

G:ENESIS



Part I: The contribution, costs and development opportunities of the Forestry, Timber, Pulp and Paper industries in South Africa

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Authors: Doubell Chamberlain

Hassan Essop

Christine Hougaard

Stephan Malherbe

Richard Walker

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- The social impacts of the forestry and pulp and paper industry in South Africa – Morabo Morajele

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Genesis Analytics (Pty) Ltd

2nd Floor, No 4 High Street, Melrose Arch, Johannesburg
South Africa, 2196.

Post to: Suite 3, Private Bag X1, Melrose Arch, Johannesburg, South Africa, 2076.

Tel: +27 11 214 4080, Fax: +27 11 214 4099

www.genesis-analytics.com

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1. OVERVIEW AND KEY FINDINGS

1.1. INTRODUCTION

This study was commissioned with the purpose of evaluating the economics of the forestry, timber, pulp and paper (FTPP) industries in South Africa. Specifically, the brief required the evaluation of the costs and benefits of the current industry across economic, environmental and social dimensions and the opportunities and obstacles for development. In addition, the brief required an overview of the various components of the value chain and the consideration of the appropriateness of the current regulatory regime. This task required extensive engagement with the industry and the documented resources and data available. More than 120 meetings were held with government officials, industry bodies, private sector players and industry experts.

Methodology

The following methodology was used to gain an understanding of the market and regulatory environment:

Understanding the individual markets and inter-relationships. The FТПP value chain consists of a number of sub-markets between them requiring a detailed understanding of the products and production processes in order to assess their impact on the economy and development potential. For a number of these components little information and no data were available. Interviews with a wide range of parties were used to construct a clear and comprehensive picture of the various components.

Quantification of contribution to GDP. Based on the review of the various sub-markets, estimates of the individual and overall contribution to GDP were required, which included consideration of prominent market sub-categories (e.g. different categories of sawmills) and regional dimensions. This required accurate data on industry inputs, outputs, remuneration and taxes paid to Government. Expert opinions, limited production datasets and a detailed analysis of various market characteristics had to be used in order to estimate missing data components and to construct the required variable from different sources. In the case of the pulp and paper industries, the information was collected through a small survey of the industry players conducted by the Paper Manufacturers Association of South Africa (Pamsa).

Assessing and quantifying environmental impacts. The assessment of the overall environmental impact of the FТПP industries required the identification and quantification of environmental impacts for each of the component industries. To convert these impacts to financial values the best available information on shadow prices¹ was used. In many cases such values were available for South Africa;

¹ "Shadow prices" are the best available estimates of the unobserved price of an environmental good/impact. These prices are unobserved as markets generally do not exist for the environmental goods in question. All shadow prices

where not, foreign shadow prices converted to Rand were used. The use of the Rand equivalents of foreign shadow prices are expected overestimate the impacts as it is based on the environmental/development trade-offs of the (mostly developed) countries from which these values were obtained. Where foreign shadow prices were used, a simple sensitivity analysis was conducted to assess the sensitivity of the overall result to these variables and the potential adjusted to take account of South Africa's different natural and economic environment. The overall results, however, were based on the Rand equivalent foreign shadow prices and not the downward adjusted values.

Where information on the impact or shadow prices was not available, a number of approaches were used to estimate the range and limits of potential impacts. Failing any of these quantification methods, a qualitative assessment was provided focusing on the degree of the impact relative to natural state as well as other agricultural activities competing with plantation forestry for water and land (including cattle farming, irrigated and dry land sugarcane). The overall analysis yielded the quantification of a large number of impacts and, for non-quantifiables, the assessment of significance and the expected extent of impact relative to other agricultural activities. *In all cases, the quantification approach taken was to use the most conservative values (i.e. the method that provided the highest cost and the lowest benefit estimates). In our view, the calculated values, therefore, present the upper limit of impact. Based on the current data and research available, we believe that the unquantified impacts will not impact significantly on the overall results.*

Environmental impact² of excessive water use/SFRA by plantation forestry³. On the specific question of water use by plantations, the analysis provides the first attempt at a framework to quantify the impact of perceived 'excessive' water use by plantations and the potential contribution to the over-utilisation of water resources. *Please note that this a worst-case estimate in which all water deficits are ascribed to plantation water use. This is clearly not realistic as plantations (with the exception of illegal plantations) are licensed water users and such an argument assumes that other economic activities has priority of use over plantations rather than the first-come-first serve basis on which water licences have been allocated to date.*

used in this study were taken from secondary literature, which includes foreign studies where South African estimates were not available. Shadow prices are context specific and are determined relative to an economy's development position and the value placed on environmental goods by its inhabitants (e.g. using foreign shadow prices (converted to Rand) will, therefore, be conservative as it is expected that the countries on which the estimates were based are far more developed and, therefore, have a far lower trade-off between economic development and environmental impact. In such cases, it can be expected that the community will place a higher value on environmental impact than would be the case for a developing country such as South Africa. In South Africa difficult trade-offs are inevitable between development and environment. A sensitivity analysis was run to test the results for downward adjustments of the shadow price (the Rand converted price is expected to overestimate the South African shadow price), but the higher unadjusted developed country shadow prices were used in the calculations.

² The environmental cost was approximated by calculating the cost to remedy the deficit (i.e. the cost to construct dams in order to ensure that sufficient water is available in the low flow season).

³ Though the National Water Act of 1998 describes plantation forestry as a lawful water user, the perception often exists that plantations are excessive water users that exclude other, downstream users from water. It is this perception that the analysis attempts to address.

The purpose of this exercise was, therefore, to establish the limits of impact that could result from plantation forestry water use. To do this a very conservative (and, in fact unrealistically so) approach was followed by defining all plantation water use in stressed⁴ catchments to be excessive and, therefore, allocating the full deficit (up to the total volume of water used by plantations) to plantation forestry. The impact of the supposed forestry-induced deficit was then quantified by applying a high-end estimate of the cost of remedying the deficit (in this case constructing dams and transfer schemes to increase the water available in the dry season) to the estimated volume of 'excessive' use. To this we added the total annual cost of the Working for Water programme to account for the cost of remedying the water impact of invasive species that may result from plantation forestry activities. Much of the work done by the Working for Water programme is aimed at species that do not stem from plantation forestry activities⁵ and the estimate total opportunity cost of plantation forestry-related SFRA of R562 million is, therefore, a ceiling estimate.

Assessing and quantifying social impacts. Social impacts were approached from a qualitative point of view as measurable impacts such as employment and wage payments were included in the economic analysis. In many cases social impacts are simply the result of economic impacts in a specific demographic or social context (labour demographics, employment dependencies, etc.). Care was taken to include consideration of such aspects in the interpretation of economic impact. Although the overall impact was not convertible into a Rand figure, available information was used to describe and quantify the extent of impact.

Synthesis of results. The above findings of economic, environmental and social impacts were then synthesised into a single framework that allowed the consideration of development impacts and trade-offs.

In the next sections we provide a summary of the findings starting with the social, economic and environmental impacts identified for the current FTTP sector. Following this the opportunities for development will be discussed and we conclude with a review of the impact of regulation on the current and potential industry.

1.2.

THE FTTP INDUSTRIES DIRECTLY CONTRIBUTE R12BN TO GDP AND PROVIDES 170,000 JOBS

The components of the forestry value chain covered in this study⁶ contributed an estimated R12.2bn to GDP in 2003 and employed an estimated 170,000

⁴ Catchments are considered to be stressed (or in deficit) if the total water use allocated exceeds the water available in the catchment during low-flow periods after allowing for the ecological and human reserves. See section 13.2.1 for a more detailed explanation.

⁵ Though it is unrealistic to ascribe the total cost of the WfW programme to plantation forestry, it will be explained in the text that this was done in an attempt to sketch an absolute worst case scenario. It must be reiterated that this does not mean that forestry is indeed responsible for the total cost – on the contrary, forestry makes annual contributions to the WfW fund and some invasive species are not plantation forestry species. Furthermore, many invasive species were actually introduced by government for e.g. dune stabilisation reasons. Thus this should be regarded as a hypothetical situation depicting the absolute maximum impact for which any activity can theoretically be held responsible. To illustrate the impact of allocating 100% of WfW cost to forestry, an alternative scenario was also provided in which 70% of WfW were used. This reduces the SFRA-related remedy cost to R270m.

⁶ Plantations, pulp and paper mills, woodchip exports, sawmilling, timberboard, mining timber, treated poles and charcoal.

permanent, contract and informal workers of which a large proportion is low-skilled and concentrated in rural areas with high unemployment. The contribution to GDP and employment amount to 1% of total RSA GDP⁷ and 1.4% of total formal employment, which is comparable with other large sectors. The textiles, clothing and leather goods sector contributed R10bn to GDP and employed 193,000⁸ workers in 2003. Gold mining contributed R23bn and employed 191,000 people over the same period. The FTTP sector earned net foreign exchange of approximately R7bn 2003.

If estimated net environmental impacts totalling R1.8bn are taken into account, the net contribution to the economy reduces to R10.4bn. Table 1 summarises the breakdown of the FTTP industries' value-added contribution to GDP, employment and identified environmental and social impacts. The following can be noted.

