Report on Task 4 of the Forestry-Poverty Linkages Project

by
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Terms of Reference
To explore the value of afforestation in the light of other use options of a parcel of land in the Lambasi area of the Lusikisiki district, Greater Port St Johns, Wild Coast, Eastern Cape, South Africa.

Method of Research

This research was conducted by 4 people. Budget was provided for ten working days. The research included two site visits (about 700 kms from Port Elizabeth), numerous telephonic interviews, internet search and select consultation of other references. This report combines observations made by the different authors.

The terms of reference were drawn up before the study site was selected. In the light of the study site selection the authors broke the research up into two tasks – both essential bases on which to determine the value of afforestation in the DWAF Lambasi site. The first task was to find out about the study site – what had gone on there, what was currently going on there, what was planned there and who had an interest in the site. This consumed most of the time. The second task was to determine values for selected crops grown there, especially forestry ones (desktop research). Almost all crops currently grown there (except tea) are for consumption in the Lusikisiki area, but in this exercise they were valued as cash crops, i.e. from a broader market perspective.

1. INTRODUCTION

Poverty alleviation is an overriding objective in many developing countries, especially Africa. An estimated 60% of rural Africans live below the poverty line of US$1 per day (Oksanen and Mersman, 2003). For this reason international institutions and agencies such as the World Bank, International Monetary Fund (IMF) and the Department for International Development (DFID) have embarked on numerous programmes to deal with the issue (Perkins, Radelet, Snodgrass, Gillis and Roemer, 2001). Rural areas in particular are targeted for such programmes, as most poverty occurs in these areas (Perkins, *et al.*, 2001).

Forests play an important role in the fight against poverty. Globally, approximately 1.6 billion people derive their income from forest related resources, while hundreds of millions of people in Sub-Sahara Africa rely on it for their livelihood. Poor rural communities draw from the environment in general, and forests in particular, to add to their meager incomes.

Forestry and forests play a significant economic role in rural areas, whether through the creation of formal job opportunities, or through informal harvesting activities. For this reason forestry is seen as a major contributor to poverty alleviation in such areas. The Department of Water Affairs and Forestry (DWAF) in South Africa, together with the DFID, is currently involved in the Water and Forestry Support Programme (WFSP), based on the assumption that rural people receive benefits from forests and forestry. They emphasise the role of integrated land-use strategies for poverty reduction – where a combination of different land uses is used to alleviate poverty and reduce vulnerability of households who depend, in part, on forests for their livelihood.

For this reason alternative land uses, such as crop cultivation, livestock grazing and production, dairy farming (intensive) or subsistence farming, depending on the suitability of the area under investigation, need to be explored. The Lambasi area in the Eastern Cape was selected by DWAF officials as suitable for a case study on alternative land use options available to the community residing in the area. This report aims to make an economic assessment of alternative land uses at the Lambasi site. It

provides a case study for use in discussions of addressing poverty through forestry initiatives in rural areas of South Africa. Being based on a real piece of land rather than a hypothetical piece, the discussion necessarily is focused on issues relevant to this site rather than any land on which forests may be grown.

The second part of this report (that following this introduction) provides selected background information on the site and the people directly affected by activity on it, the third describes what was found in connection with forestry as a land use on the site, the fourth considers selected alternatives to forestry, the fifth compares the economics of selected production options in the area and the sixth relates commercial development of the site to community constraints and draws conclusions.

2. BACKGROUND TO THE LAMBASI SITE

2.1 Location

Lambasi is situated approximately 12 kilometres east of Lusikisiki in the heart of the former rural Transkei. It falls within the auspices of the Oliver Tambo District municipality and the Port St. Johns municipality. The Port St. Johns municipality includes the towns and surrounding villages of Port St. Johns, Lusikisiki, and Umzimvubu - approximately 130 villages in total (Port St. Johns Municipality Integrated Development Plan, 2002). There are six villages in Lambasi, namely, Dimfii, Khonjwayo, Ndengane, Rhole, Ntlamvukazi, and Cuthwini. They house a total population of about 7000 people.

2.2 Current land use options and history

Agriculture plays an important role in the Eastern Cape's economy, as it is the third largest creator of employment. It is estimated that 45% of land in the former Transkei available to agriculture is not used because of unresolved ownership issues. Although many land claims have been settled in the western part on the Eastern Cape, not a single claim lodged in the former Transkei had been settled in writing by June 2001 (Ntshona and Lahiff, 2001). Land distribution has also been hampered by the shortage of suitable private land. For this reason, the focus has shifted to the restructuring of publicly owned land, but the national government has stalled on this restructuring because it does not have the necessary locally situated resources to administer it. The Department of Land Affairs (DLA) and the Regional Land Claims Commission's closest offices to Lambasi are situated in East London (Ntshona and Lahiff, 2001).

Agricultural development is also a very important part of the Department of Trade and Industry's Wild Coast Spatial Development Initiative (SDI). It aims to promote agricultural projects along this coast, especially on government owned estates such as are found in the Port St. Johns area (www.cimec.co.za/sector/headlines/agriculture.asp, 2003). One of these estates is the DWAF Lambasi site. The DWAF Lambasi Forest site consists of around 10 000 to 15 000 hectares (ha). Although plantations did previously exist in the area, no major commercial afforestation is currently occurring. Interested stakeholders are keen to develop the area as soon as possible, because parts of land have already been divided into smaller pieces by the village chiefs for household use (Mack, pers. comm., 2003). Although the land is fertile and well suited for a variety of land uses such as forestry, intensive and extensive agriculture and crop cultivation (Nja, pers. comm., 2003), little has been done to develop the area, and subsistence farming is currently the predominant land use.

Many attempts have been made to develop the area agriculturally, such as bean and maize growing projects, but these have all eventually floundered because of lack of necessary inputs and community cooperation. The community viewed these projects as schemes to make money by people living outside the area (Sisitka, 2000).

Many proposals have been advanced for agricultural projects in the area. One is to plant Eucalyptus on about 2000 ha. Another is to produce tea on 200 ha. Yet another is a dairy farm on 90 ha.

SAPPI was the firm interested in using some of the land for commercial afforestation, but it has since withdrawn from the project (Harrison, 2003). Approximately 1600ha of the site is currently covered with plantations. Indigenous forest covers that part of the site comprising of steep sloping ground running down to the sea. It was unclear how much indigenous forest there was on the site. As it grows in steep sloping land no alternative land uses to it are considered feasible (Harrison, 2003).
According to Graeme Harrison (pers. comm., 2003) the majority of the land identified as the DWAF Lambasi site is not used for commercial purposes. Subsistence farming (mainly crops and livestock) is practiced on a small scale. Various public-private initiatives have been proposed for the area in the past, but of these, few have been implemented (see Sisitka, 2000). Those implemented have all been unsuccessful (Harrison, 2003). Before 1994, the Transkei Agricultural Corporation (TRACOR) and some parastatals were involved in establishing a range of co-operatives with the community. In 2001, 2002 and 2003 the Department of Public Works attempted to rejuvenate some of these projects on approximately 400-1000 ha (mainly for bean, maize and potato growing). A red meat project was also proposed for the coastal strip, and a dairy project headed by ESKOM has also been mooted for the plateau area. The Public Works projects are ongoing, but the others have yet to get off the ground. It is difficult to determine which proposals have real backers and which are simply Wild Coast SDI speculations of potential. Harrison (2003) and Sisitka (2003) argue that most of the public-private partnerships flounder because of the top-down approach followed. Links with the community on ground level were not established, and local residents were doubtful as to the motives of stakeholders.

One of the problems encountered with all projects that have been implemented is that they are managed externally, with the development funds also originating outside the community. This leaves the community feeling vulnerable. They are suspicious and untrusting of outsiders and do not understand the dynamics of private-public partnerships. They are reported to feel like outsiders in their own environment (Harrison, 2003). The most recent maize crop was hand-harvested by the community, as they thought that it would all be taken away and sold elsewhere if machine-harvested, without them benefiting in any way (Harrison, pers. comm., 2003). The result was under-recovery of harvest and failure to cover investment outlays.

2.3 Topography and climate

This area has a humid and subtropical climate, with an average rainfall of 1100 – 1400 mm/year (mostly from October to March). In summer, the average temperatures vary between 20 and 25 degrees Celcius, while winter temperatures of between 8 and 21 degrees Celcius are the norm. The terrain is mountainous and hilly, with cliffs. Sand dunes and beaches are found closer to the coast. The gradient is steep in many places (1:3), leading to complications in accessibility and the development of the area. Sedimentary rocks and sandstone formations are present. The soil is euthopic brown and megalithic, which is conducive to concentrated agriculture.

The Lambasi study site consists of a coastal strip with indigenous forests, waterfalls and untouched beaches, becoming steeper inland with ravines and cliffs, leading to a plateau.

2.4 Vegetation

The vegetation in this region is diverse. Five key vegetation types can be distinguished:

- Coastal bushveld and grassland is found in the central, flatter, high rainfall region, from sea level up to an altitude of 300 metres. Moist upland grassland (sour grassland) occurs at an altitude ranging between 600 to 1400 metres (found on the plateau). It usually borders afromontane forests.
- Valley Thicket (also known as Eastern Cape Thicket), which occurs in valleys and consists of almost impenetrable shrubs

and trees.

- Afromontane forests, found in small patches on south facing slopes.
- Eastern Thorn Bushveld, which is characterised by the dominant Sweet Thorn *Acacia Karroo* trees, and occurs from the coast up to drier inland ridges.
- Coastal forests, established on high dunes with Dune forests

(Low and Rebelo, 1996; Port St. Johns Municipality Integrated Development Plan, 2002).

2.5 Land use patterns and land requirements

Table 1.1 depicts the percentage of land use coverage by economic activity.

Table 1.1 % of land use coverage: Port St. Johns District Municipality

Land type	% of coverage
Agriculture	23.6
Commercial	0
Industrial	0.01
Mines and Quarries	0.07
Residential	0.28
Small Holdings	0
Waterbodies	1.16
Other	74.9

Source: Port St. Johns Municipality Integrated Development Plan (2002).

The category 'other' includes forests and unused grassland (see Table 1.1). The majority of the land is used for agriculture or plantations or is unused grassland and indigenous forest.

