (2 years old). These farmers do not seem to have a very clear understanding of the contract they have with Sappi (it is similar to their contracts with small growers in KZN) and have yet to work out the details of the way in which the project will be managed. There is no lease agreement associated with this project. This project is located just north of Mbizana town and the existing state woodlots. The initiative for this project came from one participant who was an ex-forestry employee, who together with the Headman approached Sappi about a project. The farmers applied and received afforestation permits from DWAF. There has been no involvement of

the DLA or use of their grants in this project. The opinions of other members of this community who are not participating in the project were not ascertained.

Mzizi village – between Mbizana and Port Edward
This is an example of a small grower project similar to those initiated by Sappi and Mondi in KZN. In this case more than 50 growers are involved and 160 ha of previously underutilised arable lands have been planted to forest (eucalyptus) for Sappi. Planting began in 1998/9. All those households in the village that had access to arable land are participating in the project. Sappi has entered into its standard small grower contract with each grower. The participants in this project appear to be relatively clear on the nature of the contracts and will begin harvesting soon. There has been no involvement of DLA or use of their grants. The participants are very enthusiastic about the project. Despite the individual nature of the contracts with growers, there is considerable cooperation and coordination between growers and this is facilitated by an elected committee. This organisational structure helps to minimize the administrative load for Sappi and helps the growers to overcome labour shortages and reduce costs. Apparently, Sappi is advocating this organisational approach in the interests of improving the productivity and efficiency of these small-grower projects. When Sappi first approached them with the idea, they did not consider any other land use options and accepted Sappi's proposals, despite being aware of the nearby sugarcane development at Greenville.

The Lambasi Forestry Project
The Lambasi Administrative Area is made up of 12 000 ha of former TRACOR land that, since the liquidation of TRACOR in 1997, has been in the process of being transferred to the local communities who have claims over this land. It includes the 2000 ha of the Magwa tea estate (who aspire to acquiring a further 500 ha), a 1650 ha forest plantation currently managed by DWAF, a 1000 ha maize project and 100 ha of sugar beans. This leaves about 7250 ha of land that remains undeveloped and is currently used for communal grazing. There have been proposals for an additional 500 ha for tea, a dairy project on 90 ha and a proposal by Sappi to put 4000 ha under forest.

This case provides interesting insights into the preferences and concerns of rural residents. It is one of the only cases where communities have been presented with a number of sometimes competing land use development options. These include tea, forestry, dairy, maize, vegetables, beef, etc. In most cases, rural communities have never before had any developers approach them with projects, so when one does they tend to take it. The Sappi experience with the Lambasi project is instructive. They initially approached this community in 1996 with a proposal to rehabilitate and commercialise the existing forest plantations (1650 ha) and put a further 4000 ha under trees. This would have used up just over 50% of the former TRACOR land. The local communities considered the proposal but eventually rejected this plan and proposed that only 2000 ha be put under forest. At that time they were also considering other land use development options and appear to have preferred to diversify their land uses.

However, the response of this community to the Sappi proposal was also complicated by a number of factors. One was the history of these communities and feelings of injustice about the way in which the TRACOR development was created during the apartheid era. Although the development was supposedly negotiated and compensation paid, there are still many feelings of resentment and land claims have been lodged over this land. Hoskins 2004 indicates that Chiefs in the Lambasi area were wanting to subdivide the TRACOR property into smaller size plots for individual households – probably in response to local demand. This is consistent with behaviour in other parts of the former Transkei where communities that

were forcibly removed to make way for forests, developments or betterment planning, have taken the initiative to return to their old sites and customary land use practices (Fay, 2003).

Another factor that complicated the decision making process was associated with the timing of the initiative. It came at a time when there was considerable turmoil associated with substantial policy and structural changes in government and its parastatals. Communities suddenly had to deal with their new role as decision-makers over the TRACOR land and were presented with a whole range of development options. This combination of inexperience, rapid change and many competing demands from within and without, made community leaders very nervous and tense (Sisiska, 2000). According to Sisiska (2000) it was clear that the Tribal Authorities and the Lambasi Community Development Association (LACODA) were desperate to see some kind of development and were willing to work with Sappi. So much so, that they were willing to press ahead with the development even when they did not fully understand the proposal or the process. But at the same time, differences of opinion and interests within the communities and between different local and external institutions made them unwilling to commit to large, new and unfamiliar projects.

As a consequence of the lack of progress and mounting costs, Sappi sought external funding for the project that would take the process forward and enhance the community's equity in the project. The LIMA Rural Development Foundation became involved in preparing a proposal for the Food and Agricultural Organisation (FAO) Since then LIMA has been working with the communities and has developed a smaller-scale forestry project proposal that they are seeking funding for. Unfortunately, they have not yet succeeded in securing this funding, so no project has yet been initiated. However, LIMA remains hopeful and committed to working on it once funding is secured. At this stage the forestry proposal is for an area of 1500 ha of new afforestation combined with the rehabilitation and commercialisation of the existing forest plantations (1650 ha).

WWF Natural Resource Management Programme
This programme was initiated in 1997 by the World Wildlife Fund (WWF) due to concerns about the encroachment and clearing of indigenous forests to make way for new residential and arable sites. The aims of the project are twofold:

1.To encourage the intensification of homestead garden cultivation so as to reduce the need to clear forests to create arable fields (Master Farmer programme), and
2.To encourage the adoption and implementation of land use planning policies in rural and peri-urban settlements in the area of concern that could reduce the clearing of indigenous forests.

The majority of the effort is being invested in the Master Farmer Programme. The adoption of land use planning policies is seen as a much more difficult and long-term process and must be approached sensitively and slowly. Under the Master Farmer programme, more than 100 farmers from peri-urban and rural areas along the coast from Port St Johns to Magwa are being trained in more intensive (but organic) agricultural practices. Farmers are being encouraged and helped to grow a wide variety of subtropical fruits together with the more traditional crops of maize, beans and pumpkins, as well as vegetables. Some produce is sold, but most is for subsistence needs. Attempts are also being made to organise the farmers into a cooperative that could facilitate the marketing of the produce.

4.4.7 MKAMBATI – NATURE RESERVE

The Mkambati case is very similar to Magwa, except that the conflicts around land and the Spatial Development Initiative (SDI) developments have been more intense and at times violent. Here again, we have a case where people were forcibly removed in 1920 to make way for an 18 000 ha leper colony between the Msikaba and Mtentu rivers. This land was later turned over to the Transkei Department of Agriculture and Forestry in 1976. It was then that the land was divided into a 7000 ha nature reserve along the coast and an agricultural development project on the remaining inland portion (which made up 2/3 of the land +/-11 000 ha) run by TRACOR. TRACOR used the land mainly for livestock production, but also planted 70 ha of eucalyptus forest and unsuccessfully attempted a sugarcane project. The Nature reserve area was run as a company and private sector parties given a 49% share. However, these partnerships were terminated in 1982 as a result of mismanagement and neglect, after which it was run by the Transkei Department of Finance and later then Department of Agriculture. The reserve is now managed under the Eastern Cape Department of Economic Affairs, Environment and Tourism.

Even prior to the creation of the nature reserve and the TRACOR development, there were considerable tensions between the Khanyiso people who had been removed and lost access to this land and those running the leper colony. These conflicts eventually lead to the Khanyiso people being allowed to use 5 500 ha of the land for grazing in 1959. These conflicts continued during the TRACOR period when they attempted to exclude the Khanyiso people from using the land for grazing. Eventually TRACOR allowed them to use 3 500 ha of land for grazing. When TRACOR was liquidated in 1997 and the SDI initiated new developments in Mkambati, tensions and conflicts around the land intensified. A dispute arose between the Khanyiso people and the rest of the Thaweni Tribal Authority (TA) (of which the Khanyiso group form a part) about who the legitimate claimants were. The Khanyiso group are claiming exclusive rights but the Thaweni TA claim that all members of the TA have rights to this land. According to Kepe (2001) prospective claimants clearly saw the link between land rights and ability to secure access to benefits from development projects. SDI activities and negotiations with the Thaweni TA intensified the conflicts and tensions. Attempts by opportunists to loot the TRACOR facilities and land fuelled the tensions and encouraged the Khanyiso group to take control of these resources to prevent further looting. Khanyiso control lasted for 6 months, after which guards from the Department of Public Works, plus the Joint Management Committee for the Thaweni TA and the SDI asserted their control. After some facilitation initiated by DLA, these two claimants eventually agreed that the Khanyiso people (as a group) should make the land claim and obtain the rights to this land, but that the benefits of the developments that occur on this land should be shared with the rest of the Thaweni TA residents. However, slow progress in dealing with the claim, lack of enforcement and the continued preference on the part of the DLA and SDI to work with the broader Thaweni group, eventually lead tensions to boil over into violent incidents.

Eventually the claim was resolved in October 2004 with the land rights given to the Mkambati Land Trust that represents 40 000 people living in seven areas inland from Mkambati. One of the conditions of the land claim is that the nature reserve component be maintained for conservation purposes and the Trust is supposedly considering doubling the area conserved. As a result of this resolution, the Trust will now be able to enter into lease agreements with prospective ecotourism developers. The future of the Mkambati Nature Reserve is currently under discussion. There are two private tourism operators in discussion with the Eastern Cape Government about future concessionary rights to the tourism facilities.

4.4.8 EUROPEAN UNION TOURISM PROJECTS

The European Union (EU) has been financially supporting the development of community-based tourism operations along the Wild Coast, with much of its focus being on the coastal strip from Port Edward to Port St Johns. The developments have been around horse and hiking trails. These projects have met with limited success; there is a hiking trail with camps operating from Mzamba to Mkambathi. Near Msikaba the EU has been constructing camps at 6 locations. Limited progress has been made and efforts are now being made to mobilize the private sector to facilitate completion and to provide support to the operations.

4.5 INSTITUTIONAL CHARACTERISTICS OF KEY LOCAL MUNICIPALITIES

Within the OR Tambo Municipality there are certain districts (local municipalities) which have greater potential than others for the initiation of forestry. These include:

- Port St John
- Qaukeni
- Mbizani
- Ntabankulu

These four local municipalities parallel the profile of the District Municipality. Key conclusions which can be drawn about the general area are that it has:

- high levels of poverty,
- extremely low levels of formal employment,
- a dependence on government services for employment and by implication for welfare transfers,
- most commercial productive sectors are extremely small in scale and seem to have experienced significant decline over the last 30 years,
- educational attainment and skills levels are very low,
- there is a clear gender imbalance in the population, and
- the population is youthful and growing slowly.
- The language preference is for Xhosa with low levels of fluency in English or Afrikaans and
- there is poor access to basic infrastructure and services.

In terms of forestry employment, it forms a sub-set of agricultural employment in the census data. Forestry and agriculture together offers few formal employment opportunities at present (less than 2000 people have formal employment in the agricultural category in the four municipalities combined). This reality suggests that this sector is underdeveloped and that scope clearly exists to involve significantly more people in the forestry sector at both formal and informal levels. Low skills levels will however be a barrier which needs to be catered for in any development intervention.

4.4.1 CURRENT LAND TENURE SYSTEMS

In the Focus Area the dominant form of land tenure is the ***communal land tenure*** system. According to custom, under this system the land belongs to the people (as a group) and has historically been held in trust by the Chief for them. The head of each household in the community has a right to an individual residential and arable site as well as access to communal grazing lands and other natural resources. When young people grow up and marry they can apply to the Chief/Headman for their own individual sites. Usually this

process entails identifying a piece of land, consulting with the neighbours and getting their approval, and then applying to the Headman for permission.

However, this customary tenure system has been changed and reshaped over time by the State authorities and changing social conditions. There are also some variations in tenure between various settlements depending on the history of the area. In areas that were administered by the South African Development Trust (SADT) (i.e. land that was expropriated from white farmers in order to expand and consolidate the apartheid regime's black homelands), Betterment planning was introduced and rights holders were often given a certificate called a PTO (permission to occupy) that gave them permission to occupy the site.

There are also a number of areas where, during the apartheid era, the State removed people to initiate major agricultural development projects. In the Focus Area there are two of these areas, namely the Greenville sugar estate in Mbizana and the former TRACOR and MAGWA estates at Lambazi. Since the political transition to democracy, these parastatal companies have been liquidated and land claims have been lodged by residents of the neighbouring communities over these estates. These claims are still to be resolved, but it is clear that the State's intention is to transfer ownership of the land back to the local people via the process proclaimed in the Communal Land Rights Act.

4.4.2 TENURE REFORM

According the government's White Paper on South African land policy (1997), their ultimate intention in the communal areas is to transfer ownership of the land back to the occupiers. Unfortunately, the process of developing acceptable legislation and regulations to effect this change has taken a considerable amount of time and involved some heated debates. Consequently, the Communal Land Rights Act (No 11 of 2004) was only accepted and enacted in 2004 and has yet to be fully implemented. When this legislation is implemented in the Eastern Cape it will increase the tenure security of rural residents. This may facilitate a much more flexible and adaptive approach to land use and management, that could facilitate development.

Until such time as this Communal Land Rights Act can be implemented in the Eastern Cape, the State has taken measures to improve the security of tenure of those living under informal land rights systems through the "Interim Protection of Informal Land Rights Act" – No 31 of 1996. There is also a strong push to ensure that the security and bargaining power of disadvantaged communities is protected and strengthened and these 'Interim Procedures' to be used by the DLA to facilitate new land use developments apply to land use changes such as new afforestation projects. According to these 'Interim Procedures' no new land use development change can take place without the support of the community and the Minister of Land Affairs. This requires that a community resolution supporting the change is made and authorized by the Minister of Land Affairs to ensure that the process of reaching the decision was democratic and transparent. This process is also required for an application for household Settlement Land and Agriculture Grants (SLAG), and in the case of new forestry applications, other permits or licenses will also be required. Further details on this topic are provided in the Social and Economic Technical Report (Volume 2).

4.4.3 INSTITUTIONAL DYNAMICS

Since the transition to democracy in 1994 there have been some very dramatic political and administrative changes, including the demarcation and creation of 9 provinces with their own governments, and the demarcation of new district municipalities with elected councils

responsible for service provision that are much larger and fewer than the former districts. Within each district municipality a number of local municipalities have been created with their own elected local representatives. These changes introduced elected municipal and local councils in rural areas and in 'black' areas for the first time. In addition to these new political and administrative structures, there are some old structures such as the Tribal Authorities that have been allowed to continue and have been given ex-officio positions on Local Municipal Councils. There has also been considerable restructuring of civil servant posts in National, Provincial and District government departments and organisations, with considerable downsizing, many new appointments and transfers.

In addition to these changes in structures, there have also been a number of policy changes that have impacted on land use developments. Briefly, these include:

- DWAFs policy decision to withdraw from forestry production and therefore to privatise large state plantations and ultimately transfer ownership and management of smaller state plantations to local communities.
- Dept of Agriculture's decision to withdraw from involvement in direct agricultural production and liquidate the agricultural parastatals.
- DLA's land reform programme aimed at redressing historical injustices, redistributing land to disadvantaged persons, and increasing security/reforming land tenure in areas with informal tenures.
- Spatial Development Initiatives (SDI) to encourage tourism and local economic development initiatives.
- Affirmative action policies.
- A loss of rural administrative focus by the government and
- The introduction of a plethora of environmental and spatial planning legislation governing land use and developments in all areas.

The process of restructuring civil service and elected government structures has created considerable tensions, capacity problems and uncertainties about how to proceed and deal with land use developments. In the former homelands where there had previously been no elected municipal or local government structures, these councils remain very weak and inexperienced. Despite these difficulties, considerable progress appears to have been made. However, the difficulties this SEA research team encountered in trying to contact and engage with local municipalities around the SEA indicates that many local municipalities appear to be struggling to cope with the day to day issues, and find it difficult and annoying to have to deal with non-essential and long-term planning issues. The co-existence of newly elected councils and the old Tribal Authority structures with ill-defined roles and powers, has also created considerable tensions and uncertainly in the former Transkei. The Traditional Leadership and Governance Framework Act has exacerbated these tensions.

Another institutional dynamic inhibiting land use developments is the slow process of resolving land claims. There are at most 2 or 3 land claims in the former Transkei that have been resolved to date. In the Focus Area this slow progress has complicated and delayed the process of restructuring the former agricultural parastatal lands of Lambasi, Magwa and Greenville.

4.4.4 IDP PROJECTS RELEVANT TO THE FOCUS AREA

The OR Tambo DM (ORTDM) Integrated Development Plan (IDP) provides important background information concerning development initiatives in the ORTDM area including the Focus Area. In terms of the IDP, the overall goals of the District are stated as follows:

Sector	Goal
Infrastructure	Provide adequate and accessible infrastructure
Economic	Promote economic growth and create economic activity through rationalised programmes.
Social	Improve the social welfare of the communities.
Institutional	Improve the institutional systems and overall capacity.

The ORTDM IDP process identified various priority issues which were further analysed to determine the particular groups effected, causal factors, effects and the related potentials available to address these issues. The key issues highlighted in the IDP are clustered into categories. A brief overview of the issues that are relevant to the current study are provided below:

Social Development

i. The crime rate is extremely high. There are currently high incidents of abuse, rape and domestic violence. Serious crimes e.g. car hijacking, armed robbery, rape, taxi violence and murder are prevalent throughout the district.
ii. The municipality is faced with an enormous challenge of curbing the spread of the HIV/AIDS pandemic, which is threatening the economy of the area.
iii. The shortage of health and education facilities is a problem to the area.
iv. A large number of the population does not have proper housing and land ownership has been raised as a concern.

Economic Development

i. The population is predominantly rural with large tracts of arable land with a poorly developed agricultural sector.
ii. The major concern is the fact that the economy is not adequately stimulated and is likely to face further decline unless corrective steps are taken.
iii. An average of 88% of the population is living below the Minimum Living Level (MLL).
iv. Tourism and agriculture are seen as sectors within the Municipality with huge potential to create employment and rejuvenate the economy.

Physical Infrastructure and Services

i. The majority of access roads within the District Municipality are in a state of disrepair.
ii. Much of the population live in remote areas.
iii. Adequate and acceptable water and sanitation provision to all settlements were considered an essential component to bring about an improvement in the quality of life.
iv. Transport services and communication infrastructure/services are also poorly developed.

Based on an analysis of ORTDM IDP projects relevant to the Focus Area, it is clear that economic development and poverty relief are important components of the IDP. Agriculture

and tourism appear to be the two main areas of emphasis. Over R40 million has been allocated to agriculture projects, including the Mbizana, Qaukeni and Ntabankulu LMs within the Focus Area. Agriculture projects focus predominantly on maize production and to a lesser extent on goat, beef and sheep farming.

The following priority issues and strategies were identified in the ORTDM IDP:

- Land and settlement - Achieve land reform.
- Unemployment - Attract investors; create incentives; skills development i.e. training; SMME's (Mentoring, Access to Finance, Markets); assistance with business development; dissemination of information.
- Poverty alleviation - Ensure sustainability through skills development; Create links with funding agencies for projects; Develop a District Social Development Strategy; Establish and strengthen existing community development forum; Liaise with critical stakeholders; Ensure complementary integration of projects.
- Tourism - Develop and disseminate tourism information; Marketing the District both locally and internationally; Development of physical infrastructure i.e. roads, telephones, sewerage etc.; Arrange workshop for crafters and artists; train cultural groups.
- Agriculture - Encourage co-operatives i.e. by providing infrastructure (dams etc.); Provide ready markets; Revival of agriculture; Training; Massive Food Production Programme.
- Forestry – Promotion of access to forests; Capacity building and awareness; Community Forestry Management Forum.
- Human Resources - Develop a District Skills Development Forum and a Local Skills Development Forum.
- Access to Road links - Intensify the road maintenance programme; Employ specialists to investigate design and supervise construction.
- Transport Services - Commission the preparation of a Transport Plan; Employ specialists to prepare and maintain the Operating Licensing System (OLS); Public Transport Plan and Integrated Transport Plan.
- Water Supply and Sanitation - Provision of water and sanitation in the district in partnership with all stakeholders; Investigate feasibility of dams.
- Communication Networks - Lobby Telkom and other communications service providers to develop the networks more effectively.
- Electricity - Lobby for the District to be represented at forums where planning decisions are made about where and when to provide electrification; explore alternative energy solutions.

Although forestry is identified as a priority issue, emphasis appears to be mostly on the management of existing forestry resources and not on the potential to expand forestry in the area. In addition, compared with other project budget allocations, a relatively small budget of R500, 000 has been allocated to generally promote access to forests and better managed forest areas throughout ORTDM. The IDP also refers to the objective of developing an Integrated Forestry Programme by 2006. The status of this proposed project is not known.

In addition to the above, by far the bulk of the budget has been allocated to infrastructure projects including upgrading of roads and implementation of the WSDP including water and sanitation services and the operation and maintenance of water and sewage works throughout.

4.6 OPPORTUNITIES AND CONSTRAINTS TABLE

The table below presents a list of opportunities and constraints related to the various land use options, on the socio-economic environment. The implications of these opportunities and constraints are also discussed. A number of opportunities and constraints are generic and broadly applicable to all land use, as presented initially. However, as for the biophysical environment, social and economic opportunities and constraints are also specific to the land use option under consideration, as presented in Table 4.4. Unlike the biophysical environment, social and economic opportunities and constraints are also dependent on the manner in which the development intervention is planned, structured and implemented. A discussion of opportunities and constraints for different types of project management, ownership and beneficiation strategies, ranging from group projects on communal land to individual farmers, the use of SLAG funding from the DLA, and lease arrangements are also presented. These possible mechanisms for implementing forestry are discussed more fully in Chapter 6.

Table 4.4: Social, Economic and Institutional Constraints and Opportunities Analysis

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
ALL LAND USE DEVELOPMENT PROJECTS			
1	There is a desperate demand for jobs and income earning opportunities in most rural communities. The residents of such areas are consequently very eager for any kind of development.	Due to the dire levels of poverty, rural residents tend to take the first development offer that comes their way and agree with whatever the developer suggests, even when it does not entirely suit their circumstances and needs.	Considerable effort needs to be invested in negotiating an appropriate form for a new development with local land users, and ensuring that they can participate in negotiations effectively.
2	The scarcity of development options and proponents gives the few developers that do exist considerable options.	The scarcity of development options and proponents forces disadvantaged residents to take whatever offers they get.	Need to facilitate a more diverse range of land use development options
3	The under-utilisation of arable lands due to a lack of resources and markets – means that there is land that could be used for land use development projects.	The more complex and foreign the changes associated with the project, the more susceptible it will be to conflict and sabotage. Rural production methods are not considered consistent with current market expectations.	Developments which utilize existing land tenure & ownership have a greater chance of success than ones that attempt to change these traditional institutions. Will also be quicker to implement.
4	There is a willingness amongst a large (majority) number of rural residents to consider alternative land use developments for communal grazing land as they obtain insufficient benefits from it.	Land use projects must be compatible with existing uses. Communities will generally not consider any form of resettlement, or expropriation of individual lands. The area of land made available will also be limited by the need to maintain existing land uses, it is therefore unlikely that most communities will consider making more than 25% of their land available for new uses.	Developments that use many smaller parcels of land rather than large consolidated blocks are likely to be more acceptable to local residents and more compatible with their existing livelihood strategies.
5	The possibility of rural residents accessing the DLA's SLAG grants to finance development projects (only applies to cases where there is a change in land tenure).	Projects on former state parastatal lands and forests are generally prone to considerable conflict and resentment due to the top down way in which many of them were created and managed.	Past injustices need to be redressed and different interests within communities need to be accommodated. This may require developing the land in a variety of ways.
6		Disadvantaged rural residents are not familiar with	It would be advisable to start small and

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
		western business processes, property systems, legal entities and bureaucratic processes. Adjusting to these ideas is a very difficult and time consuming process. The success of development projects will require a considerable long-term investment of finances and effort in facilitation, organisation development and capacity building.	gradually expand the reach of the project as residents become more familiar with, and accepting of, these new ideas and practices.
7	The remoteness and unspoilt nature of the social and natural environment makes it attractive for nature based, adventure and cultural tourism.	Poor road infrastructure (and long distances to processing facilities) will make it difficult for many rural communities (especially those far from the main roads) to get their produce to the markets. Limited state investment in road development will make it difficult to overcome these problems in the short-term.	Private sector developments need to be supported by government investment in infrastructure.
8		Limited local markets for produce make it essential that farmers connect with broader markets.	New institutions and networks need to be created to facilitate access to markets.
9		The State's lack of a broad rural development strategy that coordinates the activities and priorities of the whole range of government departments makes it difficult for projects to secure the necessary supplementary support services they need to ensure the success of their development projects.	The development of a coordinated rural development strategy by government is required.
SPECIFIC TYPES OF LAND USE DEVELOPMENTS			
FORESTRY			
1	There is a demand for local supplies of fuel and building wood.	Trees are not a crop that farmers are familiar with growing. Afforestation establishment has been problematic on previously cultivated lands.	Start in areas adjacent to existing forestry plantations, markets and processing plants
2	There are a number of private sector forestry	Due to the high risks associated with fire, forestry	Appropriate private sector investment

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
	companies that are looking for new sources of raw material and are interested in new afforestation developments in the Focus Area and willing to enter into contracts with potential growers (groups or individuals).	projects would need to be supported by the whole community as well as neighbouring communities.	be facilitated. Employment benefits of projects should be shared with neighbouring communities.
3	There is more interest from rural residents that have had some form of exposure to the forestry industry either through employment or as a result of proximity to plantations.	Private sector would prefer to work with a small number of group projects than with a large number of individual growers – so as to minimize administrative costs, and ensure economies of scale in the provision of support services.	Start in areas adjacent to existing forestry plantations, markets and processing plants. Individual growers should be encouraged to collaborate and coordinate with one another.
4		The growing of trees on arable lands may impact on neighbouring fields and would therefore require the support and participation of neighbours.	Individual growers should negotiate with neighbours and collaborate and coordinate with one another.
5		The growing of trees on communal grazing lands may run into conflicts with livestock owners.	Employment benefits should be shared with livestock owners.
		SUGAR	
6	Existing Greenville plantation, not all land is utilized yet.	Conflicts and unresolved land claim Farmers used to being pampered and demand much from government.	Efforts should be made to resolve the land claim and restructure the project to ensure sustainability.
7	A lot of local interest in the sugar project – more farmers interested.	Shortage of capital and difficulties in accessing it until land claim resolved.	Although good for growth, NPS is considered marginal due to transport.
8	Access to markets.	Distance to markets and transport costs are a problem.	With SA sugar industry facing decline, NPS may not survive.
9	Good product being produced and demand for product.	Lack of interest and support from government departments. Export market dependence and price fluctuations.	Well suited for replacement with trees.
10	Biophysical suitability.	Invasion of forest plantation and use of water by trees. Below average yields.	
11	Potential to improve production of sugarcane in	Shortage of equipment.	

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
	existing area of North Pondoland Sugar	Distance from processing facility Replacement of mill supply quota for non performance	
12	No proponent for expansion of sugar production beyond the Greenville estate.	Lack of local mill High capital requirements	Further expansion unlikely to be viable.
	MAIZE		
1	Farmers very familiar with the cultivation of maize.	Productivity is generally low due to a lack of resources and high risks.	Farmers need support to access inputs and labour saving technology/services
2	Farmers can and want to consume this product.	Farmers are inhibited by cultural practices from selling food crops to needy neighbours – prefer to sell to outsiders.	Markets outside the village need to be accessed – facilitation required.
3	Large local demand for purchased maize.	Purchased maize is imported from outside and local wholesalers are not willing to buy from local farmers.	Incentives should be given to wholesalers to purchase local maize.
4	Less dependence on imports.	Local farmers have to compete against established commercial producers and suppliers as well as cheap subsidised imports from overseas countries.	Farmers need assistance accessing support services and developing storage facilities. Farmers need to be organized.
5	Maize projects have demonstrated that if there is a market for ploughing services then this demand can be met.	Lack of ploughing resources (tractors and draught oxen ploughing teams) at the household level.	If markets for maize can be developed then farmers should be able to pay for ploughing services.
6	Suitable for dry land cultivation especially in the higher rainfall areas.	Cultivation on marginal soils. Soil sheet erosion of the top few centimetres is a problem. Gully erosion is also severe in many places leading to silting of reservoirs.	
7	Government is currently acting as a proponent and providing financial subsidisation.	Government subsidisation has a very limited life-span and spatial extent.	Issue of market access needs priority attention in order to ensure the sustainability of these projects.
8		Maize project development agents have very limited capacity plus limited budgets.	More resources needed.

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
9		More focus on short term poverty alleviation than on long term sustainability, therefore sustainability is compromised.	More strategic, long term interventions needed (i.e. in accessing markets & developing local storage facilities for farmers.
10		No private sector proponent for maize production projects.	Incentives should be given to wholesalers to purchase local maize
11		Few jobs created for the youth and unemployed (those without access to arable land).	If viable markets can be created this problem could be alleviated.
12	Potential for processing & adding value.	Poor infrastructure, services and information.	Improvements to existing programmes likely.
13	Large local market.	Risks associated with price variability. Current weak linkages to markets.	Current market linkage weaknesses will be addressed.
14	Increased local food supply.	Low yields.	Forestry unlikely to compete with maize on employment, income and food security.
15	Government initiatives to support rural development.	Competes with traditional mechanisms for sustaining rural households and poverty alleviation.	
16	Potential multiplier effect on local economies of product produced and consumed.	Land tenure system limits consolidation of land for economies of scale.	
17	Areas with relatively low population density.		
VEGETABLES AND FRUIT			
1	Significant local demand.	Demand is met through importing from elsewhere.	
2		No proponents.	
3		Need irrigation and therefore limited to small areas.	
4		Arable lands with access to water supply are far from households, therefore susceptible to theft losses and more time consuming to invest labour in cultivation.	

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
5		Farmers less familiar with the cultivation of fruit and some vegetables.	
6		Cultivation of fruit and vegetables requires more expensive investments in pest control.	
LIVESTOCK PRODUCTION			
1	Farmers familiar with livestock farming.	No commercial proponents.	Facilitating access to markets should be a priority.
2	Some local demand for goats, meat and milk products.	Low productivity and insufficient supply.	Gradual improvement of methods likely.
3	Stocking rates may be appropriate for the type of (low intensity) pastoralism historically practiced in the region.	High risk of theft and accidental death on roads (due to lack of fences along roads).	Small scale commercialization likely.
4		Lack of access to markets and demand for local wool and hide/skin products (no buyers and processors sourcing products from farmers in these areas) – linked to distance from markets and processing operations.	Will always present an obstacle to land uses such as forestry.
5		The lack of commercial orientation amongst farmers and need to meet cultural demands.	
6	Improved production and yield.	Land tenure systems limit consolidation for commercial production.	Unless commercial proponent emerges, scale will be small.
7	Improved husbandry practices.	Traditional values.	
8	Group management of consolidated land holdings.	Access to markets & agents.	
9	Value adding through marketing and processing.	Land pressure & overstocking.	
10	Government initiatives to support rural development.	80% of livestock held by 20% of people.	
11	Areas with relatively low population density.	Degradation of veld in certain areas.	
12		Distance to markets.	

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
		TEA	
1	Existing Magwa tea estate and new ownership could revive Magwa.	Estate need to be rehabilitated.	
2	Potential to expand tea estate.	Need to co-exist with other land use options from communities.	Expansion potential is limited. If rescued, Magwa will expand from current 1800 ha to max of 2000 ha.*
3	Commercial investor secured.	Other land use options from communities can hamper the potential to expand tea. High capital requirements.	Potential for small grower options should be considered.
4	Land claim has been resolved without too many problems.	Land tenure and community involvement issues.	
5	Farmers recognized a need for a commercial partner. Partnership joint venture potential.	Skills requirement.	Will focus on out-growers.
6	Can produce a high quality product with a considerable demand.	Large scale of production	
7	High employment creation.	High relative cost of labour. Apparent shortage of labour.	
8	Economic yield potential. Optimize existing production.	Poor track record of management, yield and economics.	Crop mixing of tea and trees (properly planned) could be beneficial.
9	Closure of Sapekoe offers short term market opportunities. Good SA market. Long term opportunity for expansion.	Long lead times.	** Expansion estimate per Dept of Land Affairs*
		TOURISM	
	Proximity to KZN.	Roads infrastructure. Communication networks.	
	Focus Area has great natural potential at coast.	Will be affected by changes to natural landscapes Relatively new land use.	Will develop along coast.
	Consolidation, upgrading of existing facilities	Distance from markets.	

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
	in progress and new facilities likely.		
	SA, Eastern Cape increasing attraction as destination.	Security.	Unlikely to be affected by forestry (if forestry excludes coastal strip and areas of scenic beauty areas).
DIFFERENT TYPES OF PROJECT MANAGEMENT /OWNERSHIP/ BENEFICIATION STRATEGIES 1.GROUP PROJECTS ON COMMUNAL GRAZING LAND			
1	Support could be obtained from the majority of non-livestock owners.	Livestock owners may resist and sabotage the project.	Employment benefits should be shared with livestock owners.
2	Could produce benefits for all community members.		
3	Majority buy-in can be advantageous and help reduce the risk of fire and vandalism.	Large communities and buy-in can result in difficulties to reach consensus and manage conflict– lengthy organizational development process required.	Project designs that utilize rather than attempt to change existing land uses and institutions would reduce the difficulties of initiating and managing projects.
4	Investment of income in social services and local infrastructure can fill gaps that government cannot meet.	Complications in deciding how to share profits and benefits.	Needs careful consultations and negotiations.
5	Communities can access SLAG grant through land tenure reform process.	Could relieve pressure on government to deliver services.	Opportunities to use SLAG grants should be explored.
6		Complicated on-going management and time consuming.	Capacity building needs should not be underestimated.
7		Require changes in land tenure, administration and legal entity – would depend on assistance from DLA.	Likely to be lengthy and expensive process.
8		Tension between the relative willingness and ability of individuals and households to participate in land use developments and the fact that all community members have rights to the land.	This may require a separation of the land owning and land using entities i.e. through lease agreements.