- The pulp and paper industry (including recycling) is the largest contributor to GDP, contributing R6bn or 49% of total FTTP GDP. Even after accounting for environmental costs, it remains dominant in the value chain contributing R4.8bn (46%) of total FTTP GDP.
- Pulp and paper (including recycling) create almost 24,000 employment opportunities, almost half (45%) of which stems from the employment of hawkers in waste paper collection. The 922,000t of waste paper collected (52% of all paper produced) in South Africa in 2003 not only serves to reduce land fill space, but, through its incorporation into the paper production stream, positively influences the overall environmental impact of the pulp and paper industry. Moreover, recycling serves as an entry industry for (mostly black) entrepreneurs and as a basic source of income for almost 11,000 otherwise-unemployed hawkers, generating approximately R146m in revenue for them in 2003.
- Plantation forestry is the biggest employer with approximately a third directly employed, a third in formal contracting and a third involved in small grower schemes. Plantation forestry is the second largest contributor to FTTP GDP at R2.9bn (24%).
- In terms of direct employment, the sawmilling sector is the second largest employer, employing an estimated 20,000 people⁹.
- Both charcoal and treated poles sectors are large employers relative to their contribution to FTTP GDP, employing an estimated total of 10,500 employees but contributing less than 1% to FTTP GDP. Even though these activities are practiced on a small scale, they may, therefore, hold substantial potential for employment in rural areas.
- None of the value chain components showed a net negative result after accounting for environmental costs. In addition, it must be noted that the environmental impacts were quantified on a conservative basis (biased towards higher costs and lower benefits). For example, land-filling of waste was estimated as major contributor to environmental costs. In many cases,

⁷ StatsSA (2005) GDP Tables (P0441), Third Quarter 2004.

⁸ Including part-time employees but excluding contractors and informal labour.

⁹ Some estimates suggest 30,000, which is significantly higher than the value used here.

however, wood waste is not land-filled, but is used in other production process. As information on waste product re-use was not fully available, the environmental cost will, accordingly, be an estimate of the upper limit. It must also be noted that the margin of error (biased towards overestimating environmental costs) may result in an unrealistic picture for the smaller industries (e.g. in the cases of mining timber and treated poles where environmental costs were found to be between a quarter and a third of their respective economic contribution). These results did not affect the overall assessment and were not pursued in further detail. We suggest that decisions on the future of these industries should be based a more detailed assessment, which fell beyond the scope of this study.

The impact of FFTP activity and employment is most prominent in regions where few alternatives exist. The analysis found that the contributions to regional and municipal economic activity are more prominent than suggested by the national (or even provincial) figures. Furthermore, most forestry value chain activities (and potential activities) are in regions with high unemployment levels and few economic alternatives.

It is reasonable to assume that the economic value generated supports a substantial number of people. Firstly, parallel industries supplying the value chain with inputs and the converting industries will also have an employment impact. Secondly, in these mostly rural and poorer areas, a large number of dependents are likely to rely on each income earner. Using an employment dependency ratio¹⁰ of five, which is conservative for the areas FFTP cluster activity, the cluster supports 850,000 people most of whom are in low-income areas in low-income provinces. In addition, by creating a further 43,000 jobs, the *development opportunities* identified in this report will support a further 328,000 people, all of whom will be situated in low-income areas in the Eastern Cape and KwaZulu-Natal.

The fact that the contribution is made to rural areas with few economic alternatives and that a substantial number of low-skilled workers – often 70% or more – are employed, increases the impact of forestry related activities. This is especially the case in the Eastern Cape (the province with the most potential for additional afforestation) where the analysis revealed that there are few feasible alternatives that provide comparable returns to that of plantation forestry.

¹⁰ We use the term 'employment dependency ratio' to signal that we recognise that households containing those dependents may also have non-wage sources of income such as social grants.

Impact component	Plantation forestry	Pulp and paper (including recycling)	Woodchip exports	Sawmilling	Charcoal	Timber board	Mining timber	Treated poles	Total
Economic impact by counterparty	2,921	5,999	991	1,332	46	848	90	80	12,274
Owners of capital/company profit	1,466	3,191	955	1,028	n/a	384	71	50	7,117
Government	255	685	Included in profit and labour	Included in profit and labour	n/a	16	Included in profit and labour	n/a	956
Labour	1,200	2,123	36	304	n/a	448	18	30	4,155
Rest of Society	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-
Maximum quantifiable environmental impact (CSIR estimate & Genesis water quality estimate) (impact on rest of society)	54.5	-1,630	-7.6	-133.8	n/a	-15.6	-25.4	-32.1	-1,790
Energy use	0	-859	-1.3	-34.5	n/a	-6.7	-8.9	-7.0	-918
Landfilled waste	0	-78	-6.0	-92.2	n/a	-7.1	-14.6	-23.6	-221
Air emissions	-34.77	-487	-0.4	-7.2	n/a	-1.8	-1.9	-1.5	-534
Water quality	0	-206	n/a	n/a	n/a	n/a	n/a	n/a	-206
Carbon sequestration	89	-	-	-	-	-	-	-	89
Impact of SFRA water use (Genesis estimate) (impact on rest of society)	-562	-	-	-	-	-	-	-	-562
Net impact	2,413	4,369	983	1,198	46	833	64	47.9	9,922
Employment generated	106,844	23,981	500	20,000	5,500	6,000	2,200	5,000	170,025
Permanent	37,469	13,200	500	20,000	5,500	6,000	2,200	5,000	89,869
Contract	30,000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	30,000
Small growers and small grower labour/informal	39,375	10,781							50,156
Net foreign exchange earned	R60mn	R4.9bn	R2bn	Not significant	Not significant	Not significant	Not significant	Not significant	R7bn
Social impact	-Small grower schemes contribute to income in areas with limited economic activities and facilitates asset formation -Employ substantial number workers of which 70% is low-skilled -Bulk of low-skilled positions moved to contractors: SME affinity -Contracting facilitates small	-R57m in corporate social investment -Not a large employer, but employment generally generated in poorer areas -Dedicated industry-developed employee training programme -Wage levels generally high in formal part of industry - affects trickle down effect on the economy (through dependency rate, spending power,	-A very small employer relative to production capacity	-Particularly smaller mills operate in deep rural areas with few economic alternatives -Small business (and thus broad based BEE) potential -Large number of small and micro mills employing more labour per cubic metre produced than larger mills	-Community development projects such as Mondi's "black gold" (value included under pulp and paper corporate social investment) -Employment-intensive relative to output -Small business (and thus broad based BEE) potential; with limited capital requirements	-Relatively large wage bill with high wages paid -Involved in corporate social investment supporting schools and constructing a creche -Very high recovery rate; thus limited solid waste costs to the environment	-Employs relatively unskilled labour -Industry declining with potential negative social impacts -Some mills provide their waste products free of charge as inputs to other community production process (firewood, inputs for pallets, etc.)	-Can operate in rural areas -Relatively large employer relative to output. -Small business (and thus broad based BEE) potential, BUT capital requirements may prevent new plants from developing in rural areas	

Impact component	Plantation forestry	Pulp and paper (including recycling)	Woodchip exports	Sawmilling	Charcoal	Timber board	Mining timber	Treated poles	Total
	business ownership and empowerment but current conditions result in social costs	as well as income generated in supplier industries) -Recycling provides income to large number of hawkers and facilitates small business development for waste collectors							
Environmental notes	-Bio-diversity not quantified but will be lower than other competing agricultural crops -Substantial positive benefit due to carbon sequestration	-Impact of water quality on salinity not quantified but cost shown to be limited -Recycling reduces virgin fibre requirement and environmental impact of paper production	-Very limited environmental impact	-Impact on water quality not quantified but expected to be limited -Large proportion of wood waste generated supplied as input into other process (e.g. pulping) or used for energy creation	-Environmental impact not quantified -Utilises wood waste as well as other waste products (that contain carbon)	-Impact on water quality not quantified but expected to be limited -Utilises wood waste	-Impact on water quality not quantified but expected to be limited	-Impact on water quality not quantified but due to size of industry impact on industry impact is expected to be limited	

Table 1: Overview of findings. Impact values given in Rm.

Source: Genesis (drawing on CSIR Environmentek environmental assessment)

1.3. THE FTTP CLUSTER RESULTS IN POTENTIAL ENVIRONMENTAL COSTS OF R1.7BN

The environmental analysis conducted by the CSIR-Environmentek for the present study found that the net cost associated with the environmental impact of the FTTP cluster amounted to R1.7bn in 2003. If the Genesis estimate of the outer limit estimate of opportunity cost of SFRA water use is included, the impact increases to R2.4bn. The latter value is not a realistic estimate of the impact as it assumes that the full deficit in stressed catchments is due to forestry activities.

The pulp and paper industry, through its effluent impact on water quality and air emissions, represents about 69% of the estimated environmental impact. Mainly due to its impact on stream flow, plantations are estimated to contribute 24% of total industry environmental cost. If stream flow reduction is removed, plantations result in a net environmental benefit due to carbon sequestration. The industry environmental costs stemmed from the following quantified impacts:

- *Water quality:* In total an estimated R206m (9% of total environmental cost) in environmental cost was incurred due to water quality impacts due to pulp and paper production. Some aspects of water quality could not be quantified but available information suggests that this will not have a significant impact on the results. The impact of the unquantified factors will be discussed below.
- *Stream flow reduction:* The estimated environmental cost due to the stream flow reduction by plantations was found to contribute at most R562m (24%) of the environmental cost of the industry. A more likely estimate is however R270m, or 11% of total environmental cost (The details of this ceiling estimate are provided in the next section).
- *Solid waste (landfilled):* The environmental cost due to the landfilling of solid waste was found to contribute R221m (9%) to the total environmental impact. This was a major contributor to the environmental costs of woodchips, sawmilling, timber board, mining timber and treated poles varying between 45% and 78% of total environmental cost for these sectors.
- *Air emissions:* Air pollution from the various processing activities was estimated to contribute R534m (23%) to industry environmental costs. The bulk of this stemmed from the production of pulp and paper, which contributed R487m (91%) to the total air emission cost.
- *Energy use:* The externalities associated with energy use contributed R918m (39%) to the total environmental cost of the industry and reflected the environmental impact of energy production (from national grid and own processes).
- *Carbon sequestration.* Carbon sequestration by plantations was estimated to reduce the environmental costs of the industry by R89m. Allocating carbon sequestration benefits to commercial plantations is a controversial issue as it is argued that the carbon is released back into the atmosphere once fibre is broken down (e.g. burnt). While this may be true for some applications where the processing of the wood or fibre results in the release of carbon, it is not the case of all wood uses. In addition, the replacement of harvested trees will

ensure that a specific stock of plantations is maintained. The value assigned to plantations is based on a low estimate of the maintained stock taking account of rotation and harvesting. If the plantation area is expanded or reduced in future, this will affect the value.