2.6 Demography

Approximately 141 356 people reside in the Port St. Johns municipal area, with an average household size of 4.7 people (26 743 households). The majority of households (97.4%) live in rural areas. The economically active population constitutes 33% of the population. More than half of the households (65.4%) are headed by females, which make up 55.3% of the population. The population growth rate from 1996 to 2001 was 1.6% p.a. Due to the impact of AIDS this rate is expected to slow down considerably. A rate of –0.37% p.a. is predicted for the next 24 years. When one looks at the composition of the population, it becomes apparent why the dependency ratio (at an estimated ratio of 1 to 5) is high: 44.8% of the population is of school going age, while 17% is of pre-school age, and 5.2% is over the age of 64. This places an extra burden on the economically active population to provide for young children and old people alike (Port St. Johns Municipality Integrated Development Plan, 2002).

The unemployment rate has increased from 65.4% in 1990 to 80.5% in 2000, mainly because of a decrease in formal employment, which has decreased from 29.6% in 1990 to 14.6% in 2000. More females are employed in the formal sector than males. Employment by both males and females in the informal and formal sector has increased from 1990 to 2000 (Port St. Johns Municipality Integrated Development Plan, 2002).

Table 1.2 lists the employment by economic sector for the Port St. Johns District Municipality.

Table 1.2 Employment by economic sector: Port St. Johns District Municipality (1999)

Economic sector	People employed (%)
Agriculture	5.1
Mining	0
Manufacturing	9.8
Electrification	0
Construction	3.2
Trade	16.6
Transport	5
Finance	0.9
Community service	46.5
Household	12.7

Source: Port St. Johns Municipality Integrated Development Plan, 2002.

Community services and the trade sector provide the greater part of employment (62%) and is the biggest contributor to the Gross Geographical Product. These sectors are, however, not great generators of income.

Half of the population earns less than R18 000 per year, and 37.9% earns nothing. This, in turn, results in 89.2% of the population living below the minimum subsistence level. Only 0.4% of the population earns more than R132 000 per annum. The per capita income in the Port St Johns magisterial district has increased from R3777 in 1990, to R6709 in 2000.

Using data from the 1995 October Household Survey, the 1996 Census and the 1996 Income and Expenditure Survey, Statistics South Africa have calculated that the poorest of the poor in South Africa are to be found in the Wild Coast Council area of the Eastern Cape (Hirschowitz, 2000). The imputed mean monthly household expenditure in the area was R862, less than half the average for the Eastern Cape, about one fifth that of the metropolitan areas of Gauteng and barely above the poverty line of R800.

Table 1.3 Gross Geographical Product (GGP) by sector: Port St. Johns District Municipality

Economic sector	Percentage
Agriculture	5.6
Mining	0
Manufacturing	8.6
Electrification	0
Construction	0
Trade	12.3
Transport	3.1
Finance	3.7
Community Services	66.6

Source: Port St. Johns Municipality Integrated Development Plan, 2002.

Even though agricultural activity takes place on 23.6% of the land, it contributes only 5.6% towards the GGP, and employs only 5.1% of the economically active population. As could be expected, the community services sector employs the bulk of the economically active population, and contributes the most to GGP.

About 39.6% of all households do not have a formal education, and the illiteracy rate is 28.5% among children under 15 years of age, and 25.2% among people over 15 years of age. Only 0.6% of the population has a tertiary education, and only 1.5% has passed the matric exam. This lack in education is the root cause for unemployment and poverty (Port St. Johns Municipality Integrated Development Plan, 2002).

The majority of the population lives in informal and traditional houses (80%) with inadequate sanitation. However, only 40% of households are paying for municipal services. Although electricity stations have capacity to service most rural areas near Port St Johns, the electricity supply is infrequent and unreliable. For this reason many people rely on forests to provide wood for fuel (Port St. Johns Municipality Integrated Development Plan, 2002).

2.7 Economic development

Although local economic development enjoys the highest priority from the community and municipality (Port St. Johns Municipality Integrated Development Plan, 2002), there are numerous obstacles to overcome. These include: low income levels, low educational attainment and therefore lack of skills, high dependency ratios, lack of SMME development and a disorganised agricultural sector. The environment is under pressure from land uses being executed in a haphazard way, uncontrolled overgrazing in rural areas, and lack of control over the exploitation of marine resources and indigenous forests.

The Local Economic Division from the Port St. Johns Municipality have identified the following industries for development: tourism, skills (agriculture, business and finance, crafts), fishing and SMME's.

2.8 Accessibility

Lambasi is situated in a remote area, with minimal road infrastructure to service it (Harrison, 2003). Land uses need to be planned with this limitation in mind. Commercial afforestation, as well as dairy farms require high quality tarred roads. Extending tar roads is expensive in the Lambasi area as it is situated within a high rainfall area with steep slopes, valleys and rivers. The construction of a tar road of good quality (which is required) would cost approximately R 6 million per kilometre. Bridge construction would amount to R5 million per bridge (Matchett, 2003).

The main roads through the area are the Trunk Road 61 (R00061) and District Road 08004 (DR08004). Numerous gravel roads exist, but are not in a good condition and in need of resurfacing. An airstrip for aircraft of a considerable size, which is in fairly good condition, exists, but needs to be fenced as livestock currently grazes the area. Acid from their faeces could damage the surface of the strip (Port St. Johns Municipality Integrated Development Plan, 2002).

There are plans for a 550 kilometre N2 toll road for the Wild Coast, to run from Durban to East London. It follows 85% of existing roads – which will have to be upgraded – until it joins the existing road at Umtata. This road will cut 85 kilometres off the existing route (www.archive.mg.co.za). The road is part of the Department of Trade and Industry's (DTI) Wild Coast Spatial Development Initiative (SDI), which is based on the development of agriculture, forestry, tourism and a road for the specific area (Karras, 1997).

The construction of the toll road is a contentious issue, as environmentalists are opposing it, while government and other stakeholders are backing it. Environmentalists argue that the development threatens ecotourism in the area. The Wild Coast is host to more than 4000 species and plants. It is recognised as one of the world's 235 biodiversity hotspots, and remains the only true coastal wilderness in South Africa that is situated on the Indian Ocean – as its name suggests. The area is renowned for its

untouched beauty, many waterfalls, grasslands, forests, whales and dolphins, and Cape vulture colonies (Njwabane, 2003).

On the other hand, the Wild Coast is also well known for the poverty of its communities. The DTI holds the view that the road would empower these communities through job creation within the tourism industry, and by reducing the remoteness of the area (Njwabane, 2003). The Department of Environmental Affairs and Tourism also argues that the road would provide inhabitants there with better access to markets, opportunities for training and education, better social and health services and the development of SMME's (Cull, 2003).

The toll road would cost an estimated R6 billion to construct. Currently it is envisaged that travelers will have to pay between R105 and R150 in toll fees to use the road (Karras, 1997). Opponents of the toll road have suggested that certain parts of existing roads could instead be upgraded (which is envisaged), because locals currently drive on the road for free and cannot afford the R15 taxi fee to travel from Lambasi to Port St. Johns (Jiyana, pers. comm, 2003).

The proposed N2 toll road would go through Port St. Johns, Lusikisiki and Lambasi (Karras, 1997). It could be expected that transport costs of forestry and agricultural products would be reduced by the building of this road.

2.9 Tourist facilities

The undeveloped beaches and dramatic scenery close to the coast provides the main attraction for tourists. The natural environment also provides recreation to local residents. Tourist accommodation is limited. Only one hotel with 63 beds is currently operational – the Emboyti Hotel. There are also limited camp-sites and other accommodation – which is disconcerting when one considers that the area is considered to have high tourism potential (Port St. Johns Municipality Integrated Development Plan, 2002).

Tourism is seen as a means to develop poor and rural areas, such as the Wild Coast. The Department of Environmental Affairs and Tourism (DEAT) is in charge of the development of tourism potential, and has included a tourism plan in the Spatial Development Initiative (SDI) for the Wild Coast region. In the plan it focuses on eco-tourism development (Ntshona and Lahif, 2001). The DEAT has set the effective involvement of previously disadvantaged communities, sustainable resource use and close partnerships between all involved as paramount to its tourism policy (Ntshona and Lahiff, 2001).

3. FORESTRY/PULP OPTIONS

Approximately 1600ha of the Lambasi site is currently used for forestry. Pine trees are grown on a 25 year rotation period for timber and pulp, while gum trees are grown on a 7-8 year rotation basis for pulp. The wood is transported to SAPPI-Sycor on the Umzimkhulu river in Kwazulu-Natal, a distance of about 250 kilometres. This distance is a concern for SAPPI. It operates many plantations in the Kwazulu-Natal region, which increasingly renders the use of the plantations at Lambasi for pulp purposes as marginal (Harrison, pers. comm., 2003).

Harrison (2003) is of the opinion that the proposed construction of the N2 toll road would have a substantial impact on the viability of the forestry industry at Lambasi, as the road would run directly through this area. This road will decrease the distance to the nearest market for timber to 150 kilometres (Harrison, 2003). Forestry officials have proposed that an additional 2000ha be used for commercial afforestation with Pine and Eucalyptus trees (12-15% of the land currently not used for commercial purposes). Saw timber would be the main product from these plantations. Part of this proposal is the development of a sawmill for cutting and processing on site in order to cut down on transport costs. Three small-scale sawmills are currently operating in the area, filling the

gap left by the absence of major timber companies in the area.

SAPPI became involved in the Lambasi community in 1996. Since then it has, to a greater or lesser extent, been involved with the community. A small 'outgrower' scheme is currently operational. Only trees are provided for the scheme. For this reason there is little of their investment money involved.

If real economic development is to be achieved through forestry, SAPPI argue pulp production would not be the preferred option, as the wood would be sent elsewhere for other people to add value, and job creation would be marginal (Mack, 2003). They feel that saw milling would be the better option, with pulpwood as an add-on. The nearby infrastructure for the DWAF–run Ntsubane plantation increased the viability of forestry as a land use at Lambasi.

Activities centered on forestry are not the number one recommendation of SAPPI for this site. In 1996 it proposed an integrated land use plan to the Food and Agricultural Organisation (FAO) involving a number of agricultural projects and is still in favour of this plan (Mack, 2003).

In its dealings with Lambasi, the LIMA Rural Development Foundation (a foundation that has been involved extensively in the area since the SAPPI proposal in the 1990s) has learnt that it is better to start with small-scale projects, in order to observe its viability and suitability for the community. Forestry is well adapted to this kind of development and can easily be integrated in a multiple land use scheme. Grazing around plantations does not pose a problem, and non-timber forest products (NTFP), such as beekeeping for honey, are spin-offs from forestry.

However, there have been moves in recent times by tribal chiefs to subdivide the land into smaller sizes for households. According to the LIMA Rural Development Foundation and SAPPI these moves are considered to be inconsistent with their forestry proposal. For this reason the LIMA Rural Development Foundation is keen to get the forestry proposal going as soon as possible, before it is too late to start forestry. No business plan for the proposed afforestation was available from SAPPI at the time of writing.