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
DIFFERENT TYPES OF PROJECT MANAGEMENT /OWNERSHIP/ BENEFICIATION STRATEGIES 2. GROUP (OWNERSHIP) PROJECTS ON ARABLE LANDS OVER WHICH CERTAIN HOUSEHOLDS HAVE HISTORICAL RIGHTS			
1	Similar to above.	Similar to above	
2		Considerable possibility of tensions developing between those individuals who had historical rights to these lands and the new group legal entity regarding who benefits and who is responsible for what.	These projects should probably be avoided.
DIFFERENT TYPES OF PROJECT MANAGEMENT /OWNERSHIP/ BENEFICIATION STRATEGIES 3. INDIVIDUAL FARMERS CO-ORDINATING THEIR ACTIVITIES			
1	Requires no change in land tenure or the creation of new legal entities, therefore development could proceed more quickly and easily.	Farmers have small areas of land to contribute therefore the incomes derived from the project will be small and not equivalent to a full time job.	These types of projects should be encouraged, and the fact that growers will only get supplementary incomes should be accepted.
2	Benefits would go directly to individuals and supplement household incomes.	The large number of contracts with individual farmers would increase the administrative load for the private sector.	Farmers should be encouraged to work together in groups – alleviates resource constraints and reduces administrative burden.
3	Co-ordination of activities helps farmers to overcome their individual household resources constraints and to improve their access to inputs and support services.	It would not necessarily generate funds for general community development projects.	Farmers should be encouraged to work together in groups to alleviates individual resource constraints.
4	Coordination helps the private sector by improving the economies of scale such as the area of land made available, reducing the costs of providing services and facilitating decision making and implementation.	Cannot access DLA's SLAG funds because no change in land tenure is involved.	
5	Co-ordination improves the bargaining position of the farmers.	Co-ordination could be time consuming and problematic. If co-ordination breaks down then	The efforts invested in facilitating coordination are likely to be

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
		this could have negative impacts on productivity.	worthwhile.
DIFFERENT TYPES OF PROJECT MANAGEMENT /OWNERSHIP/ BENEFICIATION STRATEGIES 4. ISOLATED INDIVIDUAL FARMERS WITH INDIVIDUAL CONTRACTS WITH PRIVATE SECTOR			
1	Requires no change in land tenure or the creation of new legal entities, therefore development could proceed more quickly and easily.	Poor bargaining position with private sector.	Farmers should be encouraged to organize themselves or join existing organizations of growers.
2	Benefits would go directly to individuals and supplement household incomes.	Poorly resources households may have difficulty investing the appropriate levels of labour and capital in production at the right times.	Product quality may be compromised.
3		It may be more difficult and costly for the individual farmer to access support services.	Benefits to growers are reduced.
4		Working with isolated individual farmers on small plots would increase the costs of administration, service provision and harvesting for the private sector.	Private sector likely to loose interest in such contracts.
5		Farmers would depend on the support and acceptance of neighbours in order to engage in and succeed at their farming venture –this may be difficult to obtain.	Product quality may be compromised.
6		Cannot access DLA's SLAG grants.	
DIFFERENT TYPES OF PROJECT MANAGEMENT /OWNERSHIP/ BENEFICIATION STRATEGIES 5. USING SLAG GRANTS			
1	Provides farmers with access to additional funding, makes them less dependent on the private sector and increases their bargaining power.	Can only be accessed if the project entails some kind of land tenure reform such as leases and the creation of new legal entities.	This makes the process of initiating the project much more complex and potentially time consuming. However, with proper planning, the processes can run concurrently reducing delays.
2	Increases the incentive for government to provide the necessary support services.	The size of the grants forces rural residents to pool their grants in order to generate sufficient funds for the project.	

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
3	Makes the project more attractive to the private sector if it relieves the pressure on them to make loan capital available.	DLA's limited capacity puts constraints on the number of projects that it can work on and the speed with which it can deal with them.	
4	Increases the confidence/security of the community.		
5	Provides communities with capital needed to employ people on the project before income is derived from the harvest. Can also increase their capacity to provide employment.		Such benefits will encourage communities to make land available.
6	It provides DLA with an opportunity to advance their land tenure reform programme in the former homelands.		DLA is likely to advocate this approach.
7	The involvement of DLA can help the project to access other services provided by government (i.e. training).		
DIFFERENT TYPES OF PROJECT MANAGEMENT /OWNERSHIP/ BENEFICIATION STRATEGIES 6. LEASE ARRANGEMENTS			
1	Attractive to private sector – can provide them with some independence in their production decisions.	Essential that consensus between all the major stakeholders is secured – this may be difficult.	Requires lengthy and complex processes of negotiating and setting up new legal entities.
2	Allows the separation of land ownership from production. This provides those without the resources to engage in production (or the interest) to benefit without having to participate in the production process.	Requires the support and facilitation services of DLA. Process may be slow if DLA has insufficient capacity or the project is low on its list of priorities.	Process may be slow if DLA has insufficient capacity or the project is low on its list of priorities.
3	Allows land rights holders to apply for SLAG grants.	Leasing agreements are a new and unfamiliar concept in most communal areas that the residents are likely to be quite nervous and cautious about.	Will require considerable negotiations and capacity building.
4	This is a flexible mechanism that can be used to allow outside private companies or a small group of local residents to use the land.		May make the deal more attractive to the private sector.

	OPPORTUNITIES	CONSTRAINTS	IMPLICATIONS
5	Conditions can be built into the conditions of the lease to ensure that local residents get preference in employment and capacity can be built so that the community can eventually take over the project.		
DIFFERENT TYPES OF PROJECT MANAGEMENT /OWNERSHIP/ BENEFICIATION STRATEGIES 7. JOINT VENTURES (BUSINESS PARTNERSHIPS BETWEEN COMMUNITIES AND THE PRIVATE SECTOR)			
1	Can facilitate private sector investment if the market situation is positive.	Private sector needs some incentives to participate in such ventures – it is a risky and difficult/costly option for them.	Has potential but not an easy option.
2	Can provide opportunities for communities to participate in the production process and the business – can also build capacity.	Essential that consensus between all the major stakeholders is secured – this may be difficult.	Requires lengthy and complex processes of negotiating and setting up new legal entities.
3	Can allow communities to access SLAG grants and other DLA assistance.	Requires the support and facilitation services of DLA.	Process may be slow if DLA has insufficient capacity or the project is low on its list of priorities.
4		Joint venture agreements are a new and unfamiliar concept in most communal areas that the residents are likely to be quite nervous and cautious about.	Will require considerable negotiations and capacity building.
5		The community is usually a minor shareholder in the project. The Dept of Land Affairs is seeking a goal of majority shareholders or a significant minority for the communities.	Benefits to communities may be inadequate.
6		The lack of capacity and business skills in communities makes it difficult for them to participate effectively in decision making.	A lack of capacity building may jeopardize the success of the project.

4.7 CONCLUSIONS

The following conclusions are drawn from this socio-economic analysis:

- There is a desperate need for development and a willingness to consider forestry and other commercial developments within the Focus Area.
- There is underutilised arable and grazing land in communal areas that residents may be interested in utilising for commercial developments (including forestry).
- As forestry cannot provide full-time employment and incomes for residents of communal areas, the scale and character of new afforestation developments should not be such that they substantially undermine existing land based livelihoods.
- The lack of knowledge and experience of commercial developments in the Focus Area, together with weak institutional capacity, means that the commercial proponents of any new commercial development will have to invest considerable resources in developing the appropriate local institutions and capacity to initiate and maintain these projects.
- Due to the lack of knowledge and experience at the local level, efforts to ensure that the pros and cons of a wide range of choices/options for the proposed development are explored with the affected parties (i.e. where to plant trees, what kind of trees, the ways in which people can participate and benefit, the ways in which it can be managed) should be supported and encouraged in order to maximise the benefits to the participants and ensure the long-term sustainability of the project.
- The DLA is prepared to make grants available and facilitate tenure reforms and the creation of new land owning institutions required for new commercial developments which have the support and participation of local residents, but it does have limited capacity in this regard which may delay the process.
- The process of developing the appropriate local institutions and capacity to initiate and maintain new commercial projects can be simplified and speeded up if existing legitimate institutions are used and if the project is designed in such a way that it does not entail any change in land tenure (i.e. small growers on individual plots).
- Even if the project involves only a small group of residents, or individuals, it remains important to obtain the support and approval of the broader community, due to the considerable risks of fire and vandalism to the commercial viability of the project. This requires a process of broad consultation during the inception stages and a search for ways of sharing the benefits of the project with non-participants.
- Commercial developments should be initiated first in areas where there are already existing plantations, processing facilities and markets, or in areas close to these. This will ensure that costs can be shared and minimized; local experience, knowledge and familiarity can be capitalised on, and benefits can be maximised.
- The long-term sustainability of the commercial development depends critically on local support and the ability of the participants to access markets and earn incomes. Projects which cannot meet these criteria should not be encouraged.

The Focus Area Chapter 5 continues on page 91.

5 LAND USE ASSESSMENT

A major challenge in this SEA is to assess whether forestry developments can optimize sustainable development opportunities relative to, and perhaps in conjunction with, other land use options, in areas where forestry may be appropriate from a biophysical and 'distance to market' perspective. The objective is to avoid the undue "cost" of opting for an afforestation land use development at the expense of other uses that may be more economically, socially or environmentally acceptable. Within areas identified as suitable for afforestation, other potentially viable land use alternatives are given equal evaluation and consideration. It is necessary therefore to compare forestry with other potential land uses and weigh up the relative viability, suitability and costs and benefits of each relative to one another. This is the task that is dealt with in this chapter. There are three main components to this land use assessment. The first is a process of identifying the potential commercial land use developments and employing an objective method of selecting the most feasible, suitable and likely ones to subject to further investigation (Section 5.1). The second focuses on the selected land uses, investigates them in more detail and weighs up their relative opportunities and constraints (section 5.2). The third section entails a comparative cost benefit analysis of the selected land use options against existing land uses (section 5.3). These analyses are then used to draw some conclusions about the suitability of new afforestation as a land use development option in the Focus Area.

5.1 LAND USE ALTERNATIVES ASSESSMENT

5.1.1 APPROACH

In attempting to evaluate the land use alternatives, the consultant team developed a systematic and objective methodology to review, screen and select only those land use options that were considered viable and sustainable within the context of this study. The consultant team convened an expert panel to identify and assess the various land use options for the Focus Area. A primary list of possible land uses identified included:

- Forestry at a large scale (commercial and wood lot)
- Dry-land Agriculture at a large scale (maize).
- Grazing at a large scale (small and large stock).
- Commercial Dairy or Poultry Operations, which are site specific.
- Tourism (nature-based and commercial) / Conservation which are site specific.
- Tea Plantations which are site specific.
- Jatropha, (undetermined scale).
- Sugar at a large scale.
- Commercial scale Fruit and Vegetable Production which are site specific.
- Horticultural Products which are site specific.
- Commercial / Industrial Development which are site specific.
- Status Quo (natural resource utilization levels)

These were identified by the consultants from various sources, including: stakeholders, the SEA Steering Committee, national and provincial level governments, CBOs and NGOs (as documented in the Scoping Report); the Integrated Development Plans (IDPs) for Local and District Municipalities; the Local Economic Development initiatives; and expert opinion (internal consultant team).

The primary list of possible land uses was then scored using seven different weighted criteria (see table 5.1.a) and a range of scores from 0 to 4 (see table 5.1.b) to determine whether they

should be considered further in this SEA. Where land uses could be logically grouped, such as, 'vegetables' or 'grain crops' they were treated as inclusive categories. The goal of this procedure was to eliminate land uses that were deemed to be unrealistic or inappropriate for the study area. This may be due to biophysical constraints, e.g., climate or soil, or social constraints such as underdeveloped infrastructure or absence of markets. This process allowed the team to concentrate on a critical evaluation of only those land uses that appear to have considerable overlap (both geographically and economically) with potential new afforestation proposals, and which are more likely to succeed if implemented.

The land uses on the primary list were scored against the evaluation criteria in table 5.1.a using the following weightings:

1 = Low level of importance to SEA
2 = Moderate level of importance to SEA
3 = High level of importance to SEA

A weighting of 1 implies that a particular criteria has a low level of importance to the SEA and is not likely to be a driving factor in land use decisions. A weighting factor of 2 implies that this Criterion has a moderate degree of influence on land use decisions, and a weighting of 3 implies that the Criteria has a critical influence on the land use determination. The Criteria were chosen to represent those factors that influence commercial land use and resource utilization in the region. For instance, "comparable scale of land use" has a high level of importance to the SEA in that only land uses comparable in scale to commercial afforestation are appropriate for analysis at the strategic level. Market prospects are an important consideration of any economic venture but may also be influenced by institutional policies. Due to the overriding concern for poverty alleviation, land uses that have a potential for "downstream investment" are given additional weight in the selection criteria. Private and institutional proponents refer to governmental or NGO promoted economic enterprises. While their importance is noted, in regard to this SEA, their involvement is not deemed to be highly significant. If land uses are "known within the area", they are considered to be more viable as they represent some level of familiarity to the local population and institutions. If a proposed economic activity is anticipated to directly compete with commercial forestry for either, natural, capital or labour resources, it is judged to be highly significant to this SEA.

Table 5.1.a: Land Use Selection Criteria and Weighting Factor

Criteria	Weight (1-3)
Comparable scale of land use	3
Market prospects	2
Likelihood of reaching downstream investment threshold	3
Private sector interest	1
Institutional proponents	1
Land use known within the area	2
Extent of competition with forestry	3

Table 5.1.b: Score awarded for each weighted criteria in assessing each land use

Score	Value
Not Significant or Not Applicable	0
Low Significance and Low Potential	1
Moderate Significance and Low to Moderate Potential	2
High Significance and Moderate Potential	3
High Significance and High Potential	4

Using this method, the existing and potential land uses were assessed for their respective economic valuation for the Focus Area. The following Table (5.2.c) presents the preliminary results of the screening of the land use alternatives listed above. Those land use alternatives that scored 37 and above (representing the upper 50th percentile) were deemed by expert opinion to have the highest potential for implementation within the Focus Area. The complete analysis of each land use option will be provided in the Technical Volume of the SEA.

Table 5.1.c: Land Use Option Scoring

Land Use Option	Score
Dry-land Agriculture (maize)	**52**
Grazing (small and large stock)	**50**
Commercial Dairy or Poultry Operations	29
Tourism (nature-based and commercial) / Conservation	**51**
Tea Plantations	**45**
Jatropha	34
Sugarcane	**37**
Commercial Scale Fruit and Vegetable Production	33
Horticultural Products	20
Commercial / Industrial Development	18
Status Quo (natural resource utilization and subsistence agricultural production)	**42**

Those scores in bold were determined to be the most viable land use options (LUO), and also most likely to compete against new afforestation projects (representing an "opportunity cost"). An example of the scoring for Dry-land Agriculture is as follows:

Table 5.1.d: Selection Criteria Ranking for dry-land maize production within the Focus Area

Criteria	Weight (1-3)	Dry Land Maize Score	Weighted Score
Comparable scale of land use	3	4	12
Market prospects	2	3	6
Likelihood of reaching downstream investment threshold	3	4	12
Private sector interest	1	2	2
Institutional proponents	1	3	3
Land use known within the area	2	4	8
Extent of competition with forestry	3	3	9
Total			**52**

Scoring Rationale for Dry Land Maize: Maize is grown over large areas and has similar climate requirements to forestry. According to Hosking et al (2004), the Community Production Centre (CPC) maize schemes have met with moderate success but require longer term commitment to increase their chances of surviving and creating downstream economic opportunities. Maize is already grown locally and for subsistence, therefore there is familiarity in the community with this crop. Substantial areas of the Focus Area have favourable growing conditions but markets need further development and commodity prices are currently very low, depressing profits and investment.

5.1.2 LAND USES EXCLUDED

A brief discussion on the evaluation of the LUO that were both excluded and included for further analysis is provided below. Specific scoring sheets are provided in the Appendices of the Technical Reports Volume. The following is an example of scoring for a land use that was excluded from further evaluation.

Table 5.1.e: **Selection Criteria Ranking for horticultural products within the Focus Area**

Criteria	Weight (1-3)	Horti-cultural Products Score	Weighted Score
Comparable scale of land use	3	0	0
Market prospects	2	1	2
Likelihood of reaching downstream investment threshold	3	3	9
Private sector interest	1	2	2
Institutional proponents	1	2	3
Land use known within the area	2	2	4
Extent of competition with forestry	3	0	0
Total			**20**

Scoring Rationale for Horticultural Products: Horticultural products are not grown in significant quantities in the study area. This is likely the result of poor access to markets, lack of infrastructure, and poor understanding of the potential benefits of micro-enterprise development. Substantial increases in tourism may generate more market opportunities for small scale projects within the study area. However, it is not seen as occurring at the same scale as new afforestation projects and competition with forestry over labour, capital, water and other resources is considered negligible.

Jatropha plantations show some promise given the potentially favourable growing conditions in the Eastern Cape and the potential diversity of products obtained from the crops. Expected tonnages in the 800 - 1500 rainfall conditions are likely to be around 4 tonnes of oil per hectare. This makes the option marginal at best, with irrigation required to increase yields to above 6 tonnes of oil per hectare. However, no serious private or public sector motivation has been presented to initiate growing schemes and there are no examples of successful models or demonstration projects in the region with which to gain knowledge from.

Horticultural products are not grown in significant quantities in the study area. This is likely the result of poor access to markets, lack of infrastructure, and poor understanding of the potential benefits of micro-enterprise development. Substantial increases in tourism may generate more market opportunities for small scale projects within the study area.

Industrial Development is constrained by the lack of urbanized areas, infrastructure and low population density, rendering the study area as a low possibility for substantial commercial / industrial type development. However, if the N2 Wild Coast Toll road becomes a reality the situation may become more favourable, with industry development adjacent to some of the existing centres (e.g. Lusikisiki) becoming more financially viable. Despite this, new development projects are not likely to occupy large tracts of land that would otherwise be suitable for the other selected land use alternatives.

Large scale commercial fruit and vegetable production is not seen as a major land use alternative. Distance to market, poor infrastructure, high capital costs of irrigation and lack of existing operations are the primary disadvantages.

Dairy and poultry operations have been supported in the past by the Community Production Centre (CPC) with some success. However, the distance to substantial markets and lack of infrastructure are seen as disadvantages to further development. The region could potentially support a small dairy and poultry industry but these would not occupy a large land area and therefore not conflict with new afforestation on a regional basis.

5.2 LAND USES INCLUDED AND ASSESSED IN THE SEA

The challenge facing this SEA is the development of land use options in the absence of detailed information, especially when the SEA covers an extremely large area. For this reason, alternative land use options remain fairly conceptual, but information on the suitability of the area for certain crops is available from, for example, the *South African Atlas of Agrohydrology and Climatology* (Schulze, 1997). For the purposes of this SEA, commercial crop production is restricted to dry-land agriculture (i.e. no irrigation), and the growing of maize, sugarcane and tea. The following is a brief description of the Land Use Options (LUO) evaluated in a more rigorous economic and social assessment. These options, within the Focus Area, scored in the upper 50 percentile in the overall scoring exercise described above.

5.2.1 COMMERCIAL MAIZE

Overview

Maize is South Africa's most significant grain crop. It is the staple diet of the majority of South Africans and forms the main energy ingredient of most livestock feeds. Annual production varies between 8 and 10 million tons, produced on a total area of some 2,8 million hectares. The Eastern Cape Province produces an estimated 80 000 tons from 20 000 hectares and this represents less than 1% of the total South African maize production. The Eastern Cape produces just 10% of its own annual consumption requirement, the rest is imported from other areas. The adaptability and demand for this food crop has resulted in it being produced in many marginal areas, in less than ideal conditions.

Although, commercial maize production in the Eastern Cape is relatively small, it has great significance to poverty alleviation, as it is the most widely grown subsistence food crop in the former Transkei and Ciskei. Like the livestock industry, the maize industry today tends to be characterised by large commercial production on the one hand and small scale subsistence production, on the other. In the past (1850-1930) there was another sector, small African peasant producers, who grew maize on their individual arable and residential plots and sold or bartered it to traders in exchange for other foods and manufactured goods (Bundy, 1979 and Beinart, 1982). However, these peasant farmers were eventually excluded from the market through a variety of policies and investment strategies that undermined their competitive position. Today farmers in communal areas of the former Transkei and Ciskei (including the Focus Area) produce only for their own subsistence and are generally not able to meet their needs. So much so that large quantities of maize are imported into theses rural areas and sold by retailers throughout the year but particularly between September and February.

Suitability to Locality

Significant areas within the Focus Area have temperature, rainfall and soil conditions well suited to the production of maize, and indeed maize is by far the most important crop grown followed by grain sorghum, dry beans and pumpkins, which make up most of the food crops produced in the region. As a result of optimal temperature, rainfall and soil conditions, the Focus Area is considered to have one of the highest agricultural land potentials in the Province.

Existing Production

The majority of maize grown in the Focus Area is done so on a small scale in the form of subsistence production on homestead allotments. Very little of the maize production takes place on a large scale commercial basis and it is not equivalent to the commercial maize sectors in other Provinces. Significant maize production potential exists and it is estimated that if limitations to production could be overcome, maize production in the area could be increased significantly.

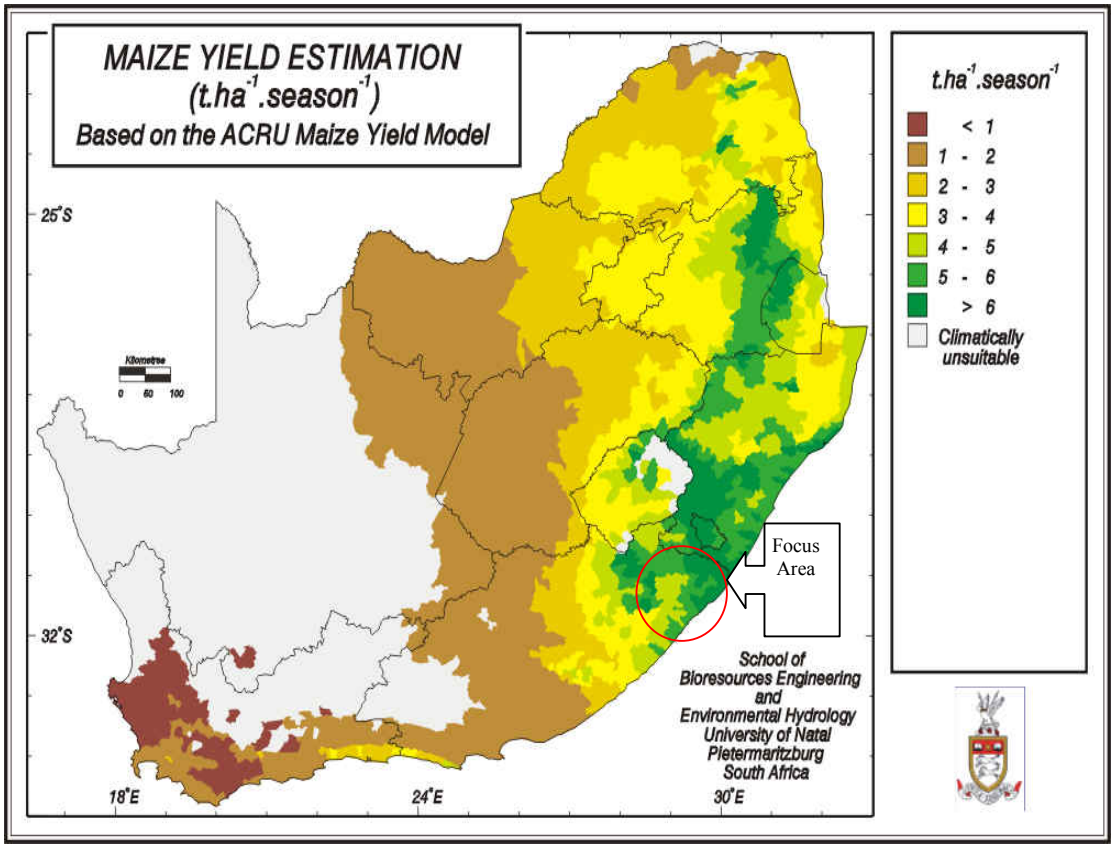


Figure 5.2.a: Maize Production Potential

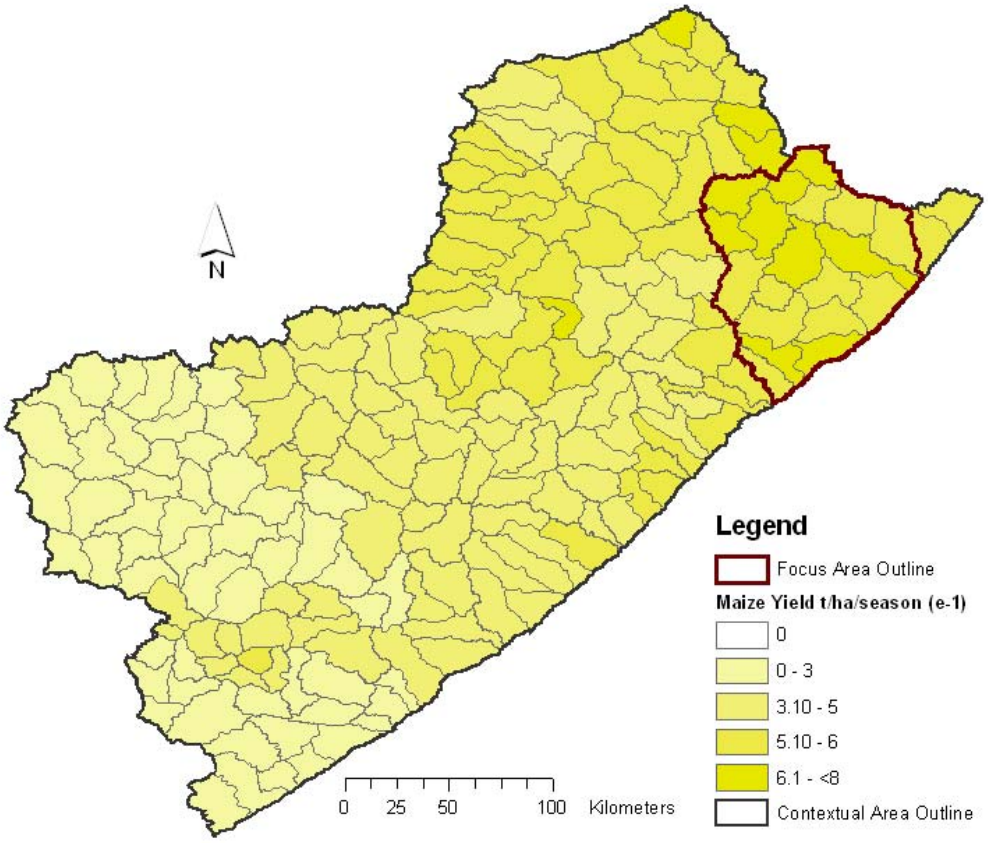


Figure 5.2.b: Maize Yield Estimation in the Contextual and Focus Areas

Limitations to Production

Despite the high local demand for maize, the level of household production for the market is non-existent or extremely low. This is usually attributed to the non-availability of essential agricultural prerequisites such as fertilizer and quality seed, as well as pesticides and good advice from extension services. In addition, Andrew and Fox (2004) also highlight the role of labour constraints, a lack of labour saving technologies (tractor and ploughing equipment and services), and a lack of capital and credit to purchase such inputs. However, they also highlight the loss of access to maize markets since the withdrawal of European Traders from these areas in the 1960s and 70s, and point out that this loss of access to markets coincides with the dramatic decline in the total area of arable land cultivated (Andrew and Fox 2004).

There are also a number of additional limitations to the development of large scale commercial crop production enterprises, including:

- The traditional land rights, occupation and use, while giving households access to arable allotments for subsistence production, in many ways complicates the development of large scale commercial crop production enterprises.
- The rugged and incised nature of the terrain in parts of the Focus Area means that large consolidated areas of arable land suitable for large-scale mechanized production are limited.

Public and Private Sector Initiatives

The Department of Agriculture and Forestry of the Eastern Cape Provincial Government has, as part of its Provincial Growth and Development Plan (PGDP) and its strategic plan, a number of initiatives either in place or planned to boost food production, in particular maize grain.

- Massive Food Production Programme (MFPP)

  This is a project within the agrarian reform initiative of the PGDP and has as its objectives food security through increased food production; increased economic activity in agriculture; sustainable use of natural resources; integrated and sustainable rural development and equitable access to agricultural resources by resource limited farmers. The MFPP has two components, a production component whereby conditional grants are provided to participants for basic crop input costs, and a mechanisation component which provides conditional grants for the purpose of establishing black commercial contractors to service the mechanisation needs of crop farmers. An administrative component provides for the administration control and financing of the project. Under this project the OR Tambo District Municipality has budgeted to plant 4 760 hectares of maize during the 2004 / 2005 production season.

- Homestead Food Production Programme (HFFP)

  This flagship programme of the Provincial Growth and Development Plan, with a budget provision for 2005/2006 of R30 million, is aimed at contributing to the food security of family households through the conditional provision of infrastructure, tools, watering systems, fertilizer, seedlings, pest control and management support. This project is aimed at small-scale subsistence production of nutritious vegetables.

- Other initiatives aimed at supporting increased crop production, include the comprehensive agricultural support programme, land-care projects and soil conservation programmes.

Conclusion

Agro-ecological conditions within parts of the Focus Area are satisfactory and the cultivation of maize can be successfully undertaken. Experience within the area has highlighted a number of problems and limitations related more to poverty, management, land ownership and politics than technical considerations, which would require careful consideration before embarking upon further investment.

If the level of agricultural production is to be raised, then mechanisms will have to be provided whereby access to local markets for maize products and for inputs is facilitated. Policies and support programmes aimed at encouraging general dealers to purchase maize locally and assisting farmers with storage and access to markets for inputs and outputs could play a valuable role in stimulating maize production for the market. In the ideal situation inputs should be made available on credit by the trader and made payable at the end of season, perhaps against a delivery of a portion of the harvest. Good extension services are also valuable if agriculture, and maize growing in particular, is to be raised from its current low production level.

Access roads in the area are a serious constraint to the marketing of any produce that could be produced in surplus of the household requirements, and are also a constraint to the import of requisites. Agricultural infrastructure required includes soil conservation works in some areas, access roads and tertiary roads to the fields.

5.2.2 COMMERCIAL LIVESTOCK

Overview

South Africa's climate is well suited to extensive livestock production, which is the most viable agricultural activity in a large part of the country with about 70% of the land surface area suitable for raising cattle, sheep and goats. At a primary production level, the red meat industry in South Africa has a strong dualistic character as a result of the political dispensation prior to 1994 and the existence of self-governing states and communal land ownership in these areas. As a result, today a large-scale commercial sector is found co-existing with a small-scale communal, developing sector. In the period 1850-1950, there was also a thriving peasant farmer sector operating in communal areas, selling animals, wool, hides and skins. Such trade declined due to restrictions imposed on such trade and the withdrawal of traders from these areas, but some recent attempts to increase opportunities for the sale of livestock at auctions have been favourably received and supported (Ainslie pers com. 2003).

South Africa has an established beef feedlot industry within the commercial sector, as well as an intensive pork production industry. Mutton is largely produced extensively and approximately 70% of the national herd consists of wool type sheep. The Focus Area falls within the communal livestock sector.

South Africa is a net importer of red meat and an exporter of wool. Beef and pork are imported primarily from the European Union while mutton comes mainly from Australia and New Zealand. Significant quantities of both livestock and imported red meat enter South Africa from Namibia and Botswana. The Eastern Cape Province, as a whole, has the following estimated livestock numbers representing a significant proportion of South Africa's total livestock numbers:

	Eastern Cape	**% of SA Total**
Cattle	3.1 million	22%
Sheep	8.4 million	29%
Goats	3.0 million	45%

The significance of livestock farming in the province is further indicated by the fact that animal products account for 69% of gross farm income in the Eastern Cape, compared to 40% in SA as a whole.

Suitability to Locality

Approximately 80% of the available farming land in the Focus Area is natural grazing, and this is therefore the greatest agricultural resource. The use of this natural grazing has to a large degree been determined by the traditional land tenure system, which provides for an individual possessing a residential site and communal grazing rights. Livestock ownership has traditionally been, and remains, a recognised store of wealth for rural holders of grazing rights. This farming system has resulted in very few large scale commercially extensive livestock enterprises being established and managed using modern scientific practices and technologies. Land pressure and overstocking, coupled with poor infrastructure and a lack of

farmer support, services and markets, remains a significant impediment to optimising livestock production and limiting degradation of the natural resource base. Despite this, beef, mutton, wool and goat production is the most significant contributor to gross agricultural product in the Focus Area.

The natural vegetation (veld types) which predominates, in the Focus Area includes Dohne Sourveld, Southern Tall Grassveld, Valley Bushveld, Coastal Forest and Thornveld, and Pondoland Sourveld. Palatability, nutritional value and productivity differ widely and the grazing carrying capacity of these veld types varies between 2 to 5 ha per Large Stock Unit (LSU).

The greater part of the Focus Area is covered by sourveld grasses which provide relatively high stock carrying capacities but low nutritional values, requiring supplementation of up to 40% of fodder requirements from arable crop lands, for optimum meat production. For optimum commercial utilisation of the natural veld, an integrated livestock enterprise, utilising a large proportion of arable land for livestock fodder is required. However due to the multiple ways in which livestock currently contribute to the diverse livelihood strategies adopted by rural households and lack of profitable markets for livestock and livestock products, it is unlikely that people will consider using arable lands to produce fodder for livestock.