In the nature of such assessments, not all impacts could be quantified. We now turn to these impacts.

Biodiversity impact of plantation forestry similar to or lower than other agricultural activities: The impact of plantation forestry on biodiversity could not be quantified due to insufficient data and are thus not accounted for in the overall quantified impact. The study, however, found that the impact of plantations on biodiversity is *similar or lower than other agricultural¹¹ activities*. In order to assess the impact, two debates need to be separated: (i) the biodiversity impact of plantation forestry relative to natural state and (ii) the impact of plantation forestry activities relative to other agricultural activities.

Biodiversity is best considered in a national debate. How should society think about the biodiversity trade-off between plantation forestry and the natural state? It is irrefutable that economic development, and also plantation forestry, result in environmental costs and the question at the basis of this debate is what environmental cost a country is prepared to bear in pursuit of development. It is debatable whether biodiversity is appropriately pursued at the level of specific crops, particularly as it is not applied even-handedly across different crops. It may be more appropriate to declare additional government (or private) reserve areas, which should be removed from the area available for commercial use. It will be more appropriate to allocate the cost of such conservation activities to society as a whole (through the tax base) or the broadest group of land-users, than 'taxing' a specific land-use.

Biodiversity impact of plantations relative to other agricultural activities may be exaggerated. The more relevant issue for this debate is therefore the relative impact of plantations versus other land-uses, and in particular agriculture. Our findings are that the impact of plantations on biodiversity may be overstated relative to that of other agricultural activities.

- *Biodiversity impact of plantations similar or lower than other agriculture.* The environmental assessment conducted for this study found that the biodiversity impact of plantation forestry is similar or lower than that of other agricultural activities (excluding cattle grazing). That is, an area of plantation is expected to have a lower biodiversity impact than the same area of agricultural activity.
- *Stricter biodiversity controls and conditionality are implemented on plantations through water licensing.* Plantation activities are subjected to stricter controls than other agricultural activities. A rule of thumb with allocating the earlier afforestation permits was that the area planted may not exceed 70% of the area available (although it is sometimes argued that a proportion of this area is taken up by housing, roads or areas unviable for plantations). In addition,

¹¹ As opposed to animal husbandry.

current SFRA licences are often issued with conditions whereby the applicant is required to clear certain areas of invasive species or to change the planting plan to accommodate environmentally sensitive areas. No similar controls are exercised over other agricultural activities.

Aspects of water quality impacts not quantified are not significant: The report quantified the key water quality impacts, with the exception of total suspended solids (TSS) and total dissolved salts or solids (TDS) produced by pulp and paper plants, which were not quantified as shadow prices were not available. A part of the TSS cost is covered by the estimate for chemical oxygen demand (COD) and should thus have a limited impact on the net environmental cost of the industry. The remaining impacts are not expected to have a major impact on the overall results. With regards to the impact of TDS, we rely on a study conducted for the Water Research Commission that found that salinity concentrations in the relevant range do not have a significant environmental impact. It may, however, result in additional costs to downstream, industrial users who may need to reduce the salinity levels of the water they use. Using an estimate of the impact on concentration levels due to effluent discharge by pulp and paper mills, the estimated impact would be R48m, too small to make an impact on results. We have included this estimate in our total costs.

1.4.

STREAM FLOW REDUCTION BY PLANTATIONS RESULT IN A MAXIMUM ENVIRONMENTAL COST OF R562M

Plantations are generally not irrigated and make use of ground water and rainfall. In the absence of plantations, this water would have flown into the general water system (including rivers, streams and subterranean water). Water use by plantations (as is the case for all other water uses), therefore, reduces the amount of water available to the rest of the water system. As plantations are often higher up in the water flow system, the impact of plantations on water levels is often observed, for example, in declining water levels in rivers. Plantations are, accordingly, referred to as a stream flow reduction water use.

The perceived cost of water use, or stream flow reduction, by plantation forestry is central to the current debate on the desirability of plantation forestry in South Africa. Critics of plantation forestry consider plantation water use to be excessive taking water away from other (implied to be more appropriate or efficient at lower water requirement) economic activities and encroaching on the environmental reserve¹² in catchments resulting in environmental costs.

The calculation. In this analysis, Genesis provides a first-order estimate and framework for the consideration of the potential impact of stream flow reduction by plantations. In order to illustrate the potential magnitude of impact, the methodology assumes that plantation critics are correct in their view that there are better or more efficient uses of water available and that it is the sole cause of deficits in stressed catchments. *Please note that the results presented in this document do not support this view. Our results show that plantation forestry adds*

¹² The environmental reserve is the body of water required to remain in the system (i.e. cannot be allocated to economic or other uses) in order to maintain the aquatic and surrounding environment.

substantial value across a long value chain and that there is no evidence supporting a call to direct water use away from plantations to other water use activities.

Based on this ultra conservative approach (biased against plantation forestry), a ceiling estimate of the impact of SFRA water use suggests a maximum environmental impact of R562m. This is based on three estimated values:

- *The extent of 'excessive' water use brought about by forestry.* In this analysis two scenarios were considered to quantify the extent of water use. The most conservative scenario (bias against plantation forestry) that was used in the overall calculations assumed 'excessive' water use by forestry to equal the total plantation water requirement (over and above the water that would have been used by natural state vegetation) in deficit catchments up to a maximum of the deficit¹³ in the respective catchments. In other words, the total deficit was ascribed to plantation forestry up to the total of forestry water usage. An alternative scenario is also shown where forestry is allocated a share of the deficit in proportion to its water use in the stressed catchments. This is also the approach followed by DWAF in reallocating water use in stressed catchments through its compulsory licensing process. Water use is not reduced only for plantation forestry, but is reduced across all activities in proportion to their current water use in the catchment.
- *The cost of such water use.* The approach followed in this analysis was to evaluate the cost of 'excessive' water use by considering the cost of remedying the impact (this cost will always equal or exceed the actual opportunity cost). The most likely remedy is the cost to construct dams and transfer schemes to improve water management and in effect transfer water from areas and periods of surplus to dry areas and periods. The cost of constructing dams or transfer schemes to remedy the deficit are estimated to be R1 per cubic metre which is based on the highest value thus far reported by DWAF in Kwazulu-Natal.
- *Working for water charges.* In addition to the above, the cost of remedying the spread of invasive tree species occasioned by forestry was estimated by including the total annual cost of the Working for Water (WfW) programme (R308 million in 2003). It is unrealistic to ascribe the total cost of the WfW programme to plantation forestry but it was done in an attempt to sketch an absolute worst case scenario. It must be reiterated that this does not mean that forestry is indeed responsible for the total cost – on the contrary, some invasive species are not plantation forestry species and forestry makes annual contributions to the WfW fund. Furthermore, many invasive species were actually introduced by government for e.g. dune stabilisation reasons. Thus this should be regarded as a hypothetical situation depicting the absolute maximum impact for which any activity can theoretically be held responsible. To illustrate the impact of allocating 100% (R308m) of WfW cost to forestry, an alternative scenario was also provided in which 70% (R215m) of WfW were used. In line with our conservative approach, the 100% scenario was used in the overall calculations.

¹³ It is the estimated water deficit that results in costs to the environment.

Applying the conservative scenarios for the SFRA water use (total deficit) and the WfW budget (100% of budget) results in a the total impact of R562 million. If the less conservative alternative scenarios are used (proportional deficit and 70% of WfW budget), the impact reduces to R283m.

It has to be re-iterated that the higher estimate presents a *ceiling estimate* as it is unreasonable to allocate the full deficit to plantation forestry¹⁴, the remedy value is ultra conservative and the full Working for Water budget is allocated to plantation forestry.

The grounds for singling out plantation forestry water use are not clear.

Evidence suggests that forestry does not necessarily use significantly more water than other forms of agricultural activity, whether measured in terms of water usage per land area, overall water usage or the intensity of water usage per unit of economic value added.

- Considering only the use of water, we found the *economic value-added* per litre of water used in plantation forestry alone (i.e. excluding downstream processing) to be comparable or higher than a number of other agricultural activities. This means that the intensity of water usage per unit of value-added in forestry is not significantly more than that for other activities.
- *Irrigation agriculture* requires up to ten times more water than plantation forestry per hectare cultivated. In addition, the annual nature of such crops and the extent and nature of fertilizer use result in higher environmental costs than is the case for plantations. The technical evidence for *sugar-cane dry-land agriculture* indicates broadly similar levels of water usage per hectare, but needs to be confirmed.
- *The argument is often made that forestry deserves to be singled out because of its sheer size.* But in terms of total usage of available water in South Africa, irrigation agriculture uses in excess of 50%, compared to the 6-7% used by forestry. Therefore the approach is nowadays taken to evaluate water use at the quaternary catchment level

As far as new afforestation is concerned, this occurs within a highly regulated environment (more so than for other agricultural activities), in which SFRA water licences are allocated within the limits of the available water resource allowing for social and environmental reserves as well as equity considerations.

Although not conclusively in favour of plantation forestry or negating the nature and extent of water use by plantations, these findings place the debate in context.

¹⁴ This is confirmed by the compulsory licensing system which intends to re-allocate water in stressed catchments in proportion to the existing water use (i.e. re-allocating water from all existing users and not only specific sectors).

1.5. THERE ARE LARGE PRO-POOR FTTP DEVELOPMENT OPPORTUNITIES IN THE EASTERN CAPE AND KZN

Large opportunities for plantation expansion are through small grower and community schemes exist in Kwazulu-Natal and the Eastern Cape. The bulk of development will also be on communally-owned land, based on community or small grower schemes creating an estimated 43,000 jobs, supporting 328,000¹⁵ in low-income areas in these provinces. This will add an estimated R739m to the annual output of these provinces. Although forestry will not be able to take households completely out of poverty, it could contribute substantially to households' income in a manner that will not necessarily tie their labour to the plantation (i.e. available time for other activities). In this way, forestry is also an investment or asset building activity.