The potential for adding value through downstream industry through expanding forestry seems real. Selected locals interviewed expressed interest in wood working and carving.

The state-owned forests in Lambasi are spread across the villages in the area. According to Mr Sijadu of DWAF, the lack of electricity connections to the villages causes a high demand for fuel wood. Mr Sijadu said there were two small woodlots in the area owned by the community, having been transferred to the communities by the government. The forests are not in a good condition. SAPPI's initial interest was in purchasing the forests and rehabilitating them for the production of pulpwood for their mills. They proposed a 4000 ha plantation but the Lambasi communities rejected this and countered proposed a 2000ha forestry plantation.

Currently villagers in the area use the forest plantations mainly for fuel and building materials, but some also use the timber for carving and sculpturing and making chairs and tables. Selected respondents in the area felt that a school for woodwork would be very useful in their area. Without the small-scale sawmills in the area, the Pine trees would not be of much value to villagers other than as firewood. The three sawmills in the area are owned by private "disadvantaged" coloured individuals. These sawmills cut planks and sell them to hardware shops in the villages and other members of the community.

Unlike the Pine trees, the Wattle trees are only used for firewood and the construction of thatch roofs. The Eucalyptus trees are used

as poles for building, roofing and firewood. Sometimes the bark of these trees is also used as a medicinal remedy for flu and colds.

The communities in the Lusikisiki area are also known as producers of hemp, a crop that can be used for making pulp and paper. The area is highly suited to growing the crop and is favoured because it yields a higher per hectare income than maize and reaches maturity quicker - under four months. The hemp plant yields tough fibres used to make canvas, rope, textiles and clothes. Its stem has a woody core that is pulped and used for making paper. Despite these attributes it is illegal to cultivate the crop in many countries, including South Africa, because the buds shooting from the crop have a psychoactive effect when dried and smoked. With increased uses of natural fibres compared to artificial fibres, more than 30 countries around the world have revived the cultivation of hemp for industrial uses. In 1999, the South African government took a bold step and joined other hemp-promoting countries in the world, undertaking to conduct a trial project in selected areas in the Eastern Cape. However, the results have not been promising yet.

4. ALTERNATIVES TO FORESTRY/PULP

4.1 Agricultural potential

Lambasi's soil, topography, rainfall, availability of water (rivers close by) and vegetation (forests) all contribute to its suitability for many land use options, but security and property rights are aspects that need attention (Nja, 2003). A variety of land uses could be implemented in the area (Harrison, 2003). The land uses investigated in this study are confined to the following farming activities: dairy, beef, crop growing (cabbage, potatoes), maize, hemp, subsistence and forestry. It has the necessary requirements for intensive agriculture, except that existing dams need to be upgraded and new dams be built if irrigated crops or pastures are planted. Access to markets is not a problem, as Port St. John's is close, and many villages are situated around the area. Historically, maize has been a major crop in the area, and it remains an important part of the staple diet in the area (Mack, 2003). Almost every household in the area grows maize on their piece of ground, mainly for own consumption. Individual household fields range from 1 to 5 hectares. The fields are ploughed manually, or by tractors, depending on availability, either from government or private individuals. In the past TRACOR equipment was used to plough community lands.

4.2 Current crop growing initiatives of the Department of Public Works

The economic motivation for the Public Works projects in the Lambasi area was to create short-term jobs under the broader Community Based Public Works Programme (CBPWP).

No formal assessments of projects undertaken were done, even though the Department stayed involved in the area and initiated other projects as well (such as maize planting and poultry farming). Because the focus of this initiative was on short-term job creation and similar projects were running in other provinces (such as Limpopo and KwaZulu-Natal), assessment focused on empowerment of communities, and not on profits.

The history of the Eastern Cape CBPWP traces back to 20 October 2000 when the first Community Production Centre (CPC) was opened at Ncora (http://www.publicworks.gov.za/speeches/minister/2000/20oct2000.htm). The CBPWP was designed to create short-term jobs in poor rural communities, alleviate poverty in these areas and create infrastructure. About R1.2 billion has been spent on it since 1996 (http://www.polity.org.za/html/govdocs/speeches/2000/sp1125.html). CPC's are part of the implementation of CBPWP, and entail the transfer of former parastatal enterprises to communities residing in these areas. CPC's encourage community ownership of resources and participation of new farmers. The creation of value-added processes within these Centres is emphasized because it leads to skills development and income generation for those involved. The broad aim of CPC's is economic development in areas through utilisation of their inherent economic potential, which translates into long-term employment and poverty

reduction (http://www.publicworks.gov.za/speeches/minister/2000/20oct2000.htm). The CPC is run by a Community Trust made up of members of the local community, traditional leaders and councilors (Ntshona and Lahiff, 2001). The Departments of Agriculture and Land Affairs are other stakeholders in CBPWP's, in order to ensure that these programmes have a broader impact in rural areas. Due to the involvement of these two departments much emphasis is placed on the provision of agricultural infrastructure.

Funding for the start-up of CPC's comes from the government, but the ultimate objective is for the projects to be self-funding. Partnerships between communities are envisaged in order to create nodes of economic development, which have spin-off effects to the rest of the region.

Six pilot projects were started in various areas in the Eastern Cape - one of which was at Lambasi. The Lambasi CPC included the communities at Lambasi, Hombre, Mbotyi, Mateko, Malangeni, Nkumzimbini and Njombela, and was opened on 25 November 2000. It was estimated that it would have an impact on the livelihoods of approximately 56 000 people. The CPC involves 14 projects, with prominence being given to a dry land maize project, renovation of farms buildings for chicken coops (poultry farming) and a bean scheme (Ntshona and Lahiff, 2001), on farmland previously owned by TRACOR (Maqhina, 2001). Labour intensive methods of production were used, while the construction of infrastructure such as footbridges, road stalls, poultry coops and roads were envisaged to create even more employment opportunities (http://ww.w.polity.org.za/html/govdocs/speeches/2000/sp1125.html). Approximately R9.6 million was budgeted for the Lambasi project alone (Ntshona and Lahiff, 2001).

In July 2001, an area of 400 ha of maize and 100 ha of sugar beans was harvested from the Lambasi CPC (http://www.dispatch.co.za/2001/07/13/features/FARM.HTM). The project produced R127 000 from the sale of beans and broilers during 2001 (http://www.dispatch.co.za/2001/07/14/easterncape/MINISTER.HTM).

The CBPWP did create jobs and hope among the poor, rural and powerless communities. However, this programme was based on short-term job creation, and specific measures were not put in place to sustain the operation over the long term (Ntshona and Lahiff, 2001).

In 2002 and 2003 the scale of the maize growing project was increased. According to Mr Colin Mziwamadoda Sijadu, an official of the Department of Water Affairs and Forestry working in Lambasi, the scale of the maize growing project rose to almost 1000 hectares in 2003. The maize is stored in silos, milled within Lambasi and sold to villagers. According to Mr Sijadu, the maize production project in Lambasi is on the brink of failure because communities are starting to sabotage it, claiming that the appointments of staff running the milling operation has been unfair. Mr Sijadu said some community members were allowing their cattle to graze on the maize fields as a show of no confidence on the maize production business.

Our observations in the area were that besides mealies most villagers grew cabbages and potatoes. Other crops they reported they grew were carrots, onions, tomatoes, beans, spinach, sweet potatoes, pumpkins, beetroot, nuts and tropical fruits such as bananas, guavas, mangoes and paw-paws.

4.3 The ESKOM dairy proposal

There is a dairy project proposal for the Lambasi area, but it proved impossible to find out anything concrete about it. People like Rory Mack (of Lima Rural Development Foundations) and Graeme Harrison (of DWAF), who have been involved in Lambasi for quite some time, know about it, but point out that it has not been implemented and no party can be identified who is likely to do so within the near future – certainly not ESKOM. It is reported that the project was proposed for 90 ha, with buildings and sheds to be built for

commercial milking facilities (Sistika, 2000), but dairy farmers consulted in the Underberg area felt that a more feasible project was in the region of 200 hectares with 800 cows – aimed at supplying the Port St Johns region with fresh milk (Turner, 2003).

4.4 The Magwa tea plantation

The Magwa Tea Corporation has expressed interest in utilising approximately 200ha of the land at the Lambasi site to grow more tea. The Magwa Tea Corporation was established during the Apartheid rule. It encompassed five tea farms, but was never expected to operate with a profit. After 1994, it was handed over to the Eastern Cape provincial government, which eliminated funding and started to reform the estate into a worker-owned enterprise. The Magwa Tea Corporation was liquidated in 1997. The Magwa Tea Company (MTC) was formed in 1998, operating under a cooperative driven by workers, who were given funding through the land distribution programme to buy the assets of the original company in liquidation. It was then taken over by Magwa and Majola tea estates (Wray, 1998).

An income of R40.3 million was expected during the 1998 financial year. Production of 3.1 million kilogrammes was expected at a price of R13/kg. Costs were estimated at R12.50/kg, resulting in a profit of R1.5 million. Magwa employed approximately 1800 full-time workers and about 2000 seasonal workers through the year (October to May).

Since its inception, the Magwa Tea Corporation has been marred by a chronic labour unrest and shortages of capital. The estate has been in financial trouble since transferred to the Eastern Cape provincial government after the 1994 elections (www.vsa.org.nz/teaco/htm). The deregulation of the tea industry in 1999 (www.vsa.org.nz/teaco/htm) added to a vast array of problems faced by the company: ineffective management in general, outdated equipment and the absence of a manager (the plantation has been without a manager since 2001) (Wray, 2002).
Although workers received government grants, they lacked the skill, management expertise and capital reserves to make a success on their own out of tea production. The equipment (tractors, trailors and shade cloth for seedlings) is in need of repair or replacement, and the tea factory is worn – it was built more than 25 years ago (http://tea.hypermart.net/countries/magwa.html).

South Africa has a short cropping period, 6 months. The tea industry in South Africa produces about 10-12 million kilograms of tea per year. About 33% of this originates from the Eastern Cape (http://tea.hypermart.net/countries/southafricafacts.html). The Magwa area is considered the best for tea growing in South Africa, also because it is a totally rain grown crop (http://tea.hypermart.net/countries/magwa.html). The tea estate is situated on 2500 ha and could produce approximately 3.5million kg. of tea per year, but needs to produce approximately 2.4 million kilograms to break even (Wray, 2002). It could potentially fill a niche market, as the tea grown at the estate is hand-picked – ensuring only the best in quality. There is a market for high quality tea in South Africa and overseas (Wray, 1998).