Existing Production

Livestock farming within the Focus Area, along with maize, represents by far the most significant agricultural activity and production. It is described more fully in section 4.3.8 of this report. Estimates of the value of livestock production are based on recognition of uneven ownership patterns, with an average of only 24-30% of households owning livestock (cattle, goats, sheep). The estimate of the value of livestock production used by Adam's et al (2000) is based on valuations made by Shackleton et al (1999b) of R5000 per owning household per annum for cattle, R415 for goats, and R163 for non-owning households. These are estimates of the total net value of all goods and services derived from livestock, including the value of goods and services provided to cropping. These values are far higher than the income that is generated from the sale of livestock and livestock products. Quantification of output and income is however difficult, as most production is utilised / marketed in the informal economic sector.

Limitations to Production

A number of limitations can be identified to improved production efficiencies and increased commercial production:

- Communal livestock production systems meet valuable diverse socio-economic needs within communities, and are not designed to maximise the financial income derived from the sale of animals, meat, milk and other livestock products.
- Any attempt to commercialise livestock production in communal areas may create tensions between those seeking to maximise profits and those who depend on the diversity of goods and services that livestock provide (owners and non-owners). Consequently, the ratios of large stock to small stock and of productive to unproductive animals in a given environment are, under the communal systems, difficult to optimize for commercial production.
- The economies of scale, control and management of breeding, grazing, nutrition and disease, are restricted through limited access to capital and inputs.

- There is a complete lack of formal markets and difficulties in accessing external markets.

Public and Private Sector Initiatives

The Department of Agriculture of the Eastern Cape Provincial Government has a number of initiatives planned or in place, aimed at addressing problems within the livestock industry with a view to improving livestock production within communal farming areas including the Focus Area. These initiatives, which form part of the Provincial Growth and Development Plan include:

- Veld management and resting demonstrations aimed at improving veld production and reducing degradation.
- Livestock improvement schemes which through conditional, supplementary funding of participating communities, are aimed at:
    - Collective management of livestock and communal grazing,
    - Subsidisation of critical infrastructural requirements,
    - Integrated resource use,
    - Supporting animal health programmes,
    - Genetic improvement initiatives,
    - Contractual marketing,
    - Livestock production in excess of cultural requirements, and
    - Provision of training in livestock management.
- Wool Production Development (Rams and Shearing Sheds).

Conclusion

Natural veld grasses cover large parts of the Focus Area and have for centuries been utilised for livestock production, which forms an integral part of traditional rural culture. Most livestock production in the region is conducted on an individual basis using communal grazing lands with little engagement in the market. A number of limitations to successful commercial production exist, not least of which are the traditional farming practices and diverse livelihoods strategies, the degradation of the natural grass cover through overgrazing and poor management practices, and the need for nutritional supplementation which competes for arable land use.

The potential financial return per unit area, from commercial livestock production is relatively low. Although difficult to quantify, it is expected to be even lower where production takes place on a communal basis. Despite this, extensive livestock production is always likely to compete for land as a result of it being a critical livelihood strategy and entrenched as part of the way of life and socio-economic system of rural communities in the region. Cognisance needs to be taken of the non-financial benefits associated with livestock ownership. The prospects for large-scale collective commercial production of livestock via agricultural cooperatives are not good due to the preference for individual ownership and farming, and a lack of institutional capacity. The consolidation of lands into single holdings via lease agreements or title ownership is also not likely to be socially acceptable. A more viable option might be that livestock holdings and engagement in the market would remain individualised, but with some form of collective lease and management of grazing by the livestock farmers from the whole community. This would require the development of Communal Property associations that lease the grazing land to residents (individuals or groups) who wish to use it for livestock farming. However, current livestock owners (many

of whom are very influential locally) may resist new measures that require that they pay for their use of communal resources.

5.2.3 COMMERCIAL SUGARCANE

Overview

The South African Sugar Industry is a multi-billion Rand industry producing cane sugar for export and local consumption. Approximately 27 million tons of sugarcane is produced annually on 433 000 hectares in sub-tropical areas stretching from Port Edward in the South through to the Lowveld of Mpumalanga Province in the North. Fourteen sugar mills process the sugarcane, producing some 2.5 million tons of sugar annually.

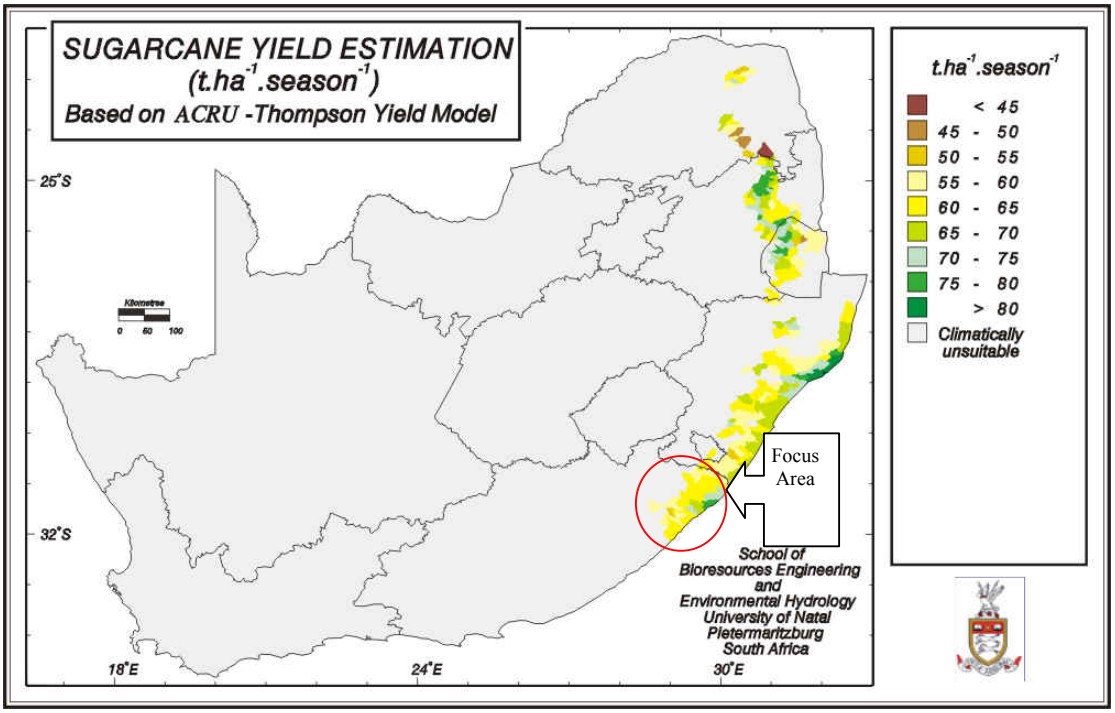


Figure 5.2.c: Sugarcane Production Potential

Approximately 50% of sugar produced is marketed and consumed within the South African Customs Union (SACU) and the remainder is exported to other countries, generating annual foreign exchange of some R 2,38 billion per annum. The industry generates total annual income of some R 6 billion.

The industry's economic welfare is to a large degree determined by global economics, world sugar prices and currency exchange rates. Some price protection is afforded through import tariffs, which keep domestic prices at higher levels than world prices. A further economic determinant is rainfall and the periodic droughts. These occur in the production areas and can have a marked effect on yield and production. The high fixed cost component of the industry, both in primary production and processing, results in a high degree of inflexibility and inelasticity of supply, and a resultant vulnerability to these external economic factors. However, the industry is well managed, organised and administered, with high levels of efficiency, expertise and technology.

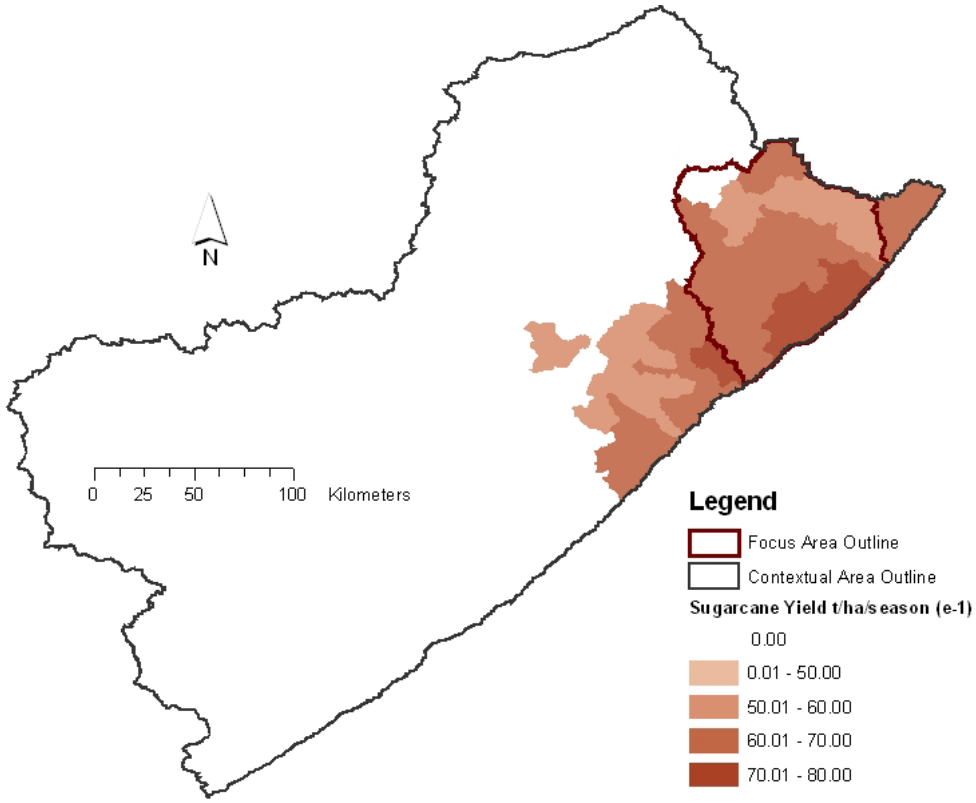


Figure 5.2.d: Sugarcane Yield Estimation in the Contextual and Focus Areas

Suitability to Locality

Sugarcane production requires deep soils with good drainage and annual rainfall in excess of 1000mm, together with a sub-tropical temperature regime. It is a crop, which is not frost tolerant and is only grown in frost-free areas. Rainfall distribution is important and rain must fall in summer (August – April), with a dry winter ripening period. Figures 5.2.c and d indicates suitable sugarcane growing areas in South Africa and the study areas. Optimum production and yield occurs in tropical to sub-tropical regions with low temperature variations and yield decreases as production moves towards more temperate areas (Figure 5.2.c). Such yield declines are evidenced by the lower yields achieved in the southern production regions of the South African industry.

Whilst sugarcane production potential exists in the Focus Area, between Port Edward and Port St John's, where soils are suitable and rainfall is adequate (above 1000mm), production in terms of economic yield is considered marginal.

Existing Production

Existing production within the Focus Area is very limited and insignificant in terms of the industry as a whole, comprising less than 0.2% of total annual sugarcane production. Production is restricted to areas around Port Edward (North Pondoland Sugar Estate) where approximately 3500 hectares with a potential yield of 150 000 tons of cane per annum was developed some 20 years ago by Illovo Sugar (Mzimkhulu Mill), based on supply contracts with small growers.

Difficulties around land claims and destruction by fires (both arson and accidental) have resulted in dwindling production, with current annual production at only 48 000 tons, this being less than one third of the potential yield of the developed area.

Production distances greater than 50 km from a processing facility are, due to transport costs, considered economically prohibitive unless cane of a high quality and yield is produced. North Pondoland Sugar Estates produces sugarcane at a distance of some 70 km from the Mzimkhulu Mill. Some subsidisation of transport is provided by the processor to the producers.

Yields achieved in this production area are 35 to 40 tons of sugarcane per hectare per annum, which compares unfavourably with the industry average dry-land yield, of approximately 56 tons. These low yields are partially due to management factors and potential yields are higher than those recently achieved.

Limitations to Production

The limitations to the expansion of sugarcane production in the Focus Area include environmental, processing capacity, distance from processor and economic considerations.

- Environmentally, sugarcane yields decrease as production moves South out of sub-tropical and into temperate regions.
- Some processing capacity currently exists at the nearest sugar mill (Mzimkhulu Mill). This capacity is limited to provide for potential production from the developed North Pondoland Sugar Estate. As a result of diminishing production from this area, capacity is being filled by supplies of sugarcane from other areas.
- New processing capacity presents a significant barrier to entry into the industry, with the estimated minimum size of a processing mill being 1,5 million tons of sugarcane per annum, at a capital cost of approximately R 900 million and producing some 165 000 tons of sugar. This translates into some 40 000 hectare of sugarcane production.
- Without a new processing facility within the Focus Area, sugarcane production within the area is restricted due to distance and transport costs.
- A combination of yield, quality, transport, price and current unfavourable Rand Dollar exchange rates, renders the expansion of sugar production in the Focus Area economically risky and highly unlikely in the foreseeable future.

Public and Private Sector Initiatives

Besides attempts to resolve land claim disputes in the North Pondoland Sugar area, no other sugar production initiatives are known to exist within the Focus Area.

Conclusion

It is concluded that sugarcane production, as a result of poor economic returns and the limiting factors discussed above, is unlikely to significantly compete with forestry or other land uses within the Focus Area, in the foreseeable future.

5.2.4 COMMERCIAL TEA

Overview

South African tea production in world context is insignificant, amounting to some 12 000 tons per annum, accounting for approximately 0.3% of world production. Of this production some 4 500 tons is exported while 13 500 tons is imported to meet South Africa's consumption requirement of 21 000 tons per annum.

The world tea industry is currently under pressure as a result of a levelling off of world demand and production increases during the 1990's in the major producing countries India and China. Although the South African tea industry is not dependent upon the export market, its prices are, to a large degree, determined by international trade trends.

Historically, the industry was established under the protection of firstly, price controls and then import tariff protection. SADC countries are the source of a large proportion of SA's imports and trade agreements within the region resulted in the recent removal of import tariffs. The impact of this gradual tariff removal was cushioned during a period of weak Rand currency, however the strength of the Rand during 2003 / 2004 has placed such pressure on local producers as to render them unprofitable. Sapekoe, the largest tea producer in SA, has indicated its intention to discontinue operations should no price improvement occur as a result of, either changed economic circumstances or the re-introduction of price protection measures by South African authorities.

Suitability to the Focus Area

Tea is a perennial tree crop propagated from seed or vegetatively. It requires a deep, well drained soil with an optimum pH of +/- 5.0. It requires humid to sub-humid sub-tropical conditions with a well-distributed rainfall of at least 1 500mm per annum and the following average temperature ranges of between 10 and 21°C. Areas exist within the Focus Area suitable for tea production and although rainfall distribution in these areas is reasonable, the months of May, June and July are dry months in which production is restricted.

Existing Production

Two tea production sites initially developed during the 1960's exist within the Focus Area. Magwa Tea Estate situated close to Lusikisiki has tea plantations covering some 1 800 hectares, while Majola Tea Estates situated in the Lutengele District near Port St Johns has plantations in production covering 370 hectares. These estates enjoy agro-ecological conditions well suited to tea production, of a high quality and an economic yield.

The economic and production potential of these estates have, over their 30 to 40 years of existence, not been realised as a result of political, ownership, management and financing problems which have repeatedly plagued them. Although job creation, one of the original objectives of these developments, has to some extent been achieved, the estates have not been economically or financially viable and repeated losses have been funded from State sources.

While average overall yields of 1 700 kg per hectare have been achieved in good years, yields of over 2 000kg per hectare are, with good management, considered to be achievable.

Limitations to Production

Limitations to the expansion of existing tea production within the Focus Area are primarily of an economic nature related to price, profitability and return on investment.

- The nature of tea production requires that a production unit consist of both agricultural and processing facilities of an economic scale, closely linked and managed to ensure optimum efficiencies and quality. A minimum economic unit is considered to comprise some 400 hectares with processing infrastructure producing some 800 000 tons of tea per annum. Distance of production from factory should be no more than that which enables harvested leaf to be transported within 30 minutes.
- Ownership of land and production has proven problematic in the region over many years. The nature of tea production coupled with the communal land ownership in the area has necessitated group / employee / corporate ownership systems which have been fraught with difficulties.
- While yields per hectare of over 2000 kg per annum are environmentally attainable, these have seldom been achieved on the existing production estates. Such potential yields require high levels of management and expertise.
- Current tea price is probably the most significant limitation to the economic production of tea. Given current production costs and in particular high labour costs relative to other tea producing countries, without increased product prices, tea production will remain economically marginal.

Public and Private Sector Initiatives

Initiatives are underway for the restructuring and revitalisation of the Magwa and Majola Tea Estates in order to improve efficiencies, viability and long-term sustainability. Initiatives are also being taken by industry role players to persuade South African authorities to provide some form of price protection to the industry in order to prevent closures and the resultant job losses.

5.2.5 CONSERVATION AND TOURISM

Overview

The Eastern Cape is the second largest province in the country with a diverse landscape and over 800 kilometres of Indian Ocean coastline. It is an attractive setting for tourism, in particular, 'eco-tourism' type developments that capitalize on the rural setting and unique fauna and flora of the region. The Eastern Cape Tourism Master Plan identifies responsibly developed, smaller-scale natural heritage tourism (also referred to as eco-tourism) as a key area of focus for the region. Other potential growth areas for the Province include expansion of National Parks, Nature Reserves, cultural tourism, agri-tourism, special events and conference tourism. Tourism within the Focus Area is seen as having significant potential for growth and development, albeit, the level to which it expands is dependent upon a variety of external factors.

Suitability to locality

The OR Tambo District is a developing rural tourism region, famous for its pristine and unspoilt wild coast. With over 120 kilometres of shoreline, the Focus Area contains ample opportunity for additional tourism growth. This stretch forms part of one of the most

undisturbed coastlines on the sub-continent, with white sandy beaches nestled within a rocky shores and unique coastal nature reserves. It is a magnificent area for the outdoor enthusiast with special reference to game fishing (more than 800 fish species). A poor road infrastructure is a limiting factor for sedan vehicles but appeals to 4 x 4 enthusiasts. The unique Xhosa culture of this region, associated with the liberation struggle heritage and the national icons of past and present state presidents and political leaders renders the district in a strong position to develop significant tourism products in the future. Most tourist flows comprise domestic family groups and small adventure tours utilising the N2 as the main access route. Mthatha serves as the regional gateway with road and air links. Lusikisiki and Bizana are staging posts, with Port St. Johns being an emerging distribution point and staging post. Undoubtedly the pristine natural beauty and unspoilt coastline is what appeals to the eco-tourist. The wild coastline is strewn with famous shipwrecks, strandloper caves and the area is traversed by major river systems which flow through scenic gorges. Important cultural and heritage tourism products are being developed in Qunu, Mvezo and the Nelson Mandela Museum in Mthatha (outside of the Focus Area).

Existing Projects/Activities

Tourism is already a major economic driver for the region with over 5.3 million trips to the Wild Coast / Transkei / Ciskei region in the 2000 / 2001 season. The total value of tourism to the Eastern Cape in 2005 is estimated to be R 8.7 billion growing to an estimated R 10.0 billion in 2006. Direct employment as a result of tourism in the EC is estimated at 36,355 jobs in 2005. The main focus is on the Wild Coast *per se,* with existing tourism consisting of the Port St Johns development node (with a multitude of products), Mbotyi (hotel and cottages), Mkambathi (lodges, bush camps and campsite), Mzamba (hotel resort) and various hiking trails and their associated overnight facilities. There are also a number of privately owned cottages at the major estuaries.

Future developments as discussed in the EC Tourism Master Plan will focus on upgrading of existing facilities, limited new facilities (such as Mkweni Lodge, possibly Ntafufu Lodge) and various small (24 bed) facilities to support hiking and eco-adventure tourism initiatives. In this area, tourism demand is for Coastal experiences. In the Focus Area, this is limited to the coastal strip (between Mzamba and Mkambati), the coastal plain below the escarpment (between Mkambati and Waterfall Bluff) and various estuaries on the rugged coastline between Waterfall Bluff and Port St Johns. New commercial forestry is unlikely along the coastal strip given the terrain, sensitive ecology and unspoilt scenic beauty of the landscape.

Limitations

Significant constraints to tourism development in the region have been identified in the Tourism Master Plan (TMP). These include a lack of infrastructure, access and marketing. An audit undertaken in 1997 identified that infrastructure is a primary constraint in the undeveloped portions of the region and access is definitely a constraint to tourism growth. The poor road infrastructure in some parts of the province and the add on cost of domestic airfares, makes it difficult for the Eastern Cape to compete with provinces such as Gauteng and the Western Cape both of which have the advantages of direct flights into international airports. In the Focus Area, indecision on the proposed N2 Toll Road may discourage investment while other more progressive improvements in the road infrastructure should definitely increase the traffic flow in certain areas. Improvements to the existing road network (including the construction of new roads) may lead to substantial tourism growth in the region with the resulting economic benefits. An inadequate marketing budget is a constraint to tourism growth because it makes it difficult to achieve the desired results. The TMP suggests

that a marketing budget of R20 million would be ideal. It also suggests a formula for such a budget based on effective partnerships, cooperative marketing actions and joint venture programmes.

Recent criminal attacks on tourists in the region have heightened the need for increased security. The tourism sector is extremely sensitive to the perceptions of safety and even isolated incidents can have a significant detrimental impact on tourism. During the 1990s a number of attacks on tourists crippled the industry in the region and it has only regained popularity within the past few years.

Private and Public Sector Initiatives

The European Union Programme of Support to the Wild Coast Spatial Development Initiative (SDI) has supported eco-tourism development in three key areas since its inception in March 2000. These are community tourism enterprise developments, related skills development and training, and environmental management systems and training. Much of the effort has been directed at the establishment of the Amadiba, Amapondo and Port St Johns - Coffee Bay Horse and Hiking Trails, the establishment of Community Trusts to facilitate community ownership in these enterprises, broad training to increase levels of awareness in conservation and tourism, and specific skills training related to the operation of the trails and associated tourism activities.

More recently, a process of extensive interaction has been initiated with Provincial stakeholders to determine the basis for cooperation between the Programme and the Province and the processes leading to integration. It has been agreed that the basis for cooperation and integration lies in the formulation and establishment of a Planning and Development Framework for the Wild Coast and a Provincial Working Group was established to support the elaboration of the Planning and Development Frameworks along the Wild Coast, focusing on a number of related and integrated elements, including:

- Integrated Conservation and Tourism Policy and Strategy.
- Spatial and Strategic Plans.
- A single, consolidated Project Approval Process.
- Development Regulations.
- Institutional capacity for project preparation, financing and implementation.
- Building a Projects Data Base.
- Building a support programme for investment in the Wild Coast.

Simultaneously, a Project Development Unit was established at the level of the OR Tambo District Municipality for the planning and preparation of projects, project facilitation and implementation, and the integration of projects into the IDP processes.

Two participatory conservation-development initiatives at the Local Municipality level have been initiated for the coastal belts of Mbizana and Qaukeni Municipalities. The processes aim to build local capacity and involvement in coastal development, whilst strengthening the coastal component of municipal IDPs and SDFs.

In addition, the Wild Coast Conservation and Sustainable Development Project (WCC&SDP) has been established to develop plans and detailed strategies to guide and support the sustainable land use, development and conservation of the Wild Coast at both the local and regional scale. The project has been contracted to develop, or support the development of, the following:

1. A Biodiversity Assessment that identifies spatially explicit options and priorities for the conservation of biodiversity in the Wild Coast.
2. A Strategic Environmental Assessment for the Wild Coast that provides for the integration of environmental opportunities and constraints into development planning at the regional level.
3. An integrated Land-Use Plan for the Wild Coast that is embedded in the Municipal Spatial Development Frameworks (SDF) and that nests biodiversity conservation objectives into the regional sustainable development framework.
4. A detailed Biodiversity Action Plan that describes specific activities, timelines, budgets and implementation arrangements that would be required to both enhance sustainable livelihood opportunities for local communities and realize optimal conservation and sustainable land use for the Wild Coast.
5. A detailed Cost-Benefit Analysis of the 2 proposed mining sites at Wavecrest and Qholobeni.
6. Implementation of two Pilot Projects in the region of the Mkambati and Hluleka reserves that focuses on building the capacity of local communities to be involved in the expansion and consolidation of the conservation estate.
7. A complete and comprehensive full Project Brief for submission to the Global Environment Facility (GEF), including an incremental cost analysis and other required information.
8. Capacity building and community development at the national, provincial, local government and community levels in support of the current project activities and future implementation actions.

Conclusion

There is significant potential for tourism development along the Wild Coast and programmes are being implemented to ensure that this potential is realized. However, tourism is not considered as a land use that will compete directly with commercial forestry, as it is being developed primarily in the coastal areas that are not considered suitable and such, tourism developments do not occupy land of a comparable scale. While conservation initiatives, whether or not linked to tourism, will present competition to forestry in areas considered pristine and identified as of biological importance, it should be noted that such areas have not been identified in this SEA as suitable for new afforestation developments.

5.2.6 FORESTRY

Overview

South Africa is not endowed with extensive natural (indigenous) forests. Approximately 0.2% of the country's land surface is occupied by natural forests considered to be a highly significant resource for biodiversity and conservation. As such, commercial timber harvesting is relatively limited and tightly regulated through national legislation.

In addition, indigenous trees grow too slowly to meet the market demands for poles (mine supports, electric supply and fencing) and paper and pulp products. For these reasons, in the late 1800's South Africa imported new tree species to be used for commercial timber plantations. The primary species imported included wattle (*Acacia mearnsii)* which is grown for its tannin rich bark and fibre, pines, such as *Pinus patula* grown for construction timber and Gums (*Eucalyptus grandis*) grown for pulp production.

This SEA only deals with the implementation of new commercial afforestation, of which the above referenced species are the most common. This report does not deal with the commercial harvesting of indigenous species, nor does it deal in a substantive manner with the management of existing forestry plantations. However, a description of these and their importance to the national and regional economy of the Eastern Cape is important as a backdrop to this SEA, and is therefore presented below.

National Overview

The South African forestry industry is mostly located in the high rainfall areas on the Eastern seaboard of the country, with the highest concentrations of plantations and wood processing capacity in the Mpumalanga and KwaZulu-Natal Provinces. KwaZulu-Natal (KZN) is the centre of a market driven forestry economy with four wood-based pulp plants and four wood chip operations.

Nationwide, the total commercial plantation forestry area is 1.37 million ha in extent, producing around 22 million m^3 of roundwood per annum. Seventy percent of the production is for pulpwood (for domestic and export pulp, paper and board manufacture and wood chip exports) and 23% is for sawtimber. The total forestry area has remained static over the past ten years, with an increase of just over 10% in the ten years before that. It is likely that the area will reduce by nearly 130 000 ha (10%) as areas are converted to alternative land uses and plantations in sensitive areas are removed to ensure compliance with international forest certification requirements. Thus, the total area under trees will have effectively remained the same over the past 20 years, unless new areas are opened up to forestry.

With economy of scale being an important factor in pulpwood manufacture, the industry in South Africa is dominated by only two companies, Sappi and Mondi, both leading international players. Scale is less important in the sawmilling industry, where LHA (2004) estimates there are 320 sawmills, 240 (75%) of which are small sawmillers (each producing less than 10 000 m^3 /annum) accounting for 25% of total sawtimber. Five major sawmilling companies (Global Forest Products, Hans Merensky, Safcol, Yorkcor and Steinhoff) account for 70% of sawtimber production.

Fifty percent of all plantations are softwood (predominantly Pinus species), nearly two thirds of which are for the production of sawtimber. Nearly 80% of all hardwood, virtually all for pulpwood, is made up of Eucalyptus species.

Since 1984 the proportion of plantations owned by the private sector increased from 65-70% to over 95%. This was due to the decision by Government to withdraw from forestry activities that are better suited to the private sector and to focus on its policy and governance roles. It is the stated intention of the government to withdraw completely from the management of plantation forestry operations.

Forestry South Africa (FSA), a national organisation that represents the interests of timber growers, estimates that the forestry sector contributes 2% of South Africa's GDP, 9% of manufacturing GDP and 10% of the GDP of the main forestry provinces. The forestry sector generates around R15 billion per annum and employs over 130 000 people, with some 60 000 employed in the growing of roundwood. Direct value of the wood sold from processing plants makes up R 5,1 billion of this amount. FSA describes the forestry sector as a world leader in forestry certification (reflecting environmental and social operational standards), records that it manages the conservation of some 400 000 ha of natural areas, has designated over 80 Natural Heritage sites and protects over 100 Red Data species. As far as its

contribution to socio-economic development, it supports health, education and infrastructure development at an annual cost of R 90 million.

There is a high level of racial disparity in the ownership of commercial timber plantations in South Africa. Transformation of the sector is the subject of the recently launched Broad Based Black Economic Empowerment Charter. In KwaZulu-Natal there are 19 000 small, predominantly black timber growers accounting for 44 000 ha. In the Eastern Cape, there are 130 growers on 160 ha, and three community plantations totalling 2 100 ha. Thus, there is a large discrepancy in the number of black timber growers in the Eastern Cape when compared to KZN. The fact that there has been no expansion of plantation areas is an issue that will have a significant opportunity cost over the next 30 years, as roundwood supply deficits develop. In their 2004 study, LHA estimates that, in a scenario of 3% GDP growth, a roundwood supply deficit of 14.3 million m^3/annum is likely. Taking into account the expected reduction in current forestry area, a further 775 000 ha of plantations will need to be established in order to meet the projected demand. Other options could include importing additional supply. The extent to which the Eastern Cape can and should accommodate a portion of this shortfall is the subject of this SEA.

Eastern Cape Overview

The commercial forestry area in the Eastern Cape covers 169 000 ha and represents 13% of South Africa's plantation resource. Forestry and timber products contribute R300 million a year to the national GDP, and the forestry sector employs approximately 8 700 people. Forestry areas are predominantly softwood (pine) with 151 000 ha grown for commercial purposes. Nearly 90% of these plantations are owned and operated by the private sector, with the balance by the Department of Water Affairs and Forestry (DWAF). The remaining 18 000 ha are hardwood plantations, mostly growing timber for use by local communities.

Timber yields in the Province do not fully reflect the potential of the existing plantations which could produce in excess of 2 million m^3/annum compared with current volumes of less than 1 million. Reasons for this include:

- A major new plantation, North East Cape Forests (35 000 ha), is not yet mature and is only now beginning to produce timber.
- Large areas are unplanted or sub-optimal due to fire damage and operational backlogs.

In the Eastern Cape, there are no major industrial wood processing facilities such as pulping, chipping, and board manufacturing. Eighty-five percent of the timber produced in the Province is processed by five large sawmills, mainly for the construction market. The remainder is processed as poles or industrial wood for pulpwood or chipboard. According to DWAF, there are as many as 65 small sawmillers who often process high value timber in marginal operations without timber supply security.

At the present time there are a number of interested parties engaged in discussions with the owners and operators of North East Cape Forests about the maturing resource against a backdrop of forestry industrial investment opportunities ranging from sawmilling to chipboard manufacture. The opportunities for additional forestry development within the Province are significant. Studies for the Wild Coast Spatial Development Initiative (SDI) estimated that 120 000 hectares of new plantation could probably be established in the Province, and in particular in the former Transkei, which covers most of the SEA study area. This SEA will help to confirm the actual numbers. Momentum for new afforestation is

building within a number of government initiatives, including the Department of Water Affairs and Forestry, Department of Land Affairs (DLA), Eastern Cape Development Corporation (ECDC) and the Eastern Cape Government, as well as the private sector.

Suitability to Locality

Commercial forestry occupies a relatively small percentage of land within the Focus Area (0.1%) However, the potential for increased commercial afforestation is widely recognized and has been documented in previous assessments. The *South African Atlas of Agrohydrology and Climatology* (Schulze et al, 1997) provides an assessment based on biophysical parameters of areas of the country suitable for typically grown plantation species. Figures 5.4.a through 5.4.c demonstrate, based on biophysical and climatic factors, where these common species can be grown in the country. The purpose of this SEA is to evaluate the potential for new afforestation in the region using not only biophysical and climatic factors, but also economic, social, ecological and institutional constraints and opportunities. This is being done using the guiding principles of Strategic Environmental Assessment.

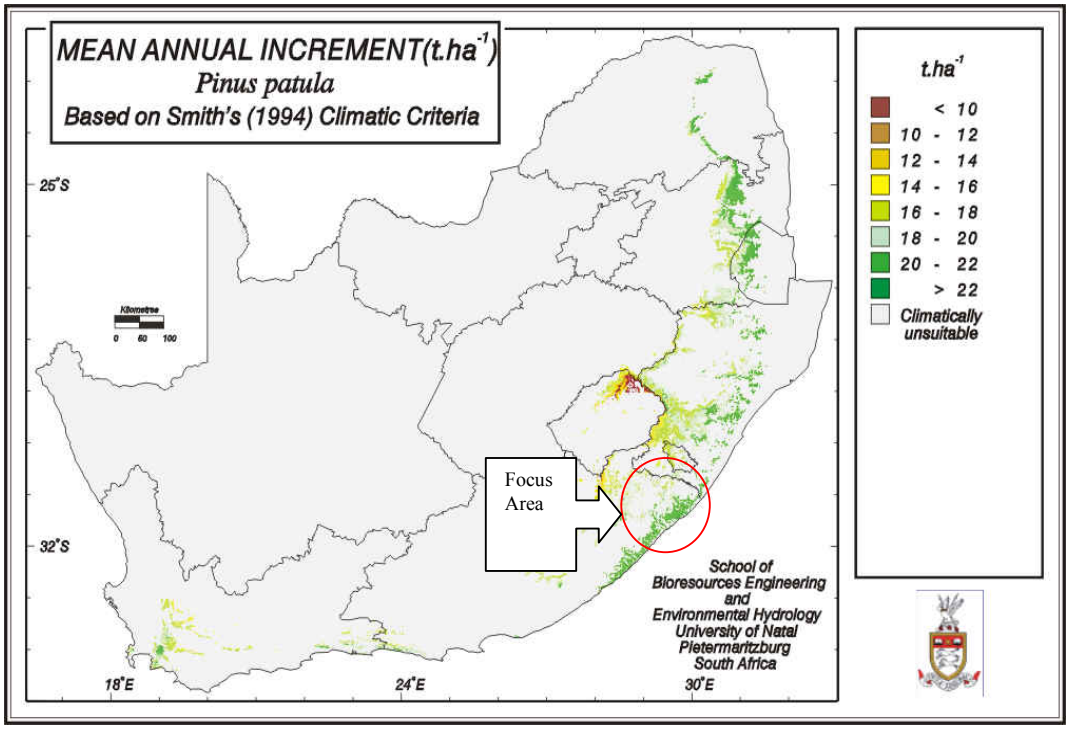


Figure 5.2.e: Pine Potential

The following is brief description of forestry in the Focus Area. Existing commercial plantations in the Eastern Cape portion of the Focus Area are described in Table 5.2.a, including the areas per species planted and the area temporarily unplanted (TUP) as estimated in 2001.