Although developments on communal land requires more effort to establish and manage, the findings of this analysis suggests that this is not an insurmountable barrier. In addition, current tenure reform processes were not found to be a barrier or concern to land-use decisions.

No evidence was found of alternative industries that directly compete with forestry on the same scale or with the same certainty of markets. We find that cattle-grazing can be managed in conjunction with forestry initiatives.

New small-grower afforestation in KZN. The main opportunity in KZN is the potential 40,000ha of new afforestation through small-grower schemes on land identified in the KZN small-grower maps. These maps are the result of large efforts from government and private sector and identify communally-owned areas that are suitable for plantation development from environmental, social and economic perspectives. It substantially reduces (or almost complete remove) the regulatory and process barriers to establishing small grower plantations as much of the assessment is done in advance for large areas of land rather than for individual applications. Having only recently been released, the realisation of this opportunity now depends on the ability and appetite of the processing companies and cooperatives to establish small grower schemes in the areas identified.

Development expected to be for pulp wood. Due to its proximity to pulp processors and woodchipping plants and the shorter rotation period required, it is expected that the bulk of plantations established will be short rotation hardwood for pulping. It is, furthermore, assumed that all the wood will be processed by domestic pulp mills as they are currently the only sponsors of small-grower programmes. Though there are a number of independent growers, it is difficult to establish a small-grower programme in the absence of such sponsors.

Based on current industry statistics and market conditions, it is estimated that utilising this opportunity could contribute approximately R484m to KZN's GGP (0.23% of current KZN GGP) and could create an additional 15,400 employment

¹⁵ Calculated based on a higher dependency ratio of 8 as is found in the potential plantation areas in the EC and KZN provinces.

opportunities. R73m of the value will be generated at plantation level creating 15,000 jobs. The remainder stems from the assumed increases in pulp and paper production. The environmental impact of such development is expected to be acceptable as the areas for development have been defined based on available water and environmental concerns and process checks in place to control environmental impact.

New small grower afforestation and improved utilisation of DWAF category B¹⁶ plantations in the Eastern Cape. In the case of the EC, the forestry opportunity holds substantial development potential for the province particularly as few economic alternatives beyond cattle grazing and subsistence farming exist in areas suitable to plantation forestry. The main opportunities stem from the establishment of new small-grower or community plantations on the estimated 60,000ha available, the conversion of 10,000ha wattle jungles to managed plantations and the improved utilisation of DWAF category B plantations.

New afforestation in the Eastern Cape will focus on short rotation hardwood. Our review of this opportunity suggests that in the absence of substantial government intervention, the bulk of new afforestation will most likely focus on short-rotation hardwood for pulping, timberboard and poles production. This is contrary to the view of preliminary forestry development plans drawn up for the province which suggests development of long-rotation softwood plantations. Based on the review of infrastructure and funding, it is unlikely that community growers will choose or be able to carry the risk and capital requirements for establishing long rotation plantation unless substantial incentives are created.

Additional processing capacity in the form of a chipping mill will be required to facilitate the development of the full available area. A large proportion of the potential plantation areas identified is not within reach of existing hardwood processing facilities. At the same time, it is unlikely that additional pulp capacity will be created in the EC in the short term (due to insufficient fibre supply, the capital investment required¹⁷ and difficulties in finding suitable location for pulp mill). We, therefore, assume that a woodchip mill will be established, which will absorb the bulk of the fibre produced once the full area has been developed. The chipping mill can produce chips for further processing in KZN¹⁸ or for export. The remainder of the fibre will be used for existing timber board and pole production or as inputs into pulp mills in KZN (where within reach).

Based on the above scenario, current industry statistics and market conditions, it is estimated that a realistic utilisation of the estimated 60,000ha available (and the conversion of wattle jungles to managed plantations under the yield enhancement programme) can contribute an estimated R257m to GGP (0.2% of EC GGP). R128m of this will occur at plantation level and could provide employment to an

¹⁶ "Category B plantations" is the name given to the approximately 70,000ha (nationally) of commercially viable DWAF plantations that are not included in the five large "packages" of plantations prioritised for privatisation (which are referred to as Category A plantations). Category B plantations are distinguished from Category C plantations in that the latter are not generally commercially feasible and mostly consist of community woodlots.

¹⁷ It is estimated that the pulp mill planned by NCT would cost in region of R2-3bn.

¹⁸ Road or rail transport costs may be prohibitive, but shipping may be a possibility.

estimated 26,250 small growers and their employees (assuming the total area will be developed by small growers). R82m is expected to stem from EC processing activities in the form of woodchip exports (to Japan or SA pulp mills) and timber board and pole production creating an additional 262 jobs. An additional R47m in GGP and 49 jobs could be generated through the processing of some of the fibre produced in the EC at KZN mills.

Substantial effort and support will be required to realise this opportunity. It must be noted that this opportunity will require a coordinated effort:

- The EC has not yet gone through the same process of establishing small grower maps as was done in KZN. Until such maps have been created there may, therefore, still be substantial regulatory process barriers.
- In our view, the realisation of this benefit also depends on the establishment of a woodchip facility in the EC (most probably Mthatha). Sufficient volumes will not be available for establishing a pulp plant in the near future and logistical and production capacity issues will limit the amount of fibre that can be absorbed by existing pulp mills in KZN and timber board production in the EC.
- The realisation of the opportunity will also require the efficient management of community plantations through corporate schemes and/or management agents as it will require the implementation of a reasonable rotation model.
- It may take some time to build up to achieve the suggested GDP level as not all areas will be planted immediately and there will be at least an eight-year delay for the first trees to reach harvesting age.
- It is unlikely that processing companies will have the capacity to establish small grower schemes on the full area identified. This is particularly the case due to the distance to the nearest processing facilities. In the absence of corporate small grower schemes, substantial upfront financing will be required in order to fund the development until harvesting. As was the case for existing examples in the EC and corporate small grower schemes, this needs to be structured in a manner to advance income to the growers in the period leading up to the harvest.

The environmental impact of such development is expected to be limited as the areas for development have been defined based on available water and environmental concerns and the process checks are in place to control environmental impact.

Improved utilisation of DWAF category B plantations in the EC. It is the intention of DWAF to transfer the remaining plantations under its control to management by private companies or communities. Currently these plantations are poorly managed, yields are below standard and large tracts of land are left unplanted. Although the exact amounts could not be quantified it is clear that rectifying this situation will require a substantial investment by DWAF or the eventual owner. The analysis illustrates that such improvements will also result in substantial benefits.

The opportunity discussed here is based on the increase in production that can be achieved by improved utilisation of 27,000ha DWAF category B plantations (improved yield and land utilisation) to that of comparable plantations in the EC. The impact of such improvements would be to increase the total production of these plantations by 131,415m³ resulting in additional GDP at plantation level of R150m and just over 1,900 additional jobs. If it is assumed that the total increase will be utilised by various categories of sawmilling operations, the impact would be an increased output by sawmills of R86m and an additional 1,400 jobs¹⁹.

The analysis of the EC and KZN opportunities suggests that substantial financial and management support will be needed to get the process off the ground. In addition, it will require a development agent or agency to drive the development. This role could be fulfilled by the forestry division of DWAF or by other private sector bodies.

Managing the risks of all parties

Our view is that the bulk of potential expansion in the plantation area lies on communal land and will need to take place through community or small-grower schemes. We also find that the bulk of small-grower plantations will be short rotation hardwood for pulping purposes. Although some success has been achieved in establishing such programmes, there are risks to be considered.

- *Risk to small growers of exposure to market volatility.* International pulp and paper markets are volatile and vertical integration between fibre production and processing activities has evolved as the principle means of managing this risk. This leaves the non-integrated components of the value chain exposed to market risk. One of these exposed components is the small-grower or community schemes. In the past, processing companies have accommodated small growers by absorbing market fluctuations in their own plantations but this has not been explicit in the contract with the small grower and provides no guarantees to the small grower.
- *Uncertainty of fibre supply to companies:* Much effort is required from companies to establish and manage small-grower schemes and, in the absence of alternatives, companies have provided finance and advance payments based on the expected harvest in order to smooth cash flow for the grower. Contracts generally bind the grower to supplying fibre to the sponsor company for the first two rotations. Due to the difficulty of monitoring a large number of small plantations, companies often find that the wood is sold to other buyers (breaking the contract) in which case it is unable to recover the cost of supporting the grower.

These issues need to be resolved to maximise development. One option is a closer tie between processing companies and small growers, including perhaps allowing the grower to share in processing profits. Another option is for small growers to join

¹⁹ This is based on the assumption that the new owners would continue production of the current plantation type, namely long rotation pine. A more likely scenario is perhaps that such plantations will be converted to eucalyptus pulpwood.

or establish their own processing cooperatives to process chips for export or supply to the domestic pulp companies.

1.6. SA HAS A COMPETITIVE ADVANTAGE IN TERMS OF PLANTATION YIELDS

Where the conditions in terms of rainfall, soil quality and temperature are right, South African plantations have high yields. The result is that South African plantations are two to three times more productive than natural forests of the same species in Europe and North America and comparable to that of other southern hemisphere countries. In the past, South Africa was also a world leader in commercial forestry research, which has resulted in substantial improvements in yields (particularly of pulpwood). The combination of these two factors, therefore, provides SA with a competitive advantage.

In addition, South Africa is a world leader in terms of certified plantation management with more than 80% of South Africa's afforested land (the highest proportion in the world) attaining FSC certification. This means that plantation management adheres to specific principles and standards with regards to environmental impact, land use and labour practices, which have been laid down by the Forest Stewardship Council. South Africa therefore has a marketing advantage and is in a good position to benefit from the increased demand for fibre (and products derived from fibre) from certified plantations.