Currently, the Estate is going through a troubled phase, and is facing liquidation once more (Manyisana, 2003). Workers at the embattled Tea Corporation have not enjoyed any income since January and 400 permanent workers have left Magwa since June. ANC MPL Joe Jordan recently told the legislature in Bisho during discussion of the department of agriculture's annual report that a number of families living on the estate had been broken up because of lack of income. Mr Jordan said that some workers at Magwa had "died directly or indirectly because of starvation". Magwa senior section manager Thokozile Moni said workers were "demoralised and cannot reap tea while they are hungry". Since September the estate has lost R3,5-million in unharvested tea. Mrs Moni said the workers were prepared to harvest the tea if they were paid by some other organizations (the workers cooperative being unable to do so).

4.5 WWF Master Farmer Programme – Umzimvubu

Mr Mbulelo Maqhanqa, the programme co-ordinator says the project involves identifying active and hardworking households who are trained on best agricultural practices. Workshops are held regularly with the farmers. The project assists households to best farm their homestead gardens, which are normally 50m x 50m or 70m x 70m in size. The programme has more than 100 farmers involved, from Port St Johns to Magwa in Lusikisiki. Some of the villages covered include Mswakazi, Gemvale, Mthambalala, Nomfalo, Mngazana, Bolani and Chwebeni. Because of the subtropical weather in the area, the farmers in the programme are mainly involved in fruit production, including Mangoes, Avocado, Bananas, Litchis, Oranges, Naartjies and Paw-paws. Seasonal crops like Maize, Beans and Pumpkins are also farmed. Vegetables are farmed but there are various problems with them, including pests and diseases. Cabbage is the biggest victim. As most vegetables are winter crops, the Wild Coast winter is mild and therefore contributes to the poor performance of vegetables. Most of the produce is for subsistence purposes but there are excesses that are sold around the villages. The programme is also trying to organise the farmers into a co-operative in an attempt to market the produce collectively. Farmers in the programme are discouraged from using chemicals and fertilisers as organic farming is the method most preferred, and small farmers can not afford fertiliser costs.

The programme was founded in 1997 by the World Wildlife Fund (WWF), an international nature conservation organisation. The main reason for initiating the project was to discourage slashing and burning of forests, thus bringing to an end the clearing of indigenous forests for subsistence agricultural purposes. It was funded by Goldfieds during its the first three years. When Goldfields funding ran out, the Green Trust Fund, through Nedbank, financed the project beginning from year 2000 to the present day (Maqhanqa, M. 2004).

4.6 Livestock farming other than dairy

After mealie growing the most common subsistence form of agriculture is probably beef cattle. Most households own a few cattle but some villagers' herds are as big as between 10 to 50 cattle. Beef is a staple food and is served in most traditional ceremonies. Disease and theft are the normal threats to this activity. Sheep, goats and pigs are also popular sources of meat production. Chickens are bred for both meat and eggs.

5. COMPARING INCOMES OF SELECTED PRODUCTION OPTIONS

5.1 Transition dairy farming

Dairy farming is an intensive land use practice and pastures need to be established even in high rainfall area like Lambasi. For this reason the carrying capacity of such land is substantially greater than that of unirrigated land.

The costs and income figures below are those for a 90 ha dairy farm under dry land conditions, with an estimated carrying capacity of one Large Stock Unit (LSU)/2 ha. Agricultural extension officers deem it wise to keep the carrying capacity low during the start-up phase of dairy projects. The pastures need time to establish. For this reason, the carrying capacity would remain low for a while (Weitz, pers. comm, 2003). Approximately 50 dairy cows could be sustained on such an area. The carrying capacity of established irrigated pastures is approximately 4LSU /ha. In this case, however, it is assumed that cows would first be kept under dry land conditions, to give the pastures time to establish (www.polity.org.za/html/govdocs/green_papers/forest2.html).

Table 1.4 lists the estimated expenses involved in the capital outlay of a dairy farm of this size. Capital costs represent the start-up costs. They are a once-off expense for the purchase of dairy cows, the establishment of pastures and irrigation facilities, building of milk stables and purchase of milking equipment (Weitz, 2001).

Table 1.4 Estimated capital expenses for a small scale dairy farm during 2002 (2001 figures adjusted for inflation in the milk industry) (in Rands)

CAPITAL EXPENSES		
Description	**Cost per ha**	**Cost per 90 ha (50 cows)**
Pastures: establishment	2 200	198 000
Purchase: dairy cow	5500*	275 000
Milk facilities (stables)	8 800*	440 000
Milking machine		237 600
Irrigation infrastructure	2860	257 400**
Waste management	290.40*	14 520
TOTAL		**1 422 520**

* These figures are per cow and not per hectare.
** This includes a centre pivot, draglines, sprinklers, stands, lateral lines and unforeseen expenses (20%).
Source: Weitz, 2001.

The capital expenses of a small-scale dry land dairy farm at Lambasi would amount to about R1.4 million. Intensive farming would increase the carrying capacity, but would also increase the capital costs as more cows are purchased, more stables are built and irrigation equipment is bought.

Table 1.5 shows the variable and fixed costs, as well as the income per year with a dairy farm containing 50 cows.

Table 1.5 Estimated fixed costs, variable costs and income for a small scale (transition) dairy farm per annum during 2002 (2001 figures adjusted for inflation in the milk industry) (in Rands)

VARIABLE AND OVERHEAD (FIXED) COSTS*		
Description	**Cost/ income per cow*** **	**Cost per 90 ha**
Feed purchases, vet and medicine, AI and labour, excluding fertiliser	5467	273 350
Overheads**	1210	60 500
TOTAL		**333 850**
INCOME PER ANNUM		
Income*^	**7111**	**355 568**

* This excludes the salary of the farmer, as well as interest (overdrafts, loans and Landbank). In the Lambasi case, Landbank loans are assumed not to be applicable, as the land would be transferred to the local community, who would, eventually, run the dairy project.
** This includes general administration costs. These include labour, office, licenses, reparations of fixed assets, fuel (on farm - not for transport of milk to market), electricity, contractors and bank costs.
*^ The income was calculated on the assumption of 16.4 litres/day/cow for 365 days at R1.19 per litre (Weitz, pers. comm., 2003).
*** Source: Weitz, 2001.

From Table 1.5 it is clear that a dairy farm of 90 ha with 50 dairy cows (capital costs excluded) would make a net profit of approximately R21 718 per annum, or R241.31/hectare/year. This constitutes an expense/income ratio of 94%, which is a fairly high ratio when compared with that of other intensive dairy farms, for instance that of the Humansdorp area (80% in 2002). However, according to heat indexes, Humansdorp is one of two ideally suited areas to dairy farming in Southern Africa (the other being Walvisbay). The Humansdorp figures include that of study farms, which reflects the income and expenses of the top farmers in the area (Weitz, pers. comm., 2003). For this reason average farmers (assumed to include Lambasi at the initial stages) would be expected to face lower incomes, but higher expenses.

The water use of agricultural activities needs to be taken into account to determine which projects would be most suitable for the area. Water is a scarce resource, especially in a country such as South Africa, which is classified as semi-arid. The water use of a dairy farm would vary between 200 to 250 litres per day to wash the milk bays, while the cows would consume approximately 50 litres per cow per day (Zeeman and Weitz, pers. comm., 2003).

Job creation at a dairy farm would depend on the capital intensity thereof: approximately 3 jobs would be created on a 90 ha dairy farm with a milking machine. This would increase to 8 jobs if milking were to be done by hand (Weitz, pers. comm., 2003).

One of the biggest problems faced with a dairy project at Lambasi is the remoteness of the area. Dairy operations rely on fast, efficient transport to markets. Milk trucks must be able to transport milk on a daily basis from Lambasi to nearby towns. It is also debatable whether nearby towns would be able to generate sufficient demand for milk, as many people have cattle that they milk for household use. The construction of the N2 toll road, however, could have a positive impact on production of such an enterprise.

Other problems associated with the establishment of a dairy farm include the experience and expertise needed to run it, the high investment involved, expensive infrastructure, competition and the hard work implicated (activities usually start at about 04h00). Managers need to have experience, and people need to be trained (Weitz, per. comm, 2003).

The high input costs in relation to the price of milk received constitute another problem. With a dairy project, such as that proposed for Lambasi, it might be the best to start on a small scale, and to enter into joint ventures with commercial dairy farmers. This option would reduce risks and limit the cost of mistakes. Small-scale dairy farms, however, are expensive to run, as the fixed costs are high.

5.2 Beef cattle farming

A beef enterprise need not be intensive in nature (no pastures needed). Natural grazing available can be used with no additional cost of irrigation. Most of the land at Lambasi is currently used for cattle and small stock grazing (Harrison and Mack, 2003), and it is well suited for this, because of the high rainfall in the area.

If an area of 400 ha (previously proposed for the Lambasi area (Harrison, 2003)) was used for beef cattle farming, approximately 100 LSU's (about 65 cows) could be stocked, assuming a carrying capacity of 4ha/LSU (or 0.25LSU/ha).

Table1.6 lists some of the capital expenses for such an enterprise. The most important fixed costs are fences, water (pipes and tanks) and dip facilities (Els, 2002). The fencing costs are provided per metre only, and not as a total; the reason being that many factors need to be taken into account when fencing decisions are made. The gradient of the land, size and shape of grazing camps and proximity to water all impact on the layout and number of camps established, and hence the length of wire used. The length of pipes needed for water could not be established as it is case specific and depends on the number of drinking troughs established. The cost of dip facilities was not included, as cattle can be dipped on their back instead of using a dip facility. Other infrastructure such as sheds were excluded, as these depend on personal decisions to be made by the farmers involved (Els, 2002).

Table 1.6 Estimated capital expenses for a beef cattle enterprise during 2003 (R)

CAPITAL EXPENSES

Description	Cost per cow	Cost per 400 ha (65 cows)
Wire	15*	
Purchase: cow	3021**	196 365
Purchase: bull	5000	5000
TOTAL		201 365

* This represents the cost per metre.
** The price of a beef cow can be determined by using auction figures. These, however, vary substantially. For this reason, the rule of thumb value was determined by dividing the live weight of a cow (on average 450 kilogrammes) by two and multiplying this value by the current meat price. The meat price is the average of class AB2/AB3, B2/B3 and C2/C3, which was R13.36 during the week of 21 November 2003 (Agrimark, 2003).