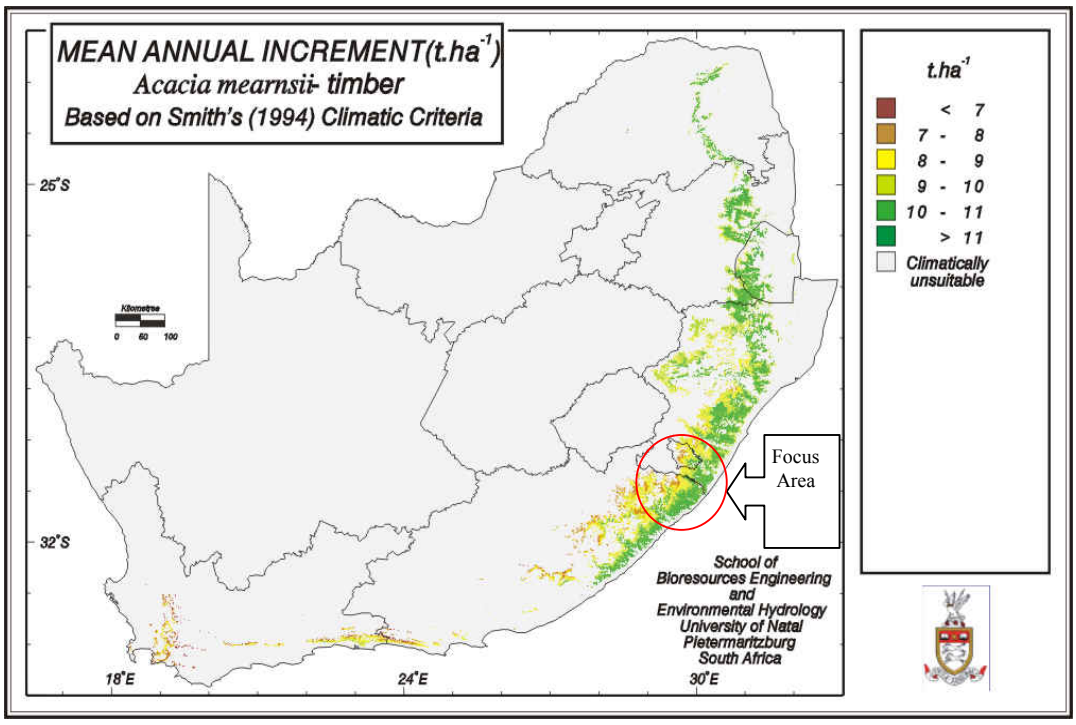


Figure 5.2.f: Wattle Potential

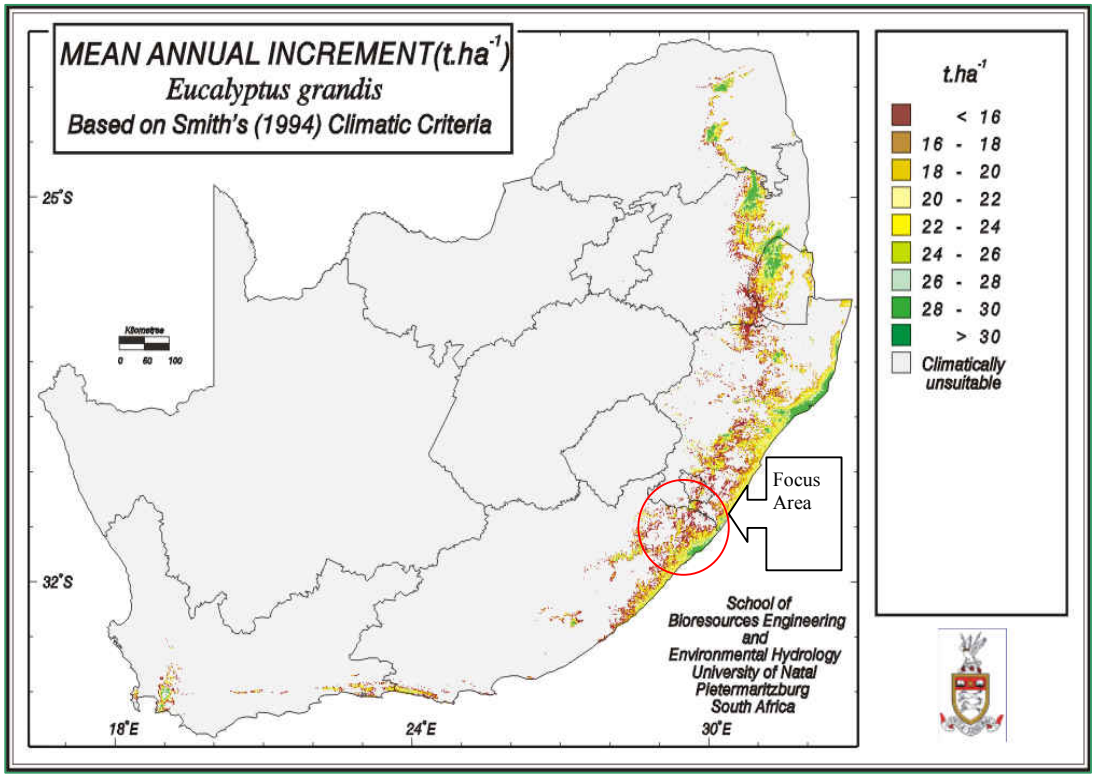


Figure 5.2.g: Eucalyptus Potential

Table 5.2.a: Existing E Cape Forestry Plantations in Focus Area

Exising Plantations in Focus Area					
Plantation	**Pine**	**Gum**	**Other**	**TUP**	**Total**
Fort Donald	5	97	1	5	**108**
Bulembu	572				**572**
Elubaleko		82	7		**88**
Ndindindi	389	9	9		**407**
Longweni		43	34	7	**84**
Bizana		258	518		**776**
Tonti	230	15	5	22	**271**
Insizwa	678				**678**
Tabankulu		89			**89**
Gomo	304	19		108	**431**
Ntsubane	334	66		1024	**1423**
Papane		219	12		**232**
Flagstaff		394	530		**924**
Lambasi		70			**70**
Magwa		50			**50**
Sappi (growers)		130			**130**
Greenville NPS	100	900			**1000**
Total	**2611**	**2440**	**1115**	**1165**	**7332**

Potential Yield from Existing Plantations					
Plantation	**Pine**	**Gum**	**Other**	**TUP**	**Total**
MAI (t/ha/a)	12	17	13	12	
Potential Yield (t/a)	**31333**	**41485**	**14496**	**13980**	**101295**

Note: MAI is Mean Annual Increment, a measure of the yield per growing season.

The total extent of the Eastern Cape forestry plantations in the Focus Area is less than 7 500 ha and it has the potential of producing around 100 000 tons of timber. Nearly 40% of plantations are made up of softwood, mostly producing sawtimber. These plantations are yielding well below their potential as a result of poor management under the Department of Water Affairs and Forestry. Over 30% of these plantations are temporarily unplanted (TUP) after excessive harvesting, fire damage and backlogs in re-establishment. Half of these softwood plantations are now operated by Singisi Forest Products under a 70-year lease arrangement. The softwood plantations were established midway through the last century and the sites would have been selected by foresters for high forestry suitability.

DWAF operates a number of hardwood plantations that consist mainly of gum species and were initially established for use by communities mainly for firewood, building poles and fencing. Plantations at Flagstaff, Bizana and Papane are relatively large, ranging between 200 and 400 ha. During the 1970s there was a functional pole preservation plant at Flagstaff, sourcing timber from nearby plantations. Since the establishment and subsequent expansions of the Sappi pulpmill at Umkomaas, much interest has been shown in the timber from Bizana and Flagstaff. The other hardwood plantations are scattered throughout the Focus Area, and although they may have commercial potential if grouped together and provided there is a local market, they are poorly served by logistics and infrastructure, especially roads.

During the 1970s a number of plantations were established on 'parastatal' land. With the objective of supplying timber to Sappi, the North Pondoland Sugar Company has planted 1000 ha of mostly hardwood. Magwa and Lambasi established some hardwood plantations both for the Sappi market and as fuel for the Magwa tea drying kilns.

The existing forestry plantations are mostly neglected or mismanaged (or both) and could make a significant contribution to the development of a local forestry sector if they were rehabilitated in parallel with any new afforestation programme.

The main markets for timber from existing plantations are:

- Umkomaas pulpmill (SAPPI) for hardwood pulpwood, Port Shepstone
- Harding Treated Timber for hardwood poles, Harding
- Weza Sawmill (Singizi Forest Products) for softwood sawtimber
- Tekwane Sawmills for softwood sawtimber, Mt Ayliff
- Mondi Merebank for softwood pulpwood or chip waste, Durban
- New NCT DWC chipping plant for hardwood, Durban
- Various small sawmillers, located at plantations

Although not regarded as "commercial," the use of timber for household purposes is significant in the rural areas, often with negative environmental consequences for indigenous forests, and livelihood implications for those who live far away from sources of wood. Shackleton, Grundy and Williams (2004) estimated that households use 0.689 m^3 (687kg) of wood per annum for fuel. If volumes of wood for construction and fencing were added, the amount increases to around 1 m^3/annum for households. This market is poorly supplied from plantations in the Focus Area. In some areas, villagers have planted small numbers of trees around homesteads to supply local needs. The species are usually Gum or Wattle.

New Afforestation Potential

In an effort to identify the areas in the WMA12 that are suitable for commercial forestry, the following approach was used, using various geographic information system (GIS) techniques. The following GIS coverages were extracted from their original sources or created and prepared as coverages of the WMA12 SEA study area:

- Mean annual precipitation (MAP) 1 minute grid values - Schulze (2004)
- Mean annual temperature (MAT) 1 minute grid values - Schulze (2004)
- Land type information, (CES/ARC 2004)
- Roads, SA Explorer, (Municipal Demarcation Board 2004)
- Existing and future forest product processing plants
- Working plan data of various forestry plantations located in the study area

An index value of the estimated potential timber yield was determined for each GIS polygon and four classes identified. The polygons varied in size according to their bio-physical characteristics, as the unique value of the climatic and soil variables were determined through a process of intersection of the various GIS overlays. The index values represent the expected response (i.e. their growth rate and yield) of commercial tree species to the climatic parameters of mean annual rainfall and mean annual temperature and the interaction with soil types and their depth. The classes are the following:

1. **Not suitable** – Commercial plantations are not recommended, planted trees are likely to succumb to the regular droughts that are experienced in these areas. There may be small, occasional localised areas where selected, drought-hardy species of trees could be grown for subsistence or shelter purposes, but not for commercial purposes.

2. **Low potential** – Commercial plantations are not recommended but there may be localised areas where small woodlots may be established, particularly for the production of poles and firewood for subsistence use.
3. **Moderate potential** – Commercial plantations could be established but yields will be low to moderate. Yields of 8-15 m^3/ha/a for pine, 22 m^3/ha/a for gum and 8 m^3/ha/a for wattle could be expected using modern silvaculture practices, appropriate siting and genetically improved plant material.
4. **Good potential** – Commercial plantations are recommended and yields will be productive. Yields of 11-22 m^3/ha/a for pine, 35 m^3/ha/a for gum and 10 m^3/ha/a for wattle could be expected using modern silvaculture practices, appropriate siting and genetically improved plant material.

The index values of the estimated potential timber yield were adjusted in order to take cognizance of the economic implications of the spatial location of the primary roads, and both the existing and potential location of processing plants. East London was added as a potential site for the development of an export or chipping facility and Butterworth was added as a future location of a pole preservation plant. The index values of those polygons that were within 10 km of a primary roads and/or within 50 km of an existing or future processing facility were increased by 7.5 points, which coincided with 0.5 of a class interval. This had the effect of indicating a higher potential for forestry for those areas in close proximity to a main road or a processing plant and therefore taking some cognizance of the economic implications of the cost of transporting forest products from the plantation to the processing plants. This adjustment is crude and could be improved upon at a later stage should it be necessary.

The adjusted index values have been incorporated into GIS layers and presented on a forestry potential map for the Focus Area (Figure 5.2.h). Catchments with a large proportion of their area having "Good" forestry potential are as follows:

Table 5.2.b: Catchments with "Good" forestry potential

Catchments		
Tertiary	**Quaternary**	**Region**
T60	D, H & J	South and east of Lusikisiki and along coast
T32	E, F, G & H	Near Mt Ayliff
T40	A & B	South and east of Kokstad in northeast portion of Focus Area

These areas define spatially where further strategic investigations of land use options have been undertaken during the SEA. Figure 5.4.d is a map of the Forestry Potential for the Focus Area. It identifies a total of 130 000 ha of "Good" and another 435 000 ha of "Moderate" forestry potential. Areas described as "Low" or "Not Suitable" equal approximately 102 400 ha within the Focus Area. These figures demonstrate the region's potential biophysical capacity for growing trees excluding other limitations. These limitations will include areas that should be excluded for new afforestation or other land uses with the potential for significant environmental impact. Site specific constraints such as steep slopes and existing settlements will further reduce the available area. In addition, consideration needs to be given

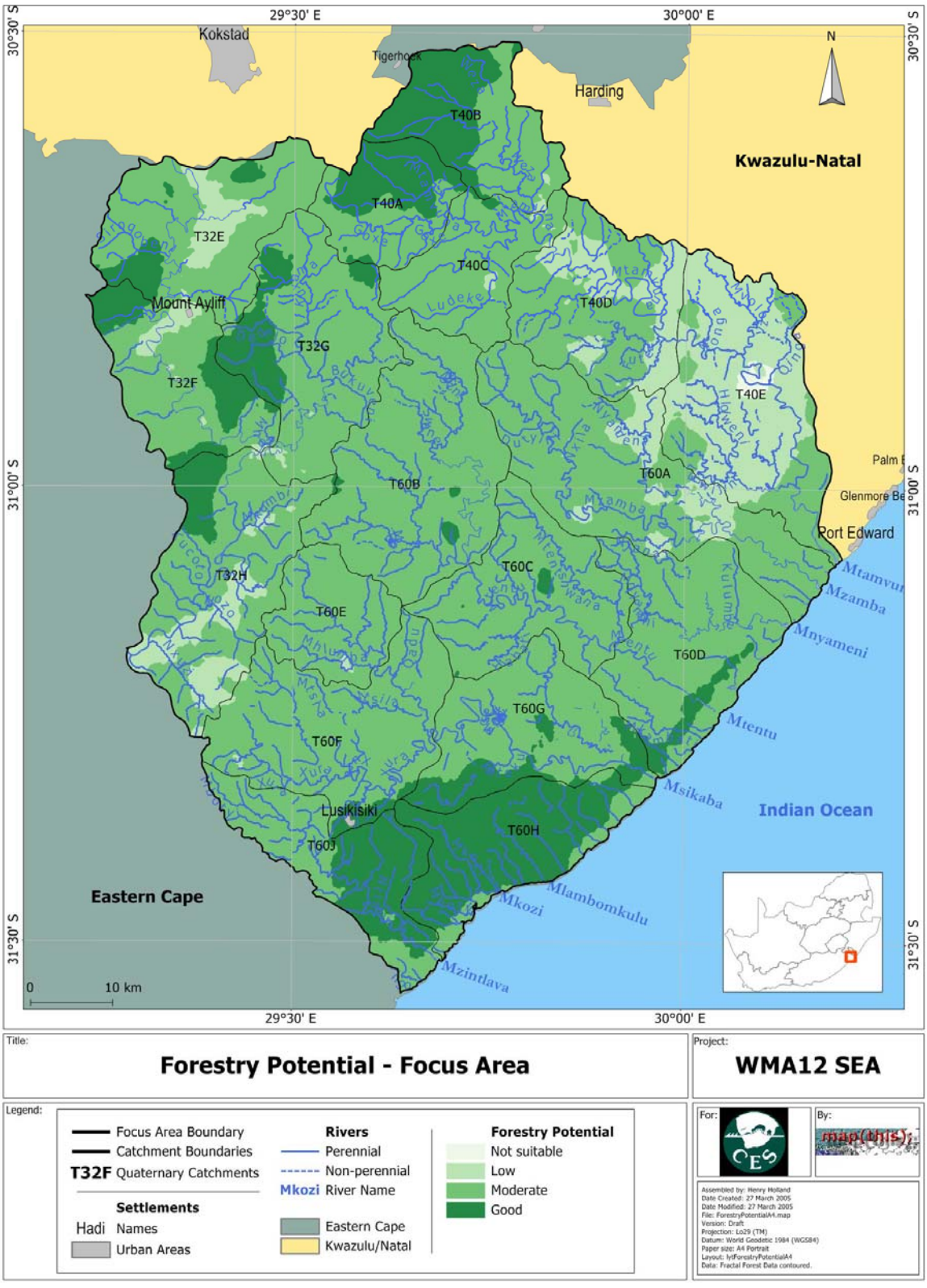


Figure 5.2.h: Forestry Potential – Focus Area

to the question of how much land residents of communal areas might be willing to make available for commercial afforestation projects. In the discussion below, the above estimate is refined through the identification of those portions of the Focus Area that are not suitable or available for commercial afforestation due to biodiversity, water and/or socio-economic constraints.

Conservation Reductions

Chapter 3 identifies those portions of the Focus Area that should be excluded from substantial new development interventions due to the potential for significant impacts upon the biodiversity and/or water resources. These potential land use interventions include new afforestation and commercial scale agricultural schemes among others. By subtracting these *Exclusionary* zones from the total potential for new afforestation as shown on Figure 5.2.h above, the result is a decrease of approximately 60% in available area. Figure 5.2.i maps the areas with afforestation potential minus these exclusionary zones. Totals for the Eastern Cape portion of the Focus Area are 22 483 ha remaining as *good* and 191 503 ha mapped as *moderate* (total of 213 986 ha). The total forestry potential of the Focus Area (including that portion in KZN), of both *good* and *moderate* mapped areas is approximately 229 000 ha, of which the vast majority (88%) is mapped as *moderate* with the remainder (12%) as *good*. This compares to an original forestry potential estimate of 565 000 ha (*good* and *moderate*) for the Focus Area. The area of *good* potential has been reduced by 73% and *moderate* by 56%, primarily as a result of the ecological sensitivity analysis where areas of ecological sensitivity are eliminated in order to meet sustainability and conservation priorities. Further reductions from more site specific constraints such as the existence of rural households and steep slopes will also occur but have not been quantified at this level of detail.

Socio-Economic Reductions

It is not possible to know with certainty how much land people living in communal areas are prepared to make available for afforestation projects without significant further consultation. We can however, make an estimate based on current practice and information concerning local livelihood strategies. We will begin therefore with an assessment of the current practices and circumstances.

In the Focus Area, rural households derive small but important monetary income from off-farm sources such as jobs, remittances and pensions. Consequently, they supplement these incomes with a diversity of land-based livelihoods such as cultivation, livestock farming and the harvesting of natural resources. These land based livelihoods provide food, water, medicines, shelter, fuel and transport goods and services to rural residents. Seldom is produce sold and if so, income from sales tends to be small. Due to the pervasiveness of poverty and the lack of reliable and sufficient sources of financial income, reliance on diverse livelihood strategies is critical to the survival of the household. This reduces the vulnerability of the household and protects them from financial shocks. These strategies are described in detail in Chapter 4 and their economic value is compared against other potential land uses in the Cost versus Benefits Analysis in Chapter 5.

Given this vulnerability, a reluctance to take risks and a dependence on diverse livelihood strategies, together with a lack of familiarity with and knowledge of forestry ventures and markets, it is very unlikely that residents of rural areas will be willing to consider making substantial portions of their land available for afforestation. Making land available for forestry, means removing this land from existing land use practices such as farming and grazing. The consequences of this will be increased pressure on the remaining land and

reductions in the product of existing land based livelihoods. These consequences will be considerable in areas where land is used quite intensively. In areas where some land, such as former arable lands, are not currently being used for cultivation (but are being used for grazing), residents may be willing to consider making such land available for forestry. However, this is not expected to be the norm in the Focus Area.

Given this situation, rural residents are likely to take a cautious approach. Some may not be interested in forestry. Those who are interested may initially make only small areas of land available and then wait to see what benefits materialize. If the benefits are seen to be significant in comparison to other opportunities, and they are adequately compensated for the loss of existing livelihoods resulting from the growing of trees, then they will likely allocate additional land to forestry in the future. However, unless forestry projects out compete other available alternatives (both in income and reliability) the amount of land made available will always be much smaller than the area of land used for existing land based livelihoods.

Another factor that will limit the ability of communities to make large areas of land available for forestry is the different interests within the communities and the potential for conflict. If grazing land is being targeted for afforestation, then the 30% or less of households who own livestock may be negatively affected and may object to such a project. Given the vulnerability of trees to fire and damage from livestock in the early stages of growth, there will be a need to accommodate the needs of all residents and gain their support, as well as to ensure that the residents of neighboring villages also support the project (rather than vandalize it). Conflict and tenure problems may be less of an issue in cases where arable lands are underutilized and residents are willing to consider making this land available for afforestation.

The proportion of land suitable for afforestation that could be made available by rural residents for afforestation projects will vary from place to place depending on local circumstances. Some communities may have very small portions suitable for afforestation and could easily make all of this land available for such a project, depending on how valuable the current use is to them. In other areas, where large portions of community land is suitable for growing trees, communities may only be willing to make a small portion of it available for such a project due to competition from other uses (i.e., maize production).

The existing afforestation projects in the Focus Area and in Mzimkhulu support the assertions made above (see Box 1 and 2). The area of land that was made available for afforestation in the specific communities listed below ranged from 3.6 ha/person to 0.2 ha/person. In the three Mzimkhulu projects, the proportion of community land made available for afforestation ranged from 10-15%. As indicated in the table below, sometimes these are communities making relatively large parcels of their grazing land available, sometimes they are individuals with their own small plots (either arable lands or former residential sites lost due to betterment planning). It is interesting to note that the area of land per person made available for forestry is larger when individual sites are made available than when community projects use communal grazing lands. This may be a result of the more direct individual benefits and the relative ease with which such decisions can be made in the case of individuals, as opposed to groups.

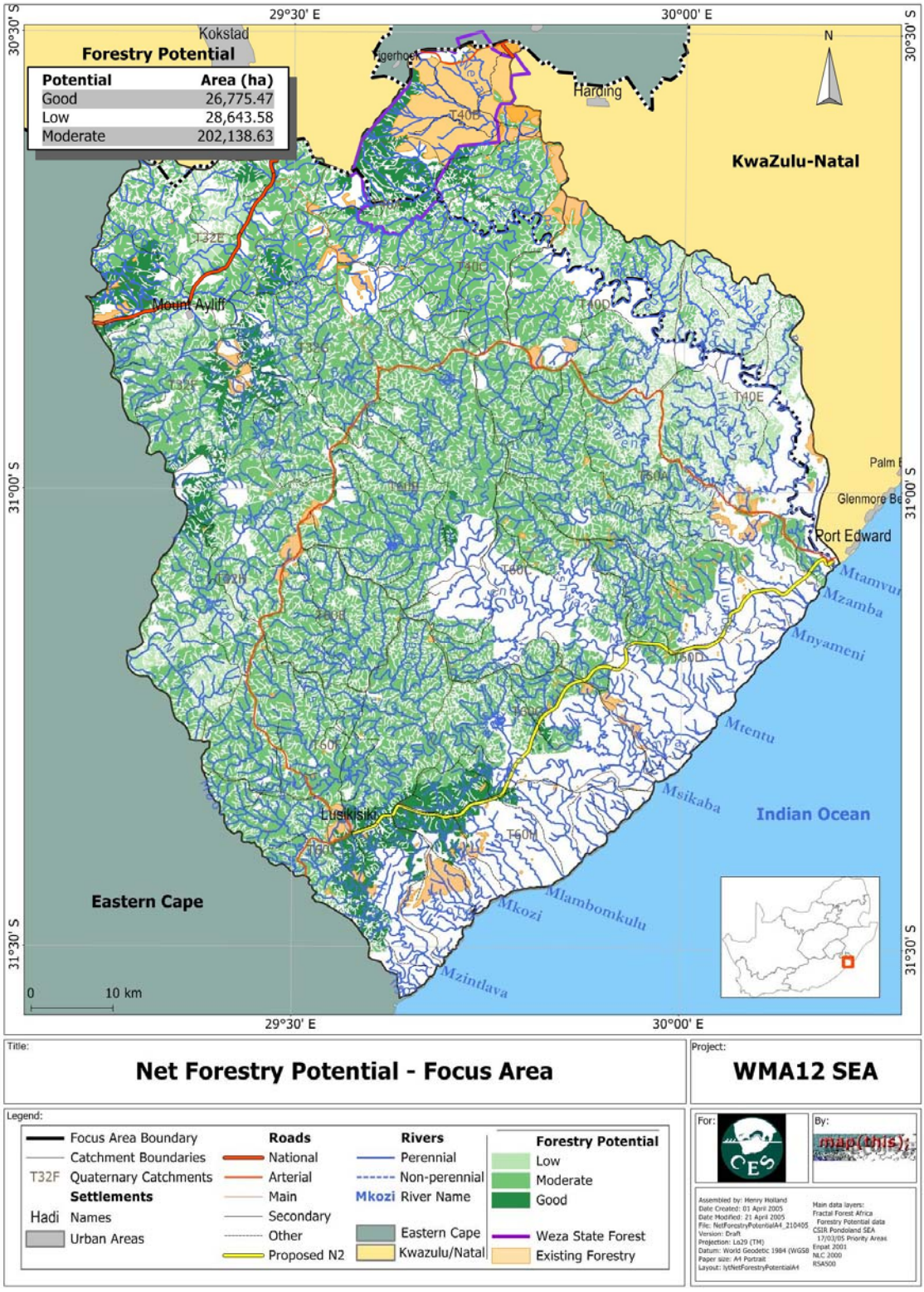


Figure 5.2.i: Net Forestry Potential Area within the Focus Area (Forestry Potential area minus the Exclusionary zones)

Table 5.2.c: Amount of land made available for afforestation projects in the Focus Area and Mzimkhulu

Project	Land Used	Group/ Individ	Number of Growers	Ha	Ha/Person
Tando – Mbizana	Pre-betterment Res. sites	individual	11	40	3.6
Mzizi – Mbizana	Arable Lands	individual	50	160	3.2
Proposed Lambasi – Qaukeni	Grazing lands	group	unknown	2000	?
Ngwevu - Mzimkhulu	Grazing lands	group	2700	472	0.2
Mabandla – Mzimkhulu	Grazing lands	group	2500	1300	0.5
Zintwala - Mzimkhulu	Grazing lands	group	400	286	0.7

On the basis of this information, we expect residents of rural areas who are approached with a commercial afforestation proposal, to take a cautious approach initially and make somewhere in the region of 10-15% of their land available for the project, gradually increasing to approximately 30% if the anticipated benefits are derived and continue to out compete other options for the majority of the residents. The determination of benefits will also be dependent upon the nature of the agreement between the growers and the forestry industry.

The Draft Focus Area SEA has determined that a total of 229 000 ha of good and moderate forestry potential exists in the Focus Area after subtracting out areas determined to be inappropriate for new commercial afforestation based on environmental and economic constraints. By applying the above rationale to the net forestry potential area of 229 000ha, the actual planted potential is further reduced to 22 900 (10%) to 34 350 ha (15%) as an initial potential planting area with a possible expansion up to 68 700 (30%) in the future. At the upper limit, this amounts to a total land cover of less than 2% of the Focus Area when combined with the existing areas of commercial afforestation. This compares to approximately 7% of Mpumalanga's land area being currently dedicated to plantation forest.

Box 1: Case study of a rural community that has made former arable lands available for afforestation.

Mzizi village – between Mbizana and Port Edward

This is an example of a small grower forestry project similar to those initiated by Sappi and Mondi in KZN. In this case, more than 50 growers are involved and 160 ha of previously under-utilised arable lands have been planted to forest (eucalyptus) for Sappi. Planting began in 1998/9. All those households in the village that had access to arable land are participating in the project. Sappi has entered into its standard small grower contract with each grower. The participants in this project appear to be relatively clear on the nature of the contracts and will begin harvesting soon. There has been no involvement of DLA or use of government grants and the participants are very enthusiastic about the project. Despite the individual nature of the contracts with growers, there is considerable cooperation and coordination between growers and this is facilitated by an elected committee. This organisational structure helps to minimize the administrative load for Sappi and helps the growers to overcome labour shortages and reduce costs. Apparently, Sappi is advocating this organisational approach in the interests of improving the productivity and efficiency of these small-grower projects. When Sappi first approached them with the idea, they did not considered any other land use

options and accepted Sappi's proposals, despite being aware of the nearby sugarcane development at Greenville.

Box 2: Case study of a rural community that has made communal grazing land available for afforestation.

Ngevu Trust Project: Mzimkhulu
Three villages, 2700 members/beneficiaries, 472 ha of former grazing land under forest [15-25% of land planted to trees]. Forestry project has been facilitated by Rural Forest Management (RFM).

In this case it was the community that first approached the forestry private sector parties about the possibility of forestry projects in their area. Some community members had worked in the forestry sector and were familiar with it. They initially approached the government run Singisi forests in 1995 but did not get a positive response. They then approached Sappi and Mondi and began negotiations with Mondi in 1996. These negotiations also involved the DLA in the person of Mr de Waal.

The negotiations, and legal and administrative process needed to get the project going took about 2 years before they got to the point of planting trees. This involved consulting with the communities, identifying the participants, negotiating issues such as how to structure the project, identifying and agreeing on where to plant the trees, conducting trials, setting up the community trust, applying for, negotiating a lease agreement and securing DLA's SLAG grants (secured in 2000), opening bank accounts and developing financial management procedures, getting afforestation permits from DWAF, etc.

In this project 475 ha of communal grazing land has been made available. When asked why they made grazing land available, it became clear that the choice of land for planting trees was informed partly by soil sampling aimed at determining the most suitable soil for trees, and partly by a perception that they had a considerable amount of under-utilised grazing land. It was also clear that the possibility of using individually held arable lands (as has been the practice in KZN) had not been considered when the project was initiated. A lack of familiarity with such land use options amongst participants and the lack of any in-depth discussion about alternative ways of structuring the project (including alternative land use options) during the design stage appear to be the main reasons for the choices made.

There appears to have been plenty of buy in from local residents, with 2700 shareholders signing up initially. There were some however who were sceptical and did not join the project when it began. The participants have subsequently decided to provide an opportunity for those left out to join the project and 300 of them have subsequently registered as members. The project has also tried to meet the needs of its neighbours by giving them employment opportunities as well (as participants).

Problems encountered by the project:

- lack of good roads and difficulties in getting government to assist with their upgrades,
- some conflict with residents from neighbouring villages being upset about loosing access to grazing land that is now under trees – cut fences in an attempt to access grazing and undermine project (this appears to have been a problem with neighbouring Singisi forests at a much earlier date).

Historical background to community:

This community is located on what used to be church land. A large section of this land was bought by the Apartheid state in the 1940s and managed by the SADT who implemented betterment in this area. No new people were moved into this area, but the existing residents were relocated into villages.

Summary of Afforestation Potential

The initial assessment identified a total of 130 000 ha of "Good" and another 435 000 ha of "Moderate" forestry potential, totaling 565 000 ha (*good* and *moderate*) for the Focus Area. This assessment primarily focused on biophysical and economic parameters. The SEA then subtracted the areas that should be excluded from new development because they were already densely settled or had the potential to negatively impact upon the biodiversity and/or water resources of the Focus Area. This left 26 775 ha (12%) remaining as *good* and 202 139 ha (88%) mapped as having *moderate* forestry potential, with a total net forestry of approximately 229 000 ha. The area of *good* potential has been reduced by 80% and *moderate* by 54%. This SEA then addressed the question of how much communal land rural residents might be prepared to make available for afforestation developments. Our conclusion is that the area that may be made available by local communities is approximately 10-15% of the total initially, with the potential to increase to 30% if the benefits are found to be acceptable. This leaves an amount of approximately 22 900 (10%) to 34 350 ha (15%) as an initial potential planting area with a possible expansion up to 68 700 (30%) in the future.

Limitations

A key constraint to expansion of the forestry sector has been the introduction of a more stringent forestry licensing and authorisation process approximately 10 years ago. This process requires a thorough consideration of the environmental impacts, with detailed analysis of the potential impact of afforestation on catchment hydrology and water. The past decade has been characterised by frustrated attempts by the forestry sector to obtain permits (until 1998) and licenses (from 1998) for new afforestation, especially in the major forestry centres, where water abstraction levels for affected catchments were seen to be at their limits. One area where large-scale new afforestation is considered possible, from a water use perspective, is the Eastern Cape. The results of this draft SEA indicate that within the catchments analysed, sufficient water is available to support a substantial increase in commercial forestry.