1.7. GROWTH IN THE DOWNSTREAM PROCESSING INDUSTRY IS MAINLY DEPENDENT ON GROWTH IN DOMESTIC PLANTATIONS

Demand for paper and wood products is expected to grow. Establishing pulp and paper plants requires substantial capital investment. With government's initial protection and support, SA has the benefit of an established, large pulp and paper industry, of which the principle companies are global players with access to developed country markets. Although the world market for pulp and paper is volatile and, therefore, difficult to predict in the short-term, the long-term growth of the market is linked to economic growth and demand for paper is, therefore, expected to continue to expand. The ability of the South African pulp and paper industries to expand will depend on: (i) the availability of fibre; (ii) the industry's ability to comply with environmental legislation (also affecting the current industry); and (iii) the availability of skilled workers.

SA also has an established sawmilling industry supplying critical domestic demand for sawn timber. This industry developed on the back of government-established softwood plantations²⁰ and it is still adjusting from the impact of losing its supply of state-produced timber at artificially low prices. The changes have resulted in closures and consolidation as mills struggle to invest in capital renewal in order to improve efficiencies. Despite this, there are still a large number of small and micro mills in operation offering economic opportunities in often remote areas. Although

²⁰ The softwood plantation scene was dominated by government until 1992 with the formation of Safcol and the subsequent privatisation of government-owned plantations.

privatisation may improve efficiencies and yields in the solid wood plantations, the increase in demand from the building and construction sector is expected to result in sawn timber shortages. Servicing of this market will be restricted by the limited supply of long rotation softwood.

Domestic processing relies directly on domestic plantations²¹. Even though some imports of inputs are possible, our view is that the FTTP industries (and particularly the pulp and paper industry) will not expand based on imported fibre inputs. It certainly would not have been established in its current form in the absence of a domestic fibre base as production efficiencies demand that production be located close to the fibre source or close to the market. Beyond production for the domestic market, a model of importing fibre and exporting final products would, therefore, be inefficient.

For the established pulp and paper industry, it may be possible to supplement production with imported fibre in order to fully utilise the assets. Analysis of the value chain and discussions with industry players, however, suggest that supporting a domestic industry with imported wood or fibre is not feasible under the current market conditions and pricing. Although imported fibre can be used to *supplement* the domestic inputs, it is questionable whether this will result in a substantial permanent production expansion as it would be more efficient to move the production closer to the source of fibre in the longer term. This is particularly the case as the pulp and paper companies in South Africa form part of global operations and, therefore, consider investment decisions and efficiencies in the global context.

Non-SA SADC fibre is unlikely to result in substantial permanent expansion of the domestic processing industry. It is possible that fibre may, in future, be imported into South Africa from neighbouring countries if infrastructural and other regulatory issues can be resolved. It is furthermore possible that the fibre may be available for a substantial period of time as domestic beneficiation (in the supplier country) will take time to develop. It is, however, expected that SADC governments will eventually insist on domestic beneficiation in order to maximise domestic gain resulting in processing operations (by SA and potentially other firms) being established in the supplier country. In addition, the emergence of such a fibre resource for South Africa seems unlikely unless the plantations are established and owned by South African pulp and paper companies (i.e. vertically integrated).

In the solid wood processing components, imports are mostly limited to particular wood types not available in South Africa. The current market conditions and transport cost (and inefficiencies of transporting roundwood) make a sawmilling expansion based on imported roundwood unlikely, and it is more efficient to import sawn timber. The expected shortage and concomitant increase in domestic sawn timber prices may result in imports becoming feasible.

²¹ It should however be noted that, just as downstream activities are dependent on fibre availability, plantation forestry is dependent on downstream activities to provide a market for its production. Thus the health and growth of the processing industries should be regarded as equally important as fibre availability.

1.8. CONDITIONS UNDER CONTRACTING PRESENT IMPORTANT SOCIAL CHALLENGES

Although the industry is seen as a substantial employer of (particularly low-skilled) labour, a large proportion (approximately 44% of plantation forestry work force) of formal employment (low-skilled labour in particular) positions have been moved to contracting companies that have taken over the management of the bulk of plantations. Contracting is not unique to forestry and not a problem in itself, but the manner in which it is done (as labour broking rather than outsourcing) may have negative consequences for the industry.

From our review of this issue, the limited secondary data available on contracting in the forestry industry, as well drawing on the perspectives of key informants we find that:

- The bulk of low-skilled jobs have been moved to contractors over the past two decades. This was done mainly to reduce costs but also to limit the exposure to an increasingly unionised labour force. By contracting labour and operational issues out to independent parties, companies feel that they can focus on their core business activities.
- Whilst the emergence of contractors has created new income, ownership and employment opportunities, the conditions under which these opportunities operate often do not meet national labour and health and safety standards²². The available information suggests that wages and labour conditions for employees have deteriorated when they were moved from permanent employment to contract employment.
- Relations between forestry firms and contractors (and the contractor umbrella organisation) are unequal, almost adversarial and based on the greater power of the former vis-à-vis the latter.
- The majority of contracts are of three year duration, insufficient to enable contractors to lease or purchase equipment. Whilst labour-intensity contributes positively to labour absorption, equipment is still required to increase efficiencies.
- Contractors servicing small growers operate under informal sector conditions, in highly competitive markets and with poor access to finance and training. All the contractors interviewed used their own funds to start their enterprises and had no assistance either from the forestry firms, government or other agencies in establishing and maintaining their businesses. Contracts with small growers were informal and too small to serve as the basis for acquiring loans.
- The most urgent requirement of informal contractors is for assistance in securing public liability cover against the risk of fire, which is the highest barrier to their formalisation. Their second most urgent requirement is for business training. Many contractors do not know how to manage their enterprises (to the point of not knowing if they have made profits or losses at any given period of time).

²² Even though FSC requires forestry companies to enforce such compliance in its contracts, it is often not monitored in practice.

- The costs of compliance with minimum wages and health and safety standards render most informal contractors unsustainable.

The tenuous nature of the current situation is acknowledged by the industry²³ and government, but as yet, no solutions have been forthcoming. A constructive solution that does not result in job losses may become easier in the context of an overall plan for growth and cooperation. A number of developments suggest that the appropriate incentives may be in the process of being created to improve the forestry contracting environment.

- It is in the commercial interest of forestry companies to improve contracting conditions as it impacts on the costs and quality of their plantations;
- Increased initiatives by the unions to increase their influence in the contracting environment may provide the necessary representation for contract labour; and
- The forestry charter may form a development pact between the various parties involved through which this issue can be resolved.

The balance between protecting labour and not precipitating employment reduction is, however, notoriously difficult to strike. While it is clear that the current labour conditions are not in the interest of contractors, any attempt at rectifying this needs to recognise the fact that inappropriate intervention may result in mechanisation.

1.9.

NON-ADHERENCE TO/CONFLICT OVER ENVIRONMENTAL REGULATION MAY PREVENT DEVELOPMENT OF THE PULP AND PAPER INDUSTRY

The environmental analysis prepared by the CSIR-Environmentek shows that the environmental impact of the pulp and paper industry are significant and substantially higher than other components of the value chain (excluding remedy cost estimates of SFRA water usage). This stems in part from the impact of pulp and paper production on water quality through discharges into the water system, the total cost of which to society we estimate at R206 million per annum. At the same time, this study has also shown that the economic impact of the pulp and paper sector (R6bn) is substantial.

Licensing. Due to the impact on water quality, pulp and paper mills require a licence for the discharge of effluent into the water resource. These licences are issued for a period of five years after which the environmental situation and compliance with licence conditions are reviewed before the licence is renewed. Renewal is not guaranteed and DWAF may withdraw the licence if the review finds that the licence holder has not adhered to the specified conditions of the licence. Conditions required by the licence are often not immediately achievable as, for example, technologies are not available or may require investment in process changes. In the past, exemptions were granted and the licence was issued on condition that such changes would be implemented over a set period. According to DWAF, compliance with these conditions has, however, been low and often

²³ Industry has launched some initiatives in this regard. See Section 1.3.6.

resulted in exemptions being rolled over. Since the inception of the NWA in 1998, DWAF has taken the stance that, in order to adhere to the Act, non-compliance will no longer be tolerated and that it will discontinue the practice of exemptions.

Integrated Water Management Plans. Each mill now has an “Integrated Water Management Plan”, in which its impact on water quality is made explicit and mitigatory measures together with a specific implementation time frame are stated. As a number of water licences are coming up for renewal for the first time since 1998, the full impact of this is now emerging with renewal of water licences as well as applications for expansion being withheld due to arguments over compliance.

The dispute. Industry argues that the standards set, in some cases requiring zero effluent discharge, are too strict and that the technologies do not exist (even internationally) to enable achievement of these standards. They also suggest that the standards are one-sided and do not consider the trade-off between development and environmental impacts. It is also stated that the South African industry compares favourably with the effluent levels of even industrialised countries.

Although the available technology argument is not contested by DWAF, their position (as encapsulated in the NWA) is that the environment cannot be compromised. The result is that existing mills may be forced to shut down, if operators are unable to show that they can, within a reasonable time frame, achieve the environmental standards set. With regard to the comparison to international standards, DWAF argues that, as a semi-arid country (in which the concentration of any pollution is higher than in a country where there is an abundance of water), South Africa cannot be compared with water-abundant countries such as those in Europe²⁴.

It seems that this dispute has achieved a deadlock with neither party able or willing to compromise its position. If this situation persists, it is expected that the respective positions will be tested in court. This report does not attempt to resolve these issues. It does, however, provide a framework for considering the matter and the inevitable trade-offs involved as well as data that may inform the issue. For example, the estimate of the annual costs of effluent (some R206 million per year) may be the basis for an assessment of the cost-benefit of various quality-improving technologies in the sector and indeed of the regulations. *Ultimately, the study's main conclusion in this regard is that the issues surrounding water quality regulation and licensing, and failure to adhere to it, will fundamentally determine the ability of the industry to expand.*

²⁴ The counterargument is however that this should not apply to mills that are situated on the coast.