Overheads include items such as fuel consumption of tractors and other vehicles, depreciation on vehicles, telephone, electricity, maintenance of implements, insurance and accounting costs (Els, 2002; Sub-Directorate of Agricultural Economics and Financing, 1998).

Personal visits to farms need to be made in order to assess these types of expenses, because they vary significantly between areas (owing to the topography of the veld). The calculation of overhead costs requires a full analysis of a farm business. Such full farm business analyses were previously done in the South African wheat and maize industries, when the government was responsible for the setting of prices of these goods. Surveys on other branches of farming, such as citrus, livestock and sugar were done in the 1970s. No more recent information is available (Antrobus, pers. comm., 2002; Sub-Directorate of Agricultural Economics and Financing, 1998; Els, pers. comm., 2002). The Department of Agriculture in the Eastern Cape does not have figures available on average fixed (indirectly allocatable) costs. It restricts its contribution to consultation by in-house experts in order to assess the viability of farms (Nyokana, pers. comm., 2002).

Table 1.7 provides an indication of the directly allocatable costs (variable costs) facing a beef cattle enterprise.

Table 1.7 Estimated variable costs and capital income of a beef cattle farm per annum during 2002 (in Rands)

Description	Costs/ capital income per LSU*	Cost/ capital income per 400 ha
Marketing (auction)	81.25	8 125
Transport	9.04	904
Medicine	48.80	4 880
Lick and feed	130.87	13 087
TOTAL	**269.96**	**26 996**
Capital income per LSU	**1059.19**	**105 919**

*Source: Enterprise budget, 2002. These figures are for beef cattle in the Queenstown area (similar figures could be expected for the Lambasi area (Zeeman, pers. comm., 2003)) sold at 7 or 12 months at an auction, or mated at 15 months. Note that these are the most recent figures, which pertain to 2002. The capital expenses in Table 1.6 are relevant for 2003.

The net profit of an enterprise consisting of 400ha would amount to R78 923 per annum, or R197.31/ha/year.

The water use of beef cattle was estimated at 50 litres per cow per day.

Access to markets and transport to and from them would be less of a problem with beef cattle farming than with dairy farming, as

beef cattle only need to be transported once a year, as opposed to daily milk transport with a dairy farming enterprise. A beef cattle enterprise seems to be particularly suited to the area because of the relative small capital expenditure and technical skills needed to run such an activity. Many residents have already been exposed to cattle farming.

Possible problems associated with beef farming activities in the Lambasi area include overgrazing, stock theft and pest control (such as ticks). Currently, cattle are allowed to roam the area freely and dipping is not executed on a regular basis.

5.3 Crop cultivation

The local population plant a variety of crops, with maize, cabbage, potatoes, carrots, beans and tomatoes being predominant (Harrison, 2003). The Department of Agriculture annually publishes its Enterprise Budget, with the most recent data on crop cultivation, livestock farming and horticultural activities. It does not contain budgets for all the crops mentioned above. For this reason only maize, cabbage and potato cultivation were covered.

In most cases, water does not pose a problem for the cultivation of the crops selected, as most of them occur on dry land (non-irrigated fields). Crops that need a lot of water (irrigated fields) increase the cost of capital outlay of these enterprises (www.dwaf.gov.za/docs/NWRS/6%20Chap4%20Complimentary%20strategies.pdf). For this reason dry land activities were selected as the most suited for possible future land use at Lambasi, where possible.

5.3.1 Maize

The most important crop cultivated is maize (Jiyana, pers. comm., 2003; Harrison, pers. comm., 2003). Various maize projects have already been initiated, with mixed results (Harrison, pers. comm., 2003). No figures are available for maize growing in the Lambasi/ Port St. Johns area, but the Department of Agriculture's Enterprise Budget (2002) does contain data for dry land maize cultivation in high rainfall areas, such as Ugie, and dryer areas such as Maclear and the Border (and East London) area. Irrigated maize cultivation figures are also available. The dry land data was used in the analysis of maize as alternative land use in the Lambasi area.

Capital costs for dry land maize cultivation depend on individual farmers' decisions. Subsistence farmers in the Transkei region especially, do not fence their maize lands. However, maize grown for commercial reasons needs to be fenced to prevent goats and other wild animals destroying the crop (Zeeman, pers. comm., 2003). The cost of wire per metre amounts to R15 (labour for erection of fences excluded).

Table 1.8 below depicts the variable costs and income flows for dry land maize cultivation in the high rainfall area of Ugie. This data bears a close resemblance to that expected at Lambasi (Zeeman, 2003).

Table 1.8 Estimated variable costs and income flows of dry land maize crops

Description	**Cost/ income per ha (R)**
Marketing cost	0
PRE-HARVEST COST	
Seed	217.20
Fertiliser (2.3.2, LAN, lime)	1182.21
Weed and insect control (Atrasien, guardian, cutworm bait and sumicidin, stalk borer)	542
Insurance (hail, fire)	0

Machinery, implements	713.32
Labour: machinery and implements	67.38
Transport of fertiliser	12.93
TOTAL	**2735.03**
HARVESTING COST	
Packing material	285.91
Machinery, implements	44.59
Labour: machinery, implements	21.55
Casual labour	171.38
TOTAL	**523.44**
INCOME	
Sell co-op	4840
MARGIN ABOVE COST	**1581.54**

Source: Enterprise budget, 2002.

The net profit of maize cultivation in high rainfall areas is estimated at R1 581.54/ha. Dryer areas (data from Maclear used) face similar costs, but a lower income. The margin above cost in dryer areas has been estimated at R724.95/ha (Enterprise Budget, 2002).

The picture changes significantly with maize under irrigation. Although no data is available for the Lambasi area, it is available for irrigated maize in the Queenstown area (see Table 1.9).

Table 1.9 Estimated variable costs and income flows of irrigated maize

Description	**Cost/ income per ha (R)**
Pre-harvest cost	3178.29
Harvesting cost	670.14
Income: sell co-op	7040
MARGIN ABOVE COST	**3191.57**

Source: Enterprise Budget, 2002.

Although the income flows are higher for irrigated maize crops than under dry land conditions, costs are higher as well. Irrigation related costs, such as electrical pumps, labour involved with irrigation structures and maintenance push up costs. Increased purchases of seed and fertiliser (especially LAN) also increase costs (Enterprise Budget, 2002).

Income and variable cost flows are available for dry land maize cultivation under small-scale and subsistence farming, as shown in Tables 1.10 and 1.11.

Table 1.10 Estimated variable costs and income flows of dry land maize crops: subsistence farming

Description	**Cost/ income per ha (R)**
PRE-HARVEST COST	
Seed	21.60
Fertiliser (2.3.2, LAN, lime)	0

Weed and insect control	0
Transport of labour	0
Machinery, implements	0
Labour: machinery and implements	0
Contract plough	280
TOTAL	**301.60**
HARVESTING COST	
Packing material	9.00
Casual labour	233.52
Contract transport from land	210
TOTAL	**452.52**
INCOME	
Sell private, use as livestock rations	990
MARGIN ABOVE COST	**235.88**

Source: Enterprise budget, 2002.

The data for small-scale farming data relates to the East London area and an average annual rainfall of about 900mm.

Table 1.11 Estimated variable costs and income flows of dry land maize crops: small-scale farming

Description	**Costs/ income per ha (R)**
PRE-HARVEST COST	
Seed	63
Fertiliser	192.33
Weed and insect control	135.50
Labour: transport, hoeing, operation of machinery and implements	502.87
Transport: fertiliser	4.31
Machinery and implements	224.59
TOTAL	**1122.59**
HARVESTING COST	
Packing material	20
Machinery and implements	23.0
Labour: machinery and implements and transport	23.14
Casual labour harvest	300
TOTAL	**366.18**
INCOME	
Sell private, use as livestock rations	2200
MARGIN ABOVE COST	**711.23**

Source: Enterprise Budget, 2002.

The margin above cost for maize depends on the number of inputs used in the production process. More inputs translate into higher costs, but the income generated is also substantially higher than under a minimal inputs process. The cost per hectare of dry land is

R2 735 and for subsistence maize farming it is R452.52. These costs are compared with respective incomes generated per hectare, viz R1 581.54 and R235.88. The biggest cost for a subsistence farmer is a plough, which has to be contracted (usually from a commercial farmer).

Subsistence farming is the predominant farming activity at Lambasi, partly because the local community does not have access to funding for large-scale commercial farming.

5.3.2 Potatoes

Residents at Lambasi grow their own potatoes (Mlangeni, pers. comm., 2003), and the area is suited for potato cultivation. The following table depicts the variable costs and income flows of a commercial dry land potato farm. The data relates to the Ugie area.

Table 1.12 Estimated variable costs and income flows of dry land potato crops

Description	**Costs/ income per ha (R)***
PRE-HARVEST COST	
Seed	2320.81
Transport of fertiliser	5.31
Fertiliser (2.3.2, LAN, Eptam super)	2960.53
Wed and insect control	2223.20
Casual labour (planting and fertiliser application)	112.11
Machinery and implements	676.65
Labour: machinery and implements	75.30
TOTAL	**8 373.89**
HARVESTING COST	
Packing material	1564.80
Casual labour	392.07
Transport to market	1003.62
Machinery and implements	1503.36
Labour: machinery, implements	165.96
TOTAL	**13 003.70**
INCOME	
Income	27 693.70
MARGIN ABOVE COST	**14 690**

*Excluding VAT.
Source: Enterprise Budget, 2002

As with maize, no capital costs are included, as these depend on each farmer's individual decisions. It would be recommended that potato fields be fenced, to keep straying animals out (Zeeman, 2003).

5.3.3 Cabbage

The Enterprise Budget (2002) contains data on variable costs and income flows for irrigated cabbage farming in the Border area. Table 1.13 shows these costs and flows.

Table 1.13 Estimated variable costs and income flows of irrigated cabbage crops

Description	Cost/ income per ha (R)
PRE-HARVEST COST	
Cabbage plants	2 907
Labour: planting	324.72
Transportation: fertiliser	30.79
Fertiliser (2:3:4, potassium chloride, LAN, kelpac, sodium mollibnite, etc.)	3 705.11
Irrigation: water, labour, pump, maintenance	359.39
Machinery and implements	296.32
Labour: machinery and implements	29.89
TOTAL	**7 653.22**
HARVESTING COST	
Packing material	3 399
Casual labour	1058 40
Machinery, implements	162.03
Labour: machinery, implements	24.71
Transport of harvest	3 809.77
TOTAL	**8 453.91**
INCOME	
Income	42 900
MARGIN ABOVE COST	**26 792.87**

Source: Enterprise Budget, 2002.