Together with inherent site potential, transport infrastructure is a key factor for economic viability of forestry development. In the Focus Area, because of the distances from markets, transport costs represent between 25% and 40% of total direct costs. Viability is dependent on the development of an improved road network and the construction of direct road and rail links to the commercial routes of KZN. At present there is no rail link between KZN and the Eastern Cape. The N2 toll road being contemplated between Port St Johns and Port Edward would decrease the transport distances from the Focus Area to the major timber markets and improve supply routes to unlock the economic potential of the area. The fact that the transport network is not ideal at this stage should not prevent commercial forestry development. Local government may be obliged to support economic developments with the provision of required infrastructure. However, it is suggested that the infrastructure investment be justified by a concomitant return through economic development.

Although forestry itself does not require electricity, it is necessary for processing and is beneficial for any commercial development. The electricity supply network has expanded rapidly in recent years and given the national attention on the Focus Area, the provision of

electricity is likely to realise as required. The telecommunication network extends to the region's towns and some of the rural areas. With the expansion of telecommunication being subject to consumer demand, it is unlikely that this will be a limiting factor.

Wood Processing

Within KwaZulu-Natal, Weza Sawmill is the most significant wood processor in the Focus Area vicinity. Annual processing is currently at 140 000 m^3/annum. Previously owned by Safcol, Weza is owned by Singisi Forest Products of which the majority shareholder is Hans Merensky Holdings. Although initially planned by Safcol as a vertically integrated primary and secondary wood processor, these plans have not materialized, and value adding is limited. Consideration is being given to the introduction over the medium term, of an industrial wood processing facility with a capacity of 350 000 tons per annum.

Downstream plants that were once flourishing are now under threat because of the unsustainable supply of timber from existing plantations as a result of poor management, and different supply channels as a result of changed ownership. Examples are as follows:

- Tekwane Sawmills, which has a capacity of at least 40 000 m^3/a, in Mount Ayliff relied on supplies from the Amanzamnyama Estate which is now unable to produce even the minimum commitment of 24 000 m^3/a. Nearly 60% of the Amanzamnyama Estate is temporarily unplanted (TUP). Tekwane is currently sawing under contract to Singisi Forest Products.

- LMS Sawmills was a small operator that was based at Ntsubane Plantation which is now depleted of harvestable timber due to uncontrolled harvesting and fires. It was liquidated in 2004 as a result of maladministration.

- The Flagstaff Pole Preservation Plant is small. Consideration should be given to upgrading and expansion given the growing demand for treated poles.

Future Processing Development Options

Downstream opportunities in forestry are dependent on the scale of sustainable wood supplies and are at the sharp end of commodity cycles and changes in supply/demand balances. Successful processing plants are those with shortest raw material supply distances, niche markets and lowest cost production units. In comparison with the major forestry centres of Mpumalanga and KwaZulu-Natal, the Eastern Cape Focus Area has relatively undeveloped forestry markets. At the present time, commercial opportunities lie outside of the Focus Area. This section identifies the most significant downstream operations and notes the distance (using current road infrastructure) from Flagstaff, a relatively major centre within the Focus Area, on a major road. ***Note: Most forestry developments are likely to take place some 50 km further than Flagstaff.***

Although value adding (secondary processing) opportunities do exist and will increase as the forestry sector develops, the initial strategic focus should be on primary conversion of logs to a range of cost effective wood products that, given sufficient scale, could justify further beneficiation. The major solid wood markets are well developed in the regions, although they are on the margins of economic transport distances. The largest markets are Singisi (300 000 m^3/a capacity) and Weza (300 000 m^3/a capacity). Distance from Flagstaff is 150 km and 120 km respectively. The closest is Tekwane which is 100 km from Flagstaff. Harding Treated Timbers (30 000 m^3/a capacity) is more than 150 km from Flagstaff.

The closest markets from Flagstaff for hardwood pulpwood are Sappi Saiccor at Umkomaas (230 km) and the NCT DWS chipping plant at Durban (290 km). For softwood pulpwood, the closest market is Mondi Merebank in Durban (290 km).

The most likely downstream developments are therefore:

- **Increasing capacity** of existing sawmillers through additional shifts, more processing lines and improved handling facilities. Between Singisi, Weza and Tekwane a further 300 000 tons (20 000 ha equivalent) could be processed at the existing facilities.
- Introduction of **veneer and industrial wood processing** facilities alongside the existing solid wood processors. At present, tree processing is sub-optimal. Butt logs are sawn when they could be turned into high-value veneer. Pulpwood and sawmill waste chips are transported more than 150 km to Merebank in Durban. The introduction of veneer and board plants, alongside large sawmills will enable optimisation of the tree and produce a range of products that are suited to onsite value addition. At present, some 80 000 tons/a of pulpwood and chips are transported from Weza and Singisi to Merebank. A Medium Density Fibre (MDF) Board plant with a capacity of 350 000 tons/a is under consideration at Weza.
- **Entry of new sawmilling operations**. Technical developments are enabling sawmills to improve the processing of smaller logs. This enables the shortening of rotation lengths to around 16 years for softwood species. At an annual volume of 45 000m^3/a (3000 ha equivalent) and capital expenditure of R 20 million, a profitable sawmill employing 150 people could be established.
- **Pole Preservation.** With expansion of electrification in rural areas and modernization of livestock farming taking place, demand for treated poles is increasing. The introduction of one new 30 000 m^3/a (2000 ha) scale pole treatment plant could be justified within South Africa's market context. Butterworth (within the SEA Contextual Study Area) has been identified as a potential location for a new facility.

Other downstream developments often raised are pulp mills and chipping plants. **Pulp mills** are large capital intensive processors that have specific infrastructure requirements to be competitive. Either they should be near the major domestic markets or at an export facility. Sappi's Ngodwana is only 250 km from South Africa's major Gauteng market and within 350 km of the export harbour of Maputo. Mondi's Richards Bay and Merebank plants are within 20 km of export harbours. The minimum volume that would justify a modern pulpmill is 600 000 tons per annum (50 000 ha forestry equivalent). A modern thermo mechanical pulp plant will use 1 500 million m^3 of water per annum and cost some R 1,5 billion to construct, while a chemical pulp plant will use 10,000 million m^3 of water per annum and cost nearly R 5 billion to construct. Even though market development over the next 20 years and rate and scale of new afforestation may produce enough raw material for a pulpmill it is unlikely that this will occur in the Focus Area due to a lack of suitable infrastructure (roads, rail, housing, electricity) and export facilities.

Chipping plants have also received considerable attention. In the absence of a competitive pulpwood market, chip export businesses have been developed over the past two decades. At present, there are three in Richards Bay and one in Durban. While the chips are presently exported, as domestic fibre supply shortages realise some of these exports may be directed to local pulp mills. With the export focus, it makes sense for chipping plants to be located at harbours. It is possible that, as the current oversupply of wood turns to an undersupply, domestic prices for woodchips will justify chipping plants that are not export oriented. The minimum scale of a chipping plant is 300 000 tons per annum (25 000 ha equivalent), at a

cost of R80 million. Although not immediately obvious, a chipping plant in the Focus Area supplying Saiccor at Umkomaas is a possibility in times of extreme wood supply shortages.

It should be noted that, although there is a market for **hardwood sawtimber** from Gum plantations, it has not been covered in detail in this study. In South Africa, hardwood sawtimber is processed by a small number of operators, notably Hans Merensky Holdings with large plants at Tweefontein and Northern Timbers, and Twinstreams with a small plant at Harding. The growing and processing of hardwood sawtimber is highly technical, with the value chain characterised by relatively lower prices, higher processing costs and lower recovery rates when compared with pine sawtimber. Growing of Gum sawtimber requires good sites, selected genetic material, precise silviculture and relatively long rotations (at least 18 years). Unlike Pine, Gum sawtimber needs to be sawn within 24 hours to minimize degradation which further reduces recoverable timber. Although it should not be precluded as a possible private sector driven option, this product is unlikely to receive "mainstream" attention in the Focus Area given the distances from existing processors and the relatively specialized nature of the value chain.

The key features in the selection of downstream processing options are listed in Table 5.2.e below. For a new forestry area in a community context, the most likely entry-level downstream processing option is a hardwood pole treating plant, which is relatively low in capital requirements and can be viable at comparatively low levels of timber supply.

Table 5.2.e: **Downstream Wood Processing Options**

Downstream Wood Processing options					
Features	**Sawmill**	**Pulpmill (Hardwood)**		**Pole**	**Chipping**
	Softwood	**TMP**	**Chemical**	**Treating**	
Minimum Scale (tons/a)	40000	250000	1500000	30000	300000
Maximum Scale (tons/a)	600000	200000	3000000	200000	1500000
Economics per ton					
Price	1150	3150	3650	750	380
Processing Cost	568	1770	1390	380	100
Roundwood	382	500	900	280	240
Nett Income	200	880	1360	90	40
Capital Cost (R millions)					
Minimum Scale	20	1500	4800	5	80
Maximum Scale	300	2000	7500	20	500
Annual Water use (megalitres/a)					
Minimum Scale		1500000	10000000		
Maximum Scale		2500000	20000000		
Employees (permanent)					
Minimum Scale	80	180	360	50	40
Maximum Scale	300	180	400	100	75

Private and Public Sector Initiatives

The private sector afforestation initiatives in the Focus Area have already been described in sections 4.4. There are currently no State initiated afforestation initiatives, however, since 1994 the Department of Water Affairs and Forestry (DWAF) has introduced major policy and structural changes. DWAF's new community forestry policy focuses on using forestry as "a vehicle for economic upliftment and improvement of livelihoods in impoverished areas" (DWAF, 1997). As a result of these policy changes, DWAF is in the process of withdrawing from the ownership and management of its forest plantations and has redefined its role. It now sees it's role as that of creating an enabling environment that encourages private investment, and to act as a broker facilitating partnerships between communities and the private sector that promote rural development. The Category A State plantations have already been leased to private sector companies, and in the Focus Area this involves the Wesa Forests which have been leased to Singisi Forest Products. The smaller Category B plantations have also been earmarked for lease to commercial companies but this process has not begun yet. The ownership and management of Community woodlots may also be transferred to local residents in the long term, but this is expected to be a difficult and lengthy process and the outcome will depend on developing the capacity of the intended beneficiaries to manage these resources themselves.

Conclusion

There appears therefore, to be significant afforestation potential in the Focus Area. This draft SEA has determined that an estimated 22 900 - 34 350 ha could be planted initially with a possible expansion up to 68 700 in the future. Additional forest products could be obtained from the commercial exploitation and rehabilitation of existing State owned plantations. Between existing processing facilities and the upgradings currently under consideration (see section on Future Processing Options) there would be sufficient local processing capacity to accommodate 48 000 ha of forest plantations (excluding that which might be processed through the KZN pulp mills). There seem to be no fatal constraints to the processing of forest products based on an assumption of 15% (34 350 ha) of the net afforestation potential area being planted. The processed products would then either be consumed locally and/or exported to other areas. Given that an estimated 775 000 ha of additional plantations will need to be established in order to meet the projected future demand for wood products within South Africa, and provided that timber can be made available at competitive prices, there is no serious concern about finding a market for these products. However, ensuring that timber can be made available at competitive prices, implies that afforestation developments must be restricted to areas that are within relatively easy reach of existing markets and processing facilities. Investments in road and rail infrastructure that could improve access to markets could increase the profitability of afforestation projects and increase the potential area that could be planted.

From a livelihoods perspective, wood is still an important resource in traditional rural areas. It is used for building, fencing and energy. In large parts of the Focus Area, wood supplies are either far from households, thus requiring significant harvesting and collection effort, or located in indigenous forests, with consequences for sustainability and loss of biodiversity. While existing plantation forestry goes some way to meeting the local demand for wood, these plantations are inaccessible to most of the communities. Future afforestation options should not exclude communities or individuals who may wish to establish trees for livelihood purposes. In time, surpluses of such plantations could develop commercial value.

Other options not assessed as part of this SEA, but perhaps with some merit, include the establishment of hardwood plantations or the planting of indigenous trees to supplement local supplies for firewood, traditional medicines, crafts, building supplies and to support local wood carving or furniture industries. Indigenous tree species are generally more "environmentally friendly" requiring less maintenance and having higher resistance to pests, disease and local climatic conditions and could be regulated more "leniently". Hardwood plantations could also result in greater downstream processing opportunities hence benefiting local communities. Other models worth investigating include forest grazing (spacing of individual trees to allow for grazing of livestock), forest farming (planting of shade tolerant crops within existing or planted forests), and the sale of non-timber forest products (NTFP). However, an investigation of these livelihood strategies is beyond the scope of this SEA.

5.3 OPPORTUNITIES AND CONSTRAINTS MATRIX BY LAND USE OPTION

In sections 5.1 and 5.2 of this chapter, the potential land use options for the Focus Area have been selected and described. These include the commercial production of maize, livestock, sugarcane and tea, new afforestation plantations and conservation based tourism. These potential land uses all exist to a certain extent within the region. One of the major objectives of this SEA is to assess the potential for these land use options, as well as existing subsistence land uses (status quo), to achieve the targets for poverty alleviation and sustainability as discussed in the beginning chapters of this report. One of the main instruments used to evaluate the relative sustainability of such land use options in SEAs is an 'Opportunities and Constraints Analysis'. In this section, the biophysical (including water use), social, economic and institutional constraints and opportunities for each of these land use options (including the Status Quo) are discussed individually and ranked as Major or Minor. Thereafter, in order to assess the most appropriate land uses, a "side by side" comparison of the different options is undertaken and summarised in Table 5.5.

5.3.1 STATUS QUO

The subsistence land uses and land-based livelihoods found in the Focus Area (referred to here as the 'Status Quo' land uses) are described in section 4.3.8 of this report. In this opportunities and constraints analysis this land use option is used as the baseline against which the other potential land use options are valued. While there are opportunities and constraints (as discussed below) associated with the continued use of this option, it is assumed that this use will continue regardless of the outcome of this SEA. In terms of this SEA, it is the "default" land use option, or the "no development alternative."

Biophysical: Subsistence level land use is practiced extensively in the region. There are MINOR opportunities to intensify this land use further within the region. More intensive gardening practices could result in higher yields. However, the necessary inputs such as labour saving technologies, fertilizer, water, fencing, etc., are beyond the means of most residents and not easily obtained. In many areas, grazing land is inadequate and the veld is characterized as being at its carrying capacity. This leads to land degradation (seen as a biophysical constraint) to the substantial intensification of this type of activity. Water use for this land use is generally low but there is little storage available for use during drought periods. Drought and the sensitivity of the landscape to the continued harvesting of natural resources are seen as MAJOR constraints to this form of livelihood. Considerable damage to the resource base has been documented (see Chapter 3 and the Technical Report) due in part to overuse (linked to poverty), poorly managed and non-regulated use of natural resources, and growing population numbers. Given the high levels of endemism of major portions of the

Focus Area, and the sensitivity of the streams and other aquatic resources (for example, estuaries), the biophysical environment is seen as a MAJOR constraint to the intensification of the Status Quo land use option.

Social: MINOR opportunities are associated with this land use from a social perspective. More intensive cultivation may assist in food security, but the necessary inputs may not be readily obtainable due to social, capacity and economic constraints. These constraints are MINOR in that the land use practices are common and well accepted within the local communities. Constraints may arise where there is conflict over competing or non-compatible land uses. Examples may include the location of nature reserves, forestry or tourism in areas utilised by local inhabitants for the collection of medicinal plants.

Economic: This land use option presents only MINOR economic opportunities beyond the subsistence level. Although the non-economic importance of maintaining the Status Quo as a rural livelihood strategy should not be underestimated, as a vehicle for poverty alleviation the option has little to offer. The economic constraints to this land use option are MAJOR, as the inputs needed to increase production to the point of providing real poverty relief are significant and beyond the means of most households. The opportunities and constraints to the commercialisation of agriculture are dealt with below.

Institutional: The institutions responsible for enhancing rural livelihoods in the Focus Area are not well developed. They offer only MINOR opportunities to the establishment of programmes aimed at improving living conditions for the local population. Local farming cooperatives, craft guilds, food growing schemes, etc., have been attempted but have met with only minimal success (see discussion in Chapter 4). Service delivery is generally poor in this region. The constraints to using the Status Quo land use option as a vehicle for poverty alleviation are thus MAJOR. While some improvements have been documented, the financial investment required from government to substantially improve the current living conditions is staggering due to the widespread population, lack of current services, infrastructure and institutions. Household access to capital and credit is problematic and micro-financing schemes have not been made widely available.

5.3.2 COMMERCIAL LIVESTOCK PRODUCTION

Large scale commercial livestock production is practised to a very limited extent in the Focus Area. Existing livestock production is described in section 4.3.8 and 4.3.9 and commercial options in 5.2.2. The Opportunities and Constraints Matrix (Table 5.3.b) characterizes this land use option as follows.

Biophysical: The biophysical opportunities for commercial scale livestock production are MINOR. In many areas, additional grazing land is scarce and the veld is characterized as being at its carrying capacity, with overgrazing and frequent burning having reduced the carrying capacity of the sourveld grasses, which have low nutritional values. This has led to land degradation, which is seen as a biophysical constraint to the substantial expansion of this type of activity. Water use for this land use is generally low and storage is needed for intensification and for use during drought periods. Considerable damage to the biophysical resources has been documented due to overgrazing and burning. Given the high levels of endemism of major portions of the Focus Area, the sensitivity of the streams and other aquatic resources (for example, estuaries), and the low nutritional value of the grasses, for the most part the biophysical environment is seen as a MAJOR constraint to commercial livestock production.

Social: The majority of the local population have a long history of animal husbandry, being expert cattle farmers in particular. There is considerable acceptance of this form of land use and it maintains high values (culturally) for the existing population. However, considerable historical resistance to the intensification and reorganisation of livestock production and its dependence on effective tenure reforms would constitute major constraints to this land use option. For these reasons, livestock production is seen as having MAJOR opportunities and MAJOR constraints from a social perspective. However, the need to provide fodder to stock may constrain household level food production. The skewed ownership issue is also problematic with respect to equitable income distribution.

Economic: There are few examples in the study area from which to draw conclusions with respect to the economics of commercial livestock production. At a subsistence level, and perhaps up to a small scale production level, the activity is extremely important as a rural livelihood strategy. However, it has failed to provide substantial amounts of employment, income or downstream positive impacts for the majority of the residents in the region due to its disconnection from formal commercial markets. As a driver of poverty alleviation, it offers MINOR opportunities. The economic constraints to the expansion of this land use option are MAJOR (and similar) to the other commercial level alternatives. In addition, the higher direct use values of livestock (due to their multiple uses) in comparison to the low market values of livestock and their products undermined the attractiveness of this land use development. Lack of markets, processing facilities, poor infrastructure, stock theft, and the need to provide nutritional supplementation of up to 40% from fodder production are all likely contributors to an overall lack of interest in this option.

Institutional: There are no major institutional initiatives associated with commercial livestock production in the region and given the lack of infrastructure, governmental input would need to be significant. The opportunities are considered MINOR for this land use option. Constraints include the distance from formal markets, lack of infrastructure and government or NGO sponsored programmes, weak land use management systems and the lack of agricultural extension services. Individual livestock farmers could be encouraged to engage more in the market if adequate support and market access was provided, but such commercialisation would need to be accompanied by efforts to manage the use of grazing land more sustainably and would probably require some form of institutional and tenure reform. The current land tenure system and individualistic farming practices do not yet provide a mechanism wherein commercial production can take place with the proceeds being distributed equitably among the community. Such a change would require some form of lease and collective management of grazing land by the livestock farmers (individuals or groups) from the whole community (represented by a Communal Property Association or other legal entity). This is not a system that has been seriously considered by the local population yet and would probably encounter some opposition from livestock farmers who have previously had free assess to such resources (although with many social obligations). There are also serious constraints in terms of government capacity to facilitate such tenure and institutional reforms. Consolidation of lands into single holdings via lease agreements or title ownership is not likely to be socially acceptable. For these reasons, the institutional constraints for this land use are MAJOR.

5.3.3 COMMERCIAL MAIZE PRODUCTION

Commercial maize production is practised to a limited extent in the Focus Area and considerable attention to this form of land use has been given in section 4.4.1 and 5.2.3. Existing cultivation is described in 4.3.8. The following is a summary of the opportunities and constraints of this land use option, as presented in Table 5.3.b.

Biophysical: According to the *South African Atlas of Agrohydrology and Climatology* (Schulze et al 1997) the growing conditions are conducive for maize in major portions of the Focus Area, thus offering MAJOR opportunities. Where the growing conditions are more moderate, the opportunities are Minor. The long-term environmental impacts of large scale commercial operations can be significant and widespread. Commercial agriculture clears the landscape of natural vegetation and therefore can have a significant impact upon biodiversity. Given the sensitive nature of much of the Focus Area (discussed in Chapter 3 and documented with the Systematic Conservation Plan), the biophysical environment is seen as a MAJOR constraint to this land use option. Water use for "dry-land agriculture" is a minor constraint in that rainfall is generally sufficient for maize production. However, regular drought cycles do occur in this area and can create significant risks for farmers. Irrigation schemes are cost-prohibitive in many cases and also result in considerable impacts to natural stream flow processes. Dam failures and illegal dam structures are a noted problem in South Africa.

Social: The Massive Maize Production Projects have been relatively well received by the community and interest and participation levels have been high. However, expectations were also high but unfortunately, not met. Familiarity with the crop, favourable growing conditions and government subsidies are all positive factors in the implementation of the schemes. For these reasons, the Social opportunities are seen as MAJOR, with only MINOR constraints.

Economic: Chapter 4 of this report provides a description of the Massive Maize Production schemes in the Focus Area. The results of the programme have been only marginally successful from an economic perspective. Market prices of maize are low, and not anticipated to climb substantially higher in the near future. This together with the lack of infrastructure for storage, processing and shipping effectively disconnects farmers from local maize markets and distant external markets. The programmes, as currently operated, are not expected to be economically sustainable without substantial government subsidization over a considerable period and policies aimed at encouraging retailers to purchase locally produced maize. So while the high local demand for maize is a MAJOR opportunity, the low prices and the unwillingness of government to intervene in markets results in MAJOR constraints to accessing the general economic opportunities.

Institutional: Much of the ground-work for the various production projects has been laid and there is good community buy-in. However, much more is needed in the way of market identification and networking, infrastructure construction, financing, training and other technical assistance. These inputs amount to considerable government investment, which is unlikely given the current depressed nature of the maize market and governments' unwillingness to intervene in agricultural markets. The institutional opportunities and constraints for commercial maize production are therefore both MAJOR.

5.3.4 TEA AND SUGARCANE PLANTATIONS

Both commercial tea and sugarcane plantations exist within a limited geographical region of the Focus Area and are described in sections 4.4.1 and 5.2.4 & 5. The following is a summary of the opportunities and constraints of this land use option, as presented in Table 5.3.b.

Biophysical: Commercial tea and sugarcane plantations are only viable at a certain "economy of scale". This requires mechanized cultivation and in many cases, irrigation and large inputs of chemical fertilizers and pesticides. The growing conditions are conducive in

portions of the Focus Area for tea and sugarcane, therefore offering MAJOR Opportunities in those areas, but only MINOR opportunities outside of these zones. Water use for tea and sugar production is based on natural precipitation which is adequate for the area in question. It is therefore a MINOR constraint for this land use. Although these operations do not tend to occupy large tracts of land, the long-term environmental impacts will be fairly significant as suitable land falls within the Pondoland Centre of Endemism. Given the sensitive nature of the areas in which tea and sugarcane are currently grown, the biophysical environment is seen as a MAJOR[1] constraint to this land use option.

Social: Commercial tea and sugarcane production exists in the Focus Area, employing a substantial number of people (roughly 1 500 in primary production), and generating revenue to the local economy. There is an existing set of skills in place and capacity to employ more people. Both operations have been in place for a number of years, albeit with varying levels of success, and consequently the social constraints are MINOR. However, as a land use option for poverty alleviation, they offer only MINOR opportunities for the Focus Area as a whole, while the benefits are greater for those people with an opportunity for direct employment.

Economic: While tea has a readily identified and fairly accessible market within an economically viable distance, sugar production is very marginal in the Focus Area as it is more than 50 km away from the nearest processing facilities. Both operations have demonstrated an ability to show profits and provide substantial economic benefits to the local population and region, but have depended on significant government support to maintain operations. They have designated areas for expansion and both can supply a greater market share and have an opportunity for value added services such as transport, processing and service industries. The potential of these LUOs to contribute to economic development in the Focus Area remains limited due to the relatively small areas of crop suitability and fluctuating and marginal profitability of the operations. For these reasons, the economic opportunities are considered MINOR for the existing facilities and for expansion opportunities. The constraints are considered MAJOR for the current operations to provide substantial poverty relief outside of their current areas of operation.

Institutional: Institutional issues exist for both operations. These include a need for infrastructure and capital investments, access to financing, management problems, land claims and labour relations. However, given the potential profitability of the operations, the institutional constraints are considered MINOR. The opportunities are considerable MAJOR given a motivated and capable work force, current and historical business knowledge in the region and good market acceptance of the products, however, this only applies to the specific operations within their limited expansion opportunities and not to the Focus Area as a whole.

5.3.5 CONSERVATION AND TOURISM

Tourism developments in the Focus Area are described in section 5.2.5. The following is a summary of this land use option as presented in Table 5.3.b.

Biophysical: The biophysical environment provides MAJOR opportunities for tourism development along the coast and within selected inland sites. The scenic natural beauty, diverse ecosystems and rural character all add to the potential. Constraints are limited to mostly site specific design and compatibility issues, and access by road. Protection of natural resources from over-exploitation and pollution (i.e., improper sanitation, runoff, etc) can be

[1] This may be considered minor due to limited spatial extent

dealt with at the individual project level. The constraints are considered MINOR from a biophysical perspective.

Social: Tourism projects exist in the Focus Area, employing a substantial number of people and generating revenue to the local economy. There is an existing skills set in place and capacity to employ more people as the industry grows. However, as a land use option for poverty alleviation, conservation and tourism offers only MINOR opportunities for the Focus Area as a whole, as benefits will be restricted to small geographic areas. However, benefits are greater for those people with an opportunity for direct employment. Given the long-term nature of the operations and potential for employment, the social constraints are also MINOR.

Economic: Tourism is seen as a major economic driver for the region, with substantial opportunity for growth and development (MAJOR opportunity). The major constraints relates to poor access (lack of road infrastructure) and effective marketing. A greater emphasis on equitable distribution of income is also seen as a priority. In general, the economic constraints are considered MINOR.

Institutional: The institutional opportunities for tourism development are MAJOR with MINOR constraints. Much of the ground-work for the various development scenarios has been laid and lessons learned from other tourism enterprises. The most likely development scenarios will be lead by the private sector with limited government intervention. In general, there is good community support for new tourism projects that are protective of the environment (ecotourism) and provide the maximum number of jobs to local inhabitants. Additional infrastructure is still needed to support access to various locations, and dealing with complex land tenure arrangements is slowing down developments. Overall, the institutional constraints are considered MINOR.

5.3.6 FORESTRY

The Forestry land use option is described in section 5.2.6. The following is a summary of the opportunities and constraints to this land use option as presented in Table 5.3.b.

Biophysical: The biophysical opportunities and constraints for new afforestation in the Focus Area are dependent upon the specific areas of interest. For instance, new afforestation removes existing vegetation cover, introduces alien species into the local environment, reduces biodiversity as compared to indigenous vegetation, and uses considerably more water than grassland vegetation and many other land use options. For these reasons, the biophysical constraints may be considered MAJOR. However, in areas where water is available (above the reserve requirements), and where biodiversity is low or the landscape has been previously degraded, the constraints may be MINOR. The opportunities provided by the biophysical environment are MAJOR in that favourable growing conditions exist for all three major commercial tree species. Plantations in the region have a documented acceptable growth rate (expressed as Mean Annual Increment- MAI) and pest infestations and fire damage have not been major issues.

Social: Commercial forestry production exists in the Focus Area, employing a substantial number of people and generating revenue to the local economy. There is an existing skill set in place and capacity to employ more people. Operations have been in place for a number of years, albeit with varying levels of success. Furthermore, small growing schemes and other models have been shown to work in KZN. However, as a land use option for poverty alleviation, forestry offers restricted opportunities for the Focus Area as a whole, given the limited number of locations where forestry is suitable. The benefits are greater for those

people with an opportunity for direct employment and as a supplementary income to small growers in the region. Given the long-term nature of the operations and potential for employment, along with the fairly secure and continuous income stream (albeit small) and potential for downstream beneficiation of product, the social opportunities are MAJOR, with MINOR social constraints.

Economic: The economic opportunities and constraints of new afforestation as a land use intervention are dependent upon the scale of operations in the region and their location with respect to markets and infrastructure. For example, those areas suitable for planting (after exclusion of environmentally sensitive features) may still not be economically viable given their distance to markets and lack of infrastructure, especially roads. In addition, the profitability ranges from marginal to high, depending upon the extent to which downstream processing can be added to the raw product value (value-added processing). In those areas where forestry is economically sustainable, and given the potential for large-scale afforestation projects and the resulting downstream processing opportunities the economic opportunities are MAJOR. Constraints to economic sustainability are again dependent upon location and include access to markets, infrastructure and land availability leading to economies of scale. These constraints are considered MAJOR.

Institutional: Much of the ground-work for the various development scenarios has been laid and lessons learned from the previous forestry enterprises. The most likely development scenarios will be lead by the private sector with market based incentives. In general, there is good community support for new afforestation projects. The institutional opportunities for new afforestation projects are MAJOR. However, more institutional work is needed to define land tenure and access agreements. Systems are in place to accomplish these goals but they are time consuming and complex. Overall, the institutional constraints are considered MINOR, but more so for out-grower schemes such as those that have been adopted KZN.

5.3.7 COMPARATIVE ANALYSIS

In the case of biophysical factors, it seems that there are a variety of major opportunities and constraints for most commercial LUO (Table 5.3.a). Tourism was the only land use with no major biophysical constraint and a major opportunity. Social opportunities and constraints are mostly minor, with some major opportunities for the livestock and maize LUOs. On the economic side, there are major opportunities for maize, forestry and tourism. However, there are also major economic constraints for maize, sugar, tea, livestock and forestry. For all land use options, the Focus Area remains a marginal economic area that is isolated and generally poorly or completely unconnected with commercial markets for agricultural and forest products. Consequently, substantial government support will be required for poverty alleviation and economic development to accelerate in this region. In terms of institutional issues, there appear to be major opportunities for most LUOs, but major constraints for maize and grazing. There are few major institutional constraints, but most land use developments will require some kind of institutional reforms and capacity building to facilitate commercial ventures.

The baseline ‘status quo’ LUO has minor opportunities and major constraints in all four of the environmental spheres (biophysical, social, economic and institutional). The conclusion of this draft SEA is that while this LUO will and must continue to exist, it will not provide the mechanism through which poverty can be alleviated and economic development accelerated. An analysis of the individual commercial LUOs indicates that although the Livestock LUO is socially acceptable, there are three major constraints (biophysical, economic and institutional). The Maize LUO has a number of major opportunities and constraints. The

Table 5.3.a: Frequency of major and minor opportunities and constraints for each LUO

Land Use Option	Opportunities		Constraints	
	Minor	Major	Minor	Major
Status Quo	4	0	0	4
Commercial Livestock Grazing	3	1	1	4
Commercial Maize Production	1	4	1	3
Commercial Tea Production	3	2	3	2
Commercial Sugarcane production	3	2	3	2
Conservation/Nature Based tourism	1	3	4	0
Commercial Forestry Plantations	0	4	3	2

economic viability of these two commercial options is not good and commercial proponents do not exist, so substantial government support would be needed to develop these LUOs. It is not clear whether the political will to provide such support is available given the current international macroeconomic political environment and policies. Commercial tea and sugar production have both major opportunities and constraints. They are unlikely to experience any major expansion beyond their current limits. Tourism on the other hand has a number of major opportunities and no major constraints, and is currently in a growth phase. However, this LUO is spatially limited primarily to the coastal areas. Finally, forestry has more opportunities than constraints but some serious biophysical & economic constraints that limit the extent to which this option can be allowed to expand within this region.

On the basis of this analysis, it is clear that in the absence of significant government support for the livestock and maize LUOs, forestry appears to have more potential than the other commercial LUOs to develop and expand in the inland portions of the Focus Area. Along the coastline, tourism and nature based developments are more suitable and common, and would be more appropriate

5.4 COST BENEFITS ANALYSIS OF LAND USE OPTIONS

The comparison of different land use options with each other presents a challenge due to the many variables that are based on assumptions and planning parameters. To compare different land use options against forestry presents even greater challenges due to the long-term nature of forestry. This comparison of costs and benefits is made for the most probable alternative land use options (livestock, maize/grain, tea and sugarcane), a range of forestry options (pine long rotation, pine short rotation, gum short rotation and wattle) and the status quo. Nature-based tourism was not included in the Costs versus Benefits Analysis (CBA) as there were no available estimates for the Focus Area on income or job generation, and the major focus of tourism should be along the Wild Coast where there will be little conflict with potential afforestation based on the findings of this SEA.

Challenges presented by this analysis include:

- The area is large, with significant variations in bio-physical characteristics.
- The economic assessment is of a general nature and is not project specific.
- The land use options are, in most cases, not practiced in the area on a significant commercial scale and/or area specific economic data is unavailable.

Table 5.3.b: Summary table of constraints and opportunities presented by the environment of the Focus Area for various land use options.