1.10.

THE REGULATORY INEQUALITY FACED BY FORESTRY MAY BE DAMAGING PRO-POOR DEVELOPMENT

Managing the balance between water scarcity and development leads to complicated trade-offs. South Africa is a water-scarce country and it is, therefore, appropriate that the use of water be managed efficiently. It is also clear that plantations use a substantial amount of water and often have a first claim on supply²⁵. At the same time, a substantial proportion of forestry industry economic activity is located (and has the potential to be located) in rural areas with high unemployment and few economic alternatives.

Additional time taken to process SFRA licences cannot be justified by the characteristics of plantations: Over the last seven years, SFRA applications in the EC and KZN on average took two years to process compared to one year for other abstraction and storage²⁶ applications. Although some of these delays are due to problems on the applicants' side, such problems are reasonably expected to exist for other abstraction applications as well and cannot fully account for the difference in processing period. In order to address this, DWAF has initiated a SFRA streamlining process, which has made recommendations for the streamlining of the application process. The implementation of some of these recommendations has improved the process but it is still too long. The impact of these delays is not only the cost of delayed earnings, but it is also particularly problematic in the context of community and small grower forestry. In such cases delays are costly to manage and often difficult to explain to the community by the management agent. It may even result in communities losing interest.

The regulatory process is creating unintended system bias against forestry. Plantation forestry is currently faced by two issues, which increase the regulatory burden and cost of establishing and managing plantations:

- Plantation species are correctly classified as invasive, which means that plantation forestry is subjected to tighter environmental control and regulation than other water uses (e.g. agriculture).
- Plantation forestry is classified as a stream flow reduction activity (the only activity to be classified as such to date). The result is that the application process for a water licence is different (and more complex) for plantations than for other applications (e.g. irrigation licences). It is subjected to a cooperative governance-based review system, which results in water and environmental legislation being rigorously enforced (more so than for other water uses).

Although the above may be justified due to the high levels of water use and the invasive character of these trees, it does not justify the substantial and unnecessary delays and uncertainties created by the licensing process.

²⁵ This is a debated point – FSA argues that, as plantation forestry only receives water through precipitation, it in fact has a zero assurance of supply. As plantations are often located higher up in the water system, it does, however, get access to water before it flows into the rest of the system giving it a first claim on use.

²⁶ Including irrigation as well as constructing of dams.

Forestry development is not a priority for cooperative governance partners. Our review found that a substantial proportion of the delay is due to the involvement of other government departments (Agriculture and DEAT) in the cooperative governance process. Although the characterisation as invasive species may require additional assessments from the environmental side, this does not justify the extent of the delay. The interaction with government departments and industry players in the course of this analysis suggests that much of the delay can be ascribed to capacity constraints and low priority of processing applications as forestry development is not a priority for these departments.

Lack of support in application process. Agricultural applications for water licences are facilitated and managed on behalf of the applicant by representatives of the Department of Agriculture. This smoothes the process substantially and helps to clear bureaucracy barriers. Although support is in some cases provided to small forestry growers, this does not apply to commercial applicants and it is not on a comparable scale to that of agriculture.

Categorisation of water use result in switching cost. Water licence applications have to be submitted if land use is changed to a different category of water use (e.g. irrigation to SFRA). This means that a farmer wanting to establish a plantation in a current irrigation area must go through the full licensing process even if the same amount of (or less) water will be used by the plantation. This does not apply to other irrigated agriculture water uses as they are all classified under irrigation water use. In cases where plantations may be the optimal land use, this system bias will result in a sub-optimal land use as the owner is incentivised to switch to other irrigation uses or remain in the current use rather than incur the cost and burden of the application process.

Innovative action may reduce regulatory burden for small growers but will not correct system bias. Even under a streamlined licensing process, substantial delays are still expected. Innovative action by the KZN licensing, assessment and advisory committee (LAAC)²⁷ has, however, resulted in a substantially shortened application process for small growers. By combining information on potential small grower communities, water availability, soil surveys and environmental concerns, the KZN LAAC created a set of maps pointing out areas suitable to small grower plantation development. As a large part of the assessment was done in advance by the maps, only a site visit is required to issue a water licence. It also saves time by directing applicants to areas appropriate to afforestation. This could reduce the time taken to process small grower applications to three months. The maps have, however, been created only for communal areas and will not benefit commercial growers.

Systematically distorted land use decisions. The result of the above is that it is more difficult, costly and burdensome to apply for plantation water licences than for other water uses. Consequently, land use decisions are systematically biased against plantations (over and above what can be justified due to the environmental

²⁷ No similar process exist in the Eastern Cape as of yet.

and water concerns) resulting in the distorted allocation of resources (including water).

Declaring other SFRA's. One suggested way of addressing the above concerns is to include other water users (e.g. dry land sugarcane) under the SFRA category. While this may technically remove some of the bias in the system, our view is that it will not address the inherent flaws in regulatory design and will have no substantive impact on the resource allocation problem.

Administrative discretion aimed at optimal resource allocation is unwise

The current pricing strategy (and by implication also the allocation policy) is designed to provide government with increasing powers to direct resource use. We understand that the water regulator intends to redirect water use to more 'efficient' applications. The definition of 'efficient' applied by the regulator means that administrative pricing will be applied to direct water use to what is considered to be 'optimal applications' (from an economic, social and environmental point of view).

This is a complex task, which this analysis suggests to be beyond the capacity of a government or regulator to pursue. Whereas it may be possible for a regulator to ensure that an activity does not result in a net cost to society, the complexity of selecting optimal activities is overwhelming. Even if the capacity was available, the fact that only water use is optimised is highly problematic. Any economic activity combines a number of resources of varying levels of scarcity of which water is only one (others include capital, land, labour, management skills, entrepreneurial skills, etc.). Optimising only water use will systematically result in distorted outcomes (even for water use) due to the inability of any central allocation system to consider the opportunity costs of all resources involved.

Saying that it is not possible or appropriate for the water regulator explicitly to direct resource allocation to perceived optimal applications does not imply a laissez faire solution where resource allocation is simply left to a market mechanism. Instead, it infers that resource allocation is a complex matter which is better dealt with through a combination of market forces and national mechanisms and policies designed to manage the economy and its resources.

In this respect, the National Water Act does provide for a market-based allocation system as an alternative mechanism to incorporate opportunity costs in water pricing. Although this is currently allowed on an ad hoc basis, the necessary institutional and regulatory infrastructure for this market has not been created. The experience with water trading is mixed but, if done in a managed manner, may provide a possible alternative to administrative allocation. It may be possible to pursue a managed/hybrid market allocation system in which the water regulator continues to manage and price for externality costs, which are not automatically dealt with by the market system.

The bottom line: water regulatory processes regarding forestry are essential, but must be redesigned to be more effective

We support the need and overall framework for water regulation put in place by DWAF. It is a thorough system that incorporates necessary safeguards. But the process is not working well for forestry, and should be redesigned in the SFRA (forestry) category. It is not clear to us that current “streamlining” activities are sufficient. Further, it should be pointed out that it is good practice to subject all important regulation to explicit regulatory impact assessments to evaluate the development trade-offs before proceeding with implementation.

The current institutional setting of forestry within government is problematic

Our impression is that the close organisational association between water regulation and forestry has thus far not effectively promoted environmentally sound pro-poor forestry development in South Africa. Partly due to the close association between the two, forestry has been the subject of regulation and regulatory processes that have proved to be problematic. Having said that, the close proximity may under new circumstances become a development positive.

Another issue is the relationship between forestry and the Department of Agriculture. We note that the development grants defined for use by ‘agricultural’ activities and managed by the Department of Agriculture are not made available to forestry as it is not defined as an ‘agricultural’ activity. This is the case even though forestry falls within the intended target market for the grants and has pro-poor impacts. These grants would contribute substantially to developing community forestry. In addition, the separation of agriculture and forestry results in conflict between the management of similar industries that utilise the same resources.

The scope of this study did not include consideration of the appropriate institutional home for forestry and therefore we do not provide suggestions as to a possible solution. But it is an issue for consideration.

PART A: CONTRIBUTION AND COSTS
OF THE FORESTRY, TIMBER, PULP
AND PAPER INDUSTRIES IN SOUTH
AFRICA

1. NET CONTRIBUTION OF PLANTATION FORESTRY

1.1. SUMMARY OF FINDINGS

Plantation forestry provides the raw material for downstream activities such as pulpmilling, paper manufacturing, sawmilling and some furniture manufacturing²⁸ and can thus be regarded as the root of the value chain under consideration. Indeed, in considering the other components of the value chain, an important aim will be to investigate to what extent downstream activities are dependent upon the local plantation industry. In 2003, plantation forestry:

- contributed R2.9bn to GDP (most of which occurred in areas where economic alternatives are limited) and resulted in environmental costs of R562m (i.e. net contribution of R2.4bn);
- employed about 37,469 permanent and 30,000 contracted labourers;
- through roundwood exports (sawlogs) earned foreign exchange to the value of about R60 million (FSA, 2005);
- contributed substantially to the income of rural households through at least 31,500 small growers and about 7,875 small grower employees;
- provided a livelihood (through the dependency of others on the income earners named above) to between 390,000 and 560,000 South Africans.