The margin above cost for this crop is substantial. However, it also needs the most inputs, in the form of irrigation equipment and payment for water used. For this reason it might not be feasible to plant cabbage for commercial purposes, but rather for own household use.

The irrigation requirement of crops varies substantially, based on environmental factors such as rainfall, length of growing season, evaporation, genetic differences, density of planting and atmospheric factors (Green, 1985). The irrigation requirement for cabbage (brassicas) (East London area) varies between 182mm and 105mm, depending on when it is planted, with an average irrigation requirement of 143.43mm over the growing season (Green, 1985).

5.4. Forestry

Afforestation has dominated the land use discussion at Lambasi for a long time. It has never been suggested that trees for commercial use be planted on the whole Lambasi study area. The current proposal is that the existing plantation be expanded by approximately 2000ha (which would bring the total afforested area to about 4000ha) (Harrison, pers. comm., 2003).

Various options for commercial afforestation exist; the most prominent being that for pulp and sawtimber. DWAF constructed a number of Cost Benefit Analyses based on the commercial use of three tree species. These included Acacia Mearnsii (black wattle) bark and timber, Eucalyptus Grandis pulp and timber and Pinus Patula timber (Harrison, pers. comm., 2003).

Forestry values (gross income, capital costs and income) are approached differently than, for instance, farming values. More equipment is needed and diverse factors play a role in the determination of the viability of it. The biggest difference between forestry and agriculture (such as crop cultivation and livestock farming as dealt with in previous sectors) is that the former is a long term investment (Mack, pers. comm., 2003). A plantation could stand for 25 years before being harvested. Some forestry costs occur at regular intervals but not necessarily on an annual basis.

The Mean Annual Increment (MAI) plays a decisive role in the timing of harvesting. The MAI of a stand of timber is the ratio of the volume of timber in the stand to the age thereof. The income from felling a uniform stand of trees would be the largest when the MAI is at its maximum (Perman, Ma and McGilvray, 1996).

The interest rate to the forest owner is the opportunity cost of capital. Time is an important component of the decision on whether afforestation should take place. Costs and benefits (profit) do not occur at the same time. The costs of establishment occur at the outset, with weeding and growing costs occurring annually from year 1 onwards. Depending on the MAI, the stand would be felled or thinned after 8 or 15 or 24 years (or anything in between). Only after this period would an income be generated. The discount rate, which is used to convert all costs and benefits accruing at different times to base year values, impacts on the optimal felling age (and thus the MAI). As the discount rate increases the optimal age for felling trees declines.

The capital costs associated with forestry activities in this area were estimated at R10 000/ha per annum (Harrison, pers. comm., 2003). These costs include vehicles for transport of labourers not living on site, as well as machines used for fire fighting, road maintenance and planting (see Rusk, Pennefather, Cronje and Meyer, 1994 for detailed machinery use).

The capital outlay for a processing sawmill amounts to between R1 million and R5 million. At Lambasi, a small mill, which would cost approximately R250 000, would be sufficient for starting things up (Harrison, pers. comm., 2003). The mill would create between three and six jobs.

Approximately 30 people are normally employed per 1000 hectares of plantation. Productivity in communal and remote areas, such as Lambasi would be lower. For this reason, for the Lambasi area it is estimated that about 45 workers per 1000 hectares would be needed, excluding labour needed for harvesting.

Water is a critical issue in planning plantations because they are heavy water users (http://216.239.37.104/search?q+cache:gpgmik3asRjJ:www.iied.org/docs/flu/psf/stakes/PS). For this reason plantations occur mostly in areas where the annual rainfall is in excess of 800mm per annum (http://216.239.37.104/search?q+cache:gpgmik3asRjJ:www.iied.org/docs/flu/psf/stakes/PS). In South Africa, which is a dry country, the appropriateness of forestry as a land use has often been questioned. Downstream requirements and the minimum ecological reserve are some of the factors assessed in the decision of the suitability of a plantation.

Currently there is little downstream opportunity cost through forestry use in the Lambasi area (Harrison, pers. comm., 2003), but it is conceivable that if some of the many tourism or agriculture proposals materialise, this situation will change. For this reason, concern over the impact of commercial afforestation on water supply and quality remains. (www.polity.org.za/html/govdocs/green_papers/forest2.html).

Estimates of water use figures for plantations, such as those at Lambasi, vary between 660 cubic metres/ha/year (DWAF figures

from Harrison, 2003) to 880 cubic metres/ha/year (Kruger, 2002).

If not managed properly, the seeds of trees grown in plantations, such as *Pinus spp*. and *Acacia spp*., can spread and become invasive. This spread is a threat to biodiversity – especially in the Wild Coast area with its pristine wilderness and hotspot status (Where to the N2, 2003). The Working for Water Programme has already cleared selected areas of alien trees at Lambasi, as well as the Magwa tea plantation (Buckle, 2003).

Biodiversity is lower in these forests than under pristine conditions (www.polity.org.za/html/govdocs/green_papers/forest2.html). However, current agricultural activities (such as crops and intensive livestock farming, together with unsustainable farming practices) also alter the biodiversity present at a site.

This report deals mainly with the consumptive use of forests, but there is also non-consumptive use values generated by plantations (Gaston and Spicer, 1998 and Turner, Pearce and Bateman, 1993). Consumptive use refers to the timber harvested from the stands. Non-consumptive use refers to the indirect use of the forestry areas, eg. pleasure people derive from walking or mountain biking on forestry roads and increased soil stability and carbon sequestration generated by the trees (Bateman, Lovett and Brainard, 2003).

The benefit of commercial forests can be estimated by summing the following:

- Timber values
- Recreation values
- Landscape values
- Soil stability (ecological function values)
- The value of trees as carbon sinks (macroclimate regulation)
- Employment
- Economic security
- Community integrity
- Air and water pollution values
- Microclimate

(Bateman, Lovett and Brainard, 2003). The authors of this report were not in a position to calculate all of these benefits.

The largest areas containing natural forests in South Africa are found in the Eastern Cape (almost 140 000 ha). Woodlands used for stock farming are in relatively good condition, while clearing by commercial farmers for agricultural purposes has degraded other areas significantly. Approximately 65% of the former homelands are situated within woodlands. Responsibility to conserve these areas rest mainly with the affected communities, and these people would have to be incorporated into correct ecosystem management procedures. Large areas of woodlands are situated on privately owned land and are used for ecotourism purposes (www.polity.org.za/html/govdocs/green_papers/forest2.html).

By way of comparison with alien plantations, the value of indigenous forests and woodlands includes that of:

- Fuelwood (major energy source)
- Timber for wood products and construction material
- Fruit

- Honey production
- Medicinal products
- Use of the bark for weaving of ropes
- Grass for thatching
- Grazing (not for commercial gain)
- Biodiversity
- Employment
- Recreation values
- Ecological function values
- The value of trees as carbon sinks (macroclimate regulation)
- Economic security
- Community integrity
- Air and water pollution values
- Microclimate

(www.polity.org.za/html/govdocs/green_papers/forest2.html; Raymond, Young, Ronald and Giese, 2003). As was the case for plantations, no attempt was made to estimate all these benefits. As far as this research team could determine, no current proposal envisaged the removal of indigenous forest.

5.4.1 Acacia Mearnsii bark and timber

Acacia Mearnsii plantations in the Lambasi area could be used for bark and timber (Harrison, 2003). The felling age of the trees is eight years, after which the bark is stripped and the timber used. Weeding costs of approximately R300/ha arise in the year after establishment (DWAF, 2003). For this reason new stands would be planted in year 0 and then every eighth year thereafter, and weeding would be done in year one and nine and then every year after establishment.

Approximately 19.58 tonnes of bark and 85.35 tonnes of timber could be harvested per hectare. Although 1500 trees are planted per hectare, this is reduced to approximately 1472 stems per hectare at clearfelling age (after thinning), when the mean height of trees reaches about 14.89 metres. The MAI of the trees is about 12.55 cubic metres/ha/yr (the average rate of growth (measured in volume increment) per hectare per year measured at an index age of 10 years). The cost associated with establishment of trees is approximately R1500 per hectare (R1 per tree), while growing costs are estimated at R4000 per hectare (DWAF, 2003).

Table 1.14 below shows the variable costs and income flows for Acacia Mearnsii timber and bark production.

Table 1.14 Estimated transport and harvesting costs and income flows from Mearnsii bark and timber for 2001 (in Rands)

Description	Bark	Timber
COSTS PER HA		
Transport	2 303*	11 007**
Harvesting	0	3 374***
INCOME PER HA**		
Gross income	12 294	41 752

Income adjusted for transport and harvesting cost	9 992	27 371

* The transport cost for bark was determined by multiplying the road haul distance (150km) by the haulage cost per kilometre (0.87 Rand/ton/km), and then multiplying that by the tonnes of bark per ha, adjusted for bark mass loss (% mass loss due to drying of exposed bundled bark, which is 11% in this case).
** The transport cost for timber was determined by multiplying the road haul distance (150km) by the haulage cost per kilometre (0.87 Rand/ton/km), and then multiplying this by the tonnes of timber harvested per ha. Railway transport is not an option.
*** The harvesting cost/ha was determined by multiplying the harvesting cost (R40/t) by the tonnes of timber per ha.
**** The gross income was calculated by multiplying the delivered price (R495 per ton for timber and R628 per ton for bark) by the tonnes of bark/timber harvested per hectare.
Source: DWAF, 2003.

Not all variable costs were included in Table 1.14. Operational costs and labour wages were not included, as more specific information was needed to calculate it.

From this information the standing value, which is the sum total of the income adjusted for transport and harvesting costs from both bark and timber, was calculated. This amounted to about R37 362 per hectare every eighth year.

DWAF performed a rough cost benefit analysis (CBA) of an Acacia Meansii timber and bark plantation, where the investment period was set at 24 years (three cycles of eight years each). The real cost of capital was set at 7.51%, and the annualised Net Present Value (NPV) came to R2950/ha (called Equivalent Annual Income in forestry). This rendered an Internal Rate of Return (IRR) of 45% suggesting that this type of land use is very profitable (DWAF, 2003).

5.4.2 Eucalyptus Grandis pulp and timber

Eucalyptus Grandis (gum) plantations have been proposed for 2000ha of the Lambasi area. Eucalypts can be used for both saw timber and pulp. The cost of establishment was estimated at R3500/ ha.