Land Use Option	Biophysical				Social				Economic				Institutional			
	Opportunity		Constraint		Opportunity		Constraint		Opportunity		Constraint		Opportunity		Constraint	
	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
Status Quo																
Commercial Livestock Grazing																
Commercial Maize Production																
Commercial Tea Plantations																
Commercial Sugarcane Plantations																
Conservation Based Tourism																
Commercial Forestry Plantations																

Key

Opportunity			
	Minor Opportunity represents an insignificant degree of potential for improvements over the status quo (current conditions).		Major Opportunity represents a significant opportunity for improvement over the status quo.
Constraint			
	Minor Constraint represents an insignificant limitation for improvements to the status quo.		Major Constraint represents a significant limitation for improvements to the status quo.

- Infrastructure in the form of roads, transport, communications, fencing, processing facilities, input supplies and markets, as well as management and technical support services are lacking.
- Production systems within a land use option may vary significantly depending upon the available natural and other resources.

Cash Flow models were formulated for each of the selected land use options: Forestry, Maize/Grain, Livestock, Sugarcane, Tea and the Status Quo. Nett Present Value (NPV), Internal Rate of Return (IRR) and Equivalent Annual Income (EAI) were derived from the cash flows. The EAI was used to enable comparison between the different crops.

For the agricultural crops and livestock, models were based on a database derived from more than 30 Eastern Cape commercial farmers, together with information from the KZN Department of Agriculture and the sugar industry and were adapted where considered appropriate. The forestry models were based on data from the 2003 Forestry Economic Services report for KwaZulu-Natal (based on data from over 100 000 ha of plantations).

Because forestry is the focus of this SEA, separate models were formulated for forestry crops that are normally grown in the region – long rotation Pine (for sawtimber), short rotation Pine (for pulpwood), short rotation Gum (for pulpwood and poles) and wattle (for pulpwood). The product objectives are the ones that are "mainstream", although it is usual for plantation products to meet a wide range of wood product requirements, regardless of the initial plantation objectives. For example, although Gums may be grown for pulpwood, a portion of the production is typically harvested and marketed for agricultural and domestic poles as well as firewood. Although the major portion of Wattle plantations are aimed at the pulpwood market, it is usual for some of the production to be acquired for local construction, agricultural and fuelwood purposes.
The economic models for the land use options have the following features:

- Assumptions used in the financial projections are based on commercial operations within the Focus Area.
- Each crop has different rotation lengths.
- The different rotation lengths present a challenge for economic comparison. The Equivalent Annual Income (EAI), an economic indicator that projects the Net Present Value as an annual equivalent into perpetuity, is used to compare crops regardless of rotation length.
- The models enable the sensitivities to be considered for forestry crops – transport distance, price and costs.
- The value of land is brought into the cash flow models as an annual land rental of R 150/ha/annum. This is based on a 10% yield on land with a value of R 1500/ha (the value of equivalent land ranges from R 1000 to R 2000 per ha).
- The residual value of Moveable Assets is the balance after deducting 12.5% per annum, and of Fixed Assets (in long rotations) is two thirds of the initial value where these assets are predominantly roads and buildings (forestry). Where there is a high portion of plant (tea), the residual value is reduced to half of the initial value. The key assumption here is that repairs and maintenance of assets

is done with diligence and there is no major technical imperative to replace assets.

A comparison of EAI's for the selected land use options is shown in the table below:

Table 5.4.a: Equivalent Annual Income (EAI) values for the selected land use options

Land Use Option	Equivalent Annual Income (R/ha/a)
Pine – long rotation	-810
Pine – short rotation	-1645
Gum – short rotation	-1408
Wattle	-557
Commercial Livestock	-95
Tea	-472
Commercial Maize/Grain	-384
Sugar	-2449
Status Quo	387

Although unfortunate for the purposes of this study, it is not surprising that the economic projections of the land use options are negative in the Focus Area – if it had been otherwise, regardless of the adverse political history, there would have been higher levels of commercial agricultural development.

Given that the market value of land in the Focus Area is not realizable as a result of its tenure status, the inclusion of an annual land rental in the financial projection, although technically correct, is somewhat artificial.

It should be borne in mind that the maize/grain price has fluctuated historically, and the current very low maize prices are considered to be unrealistic as a long-term view for the purposes of the projections. The significantly higher prices paid in the region (as a result of transport, distribution and supply) have also been taken into account. Maize grain at current (June 2005) producer prices is uneconomical to produce. However, a longer-term view has been taken and a maize price of R 1200 per ton has been assumed for purposes of the analysis. This assumption is also based on the wholesale grain price in the region, which is significantly higher than the national producer price due to availability and transport costs. Start up capital costs have been estimated for a 200-hectare farm and include basic land preparation from bare veld, fencing, vehicles, tractors and equipment.
Due to the communal nature of land use for livestock grazing purposes, adequate fencing is considered essential for crop protection.

The economics of extensive livestock production varies depending upon numerous variables not least of which are management, animal type, veld type, supplementation and marketing. Many different production systems are adopted depending on circumstances and resources. The economics used in this analysis have been based on information provided by the KZN Department of Agriculture together with a database of Eastern Cape beef and sheep farmers with some adaptation for circumstances prevailing in the Focus Area.

A combined beef and sheep enterprise has been assumed on a commercial farm size of 2000 hectare and at an average carrying capacity of 2,5 hectare per large stock unit (LSU). Estimated start up capital costs include fencing, structures, stock water, vehicles, tractors, equipment and livestock and residual values are provided for in the cash flow analysis.

Sugar as a commercial crop is not economically viable for the majority of the Focus Area, due to transport distance, yield and the dynamics of international and domestic markets. Sugarcane yield is based on recent achievement in the southern production areas and North Pondoland Sugar. These tend to be lower than industry averages, although they take into account the pressure on price resulting from current Rand strength. A major cost factor is the distance to and the cost of processing capacity. A transport distance to Mill of 50 kilometres has been assumed, this being the maximum economic distance for good quality cane. Start up capital costs have been estimated for a 200 hectare farm and include basic land preparation from bare veld, fencing, vehicles, tractors and equipment.

The production of Tea in the focus area is known to be marginal, although steps are being taken to add downstream value to improve returns. Even a small increase in sales price (2%) turns the cash flow positive. Estimates of income and expenditure have been based on information obtained from and consultations with, persons involved in the existing tea estates in the former Transkei. Conservative potential yields have been used based on well-managed tea plantations. It must be noted that such yields and quality have not been consistently achieved on the existing tea estates in the region, for various reasons.

Of concern are the economics of the different forestry crops. Four variables are chiefly responsible for the rather negative position and could vary significantly depending on choices and developments. These are: the land rental of R 150/ha/a, overheads of R 703/ha/a, transport distance and projected yield.

- As indicated before, the inclusion of a lease of communal land with no real market value is artificial and subject to additional consideration.
- The overheads are slightly higher than industry averages and depending on the forestry business models that are used, the figure could be reduced.
- The transport distances for the forestry models are taken as the distance from Flagstaff to the existing markets. Pine Long Rotation – 120 km to Weza, Pine Short Rotation – 290 km to Mondi in Durban, Gum Short Rotation – 230 km to Sappi at Umkomaas, Wattle, 230 km to Sappi at Umkomaas. The table below shows the EAIs of the various forestry types with transport distances as above compared with distances of 25 km, 50 km, 75 km, 100 km, 125 km and 150 km. As expected, Short Rotation Gum generates positive cash flows at 85 km, while Wattle is positive up to 100 km.

Table 5.4.b: Equivalent Annual Income (EAI) - Transport Distance Sensitivities

R/ha/a Rotation length	Pine Long	Pine Short	Gum Short	Wattle Short
Current distance (km)	120	290	230	230
EAI at current distance	-810	-1645	-1408	-557
At 25km	-461	-772	575	319
At 50km	-552	-854	333	212
At 75km	-644	-937	91	106

R/ha/a Rotation length	Pine Long	Pine Short	Gum Short	Wattle Short
At 100km	-736	-1019	-150	-1
At 125km	-828	-1101	-392	-108
At 150km	-972	-1184	-634	-215

The Cash flow projections were based on yield predictions recommended by M Howard of Fractal Forest. Although shown in m^3/ha/a in the table below, the yields are converted to tons/ha/a for the cash flow projections to enable the use of industry figures, which are expressed in tons. The cash flows are based on the averages between "Good" and "Moderate" potentials.

Table 5.4.c: Rotation length and yield ranges for various forest types

Forestry Type	Rotation Length (yrs)	Yield ranges (m^3/ha/a)		
		Good	Moderate	Poor
Pine Sawlogs (with pulp market)	25	22	15	8
Pine pulp	16	22	15	8
Gum Pulp	9	35	22	15
Wattle Pulp	10	10	8	6

The table below shows EAIs for 10% fluctuations in predicted yields. If yield fluctuations are combined with fluctuations in other key variables such as overhead costs and transport distances, then significant changes in EAI occur.

Table 5.4.d: EAIs for 10% fluctuations in predicted yields for various forest types

Forestry Type	EAI (R/ha/a)		
	+10%	Base	-10%
Pine Sawlogs (with pulp market)	-743	-810	-877
Pine pulp	-1648	-1645	-1641
Gum Pulp	-1202	-1408	-1613
Wattle Pulp	-303	-557	-811

Employment creation by the various land uses will vary from project to project. An estimate of jobs per ha per annum is shown in the table below.

Water Use per Hectare

Water use per hectare is difficult to quantify equally across all land uses given a lack of information for certain land uses (tea) and differing units of measurement (i.e., reduction in runoff versus litres per day). However, generalizations can be made based on the available data and expert opinion. Large users of water such as irrigation and transfer schemes do not exist in the Focus Area, therefore, the largest "user"of water is the environment when considering the requirements of the Reserve.

Table 5.4.e: Employment creation by the selected land use options

Land Use Option	Jobs per ha/a
Pine – long rotation	0.03
Pine – short rotation	0.04
Gum – short rotation	0.04
Wattle	0.04
Commercial Livestock	0.01
Tea	1.90
Commercial Maize/Grain	0.10
Sugar	0.20
Status Quo	0.04

According to the Integrated Strategic Perspective (ISP – DWAF, 2004), the total yield (expressed as Mean Annual Runoff [MAR] in million cubic metres of water) from the Wild Coast Sub-Area is 796 mil m^3 per annum. Reducing from this the Ecological Reserve estimate (148 mil m per annum) and the Human Reserve (0.04 mil m^3 per annum) leaves approximately 648 mil m^3 per annum for other existing and proposed uses. However, also according to the ISP, only 1 mil m^3 per annum of use is actually available for new development, as most of this water (the 648 mil m^3 per annum) effectively flows into the sea as run of river, especially during high flows. This estimate is refined by the results of the modelling completed as part of this SEA. New afforestation is expected to take up to 5.1 mil m^3 per annum of water, (assuming 80 000 ha of new afforestation, at maturity) which based on the most recent modelling results is available within the eight selected catchments. An analysis of the impact upon MAR from existing uses and proposed afforestation (80 000 ha) indicates a high surplus in run-of-river flow for the Wild Coast Sub-Catchment area will remain. However, the MAR is highly variable both seasonally and yearly and significant fluctuations in flow can be expected.

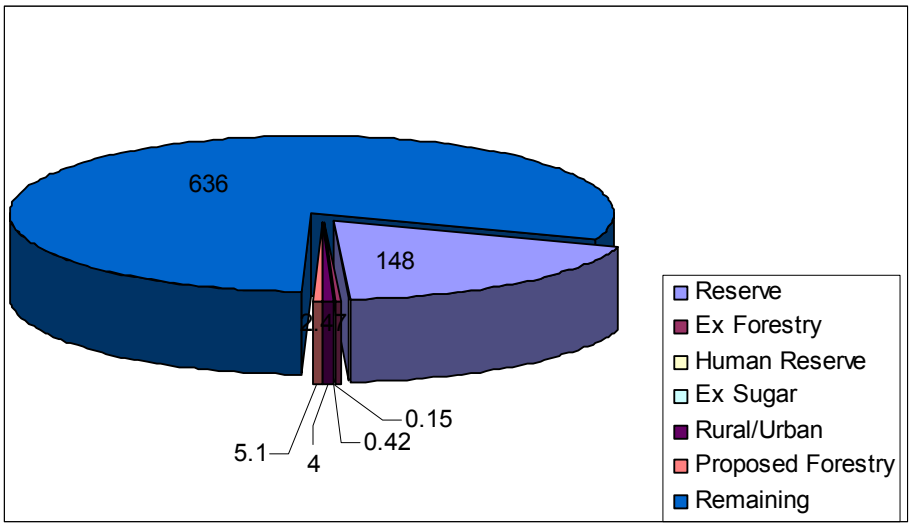


Figure 5.4.a: Indicating relative availability of water within the Wild Coast Sub-Area catchments (million m^3 /annum)

It is clear from the graph (Figure 5.4a) that water is available for abstraction to support new afforestation or other types of development within the analyzed catchments and to a more undefined extent, in the Wild Coast Sub-Area. Only

irrigated commercial agricultural or out-of-basin transfer schemes are likely to match afforestation for water demand. However, there are no significant proposals for these within the Focus Area. On a per hectare basis, new afforestation will have the highest demand followed by dry-land agricultural production. While sugarcane is a significant water user, the potential for expansion in the Focus Area is limited.

Secondary Value Added (Downstream Beneficiation Potential)

The assessment of the secondary value adding potential for each of the land uses is also problematic due to differences in the type of land use discussed, the unpredictable nature of markets and the time needed to establish new development and critical thresholds needed to support downstream investment. However, based on the description of the various land use options and their potential for valued added services, it is possible to develop a comparative analysis of these potential benefits. It is clear from Table 5.4.e that afforestation with pine (long rotation) represents a low likelihood of downstream beneficiation in the Focus Area. This is the result of poor economic returns for investment and existing capacity within the regional sawmills. Utilizing existing sawmills more efficiently will generate incremental downstream benefits (higher employment levels, more shifts, etc.). However, transport distances to the major sawmills is still a constraint. Short rotation pine has slightly higher chances (low to moderate) of generating downstream value but only through the construction of a local industrial wood processing facility. The potential for such a facility at Weza (near Harding) increases the market opportunity for industrial wood processing, including short rotation pine, however, a large timber base is needed to feed a facility, and the most economical locations (in terms of transport distance) will be close to the facility. Short rotation gum does provide a capacity for downstream benefit with a plantation area of between 2000-5000 ha for a pole treatment plant. Additionally, excess supply could be supplied to the industrial wood processing plant if constructed in the region. Wattle, while having the highest sale value is an industrial wood that has low potential for adding value within the Focus Area. The primary market is for chipped product or as pulp and all sales will take the raw product out of the Focus Area. At a very significant scale (minimum 50 000 ha), Wattle could support a pulp plant, but this would also likely be constructed at an existing commercial port, outside of the Focus Area.

The downstream secondary value potential of the other land uses has been assessed in general terms in comparison to the more detailed assessment for forestry options. The potential for livestock grazing can be realized by the introduction of processing (abattoir) and export facilities. The potential is considered low resulting from an overall low stock density, distance to market and anticipated low employment levels. Maize production does offer a moderate opportunity for processing (milling) of grain and regional sales are generally good. There is a demand for processed goods in the area though the market is not substantial. Institutional interest in growing schemes may result in downstream benefits at a later date. The potential for tea is considered high as the current operation does show promise for expansion (given congruent market and management conditions) and the process is very labour intensive. Sugarcane does not represent a high potential for downstream beneficiation due to the moderate yields and existing processing capacity across the border in KZN. The status quo provides very little secondary value added opportunity for the Focus Area. Small “cottage” industries, for example, arts and crafts or furniture making, are

possible and should be promoted where possible. However, these will not likely generate substantial employment or economic multiplier benefits.

Conclusion

The above estimates are somewhat crude in that the specificity of data is not consistent across all land use types and assumptions are made as to potential markets and prices. These projections are often flawed as they can not accurately predict future conditions. It is evident from the above analysis that none of the land use options assessed will bring significant economic benefits to the area in the form of jobs, income per hectare and downstream benefits. All except nature-based tourism have major constraints, but this option also only has minor opportunities. Constraints are primarily biophysical, and but also economic and institutional, with few social constraints. Fortunately there are also major biophysical, economic and institutional opportunities, but the analysis in this SEA reveals no "clear winners" in terms of land use options to be implemented as poverty alleviation strategies. What is more apparent is that the alternative land uses should not be viewed as mutually exclusive but rather that a model of integrated development needs to be promoted and encouraged in which livelihoods and sustainability are improved through multiple-land use practices.

The constraints and opportunities are also site specific and hence further analysis will be required when deciding on any potential development intervention. The following chapter outlines a possible afforestation development strategy for the Focus Area. A similar exercise will be required for the development of other land use options if they are to be considered as potential development interventions. This approach is encouraged (but is not seen as part of this "forestry driven" SEA), as multiple land use development interventions will be required to achieve the desired goals of sustainable development and poverty alleviation.

6 INTEGRATION CHAPTER

6.1 REVISITING THE POLITICAL CONTEXT AND VISION FOR THE SEA

Over the last 10 years the Department of Water Affairs and Forestry (DWAF) has been faced with increasing demands from prospective growers and industry for SFRA water use (forestry) licenses, especially in the Focus Area. At the same time they have also been under political pressure to facilitate forestry land use developments that can alleviate poverty in the Eastern Cape. There are also concerns both within and outside DWAF about the potential negative impacts afforestation could have on the biophysical environment, for example the loss of valuable biodiversity, terrestrial habitats and rivers that form a particular feature of the Focus Area. New water legislation also requires that water use be licensed and regulated to ensure that enough water is left in the streams and rivers to meet the ecological and basic human needs reserves.

DWAF needs to find a way to accommodate the demand for afforestation developments whilst avoiding the potential negative environmental (biophysical, institutional and socio-economic) impacts; in other words, ensuring that afforestation is permitted and developed in a sustainable manner. In an attempt to reconcile these competing concerns and find a way forward, this Strategic Environmental Assessment (SEA) of Afforestation Potential in the Focus Area of Water Management Area 12 was commissioned by DWAF to assess the potential for new afforestation and its relative costs and benefits in comparison with other potential land uses. The overall vision for the SEA is defined as follows:

> ***"To assist in the alleviation of poverty in the rural areas of Water Management Area 12 in the Eastern Cape by investigating sustainable land use options that ensure equitable access to natural resources, and most especially water, with an emphasis on forestry development where appropriate and acceptable."***

As indicated in the vision statement, the SEA is fundamentally concerned with assessing whether afforestation can alleviate poverty, generate new rural livelihood options, improve social conditions, generate new employment prospects, enhance skills and improve the 'overall wellness' of people in the Focus Area. A major challenge of the SEA is to assess whether forestry developments can optimize sustainable development opportunities relative to, and perhaps in conjunction with, other land use options, whilst considering the constraints presented by the environment. The ultimate objective is to assess the potential for new afforestation projects in the region, and then to determine if these provide the most "sustainable" development option. In doing so, the SEA must reflect on the nature of the forestry industry, including the history of existing plantations, and the role that new forestry operations could play in the regional economy. Successful forestry depends on managing and harvesting timber, and establishing markets for the product.

The critical issues investigated in this Strategic Assessment include (in no particular order of importance):

- Areas where it may be appropriate to grow trees, establish crops such as maize, tea and sugar, or develop livestock farming and tourism on a sustainable basis;
- Whether the necessary skills base to manage commercial afforestation and commercial agricultural developments exists;

- The extent to which afforestation, and other possible commercial agriculture and tourism ventures could generate new income earning and employment opportunities in the region;
- The extent to which afforestation will compete with existing land uses and other potential commercial land uses, such as agriculture, and livelihood strategies, typified by a multiple land use strategy;
- The impact afforestation and commercial agriculture and tourism may have on existing livelihoods and land uses;
- The impact afforestation may have on water availability and use, as well as biodiversity, as compared to other potential uses such as commercial agriculture which are not stream flow reduction activities, but may require water for irrigation.
- Whether there is the potential to effectively link afforestation developments with timber processing industries and markets.

In the rest of this chapter, a summary of the major findings of the SEA in terms of the current context and the comparison of different land use development options is provided. This is followed by an examination of the sustainability principles that need to inform any afforestation development strategy and their implications for the Focus Area in particular. These principles are then used to outline a possible sustainable afforestation strategy for the Focus Area. A conclusion and look at the way forward for this SEA is provided at the end.

6.2 THE CURRENT SITUATION IN THE FOCUS AREA

6.2.1 BIOPHYSICAL CONTEXT

The spatial biophysical assessment of the climate, soils, and topography (excluding the settlement areas, roads and protected areas) of the region found that 130 000 ha of land within the Focus Area is well suited to the growing of commercial trees (gums, pines and wattle), while another 435 000 ha is moderately suited. The water assessment and modelling of eight quaternary catchments where large areas of moderate and high potential forestry land were identified (T32E-H, T60C, E, H & J), found that there is sufficient water for an additional 80 000 ha of forestry (above the existing forestry plantations). Results show that there is sufficient water for additional forestry in these catchments while still meeting the Reserve requirement. Having determined that there is enough water, a Systematic Conservation Planning exercise undertaken by CSIR (2005) was factored into the analysis. This data identified 19 priority areas that should be conserved due to their exceptional biodiversity value. They include areas with important and conservation worthy vegetation, priority estuaries and rivers, priority indigenous forests, and areas of importance for species level conservation. In addition, catchments linked to estuaries sensitive to flow reduction were also included. It is important to note that these priority areas are not synonymous with protected areas, and may therefore not require formal protection, but should be managed and utilised for developments that will not impact significantly on biodiversity. They are pieces of land or water bodies that contain biodiversity features (e.g. species or habitats) essential for achieving the conservation targets and goals set for the Wild Coast, as determined in the National Spatial Biodiversity Assessment and Forest Conservation Plan, modified with expert review. These targets provide an indication of how much of each vegetation type must be conserved to ensure the representation and persistence of biodiversity in a region. Figure 3.4 illustrates the 19 integrated priority areas (PA) of congruence between priority areas for vegetation, indigenous forest, estuaries, river, and species conservation areas. These areas should be avoided at all costs in any development plans which threaten biodiversity or reduce flows.

Once these conservation areas were excluded from the areas identified as suitable for afforestation, together with areas used for settlements, the initial figure of 565 000 ha of land with good and moderate afforestation potential, was reduced to 26 775 ha remaining as *good* and 202 139 ha mapped as having *moderate* forestry potential. The total net area for potential afforestation is approximately 229 000 ha. These areas are mapped in Figure 5.2.i.

6.2.2 SOCIO-ECONOMIC CONTEXT

The Focus Area forms a large section of the OR Tambo District Municipality and very small southern portions of the Alfred Nzo Municipality. Historically, this area formed the eastern border of the former Transkei and in the colonial period was known as Mpondoland. The Mpondos were the last of the African chiefdoms to be annexed by the British and brought into the Cape Colony. The area is known for its conservative and traditional ways, being much less disrupted by western influences than other African societies. While there is historical evidence that farmers in this area were productive peasant farmers during the early 20th Century, today agricultural production is below subsistence level and not oriented to the market. Local residents must supplement their land-based livelihoods (cultivation, livestock farming and the harvesting of natural resources) with off-farm incomes from migrants, commuters, local wage earners, entrepreneurs and those receiving social grants. These incomes are extremely low. According to the 2001 Census data, 81% of the population in the OR Tambo District were receiving no income, with 15% earning less than R 800 per month. The remaining four percent are earning above R 800 per month, with most of that number earning between R800 and R6400 per month (Demarcation Board, 2004). Of a total potential labour force of approximately one million in 2001, 67% were not formally employed in 2001. The low educational skills levels exacerbate these problems. Only 94 136 people (just over 5%) have attained Grade 12 or higher. While population growth was very rapid in the last century, it appears that this growth is tapering off now. In the OR Tambo district, the bulk of the population also remain rural with almost eight percent being urbanised, despite the inclusion of Mthatha in the District.

There are some commercially oriented land use developments in the Focus Area. These include the old agricultural parastatal developments at Magwa, Lambasi, Mkambati and Greenfields. However, these parastatals were liquidated in the mid 1990s and much of the commercial production of tea, sugar cane and other products on these lands either came to a halt, or was seriously disrupted through the process of transfer to local parties and have suffered many financial difficulties. Disputes around land claims, difficulties in finding commercial partners and other labour and capacity problems have plagued these projects over the last few years. While some of these projects are getting under way again (Magwa), others still experience major difficulties linked to their marginal position relative to the commercial markets. There are serious concerns, therefore, about the economic sustainability of these projects.

Other more recent land use developments include the many Massive Maize Production Projects, some vegetable production projects and tourism developments along the coast. There are also some small-scale forestry grower projects that have been initiated by Sappi in the Mbizana municipality. Sappi has also expressed interests in DWAF plantations near Lusikisiki and Flagstaff.

The major constraints to land use developments, including forestry, are related to the regions marginal location relative to the main markets, processing facilities and export points. The rugged terrain, poor roads and long distances undermine the economic viability of accessing external markets. Language, knowledge, experience and communication barriers further

isolate producers (and prospective producers) in this region from commercial markets. These market access problems are not limited, however, to export products such as wood, sugarcane and tea. Local farmers also have no access to local maize markets, despite the fact that large quantities of maize are imported into these rural areas from elsewhere (Bank, 2001). The lack of storage facilities, agricultural organisations, inputs and services, together with a lack of experience, knowledge and resources, undermine people's ability to be able to access these markets.

There is a desperate need and demand for commercial land use developments in the area. Most rural residents are very willing to consider such developments, but few if any opportunities come their way due to a lack of commercial proponents and partners. The private forestry corporations are one of the few commercial proponents willing to invest in the area. Government is supporting food production schemes, but largely with a short-term job creation and poverty alleviation objective. Many of these projects have become commercially unsustainable (despite the best of intentions) and will require continued support and more directed interventions in local markets to make them viable.

It is clear that many rural people are willing to make a portion of their land available for new land use developments that can provide them with income and employment opportunities. However, given their aversion to risk, the large number of persons who need to share the benefits of such developments, and the marginal nature of the area for most commercial products, it is unlikely that such developments will be able to replace existing land based livelihoods. Rather, such new commercial developments will have to be accommodated alongside existing land based livelihoods, and will only generate supplementary incomes (as opposed to the equivalent of full time farming incomes). Given the factors outlined in preceding paragraphs and considering the high value of existing livelihoods, the aversion to risk and the experience of other land use developments in the Focus Area and surrounds, it is anticipated that rural communities will only be prepared to make 10-15% of their land available for new afforestation projects initially. If the financial benefits materialise and prove worthwhile, then they may make additional land available.

Thus, in considering the ecological and biodiversity constraints dictated by the landscape, together with the socio-economic constraints articulated above, we anticipate a net area of about 22 900 (10%) to 34 350 ha (15%) may be made available initially for afforestation projects within the Focus Area with a possible expansion up to 68 700 (30%).

6.2.3 INSTITUTIONAL CONTEXT

The dominant form of land tenure is the ***communal land tenure*** system under which households are allocated individual use rights over residential and arable sites, and communal rights to grazing land and natural resources. Under the new land reform polices, the Government's intention is to transfer ownership of the communal lands back to the rightful users of the land, and the Communal Rights Act has been passed to regulate and facilitate this process. The State is the current nominal owner. However, there will likely be a considerable delay before this legislation is implemented in the Eastern Cape Province. There are also some areas where land was expropriated by the Colonial and Apartheid regimes for large-scale agricultural projects (such as Magwa, Lambasi, Greenfields and Mkambati), forest plantations, and indigenous forests and other protected areas. These expropriated lands have also been targeted for transfer back to the rightful owners. In some cases there are land claims over these expropriated lands, and some of these have been resolved. However, most of the forests and plantations remain in State hands, or have been leased to private consortiums. The transfer process is complicated by capacity constraints within DWAF and

local communities, and difficulties in resolving land rights disputes. These lands should therefore be considered communal lands, while keeping in mind that rural communities have the opportunity, through the use of various land tenure reforms, to make such land available for commercial developments under lease and joint venture agreements.

Institutional capacity constraints

The process of restructuring civil service and elected government structures since the transition to democracy in 1994 has created considerable tensions, capacity problems and uncertainties about how to proceed and deal with land use developments in the OR Tambo District and many others. In the former homelands where there had previously been no elected municipal or local government structures, these councils remain very weak and inexperienced. Despite these difficulties, considerable progress appears to have been made. However, the difficulties this SEA research team encountered in trying to contact and engage with local municipalities around the SEA indicates that many local municipalities appear to be struggling to cope with day to day issues, and find it difficult and annoying to have to deal with non-essential and long-term planning issues. The co-existence of newly elected councils and the old Tribal Authority structures with ill-defined roles and powers, has also created considerable tensions and uncertainly in the former Transkei. The Traditional Leadership and Governance Framework Act have exacerbated these tensions.

This institutional context has a number of implications for potential land use developments, including forestry. Firstly, private sector investors are much more familiar with private tenure systems and would much rather focus on areas where they can easily purchase or lease land for their projects. They generally have a negative attitude towards communal tenure systems and are unfamiliar with them. They also find it easier to deal with individual land owners rather than groups. When added to other characteristics of the Focus Area such as a weakly developed infrastructure, poor access and language and knowledge/experience barriers, it is not surprising that there are few commercial proponents willing to invest in developments in these areas.

The National Government's Tenure policy reforms are designed to facilitate commercial land use developments in communal areas and should help overcome some of the tenure problems. However, the capacity of government to implement such reforms is limited and progress is generally very slow. This will therefore continue to be a constraint to the implementation of commercial land use developments. One way of reducing these constraints is to design the developments in such a manner that they do not require any significant change in land tenure institutions. The small sugarcane and timber growers in communal areas of KZN are examples of such developments.

Weak local institutions and capacity, combined with tensions between competing institutions, and a lack of resources, means that it will be a serious challenge for these institutions to provide adequate support to facilitate commercial land use developments. Additional support from Provincial and National government will be needed to overcome these problems and strengthen local capacity. However, investments in assessments such as this SEA should help the local authorities to develop sustainable land use plans and make sure that their investment strategies are strategically targeted to effectively facilitate the economic development of the area.

6.2.4 CURRENT SITUATION FOR FORESTRY

South Africa's forestry industry is mostly located in the high rainfall areas on the Eastern seaboard of the country, with the highest concentrations of plantations and wood processing capacity in the Mpumalanga and KwaZulu-Natal Provinces. KwaZulu-Natal (KZN) is the centre of a market driven forestry economy with four wood-based pulp plants and four wood chip operations. Nationwide, the total commercial plantation forestry area is 1.37 million ha in extent, producing around 22 million m^3 of roundwood per annum. The total area under trees has remained effectively the same over the past 20 years. The fact that there has been no expansion of plantation areas is an issue that will have a significant opportunity cost over the next 30 years, as roundwood supply deficits develop. In their 2004 study, LHA estimated that, in a scenario of 3% GDP growth, a roundwood supply deficit of 14.3 million m^3/annum is likely to develop. Taking into account the expected reduction in current forestry area (to adhere to new environmental regulations), a further 775 000 ha of plantations will need to be established in order to meet this projected shortfall. Other options could include importing additional supply.

The extent to which the Eastern Cape can and should accommodate a portion of this shortfall is the subject of this SEA. A key constraint to expansion of the forestry sector has been the introduction of a more stringent forestry licensing and authorisation process approximately 10 years ago. This process requires a thorough consideration of the environmental impacts, with detailed analysis of the potential impact of afforestation on catchment hydrology and water. The past decade has been characterised by frustrated attempts by the forestry sector to obtain permits (until 1998) and licenses (from 1998) for new afforestation, especially in the major forestry centres, where water abstraction levels for affected catchments were seen to be at their limits. One area where large-scale new afforestation is considered possible, from a water use perspective, is the Eastern Cape. The availability of water to support new afforestation has been confirmed by this SEA (within the limits of the study methodology).

The national forestry sector generates around R 15 billion per annum and employs over 130 000 people, with some 60 000 employed in the growing of roundwood. The direct value of the wood sold from processing plants makes up R 5,1 billion of this amount. The large forestry plantations are still predominantly owned by "white" business, although there are a number of programmes being implemented that should change the situation in the future. Since 2004 over 95% of plantations are owned by the private sector, which represents a significant change from the 65-70% level of private ownership 20 years ago. This is due to the decision by Government to withdraw from wood production activities that are better suited to the private sector and to focus on its policy and governance roles. It is the stated intention of the government to withdraw completely from the management of forestry operations and lease these out to the private sector.

However, there has also been a significant expansion in the participation of small scale farmers from communal areas in the growing of trees for the market. In KZN there are 19 000 small, predominantly black timber growers accounting for 44 000 ha. Unfortunately, in the Eastern Cape, there are only 130 growers on 160 ha, and three community plantations totalling 2 100 ha. This is largely due to their greater distance from processing facilities and export nodes.

In the Eastern Cape, the commercial forestry area covers 169 000 ha and represents 13% of South Africa's plantation resource. Forestry and timber products contribute R 300 million a year to the national GDP, and the forestry sector employs approximately 8 700 people. Forestry areas are predominantly softwood (pine) with 151 000 ha grown for commercial

purposes. Nearly 90% of these plantations are owned and operated by the private sector, with the balance owned by DWAF. The remaining 18 000 ha are small hardwood plantations, mostly growing timber for use by local communities.

Weza Sawmill is the most significant wood processor in the Focus Area vicinity. Annual processing is currently at 140 000 m^3/annum. Previously owned by Safcol, Weza is now owned by Singisi Forest Products of which the majority shareholder is Hans Merensky Holdings. Value adding is currently limited, but consideration is being given to the introduction, over the medium term, of an industrial wood processing facility with a capacity of 350 000 tons per annum.