Impact component	Plantation forestry
Economic impact by counterparty (Rm)	2,921
Owners of capital/company profit	1,466
Government	255
Labour	1,200
Rest of Society	n/a
Maximum quantifiable environmental impact (CSIR estimate) (impact on rest of society) (Rm)	54.5
Impact of SFRA water use (Genesis estimate) (impact on rest of society) (Rm)	Scenario 1: -562; Scenario 2:
Net economic impact (Rm)	2,413
Employment generated	106,844
Net foreign exchange earned	R60mn
Social impact	Small grower schemes contributes to income in areas with limited economic activities and facilitates asset formation
	The industry employs a substantial number workers of which bulk is low-skilled
	Bulk of low-skilled positions moved to contractors: SME affinity
	Contracting facilitates small business ownership and empowerment but current conditions result in social costs
	HIV prevalence may affect productivity. Small growing may be a rural income base for migrant workers – hence 80% of current smallgrowers are female.
Environmental notes	Bio-diversity not quantified but will be lower than other competing agricultural crops
	Substantial positive benefit due to carbon sequestration

Table 2. Overview of plantation forestry impacts on South Africa

Source: Genesis

²⁸ Additionally, plantations also provide the inputs required for e.g. mining timber, pole manufacturing, fibreboard manufacture, charcoal and woodchip production.

In addition, it facilitated economic value added through the value chain of R9 billion and additional direct employment in the value chain of more than 60 000 (this will be illustrated under the relevant components of the value chain).

1.2.

OVERVIEW OF THE MARKET

Plantation forests cover some 1.37m hectares,²⁹ accounting for some 1.1% of the country's total surface, compared to the 0.3% comprised by natural forests, and the respective 13.7% and 68.6% respectively accounted for by agricultural crops and grazing (Mayers et al, 2001; Godsmark, 2004). Kwazulu-Natal (KZN) and Mpumalanga together contain about 80% of the total plantation area with the Eastern Cape accounting for another 11%. Plantation forestry covers some 6.8% of the surface of Mpumalanga, and some 5.9% of that of KZN.

According to the latest available data, so-called *short-rotation hardwood* – mostly eucalyptus with some wattle, and the type of wood required for paper-making and woodchip exports – accounts for some 48% of planted area in South Africa: this wood has a rotation period³⁰ of 8-10 years. *Softwood*, namely pine, accounts for some 52% of plantations. *Short rotation* pine has a rotation of 12-15 years and is used mainly for pulpwood. *Long-rotation* pine, required for sawn timber products, has a rotation period of 27-30 years. These differences in rotation periods turn out to be commercially important variables, with, for example, a critical impact on the viability of small-grower schemes.

Plantations cover 1.1% of SA's surface and recent trends in new afforestation have been biased towards pulpwood. Though historically skewed, prices have recently adjusted to competitive levels.

Wood production and use. Due to its shorter rotation and higher yield, annual hardwood production outstrips that of softwood: of the approximately 19.2 million m³ of wood produced annually in SA, hardwood comprises about 56%, and softwood the balance. Some 64% of the timber produced is used as pulpwood (12.4 million m³), some 27% as sawlogs (5.2 million m³) and the remaining 9% for other uses, such as mining timber and poles. The production of pulpwood relative to sawlogs has increased markedly over the past two decades. This is indicative of the fact that new afforestation over the past two decades has been mainly for pulp production purposes, due mainly to the strong demand for paper and paper products on local and international markets. Furthermore, the shorter required rotation provides growers with the incentive of a more regular cash flow.

Pricing changes in the softwood sector. Softwood sawlog plantations in South Africa were traditionally largely state-owned. In order to promote the use of domestic rather than imported timber, government entered into so-called "evergreen"/long term contracts with sawmillers in which the millers were ensured of favourable prices. Such contracts served to keep the sawlog price artificially low. With the gradual rise of the private sector, and especially since Safcol was formed

²⁹ FES, 2004a – 2002/03 data. FSA (2005) notes that some 160,000ha will potentially be removed over the medium term due to the state forest restructuring process (60,000ha), the implementation of wetland and riparian zone delineation procedures (50,000ha) and compliance with unauthorised planting processes (50,000ha).

³⁰ The rotation period is the number of years a tree needs to grow to maturity, before it can be harvested. An optimal rotation would be a plantation consisting of as many "compartments" as there are years in the rotation so that, each year, one compartment can be planted and one harvested. Thus a plantation managed according to an optimal rotation would deliver a sustainable annual production.

in 1992 to manage and privatise the state's plantations according to sound business principles, prices have however risen significantly to come into line with international benchmark prices. Recent restructuring in the timber industry also saw an end to the subsidies received mainly by Safcol. It is estimated that the log price has since adjusted to reach an internationally competitive level (Mayers et al, 2001) and that short term supply and demand imbalances now interact to cause price variations.

Pricing changes in the hardwood pulpwood sector. In this area, the duopsonistic (i.e. only two buyers) market structure historically kept wood prices down. Since the middle of the 1970s, however, the export of woodchips (mainly organised by NCT in reaction to the pricing power of the domestic buyers of wood) has at least ensured that domestic market prices are on par with prices that can be reached on the export market, as independent suppliers to large buyers have the option to switch to export, should they be unhappy with domestic prices. In strong Rand situations, the profitability of exports may deteriorate and the only alternative to export will still be selling to one of the two South African buyers.

Ownership remains concentrated in the hands of large growers (53%) and the state (more than 25%).

Ownership. Though plantations have a legacy of state ownership, less than 30% (mostly long rotation softwood) of the total plantation area is currently under government control, and the privatisation thereof is in the pipeline³¹ (Godsmark, 2004). The *large grower* category of plantation ownership is highly concentrated, with the two biggest players owning 40.6% of the total plantation area in 2003, with other corporate players – including two black economic empowerment consortiums who recently signed lease agreements for Safcol forests – account for a further 13% of total area. The *medium growers*, namely formal-sector private timber growers/farmers, owned 17.6% of all plantations in 2003.

The approximately 31,500 *small growers*, some 80% of whom are female, own the remaining 3.2%. About 24,000 of these belong to Sappi and Mondi's outgrower schemes, as well as smaller schemes by the SA Wattle Growers and NCT Co-operative Ltd. In Sappi's Project Grow, initiated in 1983, and Mondi's Khulanathi, initiated in 1988, the companies provide independent small growers with seedlings, advice, and organisational support to plant small woodlots. Over the rotation period, the company provides them with interest free loans and cash advances on the income to be earned on harvesting. Upon maturity, these growers are contractually bound to sell their timber to the "sponsoring" company for one or two rotations. About 65% of small growers are located in the Zululand region. The prospects for small growers are an important theme of this report.

A small proportion of solid wood is traded on the domestic open market and the number of buyers is limited

Vertical integration and buyer concentration. The plantation market is defined by a large degree of *vertical integration* with downstream activities for both the solid wood and pulp wood components. The major plantation owners are also the major processors, and thus buyers, of wood. Examples of this are Mondi and Sappi in the case of purchases of wood for pulp and paper, Masonite in the case of fibreboard, and Global Forest Products and Hans Merensky for sawmilling. This implies that

³¹ This is in line with government's privatisation drive since the 1990s.

large quantities of wood produced are effectively removed from the market and supplied directly to a company's own processing plants. The "open market" for unprocessed wood is therefore a residual market subject to volatility and dominated by a few large buyers.

1.3. CONTRIBUTION TO THE ECONOMY

The contribution of plantation forestry to the economy has been assessed across economic, environmental and social dimensions.

1.3.1. PLANTATION FORESTRY DIRECTLY CONTRIBUTED R2.9 BILLION TO GDP IN 2003³²

Plantations directly contributed 0.2% to GDP in 2003 – equivalent to 7.4% of agricultural GDP. Most of this is contributed by pulpwood plantations.

We estimate that the total *direct* value-added (or gross product) of plantation forestry to have been R2.9 billion in 2003. Value-added is nothing other than the difference between the value of all outputs produced and the value of all inputs other than labour used in production. We estimate the total value of output produced in 2003 to have been some R5.1 billion; this is an extrapolation of the findings of the plantation forestry industry survey conducted by FES (2004a) for DWAF, and which recorded a total value of production of R4.1 billion for the (representative) 80% of the country's plantation area that was surveyed. From that, non-labour input costs for the industry estimated at R2.4 billion is subtracted and an adjustment of R255m is made to account for net VAT payment.

It should be noted that our direct plantation forestry GDP is lower than the current estimate of R5.4bn claimed by Statistics South Africa. This discrepancy is discussed in Box 1. Both of these estimates may appear quite low but are not insignificant relative to the contribution of other sectors of the economy.

Forestry's value added and share in GDP, 2003	
Value of production (Rm)	5100
Total input costs (excl tax) (Rm)	3634
Remuneration (Rm)	1200
Forestry VAD, 2002/03 (Rm)	2921
SA GDP (R million) ³³	1,248,730
Forestry as % of SA GDP	0.2%
Forestry as % of Primary Sector GDP	2.4%
Forestry as % of Agricultural GDP	7.4%

Table 3. Contribution to GDP by plantation forestry, 2002/03.

Source: Genesis calculations based on StatsSA GDP data for South Africa, FES (2004a), FES (2004b) and FIETA remuneration data (as provided by Deloitte, 2004).

³² See Section 4.3 of the technical appendices (Part III of the report) for details of the methodology for calculating GDP and the estimates underlying the values shown here.

³³ At market prices, adjusted for the discrepancy between StatsSA's forestry GDP and that calculated by Genesis.

The value-added of R2.9 billion can, in turn, be divided into (after tax) labour wages, tax taken by the state, and the (after tax) returns to providers of capital. Data shortcomings preclude this calculation, but we can conclude, after cross-checking, that the wage remuneration earned in the industry was approximately R1.2 billion in 2003³⁴.

Some 76% of plantation forestry's GDP is derived from *pulpwood plantations*, with *sawlog plantations adding 24%* and plantations for other management objectives (such as poles, charcoal and mining timber) contributing only 0.4% of plantation forestry's total value added.

Management objective	% of total GDP
Saw & veneer logs	23.6%
Pulpwood	76%
Other	0.4%
Total	100%

Table 4. Plantation forestry GDP by management objective, 2002/03.