5.4.2.1 Eucalyptus Grandis pulp

The felling age for gum trees is 8 years, when their mean height is 24 metres. Approximately 1600 trees are planted per hectare, but this is reduced to about 1505 stems at clear felling age. Weeding and coppice reduction occur regularly throughout the 24 year investment period. Weeding takes place every eight years (one year after establishment), at a cost of approximately R300/ ha. Coppice reduction occurs in between and during harvesting periods, at a cost varying between R200 and R400 per hectare. The MAI is set at around 44.44 cubic metres/ha/yr (average rate of growth (measured in volume increment) per hectare per year measured at an index age of 10 years).

Table1.15 below shows the harvesting and transport costs, as well as the income flows associated with gum pulp production.

Table 1.15 Estimated transport and harvesting costs and income flows from Eucalyptus pulp for 2001

Description	**Costs/ income per ha (R)**
COSTS	
Transport	8 707
Harvesting	17 777
INCOME	
Gross income	71 109
Income adjusted for transport and harvesting cost	44 625

Source: DWAF, 2003.

Transport costs were calculated by multiplying the road haul distance (120km) by the haulage cost per kilometre (0.3 Rand/ton/km) by the tonnes of pulp harvested per hectare. No railway transport was provided for. The harvesting costs were calculated by multiplying the cost of harvesting per cubic metre (R50/cubic metre) by the volume of pulp harvested per hectare (355.55 cubic metres). The gross income was determined by multiplying the delivered price (R200/ton) by the volume of pulp harvested per hectare (355.55 cubic metres). From this information it was calculated that the standing value of the trees (or the income adjusted for transport and harvesting cost) would be R 44 625/ha, accruing every eight years.

DWAF (2003) performed a similar CBA as that for Acacia Mearnsii plantations, with the real cost of capital set at 7.51%. In this case, however, the IRR was calculated at 30%, with an annualised NPV (Equivalent Annual Income) of R2925/ha.

5.4.2.2 Eucalyptus Grandis saw timber

Eucalyptus Grandis used for saw timber is subject to a different income and cost stream, as the trees are thinned three times during the 24 year rotation period (at 3, 6 and 9 years), before they are felled. It was assumed that timber harvested would be sold and delivered at the nearest sawmill at prevailing saw log prices.

Weeding is normally done in year 1 only, at a cost of R300/ha. The MAI is 27.01cubic metres/ha/yr. Table 1.16 shows the costs and income flows involved in this production.

Table 1.16 Estimated costs and income flows from Eucalyptus sawtimber for 2001

Description	**Costs/ income per ha (R)**
FIRST THINNING	
COSTS	
Transport	0
Harvesting	1 153
INCOME	
Gross income	1 845
Income adjusted for transport and harvesting cost	692
SECOND THINNING	
COSTS	
Transport	1 817
Harvesting	2 524
INCOME	
Gross income	10 095
Income adjusted for transport and harvesting cost	5 754
THIRD THINNING	
COSTS	
Transport	3 111
Harvesting	4 321
INCOME	
Gross income	17 286

Income adjusted for transport and harvesting cost	9 853
CLEARFELL	
COSTS	
Transport	1 223
Harvesting	24 454
INCOME	
Gross income	97 817
Income adjusted for transport and harvesting cost	72 140

Source: DWAF, 2003.

The transport costs for each thinning are determined by multiplying the number of kilometres driven by the cost per ton per kilometre and the volume per ha. Approximately 120 km are driven for the second and third thinning. This distance is reduced to 5km for the clear felling stage. The harvesting cost is calculated as the product of the volume harvested per ha and the harvesting costs per hectare (R50/ha).

In a CBA performed by DWAF (2003), an investment period of 24 years was used, and the real cost of capital was set at 8.92%. The annualised NPV was calculated at R678/ha/yr and the IRR came in at 15%.

5.4.3 Pinus Patula saw timber

Pinus Patula (Pine) used for sawtimber production is subject to similar conditions as Eucalypt saw timber. The trees are thinned (harvested) three times (at 8, 13 and 18 years) before clear felling in year 24 of the 25-year rotation cycle. It is assumed that timber harvested is sold and delivered to the nearest sawmill at prevailing saw log prices.

The cost of establishment was set at R3500, and weeding provided for in year one, at a cost of approximately R250/ha. The trees were assumed to reach a standing height of 28m in year 20. The MAI was estimated at about 21.93 cubic metres/ha/yr.

Table 1.17 shows the cost and income streams for the first, second and third thinning, as well as those for clear felling.

Table 1.17 Estimated costs and income flows from Pinus sawtimber for 2001 (in Rands)

Description	**Costs/ income per ha (R)**
FIRST THINNING	
COSTS	
Transport	103
Harvesting	2060
INCOME	
Gross income	1 717
Income adjusted for transport and harvesting cost	-446
SECOND THINNING	
COSTS	
Transport	204
Harvesting	4 073

INCOME	
Gross income	6 788
Income adjusted for transport and harvesting cost	1 215
THIRD THINNING	
COSTS	
Transport	236
Harvesting	4 725
INCOME	
Gross income	7 875
Income adjusted for transport and harvesting cost	2 914
CLEARFELL	
COSTS	
Transport	1 102
Harvesting	22 042
INCOME	
Gross income	80 819
Income adjusted for transport and harvesting cost	57 675

Source: DWAF, 2003.

The transport cost for each thinning was determined by multiplying the number of kilometres driven by the cost per ton per kilometre and the volume per ha. Approximately 10 km are driven for the thinning and clear felling, at a cost of R0.3/ton/km. No use is made of railways as a means of transportation. The harvesting cost was calculated as the product of the volume harvested per ha and the harvesting costs per hectare (R60/ha).

In the CBA performed by DWAF (2003), an investment period of 25 years was used, and the real cost of capital was set at 8.92%. The annualised NPV was calculated at – R379/ha/yr and the IRR at 6%. These results suggest that the sawmilling of Pine trees is not an efficient forestry activity in the area, and would operate at a loss. However, there are many factors that should be taken into consideration and quantified. Some factors, such as employment creation (in this case it was estimated that an additional 12 full-time jobs would be created) and social upliftment are difficult to value, but have an effect on the attractiveness of a project.

5.5 Towards a comparison of values of land uses at Lambasi

Table 1.18 below summarises the margin above cost, net income and standing values per hectare of each land use. These figures cannot be compared because they are inconsistent in cost inclusion. More information was needed to estimate these costs than was provided for in research time for this project. The dairy farming figures include most variable costs, but exclude transport and fencing costs. The potato cultivation figures exclude VAT, while it is included in all other costs and income flows. Fencing costs would be essential in the case of high investment crops like cabbages, dairy and potatoes. The forestry figures included are the NPV values as determined by DWAF. The income and cost flows of this land use have to be discounted. The same procedure was not necessary for the other land uses because all variable costs and income accumulate in the same time period (one year). No capital costs are reflected in the figures presented in Table 1.18. Capital costs need to be considered when investment decisions are made, e.g., the construction of dams and water transport infrastructure, as well as the connection to electrical supplies. Transport costs would vary depending in which market is targeted.

Table 1.18 merely provides an indication of the income (net profit in most cases) per hectare per year for each land use.

Table 1.18 Summary of income per hectare of alternative land use practices at Lambasi

Land use	Income/NPV/ Margin above cost per ha (R)
Non-irrigated crops	
(1) Potatoes	14 690
(2) Acacia Mearnsii: timber and bark	2 950
(3) Eucalyptus Grandis: pulp	2 925
(4) Dry land maize	1 581.54
(5) Dry land maize: small-scale farming	711.23
(6) Eucalyptus Grandis: sawtimber	678
(7) Dry land maize: subsistence farming	235.88
(8) Beef cattle farming	197.31
(9) Pinus Patula	-379
Irrigated crops	
(1) Cabbage - irrigated	26 792.87
(2) Irrigated maize	3 191.57
(3) Small scale dairy farming	241.31

The above comparison, tells us very little because of cost omissions. It does not factor in anything about farmers themselves nor about the local markets in which they sell their produce. After taking into account their expertise, working capital, tastes, traditions and local market prices, it is almost certain that a different set of margins values would emerge. The people living in the Lambasi area are mainly poor and would almost certainly find the investment in high cash crops like potatoes prohibitive, especially given the high probability of damage from droughts, pests and livestock. As would be expected, given their poverty, they like minimal investment and directly edible crops – subsistence agriculture. The communities already have a knowledge and skills base in this type of farming and it is clear that there is some resistance to change.

The problem is that low investment crops also yield low yields and incomes, and this is what Table 1.18 does show us. For instance, small-scale dry-land maize production only yields a return per hectare of just over 20% that of irrigated maize. Potatoes and cabbages respectively, head the profit margin lists in the categories non-irrigated crops and irrigated crops.

Forestry suffers all the deficiencies of the high investment cash crops, but does not yield as high a return per hectare. We do not find pine growing to be economic and were surprised in the light of this to see so much pine is being planted at the site. Wattle and Gum look attractive propositions in the light of DWAF figures. Unfortunately, it is pine that is linked with the most value added downstream, in the form of timber wood products.

If assumptions are made about costs not included in Table 1.18, the income generated from the land uses listed changes substantially. In order to make these land uses more comparable, certain assumptions were made. Table 1.19 provides a summary of the income per hectare of alternative land uses at Lambasi, under the assumptions explained below.

Table 1.19 Revised summary of income per hectare of alternative land use practices at Lambasi

Land use	Income/NPV/ Margin above cost per ha (R)
Non-irrigated crops	
(1) Potatoes	2 842
(2) Acacia Mearnsii: timber and bark	1 950
(3) Eucalyptus Grandis: pulp	1 925
(4) Dry land maize	800
(5) Dry land maize: small-scale farming	340
(6) Eucalyptus Grandis: sawtimber	678
(7) Dry land maize: subsistence farming	156
(8) Beef cattle farming	170
(9) Pinus Patula	0
Irrigated crops	
(1) Cabbage - irrigated	5 500
(2) Irrigated maize	0
(3) Small scale dairy farming	0

In the case of non-irrigated potatoes, it was assumed that:

1) Transport costs to markets would be higher than those faced by commercial farmers (as set out in the Enterprise Budget), as many residents grow their own potatoes in a subsistence based manner and potatoes would have to be transported to markets further a field (such as Umtata). An additional transport cost of R1000 per hectare was assumed.
2) In the absence of fences, livestock would damage approximately one third of the crop. These damages would be prevented if fences were erected. Fencing costs would amount to R15 per metre, or R6000 for one hectare, if camps were divided into one hectare sizes (Zeeman, pers. comm., 2003).
3) In the absence of insecticide (because residents cannot afford it) approximately one third of the crop would be damaged.