There are some downstream plants in the Focus Area that were once flourishing, but are now under threat because of the dwindling supply of timber from existing plantations as a result of forest fires, poor management, and different supply channels as a result of changed ownership. These plants include the Tekwane Sawmill at Mount Ayliff and the Flagstaff pole preservation plant. These plants could become operational again if sufficient supplies of wood can be obtained. Additional downstream options that could be developed if sufficient forestry is developed include:

- **Increasing the capacity** of existing saw millers through additional shifts, more lines and improved handling facilities. Between Singisi, Weza and Tekwane a further 300 000 tons (20 000 ha equivalent) could be processed.
- Introduction of **veneer and industrial wood processing** facilities alongside the existing solid wood processors. A Medium Density Fibre (MDF) Board plant with a capacity of 350 000 tons/annum is under consideration at Weza.
- **Entry of new sawmilling operations** for the processing of smaller logs grown in shorter rotations (16 years for softwood species). At an annual volume of 45 000 m^3/a (3000 ha equivalent) and capital expenditure of R 20 million, a profitable sawmill employing 150 people could be established.
- **Pole Preservation.** With expansion of electrification in rural areas and modernization of livestock farming taking place, demand for treated poles is increasing. A new pole plant could be justified at 30 000 m^3/annum (2000 ha).
- Even though market development over the next 20 years and rate and scale of new afforestation may justify investment in a **pulp mill** it is unlikely that this will occur in the Focus Area due to a lack of suitable infrastructure (roads, rail, housing, electricity) and export facilities.
- The minimum scale of a **chipping plant** is 300 000 tons per annum (25 000 ha equivalent), at a cost of R 80 million. Although not immediately obvious, a chipping plant in the Focus Area supplying Saiccor at Umkomaas is a possibility if extreme wood supply shortages occur in the future.

In the Focus Area, because of the distances from markets, transport costs represent between 25 and 40 percent of total direct costs. Viability is dependent on the development of an improved road network and the construction of direct road and rail links to the commercial routes of KZN. At present there is no rail link between KZN and the Eastern Cape. The N2 toll road being contemplated between Port St Johns and Port Edward would decrease the transport distances from the Focus Area to the major timber markets and improve supply routes to unlock the economic potential of the area. Although it should be noted that the new N2 will only affect the distance from the Lusikiski area; Flagstaff will not be affected. The fact that the transport network is not ideal at this stage should not prevent commercial forestry development. Local government may be obliged to support economic developments with the provision of the required infrastructure. However, it is suggested that the infrastructure investment be justified by a concomitant return through economic development.

Forestry Development Models:

The type and status of land tenure has an impact on various aspects of the development options for land. The following is a brief description of how commercial forestry plantations can work within the various land ownership/tenure systems. Although described in the context of forestry development, most of these models and the discussion in this section are applicable to all the other land uses evaluated in this SEA.

Private Land

There are few opportunities for afforestation on privately owned land in the Focus Area. However, there could be opportunities to lease State Forest plantations as in the case of the Weza Forests.

Former Parastatal lands

These areas have been the target of interest for commercial land use developments in the Focus Area since 1994. These areas are of particular interest to developers because they offer the opportunity to establish large plantations which could achieve their desired economic and downstream benefits of scale. These areas are in the process of being transferred to those who are considered to be the historic local rights holders of this land. Consequently any developer will need to enter into negotiations with these rights holders to establish large plantations under lease or grower schemes (see below).

Use of communal grazing lands

Land use changes in communal areas require informed decisions that are supported by the affected community. To operate businesses, such communities need to be represented by legal entities, typically Communal Property Associations or Trusts, founded on principles that enable equitable participation by members of the community and fair management and distribution of benefits derived from the portion of land under consideration. Typically, the extent of such portions of land would range from 50 to 2000 ha, but the forestry blocks are likely to be fragmented (with benefits for fire protection) rather than contiguous stands.

In areas where developments may be on communal land such as those found in the Focus Area, models for forestry could include:

- ***Company leases, operates, manages and ensures market***. The company benefits from difference between sales proceeds, operating expenses and cost of lease. The community provides labour and benefits from employment and leases.
- ***Company and community enter into a joint venture (JV) agreement***. The company provides expertise, finance and market security. Community provides land, part-ownership, employees (not only labour). The company provides technical, managerial expertise, and finance. The community benefits from business participation, empowerment, secure markets and employment. Company benefits from business participation and secured timber supplies.

Use of individual plots

Under communal land tenure systems, individual households have rights to use certain land for residence and subsistence cropping. As in KZN, rural households can use these individual plots to grow trees or other commercial crops for the market. Typically, the extent of such portions of land range from 1 to 5 ha. In this 'small grower' model as initiated by the forestry companies Mondi and Sappi in KZN, the grower's inputs consist of the land, labour and protection of trees. The inputs from the forestry companies consist of seedlings, technology and methods, advance payments, harvesting and access to secure markets.

In the Eastern Cape where the market conditions are as yet undeveloped, it may take some time for such individual grower operations to gain momentum in areas that are not within easy reach of existing processors. There may, however, be the opportunity to stimulate such 'small growers' to produce wood for domestic purposes in anticipation of a marketing 'surplus' for existing and possible future markets. In the Focus Area, the forestry base is still small and the most likely market opportunities are limited to a pulp mill some 150 km away, and sawmills that require wood from long rotation softwood plantations. Unless this scenario changes, from a commercial perspective, the ***priority will likely focus on the establishment of large-scale forestry operations and then later, once more attractive and secure market conditions emerge, to promote small grower forestry.***

6.3. LAND USE ALTERNATIVES AND OPTIONS

Because afforestation could have much more significant impacts on the environment than other commercial land-uses, and because it is a very long growing period during which farmers obtain very little income, concern has been expressed over whether afforestation is the most appropriate and sustainable land use option. In order to avoid the situation where afforestation is recommended at the expense of other commercial land uses that may be more economically, socially or environmentally acceptable, this SEA was tasked with identifying, reviewing and evaluating various land use alternatives, in accordance with the sustainability themes described earlier. To do this, the consultant team developed a systematic and objective methodology to select, screen and review only those land use options (LUO) that were considered viable and sustainable within the context of this study. The spatial focus of this assessment was limited to areas identified as suitable for afforestation.

The criteria used to select the various land uses, and the method of weighting the opportunities and constraints associated with each land use in order to come up with a score for each land use are explained in depth in section 5.1.1 of the report. On the basis of this method five commercial land uses were selected for comparison with forestry and existing land uses namely: maize, livestock, tea, sugar and tourism.

The opportunities and constraints assessment concluded that with regard to the baseline 'status quo' LUO, there were minor opportunities and major constraints in all four of the environmental spheres (biophysical, social, economic and institutional). The conclusion drawn was that while this LUO will and must continue to exist, it will not provide the mechanism through which poverty can be alleviated and economic development accelerated. When the individual commercial LUOs were examined, it was clear that although the Livestock LUO is socially acceptable, there are three major constraints (biophysical, economic and institutional). The Maize LUO has a number of major opportunities and major constraints. The economic viability of these two commercial options was found to be questionable and since commercial proponents do not exist, substantial government support would be needed to develop these LUOs. It is not clear whether the political will to provide

such support is available given the current international and national macroeconomic political environment and policies. Commercial tea and sugar production have more major opportunities than constraints, but these are limited to improvements on the existing production capacity. They are unlikely to experience any major expansion beyond their current sites due to biophysical constraints and distance to markets. Tourism on the other hand has a number of major opportunities and no major constraints, and is currently in a growth phase. However, this LUO is spatially limited to the coastal areas. Finally, forestry has more opportunities than constraints but some serious localised biophysical and economic constraints limit the extent to which this option can be allowed to expand within this region.

On the basis of this analysis, it is clear that in the absence of significant government support for the livestock and maize LUOs, forestry appears to have more potential than the other commercial LUOs to develop and expand in the inland portions of the Focus Area. Along the coastline, tourism and nature based developments are more common and more appropriate.

a. The Cost Benefit Analysis of LWO

The comparison of different land use options with each other presents a challenge because of the many variables that are based on assumptions and planning parameters. To compare different land use options against forestry presents even more challenges due to the long-term nature of forestry. This comparison of costs and benefits is made for the most probable alternative land use options (livestock, maize/grain, tea and sugarcane), a range of forestry options (pine long rotation, pine short rotation, gum short rotation and wattle) and the status quo. Nature-based tourism was not included in the Costs versus Benefits Analysis (CBA) as there were no available estimates for the Focus Area on income or job generation, and the major focus of tourism will be along the Wild Coast where there will be little conflict with potential afforestation. Cash Flows for each of the land use options were projected (in real terms) over a periods that represent logical rotation lengths of each, and then Equivalent Annual Incomes (EAI) were calculated to facilitate comparison. EAIs are derived from Net Present Values of cash flows, taking into account differences in rotation lengths. Table 5.4.a shows the economic returns for comparison. In comparing the different land uses, the following emerged as key observations:

- The economics of long rotation pine are affected severely by the interest on inputs which are only recovered after a period of 25 years.
- The distance from industrial wood processors seriously affects forestry economics.
- Wattle is by far the most viable timber crop, even with lower yields than other crops and long distance from market.
- Growing sugarcane generates negative returns in the Focus Area unless subsidised, but there are benefits because of labour intensity.
- Tea generates high revenues, is highly labour intensive but is affected by high costs and capital requirements.
- The Status Quo compares favourably against forestry, except Wattle.

6.4 SUSTAINABILITY PRINCIPLES AND THEIR IMPLICATIONS FOR AN AFFORESTATION STRATEGY IN THE FOCUS AREA

Given the context above and the objectives of this SEA, there is a need now to define a possible, appropriate and sustainable afforestation development strategy for the Focus Area. Such a strategy is detailed in the next section. However, any such strategy must be based on the sustainability principles outlined in Chapter one of this report. The table below highlights these sustainability principals and the implications for afforestation development in the Focus Area.

Sustainability Principles	Implications for Afforestation and other Development Initiatives in the Focus Area
BIOPHYSICAL/ECOLOGICAL SUSTAINABILITY	
• Promote responsible stewardship of natural resources and the environment, including remediation for past damages. • Exercise prudence where impacts are unknown or uncertain. • Operate within ecological limits and protect critical natural capital.	• Avoid or minimize the use of highly invasive species like wattle and engage in the clearing of invasive alien tree species in areas outside permitted afforestation areas and plantations, in particular, within sensitive areas. Mechanisms need to be put in place to ensure sound environmental management in areas where it is a source of fuel and domestic timber. Conversion of jungle wattle to managed woodlots should be prioritised and actively pursued in the local communities. • Focus on areas with good to moderate potential only, limit the area of afforestation within each catchment to ensure that the ecological and human reserve is maintained and water is available for other commercial land uses if needed; and avoid areas with high biodiversity and endemism that need protection
SOCIAL SUSTAINABILITY	
• Ensure a fair distribution of the costs and benefits of development. • Respect and reinforce the fundamental rights of human beings, including civil and political liberties, cultural autonomy, social and economic freedoms, and personal security. • Seek to sustain improvements over time, ensure that depletion of natural resources will not deprive future generations through replacement with other forms of capital.	• Balance the needs and responsibilities of different interest groups within communities and between communities and other parties such as the private sector and government through engagement. • Protect and enhance the rights of land users and ensure that contracts entered into are thoroughly negotiated, understood and enforceable. • Seek to avoid unsuitable areas and limit the amount of afforestation permitted to remain within biophysical/ecological constraints • Seek to enhance other forms of capital (social, human, financial and physical) through investment in infrastructure, institutions, markets, capacity building, etc.

Sustainability Principles	Implications for Afforestation and other Development Initiatives in the Focus Area
ECONOMIC SUSTAINABILITY	
• Maximise human well-being. • Ensure efficient use of all resources, natural and otherwise, by maximising income. • Seek to identify and internalise environmental and social costs. • Maintain and enhance conditions for viable enterprises.	• Ensure that afforestation developments add more than they take in terms of opportunity costs of existing and alternative land uses. • Ensure that afforestation developments do not undermine existing land based livelihoods but add to them. • As a first step, ensure that the existing forestry plantations are used efficiently and income from these maximised. • Make sure that afforestation does not negatively impact on the ecological and social reserve and water for other commercial developments. • Ensure that afforestation initiatives are within reach of appropriate local and external markets for wood products. • Ensure that appropriate supportive investments in infrastructure and services are secured to ensure access to markets.
GOVERNANCE AND INSTITUTIONAL SUSTAINABILITY	
• Support representative democracy, including participatory decision-making. • Encourage free enterprise within a system of clear and fair rules and incentives. • Avoid excessive concentration of power through appropriate checks and balances. • Ensure transparency through providing all stakeholders with access to relevant and accurate information. • Ensure accountability for decisions and actions, which are based on comprehensive and reliable analysis. • Encourage cooperation in order to build trust and shared goals and values. • Ensure that decisions are made at the appropriate level, adhering to the principles of sustainability wherever possible.	• Afforestation initiatives must have the support, participation and cooperation of local land users and rights holders. • Commercial ventures must be negotiated around transparent and viable business plans and fair contracts that clearly specify the agreed upon manner in which the costs and benefits of the project will be shared amongst the various parties. • Ensure that adequate information is provided and negotiations conducted in the local language. • The need for government support needs to be acknowledged and appropriate institutions strengthened. • Build capacity and local management institutions that will be able to manage the afforestation project efficiently, accountably and fairly. • Wherever possible and appropriate, institution and capacity building efforts should focus on building and strengthening legitimate existing institutions (organisations, norms, rules, etc) rather than completely replacing them, i.e. tenure systems, local land administration institutions, etc.

6.5 KEY DRIVERS OF AN AFFORESTATION STRATEGY FOR THE FOCUS AREA

Given the biophysical and socio-economic characteristics of the Focus Areas, a strategic approach to large scale new afforestation within the areas identified as having "good" and "moderate" potential, must consider the following as key drivers:

- Core focus on areas with "Good" potential, expanding to areas of "Moderate" potential once sufficient scale is reached.
- Scattering new forestry between catchments to minimize hydrological impact.
- Proximity to existing processors that have existing or planned processing facilities – to minimize transport costs.
- Expansion on land adjacent to existing forestry operations for local markets – to harness existing skills and improve economies of scale.
- Development of plantations for new, low-risk markets.
- Provision of fuel and building timber for local use in rural areas – as close to homesteads as possible. The conversion of jungle wattle to managed woodlots should be pursued.
- Communal land tenure system and community approaches to land management.
- The need for financial, technical, and business management support from private sector and/or government.

It is likely that a comprehensive forestry development strategy will include the following components, each of which are described in more detail below:

- Commercial Softwood around Existing Medium/Large
- Processors Commercial Softwood around Existing Plantations near Commercial Centres
- Commercial Hardwood around possible Pole Treatment Plant
- Strategic Afforestation
- Homestead Forestry

6.6 COMMERCIAL SOFTWOOD AROUND EXISTING MEDIUM/LARGE PROCESSORS

It is estimated that there could be as much as 26 775 ha of *good* potential and 202 139 ha of *moderate* (total of 228 914 ha) potential land available for afforestation. Two areas identified as having large areas of "good" forestry potential are within economic distance of the existing processing plants at Tekwane Sawmill and Weza Sawmill. These are the areas adjacent to the Ntsizwa and Weza plantation. It is envisaged that up to 10 000 ha could be established in these areas. It is likely that afforestation in these areas, and on such a scale, will be driven by the private sector operators in the area. At this stage it is limited to Singisi Forest Products (Pty) Ltd., but others could emerge. Although the development will be driven by the private sector, it should include the close support of the Municipalities.
The characteristics of such forestry establishment will likely include:

- Predominantly pine species composition – to supply the existing softwood sawmills, although it could include gum and wattle depending on the nature of a new industrial wood processing facility.

- Mixture of long and short rotations, depending on the emergence of an industrial wood processing facility as currently contemplated.
- New plantation of 3000-5000 ha adjacent to Ntsizwa, 5000-7000 adjacent to Weza.
- Relatively large blocks of forestry – ranging from 100 ha to 1000 ha per community entity.
- Focus on areas with proximity to the existing road networks, but it may require municipal investment in new roads.
- Ownership of plantations in the hands of legal community entities.
- Funding facilitated by the private sector operator, with government support.
- Management and technical support provided by the private sector operator.
- Market commitment provided by the private sector operator.
- Institutional support provided by Municipalities.

6.7 COMMERCIAL SOFTWOOD AROUND EXISTING PLANTATIONS NEAR COMMERCIAL CENTRES

Commercial Centres in the Focus Area include Lusikisiki, Flagstaff, Bizana, and Mount Ayliff, with Kokstad, Port St Johns, Tabankulu and KwaZulu-Natal resort towns on the periphery. DWAF plantations are situated near each of the centres in the Focus Area. It is estimated that around 26 000 m^3 of rough sawn pine – harvested, sawn and marketed by small, family-owned mills, is retailed into these centres annually. In this area, around 3000 ha of pine plantations are required to produce this volume. Excluding the pine plantations that are committed to the large processors, there are 1000 ha of plantations producing wood for this purpose. The establishment of another 2000 ha around some of the existing plantations would meet consumer needs and support the functioning of a selection of small sawmillers.

The characteristics of such forestry establishment will likely include:

- Predominantly pine species composition – for softwood sawtimber.
- Short rotations because quality is not critical.
- Relatively small blocks of forestry – ranging from 50 ha to 500 ha per community entity adjacent to existing plantations.
- Establishment and management of plantations linked to rehabilitation of existing DWAF and Municipal plantations.
- New afforestation areas estimated at 500 ha for Bizana, 500 ha for Flagstaff, 700 ha for Lusikisiki and 300 ha for Gomo/Tonti.
- Focus on areas with proximity to the existing road networks, but it may require municipal investment in new roads.
- Ownership of plantations in the hands of legal community entities.
- Funding facilitated by government.
- Management and technical support facilitated by government.
- Market issues addressed by sawmillers.
- Institutional support provided by Municipalities.

6.8 COMMERCIAL HARDWOOD AROUND A POTENTIAL POLE TREATMENT PLANT

The South African treated pole market has capacity for another 30 000 m^3 per annum, and could have even more capacity if the R/USD exchange rate becomes more favourable for export. Such a plant will require around 3000 ha of gum plantations for wood supply. With the efforts to improve agricultural production in the former homeland areas, it is envisaged that the local fencing market will also expand significantly, lending further justification for a new pole treatment plant in the Focus Area.

Much of the area around Flagstaff is suited to gum plantations and there is already a plantation of nearly 400 ha. Although marginal for the Sappi market, Flagstaff is reasonably well positioned for the high demand periods during which Sappi may subsidize transport. This reduces the risk of establishing plantations for a single purpose.

The characteristics of such forestry establishment will likely include:

- Species composition is Gum – for hardwood poles.
- Plantations are grown on short rotations because the emphasis is on building and fencing poles rather than telephone and transmission poles.
- Relatively small blocks of forestry – ranging from 50 ha to 300 ha per community entity, although smaller plantations of between 2 ha and 50 ha could be possible as the market demand emerges.
- Establishment and management of plantations linked to rehabilitation of existing DWAF and Municipal plantations.
- The focus of the new afforestation is envisaged within 20 km of Flagstaff.
- Focus on areas with proximity to the existing road networks, but may require municipal investment in new roads.
- Ownership of plantations in the hands of legal community entities.
- Funding facilitated by government.
- Management and technical support facilitated by government.
- Market planned for pole treatment plant, but using Sappi's pulp mill as a backup.
- Institutional support provided by Municipalities.

6.9 HOMESTEAD FORESTRY

With over a million people living in rural areas and with homesteads each requiring around one m^3 of wood per annum, more than 15 000 ha of trees are needed to supply the requirements. Assuming that 5000 ha of existing plantations are available to rural communities (bearing in mind distance from homesteads), a further 10 000 ha of plantations situated in close proximity to homesteads will contribute significantly to rural livelihoods. It is known that the preferred plantation species for homesteads is Wattle because of its high calorific value and resistance to rotting. Due to the environmental concerns associated with Wattle, consideration should be given to the use of alternative Gum species. If established using best practice silviculture, there could be opportunities for commercial harvesting of trees that are surplus to homestead requirements.

The characteristics of such forestry establishment will likely include:

- Mixture of gum and wattle, depending on environmental risks.
- Short rotations.
- Plantations throughout areas of "good" and "moderate" potential.
- Small (micro) blocks of forestry – 0.1 to 0.5 ha.
- Spread throughout the Focus Area, regardless of infrastructure network.
- Ownership of plantations in the hands of households.
- Funding facilitated by the private sector and/or government.
- Management and technical support provided by the private sector and/or facilitated by government.
- Low technology, but sound silviculture, in forestry applications.
- Institutional support provided by Municipalities.

6.10 STRATEGIC AFFORESTATION AND CARBON CREDIT TRADING

The Focus Area is one of the only areas in South Africa where there is potential for large areas of new afforestation, although there is relatively little opportunity for large-scale industrial processing due to the lack of infrastructure and access to markets. The approach of this SEA positions new forestry projects in areas where market risks are minimised. However, there are factors that could justify new afforestation under conditions that may not seem to be economically justified. It is predicted that there will be a significant shortage of timber in South Africa by 2030. Forestry is seen as a significant employer in rural areas. Under these conditions, government may decide to fund new afforestation for three strategic reasons: Reducing the future supply deficit, creation of employment and carbon credit trading. Similarly, the large industrial processors such as Sappi may decide to subsidise the establishment of plantations and to guarantee timber prices that compensate for the cost of transport. The extent of such forestry could be between 5000 and 10 000 ha, depending on progress in other areas with low economic risk.

The characteristics of such forestry establishment will likely include:

- Mixed species composition – pine, gum and wattle.
- Mixture of long and short rotations.
- New plantations initially focussed in the areas of "good" potential, expanding into areas of "moderate" potential depending on scale.
- Large and small blocks of forestry – ranging from 50 ha to 1000 ha per community entity.
- Focus on areas with proximity to the existing road networks, but will require municipal investment in new roads.
- Ownership of plantations in the hands of legal community entities.
- Funding facilitated by the private sector and government.
- Management and technical support provided by the private sector and/or facilitated by government.
- Market commitment provided by the private sector operator where appropriate.
- Institutional support provided by Municipalities.

6.10.1 CARBON CREDIT TRADING

Over a decade ago, most nations signed an international treaty called the United Nations Framework Convention on Climate Change (UNFCCC) aimed at initiating a process to address global warming. In 1997, the Kyoto Protocol was adopted including legally binding measures for addressing climate change. The Republic of South Africa is a signatory to the UNFCCC. The Kyoto Protocol entered into force following ratification by the required number of member states (55%) in November 2004. The Protocol became legally binding on its 128 Parties on 16 February 2005. One strategy within the protocol for achieving a reduction in "Greenhouse Gases" is the Clean Development Mechanism or the CDM. The CDM allows industrialized countries with emission reduction commitments to meet part of their commitments by investing in projects that reduce emissions in developing countries. These projects need to support sustainable development in the host countries and must lead to emission reductions that are real, measurable and long term.

Carbon mitigation projects include the transfer of energy efficient technologies and the planting of forests to "sequester" (trap) atmospheric carbon in plant tissues. Forestry projects that are permitted under the Kyoto Protocol include reforestation and afforestation.

- **Afforestation**: Direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land through planting, seeding and/or the human induced promotion of natural seed sources.

- **Reforestation:** Direct human-induced conversion of non-forested land to forested land through planting, seeding and/or the human induced promotion of natural seed sources, on land that was forested but that has been converted to non-forested land. For the first commitment period, reforestation activities will be limited to reforestation occurring on those lands that did not contain forests on 31 December 1989.

Afforestation and reforestation projects are currently only eligible for the first commitment period of the Kyoto Protocol which is 2008-2012. The role that forestry related projects will play after this period is uncertain, but certainly cannot be ignored. Recent studies, (ECDC, 2003) have identified the Eastern Cape in general and the former Transkei in particular as potential target areas for developing carbon credit projects using reforestation and afforestation of indigenous forest. In addition, cost versus benefit scenarios developed as part of this study show a positive total return on investment using carbon credit trading as an incentive. The extent that plantation forestry can also benefit from carbon credit trading has not yet been determined. However, if plantation forestry is considered as qualifying CDM and offers suitable carbon credit trading values, then the value added by this option can be significant for the local participants. The South African Department of Minerals and Energy (DME) is the Designated National Authority (DNA) for CDM and has published guidelines (2004) for the review of proposed projects. This SEA has identified commercial afforestation as a sustainable development activity (pursuant to the guidelines established by the DSS) and as such, it could be qualified as a CDM project by the DNA. Additional interaction is needed and recommended between DWAF (the sponsor of this SEA) and DME to facilitate and align policy with respect to this issue.

6.11 CONCLUSION

This SEA has assessed the current environment in the Focus Area and the forestry industry, identified the area and sites where afforestation may be a suitable land use option, identified and evaluated the opportunities and constraints, as well as costs and benefits for a number of land use development options (including forestry) and outlined a possible sustainable afforestation strategy for the Focus Area. Afforestation has been found to be a sustainable land use development option in parts of the Focus Area where it could assist in alleviating poverty. An estimated 22 900 ha - 34 350 ha could initially be made available for afforestation.

This SEA has developed the following general conclusions and recommendations for land use interventions within the Focus Area, and in particular new afforestation developments. It has also raised a few significant issues that have not been addressed as they are either outside the scope of this SEA or require additional, more detailed investigation and analysis. However, the points provided below highlight the findings and provide guidance as to additional work that may be warranted to develop these concepts more completely.

1. A number of issues have been raised with respect to the management, use and disposition of existing forestry plantations within the region. For example, it is noted that approximately 30 percent of existing plantations have been harvested or burnt and remain unplanted. These areas need to be prioritised and managed for higher yield and greater efficiency, and this should be a priority before developing new areas of afforestation.

2. A review of the management situation and expansion potential of existing operations is needed to determine how best to optimise benefits from forestry and target new investment. By applying the sustainability principles that have guided this SEA, the existing operations may yield greater benefits to the local community with less investment than would be needed for the establishment of new facilities. This should be completed before promoting new forestry.

3. It is clear from this SEA that new afforestation should first consider the expansion of existing plantations into areas of good and moderate potential, and secondly seek to optimise efficiency and economies of scale through the development of plantation blocks starting with areas of net good potential and then expanding into areas of moderate net potential.

4. Where new afforestation is proposed, the decision support system (DSS) in Appendix 1 should be consulted to determine suitability and desirability. Other land use proposals should also consult the DSS as it incorporates the principles of sustainable development.

5. New large-scale afforestation should not be encouraged in areas of low potential. Most prudent would be to focus on areas with good potential and then expand into areas of moderate potential where shown to be viable.

6. In areas of high environmental sensitivity, conservation targets should be met. These conservation goals should be discussed with a broad array of stakeholders, including local communities, government departments and other interested and affected parties.

In keeping with the *precautionary principle*, these targets have been incorporated into the current draft DSS.

7. New afforestation should only be considered in catchments that can support the water use and still meet the Ecological Reserve requirements. Additional modelling will be needed to establish these levels and should be based on actual afforestation proposals to determine site-specific constraints. The modelling should also incorporate the potential for competing water demands (e.g. Municipalities) and future development opportunities.

8. New afforestation should consider alternative and potentially competing land uses that offer similar or greater benefits (for example high potential maize). A project specific cost versus benefit analysis may be required to determine the most sustainable option. The DSS has incorporated the consideration of other potential land uses.

9. New afforestation in the first instance should concentrate in areas where existing infrastructure is adequate or formal commitments to provide it has been made.

10. New commercial afforestation should only be encouraged when a proper and site-specific environmental management plan is in place (e.g. to deal with issues such as alien infestation).

11. For all development interventions a skills transfer and capacity building programme should be considered. These should be negotiated with the local communities, municipalities, relevant governmental departments and the development proponent.

12. A mechanism for decision-makers to deal with instances where afforestation (or another land use option) is proposed and supported by the local community, but conflicts with other competing land uses, is required.

13. A mechanism for decision-makers is required to deal with instances where new afforestation (or another land use option) is proposed and is supported by the local community but conflicts with the goals of sustainability, or fails to adequately ensure its economic sustainability.

14. The following considerations for local communities should be assessed as part of any land use intervention proposal:

    - Are there other potential land uses that may be more sustainable?
    - Are there alternative ways of structuring the preferred option that could offer greater community benefit, and have these been fully explored?

    These considerations have been developed to the extent possible in the draft DSS as part of the Focus Area SEA.

Way forward after the SEA:

This draft SEA report for the Focus Area will be finalised after the one month public review period, and the DSS will be refined after this stage, incorporating comments from the various stakeholders. Thereafter, a broader SEA report for the whole WMA 12 Contextual Study Area will then be developed and released for public review. This SEA will incorporate the final Focus Areas SEA report, which will have been revised to address comments made

during the review process.

This SEA has developed a draft decision support system (DSS) (Appendix 1) to guide land use planners and decision-makers at the National, Provincial and Local Municipal Level towards more sustainable development. The purpose of this DSS is to incorporate the rationale and findings of this SEA into land use planning processes at the District and Local Municipal Level (i.e. the Spatial Development Frameworks (SDFs), Integrated Development Plans (IDPs) and Structure Plans). It is developed as a "decision-tree" process, integrated to an accompanying Geographic Information System (GIS) database. The DSS has been developed to evaluate those land uses that are proposed in areas determined to be suitable for new afforestation projects within the Focus Area. However, the process is also transferable for decisions about other potential land use developments.

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APPENDIX 1

DECISION SUPPORT SYSTEM

1. INTRODUCTION

This SEA has developed a decision support system (DSS) to guide land use planners and decision-makers at the National, Provincial and Local Municipal Level towards more sustainable development. The purpose of this DSS is to implement the rationale and findings developed as part of the SEA process. It is presented here in "draft" form and will be subject to revisions based on comments received by stakeholders and implanting departments at the District and Local Municipal Level. A final version will appear in the Final SEA for the Zone of Afforestation Potential in the Eastern Cape, with an anticipated delivery date of August 2005.

This DSS is intended to guide land use planning at the District and Local Municipal Level, through interaction with the Spatial Development Frameworks (SDFs), Integrated Development Plans (IDPs) and Structure Plans. It is developed as a "decision-tree" process, integrated to an accompanying Geographic Information System (GIS). The DSS has been developed to evaluate those land uses that are proposed in areas determined to be suitable for new afforestation projects within the Focus Study Area. However, the process is transferable for decisions about other potential land uses. It is presented here for the entire Focus Study Area, however, it is envisaged that a more detailed final version will be delivered to each of the Local Municipalities (LM) within the Focus Area, and to the District Municipalities (DM) that make up Water Management Area 12.

The DSS can be used to inform and guide either the development or update of a Spatial Development Framework, Integrated Development Plan or Structure Plan. This is an appropriate starting point for the integration of the DSS, as it has the potential to incorporate the principles of sustainability into decision processes about various land use options and the most efficient development of infrastructure. For example, using the DSS, a LM may determine that tourism development is the most sustainable land use option for a particular area, but the area lacks the necessary infrastructure and has been incorrectly identified for a maize production scheme. This information can then guide potential developers and local communities to identify prospective concessionaires and once found, work towards infrastructure improvements that will increase the project's success.

While the DSS is not developed to guide individual project review and licensing, it will undoubtedly inform the process. Potential projects, for example a new afforestation site, may be reviewed in light of the information presented in this SEA and in accordance with the procedures outlined in the DSS. The use of the DSS in a "first pass" review capacity will allow potential conflicts to be identified early in the process. For example, if a new afforestation project is proposed in a catchment that has previously been identified in this SEA as being "water stressed", then both DWAF, the Municipality and the project proponent will realise early in the process that water licensing may present a substantial constraint to the proposal, and that detailed (and expensive) water studies will likely be required. This information may then point the project proponent to an area already identified as being more suitable for new afforestation efforts.

The DSS follows the same overarching themes carried forward by this SEA, namely Biophysical (including water resources), Social and Institutional, and Economic. The following is a brief description of the inputs the DSS requires from each of these Themes.

2. BIOPHYSICAL

The biophysical component incorporates the findings of the biophysical assessment, including the data layers presented below, and initiates the DSS process. This component has five steps, as indicated in Figure 2.1 below.