In the case of Acacia Mearnsii for timber and bark purposes, and Eucalyptus Grandis used for pulp, the assumption was made that transport costs would be higher than under the conditions assumed in Table 1.18. Logging trucks are heavy and cause high maintenance costs on roads. The high rainfall in the area and steepness of the land are other contributing factors to higher road maintenance costs. These costs were adjusted upwards by R1000 per hectare in the calculations made in Table 1.19.

For dryland maize, it was assumed that:

1) There would be additional transport costs of R300 per hectare yielded. Many residents in the area grow their own maize, and transport costs would become evident as markets from towns further away are used.
2) Labour costs for machinery and implement operation would be higher than under commercial conditions, as local people lack expertise in their use. There would also be marketing costs. An additional R100 per hectare yielded was added for these costs.
3) Approximately a third of the crop would be destroyed by pests because the local population cannot afford fertiliser and insecticide.

Fencing of dryland maize fields to keep out straying animals would amount to approximately R6000/ha. If this figure were included in the cost and income stream for dryland maize, it would become a loss making land use option. Currently, maize growers are

experiencing damages related to straying animals, which impact upon their harvest. It remains a popular land use nonetheless. Perhaps the cost damage is currently less than the fencing cost, given the structure of property rights in the area.

The returns to small-scale dryland maize farming per hectare would decrease for the following reasons:

1) There would be transport costs towards markets, as well as marketing costs. These costs were estimated at R200 per hectare.
2) No fencing costs would be included, because of the small-scale nature of this enterprise. Farmers would be able to keep roaming animals under control.
3) A third of the crop would be destroyed because of the failure of farmers to use fertiliser and insecticide to keep pests under control.

The income per hectare from Eucalyptus Grandis used for sawtimber purposes would stay as in Table 1.18. This land use is suited to on-site processing, with many add-on products. The nearby infrastructure for the DWAF–run Ntsubane plantation could be used, resulting in no additional costs envisaged for this land use.

With regards to subsistence dryland maize farming, the assumption was made that income from this crop would be lower, as pests would damage it in the absence of insecticide. For this reason approximately a third of the crop would be destroyed.

With respect to beef cattle farming, although fences would be advisable, it does not seem a prerequisite for the success of this type of livestock farming in the area. The only additional cost that we included in Table 1.19 was for dipping.

The afforestation of the region with Pinus Patula remains an unattractive option.

In the case of irrigated crops, such as cabbages, it was assumed that:

1) Transport costs to markets would be higher than those faced by commercial farmers (as set out in the Enterprise Budget), as many residents grow (or attempt to grow) their own cabbages for subsistence. For this reason cabbages would have to be transported to markets further a field. An additional transport cost of R1000 per hectare was built into the calculations.
2) In the absence of fences, livestock would damage approximately one third of the crop. Fencing costs would amount to R15 per metre, or R6000 for one hectare, if camps were divided into one hectare sizes (Zeeman, pers. comm., 2003).
3) Problems with pests and diseases from lack of insecticide would damage approximately 50% of the crop. This damage is higher than for the other crops because cabbage is very susceptible to pests (Mlangeni, pers. comm., 2003).
4) The high input cost associated with irrigation equipment would divert the attention towards other land uses with lower input/ start-up costs.
5) Increased water use would imply payment for such water, which would push up costs. The lack of dams in the area would be a problem for irrigated crops.

Cabbage is currently grown in the Lambasi area for subsistence purposes. The figures in Table 1.19 show that even after cost additions commercially grown cabbages yield very high returns. However, high input/ start-up costs, lack of expertise and dams in the area, high transport costs, as well as pests make it a risky crop in the area.

In the case of irrigated maize, similar obstacles are faced as for cabbages, but the fencing of an irrigated maize field (R6000/ha)

would negate much of the financial appeal of this crop.

With respect to dairy farming it was assumed that:

1) Income per hectare would be twenty percent lower than the figure stated in Table 1.18, as this figure reflects the income from established expert farmers, who belong to study groups (Weitz, pers. comm., 2003). The Lambasi farmers lack expertise.
2) Transport costs would have a significant impact on costs, as milk has to be transported every day. When transport costs are included (estimated at R1000 per hectare), this land use becomes unprofitable.
3) Fences would have to be erected for commercial dairy farming. This would amount to R6000/ha, if it were assumed that one hectare sized fields would be fenced.

The assumptions made in Table 1.19 about costs faced by farmers in the Lambasi area have a substantial impact on the profitability of various land uses in the area. Transport costs, lack of markets close at hand, high input costs (such as irrigation requirements and fencing) as well as damage from pests are the factors incorporated. Their incorporation has the effect of turning dryland maize (if fenced), irrigated maize and dairy farming into unprofitable land use options. It is strongly recommended that a full study be done, where these assumptions are tested on a ground level, instead of at a desktop level.

6. COMMUNITY CONSTRAINTS AND CONCLUSIONS

The authors of this report envisaged this enquiry as a step towards deciding how to best use the land at the DWAF Lambasi site. There are many options, some of which have not been explored in this report. Carrying out Cost Benefit Analyses of each possible project will be a complicated exercise. There are many valuation problems, there is uncertainty over property rights and who the investors would be and there are environmental issues to consider.

The DWAF Lambasi site is situated in a very fertile, well-watered and beautiful area. The site has many potential land uses – almost all of which could yield profits. The road infrastructure has improved steadily along with progress on the Wild Coast SDI. As a result the problem of poor access to markets is steadily lessening.

Numerous land using projects have been initiated in the area in the past but have failed to be sustained. Current attempts to start up new projects and revive old ones appear to be faring no better. The common factor with respect to the sustainability problem is community complications – with land use rights, labour and management.

The community complication problem is a serious one and needs to be overcome if real progress is to be made in realising the production potential of the land. It appears that frequently all relevant members of the community are not included in the formative stages of developing projects for the area and as a result many members look upon new projects with suspicion, especially ones managed by people and organizations outside of their sphere of influence (Harrison, 2003). These members fear that by losing control they will forgo benefit of local development to outsiders (of the community currently living there). However, their poverty traps them into seeking out some sort of dependence relation with outsiders. For these reasons the community members are found to be simultaneously soliciting help from and resentful towards outsiders (Sisitka, 2000).

From a private enterprise led development perspective the core problem in the whole Wild Coast area is uncertainty over property rights – an issue that has long been complained about (Zeeman, 2003). Historically, use of property in this area has been at the

discretion of tribal authorities, and on sites such as the DWAF Lambasi one, they are still a major influence (see Sisitka, 2000). For this reason DWAF has proposed a meeting between all affected parties at Lambasi. The Department of Land Affairs has been identified as the leading entity. This meeting is proposed for early 2004 (Harrison, 2003).

The intentions of the government departments involved in developments in the Lambasi area after 1994 have been very honorable - for the community to gain expertise in land management – be it with the cultivation of maize, beans or forestry. As far as we were able to determine, in all cases some members of the community were consulted about the projects before they were implemented. The government and others recognised the importance of securing community support.

No one contests that community consultation is an important ingredient in establishing a successful and sustainable project. However, the transaction costs of this exercise are high, and the probability that key members of the community may feel left out is also high. We think the problem will still occur in the future.

Property right problems manifest in petty theft by large numbers of people. The large scale theft of the maize crops and feeding of cattle in the maize fields of the Department of Public Works and the cutting down of state owned trees for won use and resale during the 2002/3 seasons are just two of many examples of the problem. Some stakeholders in the area argue that this problem will be overcome with education, job creation and the transfer of property rights to communities (Harrison, 2003). They are of the opinion that the situation is caused by feelings in the community of being marginalised. They argue that when the members of the communities are involved as primary stakeholders the situation will change.

It is an optimistic view. Unless the government does more to contain the problem of disrespect for the property rights of others (in addition to education and negotiating with the community) they can forget serious private sector investment in developing the area. Private investors will need security of property rights with respect to their crops and return on production inputs before they become involved. This problem is not insurmountable by any means.

Specifically with respect to afforestation aspects, certain members of the Lambasi community were impressed with how the forestry project was being run in partnership with communities at Mabandla district in Mzimkhulu (Sijadu, 2003). The Mzimkhulu project is totally owned by the community and managed by a Trust (Sijadu, 2003). In this project trial plots were established and the trees are currently being harvested. The villagers who are trustees are reputed to be receiving 'sizeable' cash dividend benefits from the income this forestry is generating in the form of capital accumulating at Agribank (Sijadu, 2003).

Based upon the values reported in Tables 1.18 and 1.19, this report supports proposals to commercially afforest the DWAF Lambasi site with wattle and gum trees. It does not find it to be the best option, but finds it a reasonable bet in an area that has recorded many failures in the agricultural sphere. It will not result in any loss in indigenous forest and holds the potential for value adding downstream industry.

In the end the Lambasi community will dictate that a mixture of land-uses be followed on the DWAF Lambasi site. A mix seems a good idea, given the levels of uncertainty about the net benefits of different projects and to reduce risks, but our team of researchers was unable to generate sufficient knowledge about the costs and revenues to estimate what the optimal mix should be. It will change as costs and market conditions change. Given the need for substantial community involvement, a social forestry approach would seem appropriate for this case (one that determines the land use mix on the basis of local economic, social and environmental needs) (www.polity.org.za/html/govdocs/green_papers/forest2.html).

It is already known from the work of Olbrich and Hassan (2000) that plantation and ecotourism based forestry cannot compete on direct financial or water use terms with intensive irrigated agriculture in environments suitable for such agriculture, such as the Crocodile River valley (see also Pollard et al (1998). Like the Crocodile valley, the Lambasi site has the required features for intensive irrigated agriculture.

From the economic perspective it would be advantageous to invest much more than is being done in dams, irrigation equipment, other equipment, fences, fertilizers and dips, and to solicit as much private sector investment in productive inputs as possible. This investment will vastly increase the amount of income generated in the area and the community as a whole should benefit. Virtually every crop has some downstream potential, but it has to be generated first. Agricultural experts seem to regard the place as an untapped reservoir of opportunities.

The unwillingness of the private sector to invest is the binding constraint. For this reason the authors of this report caution the government against making arrangements with the community that limits 'outside' private sector investment. These people are as poor as they are, not because the area lacks the natural resources or appeal to investors, but because the community has not been sufficiently friendly towards 'outside' private sector investment. Ideally private sector investors should be made to compete for the right to invest there. At the very least the government should not allow arrangements to be made on its land which effectively reduce the land use options to subsistence ones, the current status quo.

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