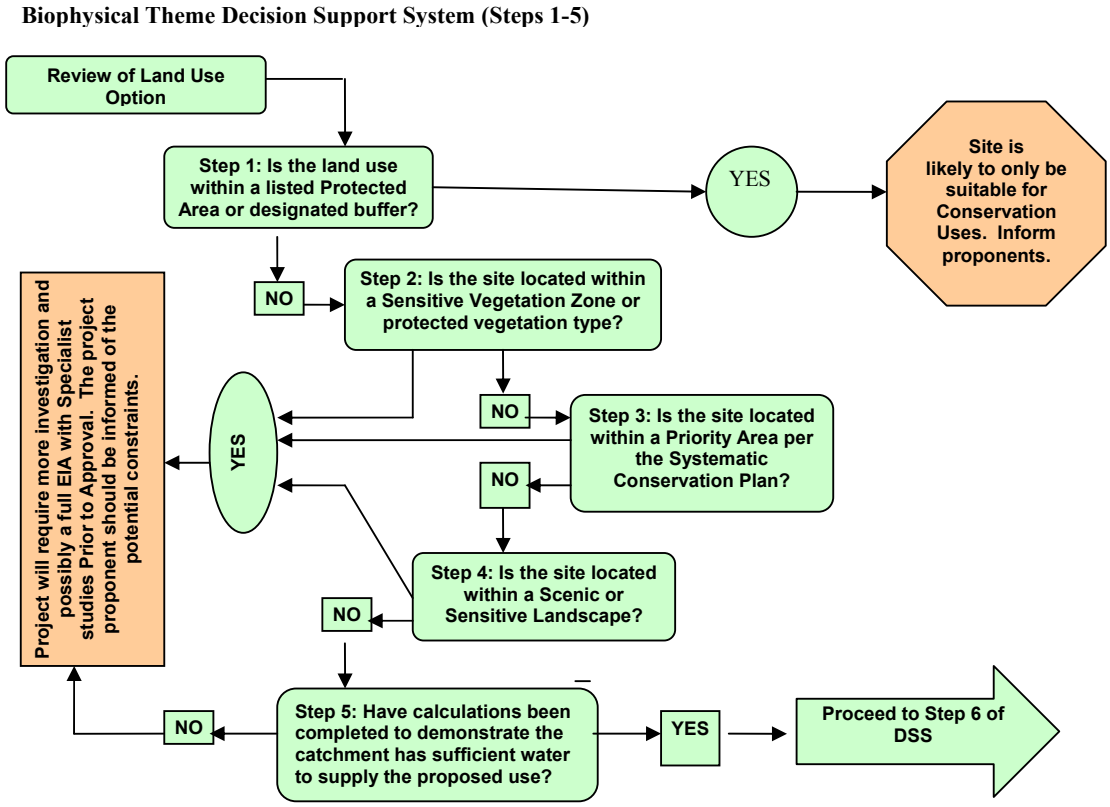
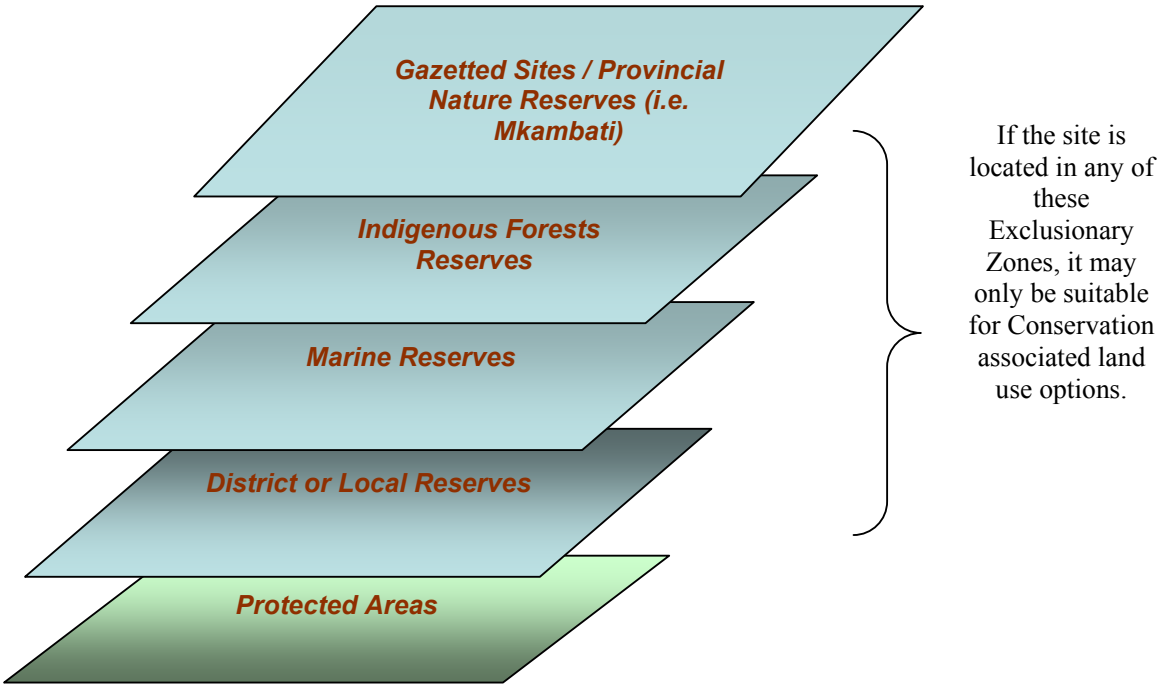


Figure 2.1: Steps in the DSS relating to biophysical (ecological) aspects.

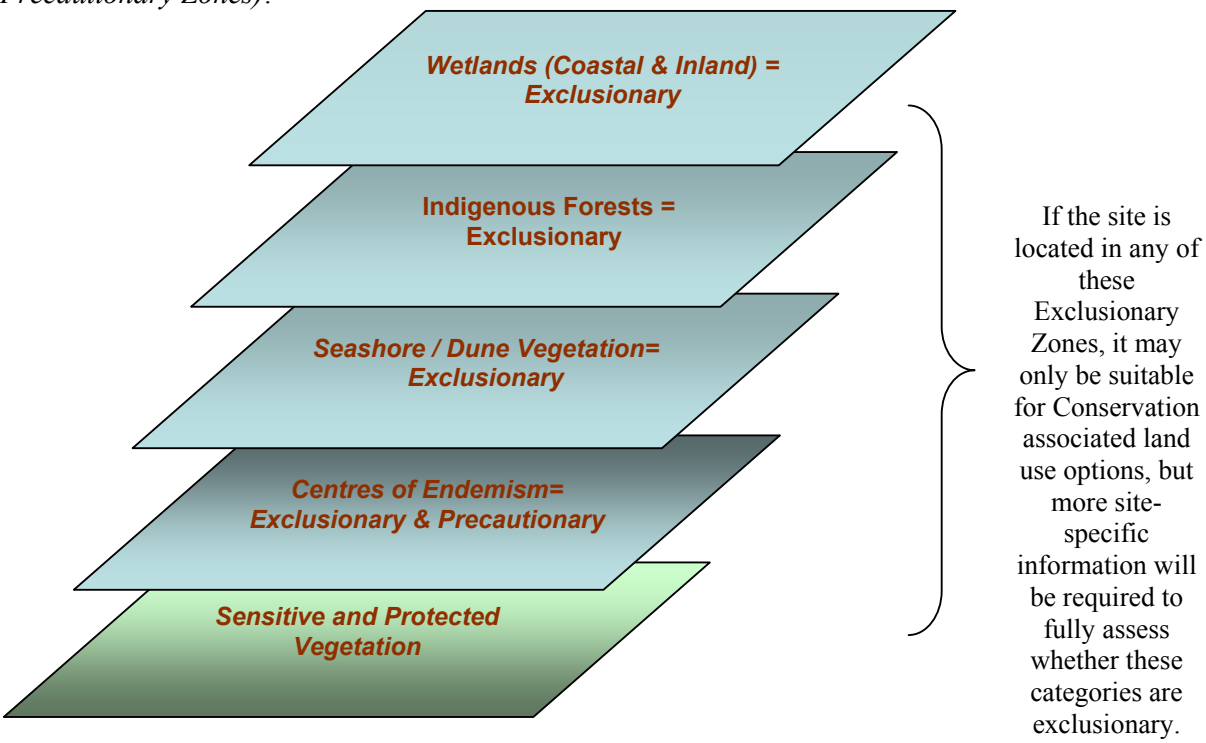
***Step 1**: Assess the location of the area in question against the following criteria:*

*Is the site located in any of the following **Protected Areas** (Exclusionary Zones)?*



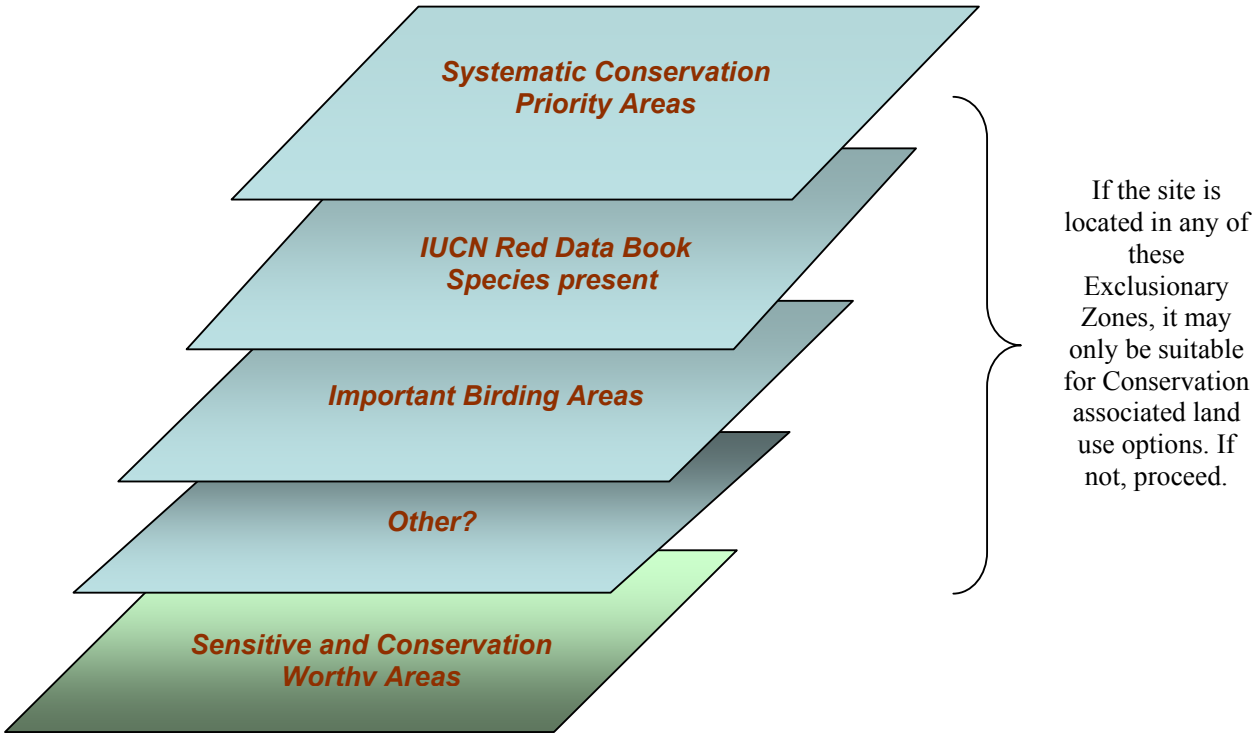
***Step 2:** Assess the location of the area in questions against the following criteria:*

*Is the site located in any of the following **Sensitive Vegetation Areas** (Exclusionary and Precautionary Zones)?*



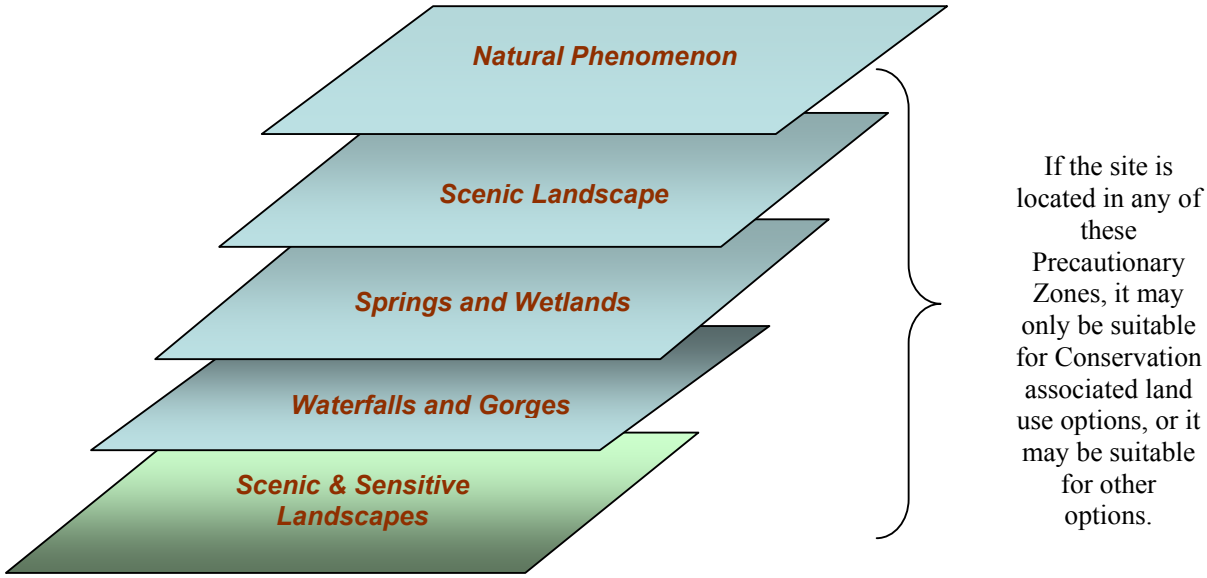
***Step 3:** Assess the Location of the area in question against the following criteria:*

Is the site located in any of the following ***Sensitive Faunal Areas*** *(Exclusionary if specific locations and habitats are identified and Precautionary Zones if the area is suspected of containing sensitive species)?*



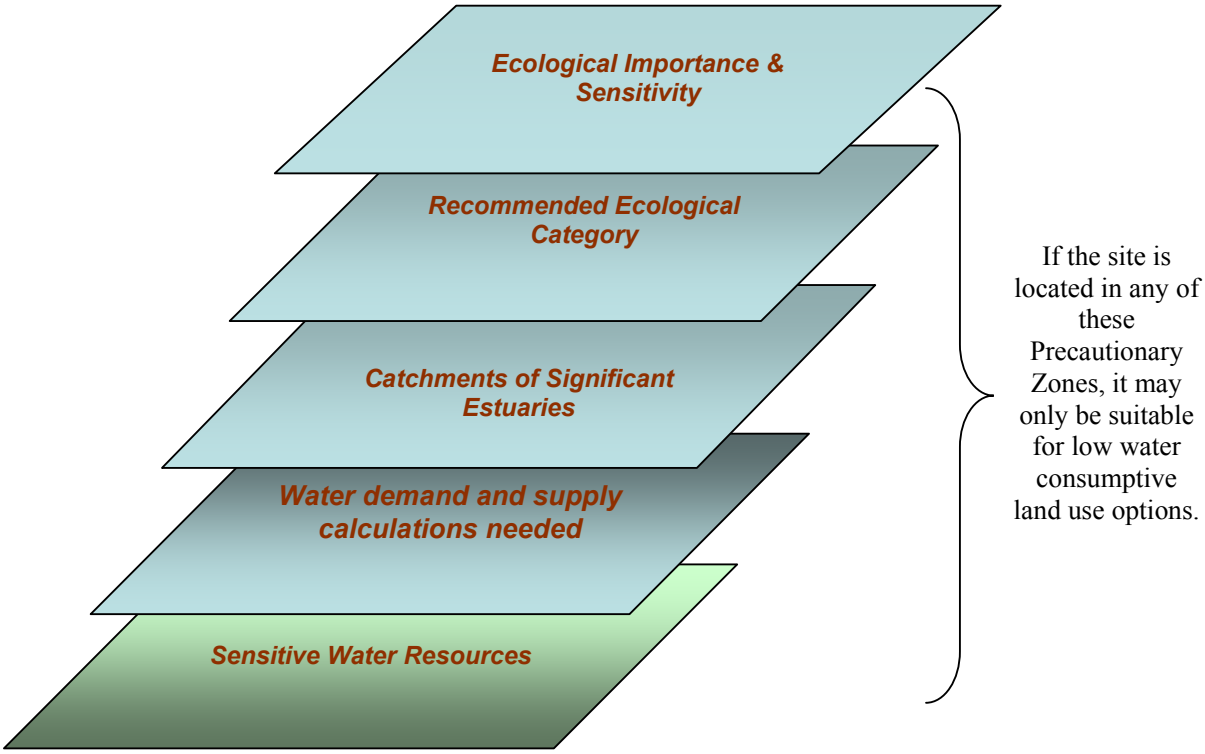
Step 4: *Assess the Location of the area in question against the following criteria:*

Is the site located in any of the following ***Scenic or Sensitive Landscapes*** *(Precautionary Zone)?*



Step 5*: Assess the Location of the area in question against the following criteria:*

*Is the site located in any of the following **Catchments** that are classified as having a Very High or High Ecological Importance and Sensitivity, a Recommended Ecological Category of A, A/B, B or B/C or a catchment that drains to an identified sensitive estuary (Precautionary Zone)? In addition, have calculations been completed to demonstrate there is available water for the intended use while maintaining the current REC and meeting the Reserve?*



Conclusions of Biophysical DSS Steps:

1. If the area in question (or project) is located within a Precautionary Zone, then it will probably be unsuitable for certain types of development and a full EIA is recommended, focused on those zones most likely to be affected, or the option is excluded from further analysis if it will impact on a precautionary criteria.

2. If the area in question (or project) is located within an Exclusionary Zone, then it may be unsuitable for most types of development activities, and any proposed disturbances should be subjected to a full Environmental Impact Assessment at the project level stage.

3. Land use options with anticipated significant environmental impacts should ideally avoid the Exclusionary and Precautionary Zones identified above. If they are proposed outside of these areas, then a less restrictive environmental review process may be prescribed.

3. SOCIAL AND INSTITUTIONAL

The social and institutional component incorporates the findings of the social and institutional assessment completed as part of the SEA. This information is not spatially oriented in the same way as the biophysical data. However, specific data sets have been developed and appropriate queries can guide the land use planning and project review process. These are segregated under broad categories and their relationship in terms of decision-making is shown in Figure 3.1 below.

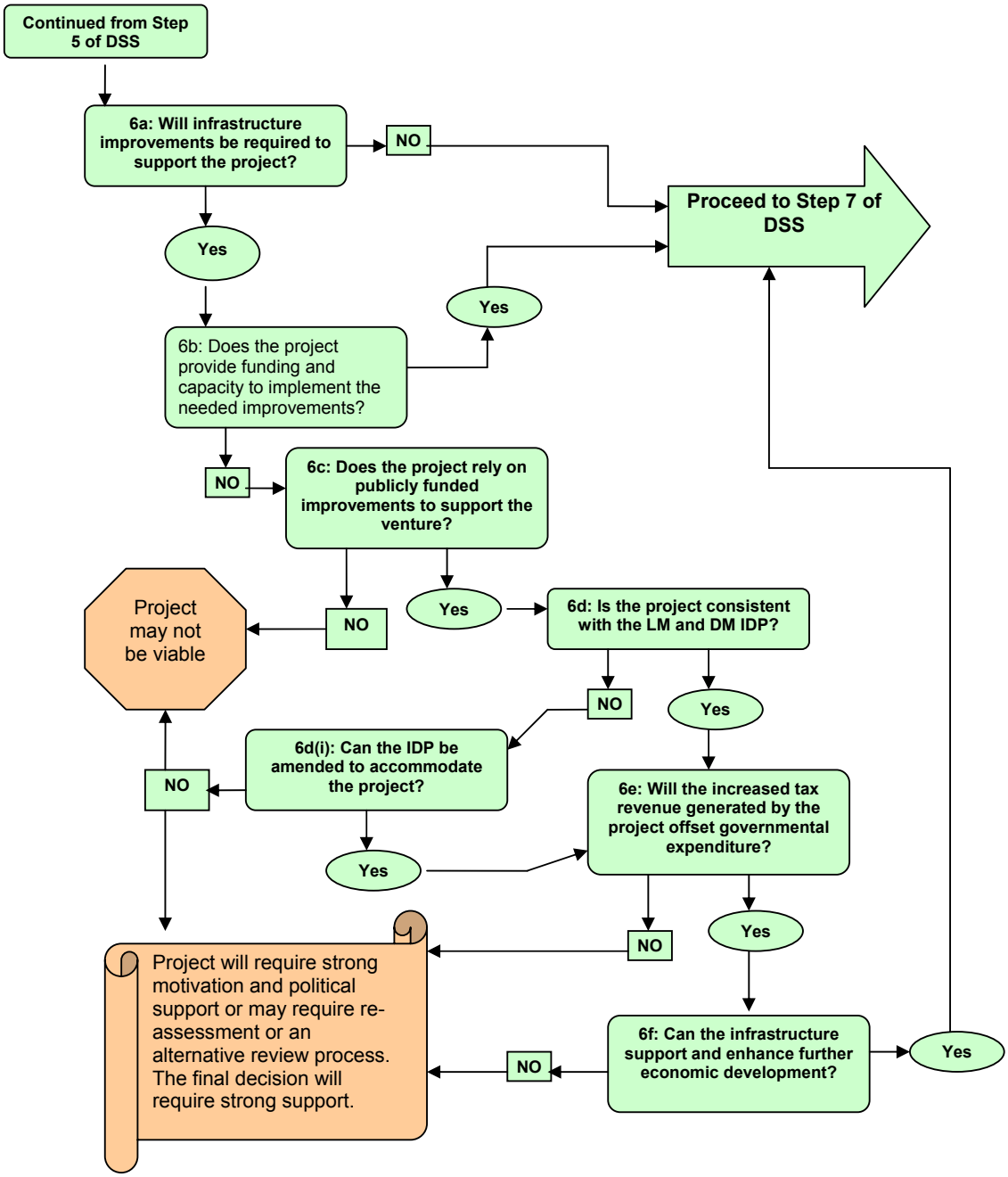


Figure 3.1: Steps in the DSS relating to infrastructure.

Infrastructure

Step 6: *Assess the location of the area in question against the following criteria:*

6a. Will infrastructure improvements be required to support the proposed development initiative?
6b. Does the project provide funding and capacity for installation of the necessary infrastructural improvements?
6c. Does the project rely on publicly funded improvements to support the venture?
6d. Is this consistent with the LM or DM IDP?
6e. Will the increase to local tax revenue generated by the proposed development intervention offset any government expenditure needed for the project?
6f. Will the installation of the necessary infrastructure support and enhance further economic development?

If the answers to these questions are positive, then the project should proceed to Step 7. If the project's required infrastructure is not sustainable then a more rigorous review may be warranted and/or the project may not be viable or advisable. In certain circumstances the overarching benefits derived may warrant the public funding of infrastructure and in these cases a reasoned and pragmatic approach should be followed to ensure that public funds are spent in a responsible manner. In all cases, a fully transparent and participative process should be followed.

Step 7 deals with the social and institutional aspects of the decsion making process, and is summarised in Figure 3.2.

Social Equity

Step 7: Assess the following goals for Social Equity?

7a. Is the ownership/tenure structure of the project reflective of National goals for inclusion of previously disadvantaged individuals (BEE)?

7b. Does the project help to alleviate poverty through job creation, equity sharing or other mechanisms and are details provided on the number of jobs, skill levels required, pay scales, employment duration, gender equity, etc., provided?

7c. Do local residents regard the project as acceptable and is it compatible with existing livelihood strategies?

7d. Have the requirements of the Communal Land Rights Act (CLRA) or other applicable land reform procedures been complied with?

7e. Does the project provide for long-term employment and economic viability?

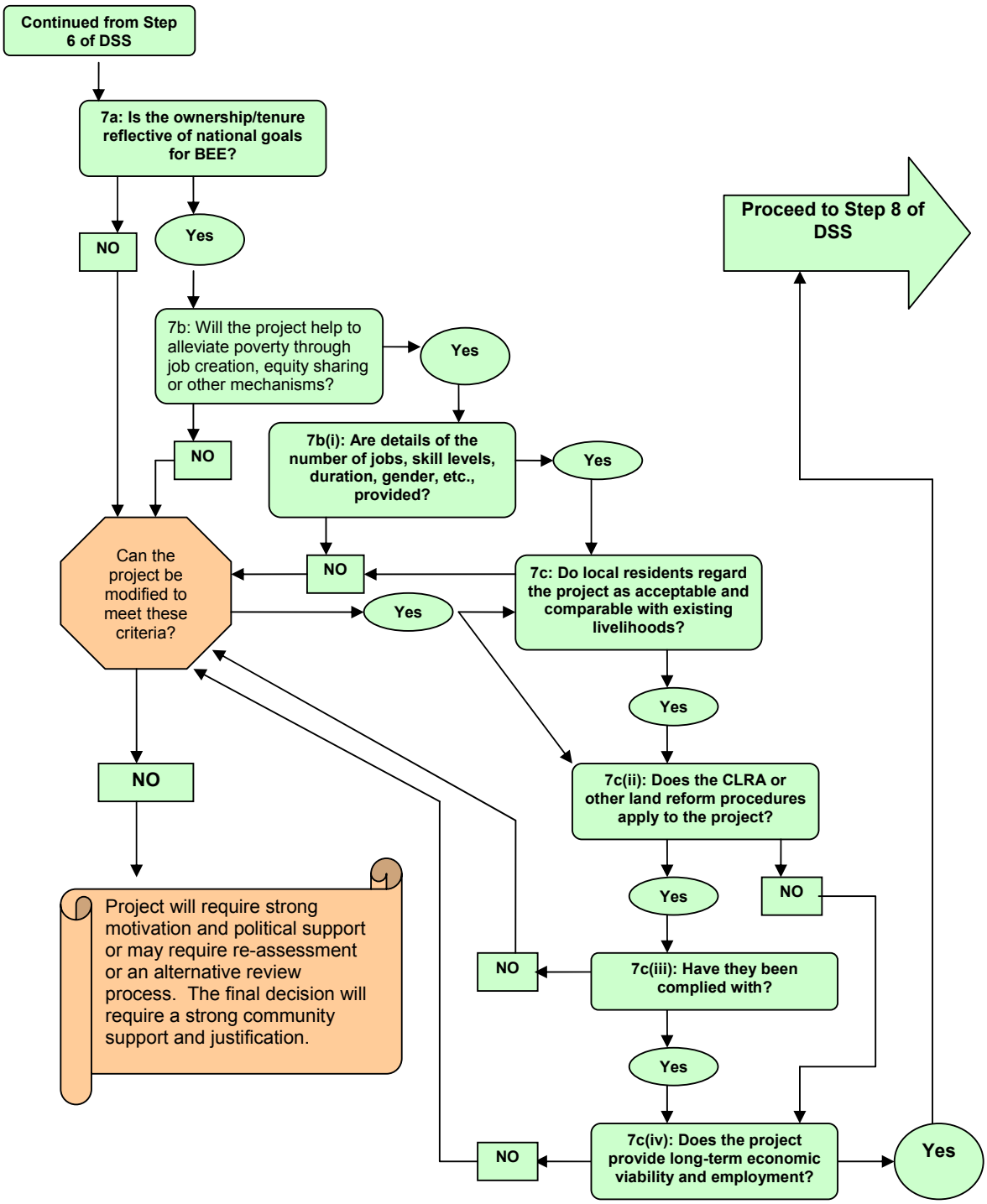


Figure 3.2: Steps in the DSS relating to social and institutional aspects.

If the answer to any of the questions in Step 7 is no, then the project should undergo a more thorough economic and social impact analysis in order to ensure that it is the most sustainable land use, given the potential for other development options to occur.

The next series of questions can essentially be answered as Yes or No and depending upon the results, the project may be deemed appropriate, require additional assessment, or be rejected as not sustainable.

Institutional Capacity

Step 8: Assess the following goals for Institutional Sustainability?

8a. Will the decision take into consideration public comment and does it support participatory decision-making?

8b. Have all potentially interested and affected parties been provided an opportunity to submit comments on the proposed development and have these been successfully addressed or accommodated?

8c. Does the project rely upon and support free market forces such as supply and demand, open market access, open tendering and independent audits?

8d. Have all other institutional requirements been identified, for example, zoning restrictions, water licenses, environmental permits, etc., and is there a programme in place to ensure they will be complied with both initially and on an on-going basis?

8e. Do the relevant and responsible authorities have the capacity (manpower, training and resources) to ensure continued compliance with all appropriate regulatory requirements?

If the answer to either of these questions is no then the project should undergo a more thorough assessment in order to ensure that it is the most appropriate land use given the potential institutional constraints. This assessment must identify mechanisms for improving institutional capacity constraints, but at the same time the decision-maker must recognise that goal 8e is not the responsibility of the project proponent, especially if that agency is in the private sector. In order to approve a project that substantially fails these goals, strong motivation and political and community support should be demonstrated.

4. ECONOMIC SUSTAINABILITY

The Economic component incorporates the findings of the social and economic assessment completed as part of the SEA. This information is not spatially oriented in the same way as the biophysical data. However specific data sets have been developed and appropriate queries can guide the land use planning and project review process. There are two broad categories and six questions which need to answered, as indicated in Figure 4.1 below.

Economic Sustainability Theme Decision Support System (Steps 9-10)

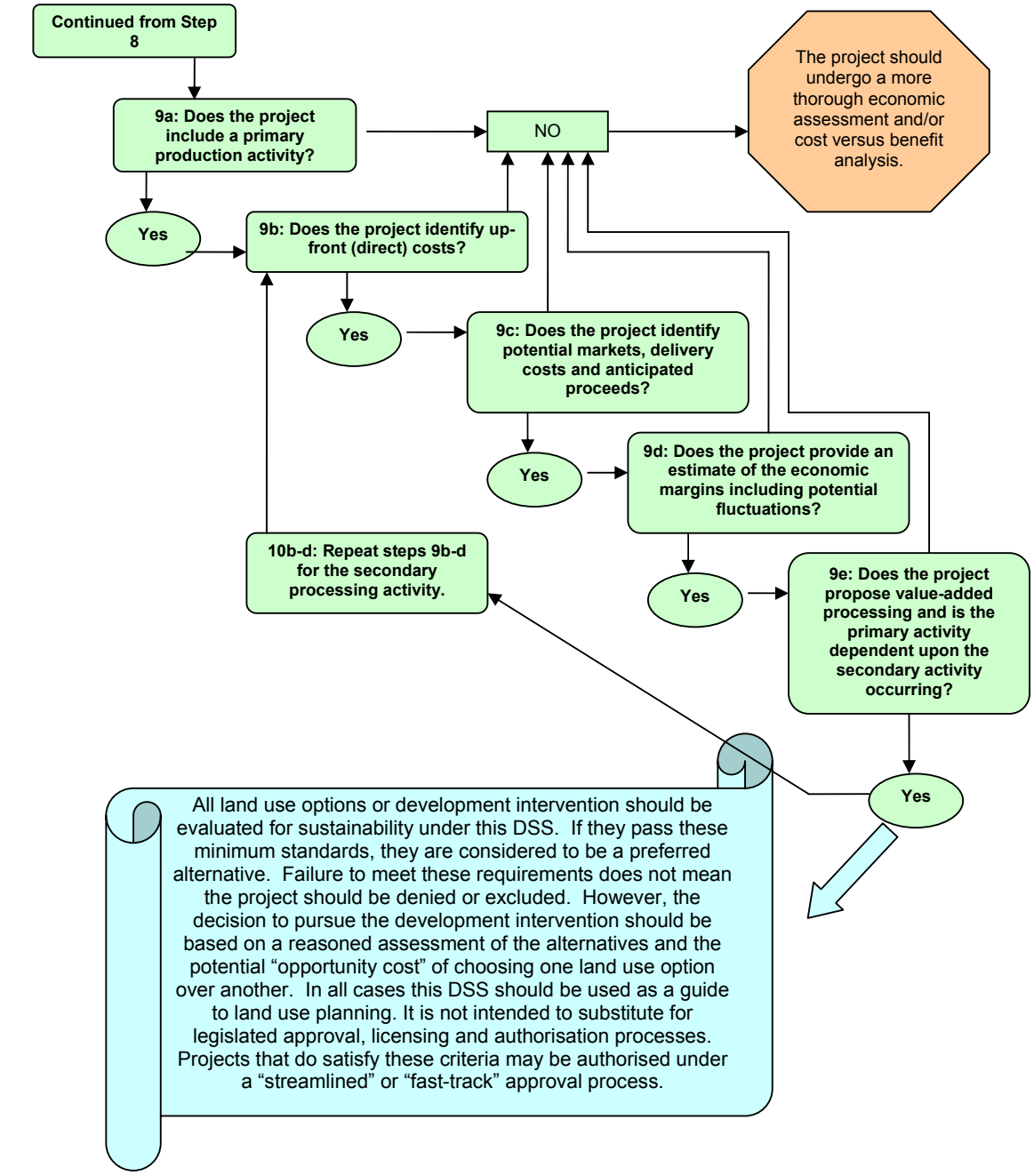


Figure 4.1: Steps in the DSS relating to economic aspects.

Primary Activity Assessment

Step 9: Assess the following goals for Primary Market Activity?

9a. Does the project or development intervention include a primary production activity (for example, fishing, mining, forestry, or agricultural production)?

9b. Does the project or development intervention identify anticipated up-front start-up costs such as land rights acquisition, infrastructure improvements, facilities, training and raw materials?

9b. Does the project or development intervention identify potential markets, their distance, transport costs, delivery volumes and estimated proceeds?

9c. Does the project or development intervention provide an estimate on the economic margins and how these may be subject to external market fluctuations (for example commodity prices, price fluctuations for needed inputs, fuel expenses, etc)?

9d. Does the project or development intervention propose a Secondary Activity (product beneficiation or processing) and is the economic viability dependent upon the implementation of downstream value-added processing?

Secondary Activity Assessment

Step 10: Assess the interdependence and economic viability of the Secondary Activity?

10a. Does the proposed secondary activity identify potential markets, their distance, transport costs, delivery volumes and estimated proceeds?

10b. Does the proposed secondary activity provide an estimate on the economic margins and how these may be subject to external market fluctuations (for example commodity prices, price fluctuations for needed inputs, fuel expenses, etc) and has the project allowed for an appropriate level of change?

If the answer to either of these questions is no, then, the project should undergo a more thorough economic impact analysis and/or a cost-benefit analysis in order to ensure that it is economically sustainable given the potential for other development options. The review should refer to the Social and Economic Report, Opportunities and Constraints Matrix, Cost versus Benefits Analysis and Sustainability Appraisal sections of this SEA for more comparisons to other potential land use options.

5. WAY FORWARD

The DSS presented here is the framework of a decision system that will incorporate the principles of sustainability in the process. It is intended to, after public review and completion of the SEA for the entire WMA 12 area, to produce a series of maps at Local Municipal scale in the Focus Area, and a broader scale for WMA12, which shows areas that are sensitive to various land use options for ecological or other landscape reasons (e.g. villages, topography etc.), but with an emphasis on those areas suitable for afforestation.

This draft SEA will be finalised after the one month public review period, and the DSS will be refined after this stage, incorporating comments from the various stakeholders. It will then be developed in more detail for the Focus and Contextual Study Areas.