Source: Genesis calculations based on information provided by FES (2004a), FES (2004b)

Box 1. Note on plantation forestry data

The plantation forestry GDP calculated above differs substantially from that calculated by StatsSA for 2003. A number of differences in the details of calculations need to be noted:

The StatsSA figures are based on their own five-yearly 'benchmarks'³⁵ from which year-to-year values are interpolated using trend data derived from the FES industry survey (the same survey used in our calculation of GDP). Based on the trend-adjusted benchmark data, StatsSA estimates total value of production as R8.7bn (at basic prices, thus not including VAT) in 2003, compared to our estimate of R5.1bn.

FES only recently started collecting cost of production data through the same survey and these figures are not considered to be reliable due to the low response level and uncertainties about accuracy of information provided. However, FES has built up a substantial database of in-depth company reviews (estimated to cover about 40% of plantation area, but covering small, medium and large plantations across all the regions) that are compiled into a different report detailing cost structures across regions and plantation types and providing the most comprehensive and in-depth view on production costs available in the industry. StatsSA does not use this data to derive their benchmarks. The overall result is that StatsSA estimate plantation forestry and logging's contribution to GDP to be R5.4bn in 2003, which is more than the total production value reported by the FES industry survey. Based on the industry production and cost data, we believe that the contribution to GDP is only about half that at R2.7bn.

This discrepancy could partly be explained by the fact that the value of production calculated by FES is estimated as *the value of production sold from plantations*. As plantation forestry is highly vertically integrated (at least 50% of plantation area is owned by vertically integrated large growers), it means that prices paid for timber may be depressed if companies choose to rather add value at the processing stage. It is not known what basis StatsSA uses in assessing the true value added by the industry. Thus it could be that value added calculated according to our method, while representative of the total value added by plantation forestry, is a "depressed" value added in favour of processing industries. This should however not affect the overall value added by the value chain.

³⁴ See Section 4.3 of the technical appendices (Part III of this report) for details of this estimation. Note that the 1% levy is on wage bill excluding medical and pension. We are, therefore, underestimating the full wage bill. It is however expected that a large proportion of the labour (particularly lower skilled, lower paid) will not have substantial pension or medical contributions (if any at all). It is furthermore expected that this will be even less likely to be the case for labour brokers/contracting.

³⁵ We have been unable to obtain these benchmarks from StatsSA and it is not clear how this is derived. It is interesting to note, however, that the Agricultural Survey referenced as source for the Agricultural, Forestry and Fishing GDP calculations does not cover the plantation forestry industry.

It must be noted that the estimates in this section only reflect economic activity and employment in plantation forestry and do not include that generated in downstream activities such as pulp, paper and sawmilling (e.g.: total direct employment in the plantation forestry and forestry-related industries, such as pulp and paper, is estimated by Pamsa, 2004c, to amount to 135 000).

Further, considering only contribution to GDP may be misleading as it does not take account of the regional impact (where plantation forestry may play a larger role than is suggested at a national level), its employment characteristics (where a large number of unskilled workers are employed in regions of high unemployment) and the multiplier impact. These issues, as well as the main social and environmental impacts identified, are discussed in the next sections.

1.3.2.

PLANTATION FORESTRY CONTRIBUTES SUBSTANTIALLY TO REGIONAL ECONOMIES AND POOR COMMUNITIES

The General Household Survey and Labour Force Survey (September 2003) conducted by Statistics SA (2004a,b) provides the following socio-economic indicators for the provinces in which plantation forestry is concentrated:

Regional socio-economic indicators	Official unemployment ³⁶	Expanded unemployment	Households with access to piped water	Households using fuel wood for cooking	Households living in informal dwellings
Mpumalanga	25%	41.5%	70.3%	19.9%	19.7%
KwaZulu-Natal	31.3%	45.0%	58.5%	24.8%	31.5%
Limpopo	30.6%	55.8%	39.2%	60.0%	17.6%
Eastern Cape	31.8%	49.4%	36.7%	37.7%	43.2%
Western Cape	20.6%	26.3%	91.2%	3.4%	15.2%
TOTAL South Africa	28.2%	41.8%	68.3%	20.0%	26.0%

Table 5. Socio-economic indicators for the provinces in which plantation forestry is concentrated.

Source: StatsSA (2004a),b: Labour Force Survey (Sept 2003) and General Household Survey (Sept 2003).

Table 5 confirms that commercial plantations are concentrated in some of South Africa's least well-off provinces in terms of socio-economic indicators. Where income levels are concerned, Census data (2001) shows that more than 40% of the households living in Limpopo, Mpumalanga, the Eastern Cape and KwaZulu-Natal survive on less than R1 500 per month. The corresponding national rate is only 23% (Census 2001, analysed in Lewis et al, 2004). In addition, plantation forestry is concentrated in rural areas within these provinces where unemployment is high and alternative economic activities and employment opportunities are scarce. Within this provincial set-up, plantation forestry makes the following contribution:

³⁶ Official unemployment is defined in the Labour Force Survey as "those people within the economically active population who: (a) did not work during the seven days prior to the interview, (b) want to work and are available to start work within a week of the interview, and (c) have taken active steps to look for work or to start some form of self-employment in the four weeks prior to the interview". The expanded definition of employment excludes criterion (c). Thus discouraged job seekers are included in the expanded, but not the official definition of employment.

	Forestry as % of regional GGP	Regional forestry GGP as % of total forestry GDP	Forestry employment as % of provincial employ- ment
Mpumalanga	1.4%	40%	3.2%
KwaZulu-Natal	0.5%	37%	1.4%
Limpopo	0.2%	5%	0.4%
Eastern Cape	0.3%	9%	0.5%
Western Cape	0.1%	6%	0.1%
Total RSA GDP	0.2%		0.6%

Table 6. Plantation forestry GDP by region, 2002/03.

Source: Genesis calculations based on data provided by FES (2004a), StatsSA (2004a,b,c – GDP Tables P0441, Tables 17 to 25; Labour Force Survey, Sept 2003; General Household Survey, Sept 2003), and FES (2004b.)

The economic impact was mostly felt in Mpumalanga and KZN, with even more important impacts in local contexts.

The largest contributions from plantations are in Mpumalanga and KwaZulu-Natal, both of which have high unemployment rates. Even though the contribution made by plantation forestry to total employment in the Eastern Cape is currently quite low, there is substantial potential in this region for additional afforestation and, possibly, beneficiation (see Section 10).

Sub-provincial impacts. To understand the impact of forestry on particular communities one has to consider sub-provincial regions with a high dependence on forestry. The bulk of plantation forestry activity is based in rural areas where there is relatively little alternative economic activity. Economic and GDP data at district or municipal levels are not readily available but a number of case studies summarised in Box 2 illustrate the importance of plantation forestry in specific municipal areas.

Box 2. The importance of plantation forestry in three communities

Piet Retief

According to the Mkhondo Local Municipality (Nthupha, 2005) forestry and its processing activities are the main employers within the local community, with up to 80% of the workforce in some way owing their livelihood to forestry-related activities. Apart from the private sector presence, the municipality itself has about 2 500ha of plantations, of which some is made available to the local community for fuel wood purposes.

The presence of the industry is also felt in society through donations and initiatives such as the "black gold" charcoal programme. There is active interaction between the municipality and the industry. Not many negative effects could be identified. According to Mr Nthupha pollution in the form of air emissions from the pulp and paper mill is not such a significant factor to the community and, due to FSC certification, the environmental impact of the industry is within acceptable bounds. The move towards outsourcing however represented a pronounced negative impact on the town. Apparently, it caused many people to be retrenched and unskilled wage levels to drop from between R1500 and R1800 per month to as low as R500 per month.

Richards Bay

In its Local Economic Development Plan (which is part of the broader Integrated Development Framework) the municipality of uMhlatuzi (Richards Bay and Emgangezi) names six "key focus areas" within its broad strategy for advancing local economic development. One such area is the creation of jobs through agriculture and plantation forestry and the clustering of projects around such activities to improve efficiency. One possibility identified is to take advantage of recycling possibilities and identifying and supporting the establishment of small and medium enterprises to add value to the products of local agriculture and plantation forestry. The municipality has also just commissioned the Institute for Natural Resources (INR) to develop an Agricultural Development Strategy for the area, of which plantation forestry forms a part.

Conversations with local role players revealed that plantation forestry and its processing activities (e.g. the chipping plants and the Mondi mills) are large components of the local economy and play an

Box 2. The importance of plantation forestry in three communities

important role in the local economic strategy. No quantitative estimates were available.

Nelspruit

Plantation forestry and its processing sectors are an integral part of the integrated development plan of the Mbombela Municipality (comprising Nelspruit, White River and Nsikazi). According to the Mbombela Economic Baseline Assessment, the agricultural sector contributed about 6.2%, or R380 million, to the district's Gross Geographic Product in 2002. The corresponding share of manufacturing was 27.5% (about R1.78 billion) in 2002. The Mbombela Municipality (Schonfeldt, 2005) estimates plantation forestry's share in the local agricultural GGP to be at least 50% (thus: 3.1% of local GGP), and forest products (e.g. sawmilling, pulp and paper manufacturing) to in turn contribute at least 50% to manufacturing GGP (thus: 13.8% of local GGP). This implies that plantation forestry contributed an estimated R190 million towards the local economy in 2002, and that its processing facilities contributed a further R539 million, bringing the total contribution to some R729 million, or 16.9% of local GGP.

The plantation forestry and forest products industry collectively employed about 18% of all employees in the municipal area in 2002, and the remuneration accruing to these employees amounted to an estimated R100 million for plantation forestry and R390 million for its manufacturing downstream activities. Thus it can be concluded that the economic impact of plantation forestry, in itself significant, gets multiplied by the presence of downstream activities and that it not only accounts for almost a fifth of local employment, but through the spending power of its employees in the local community and parallel industries, can be regarded as *vita* to the working of these towns.

1.3.3.

PLANTATION FORESTRY PROVIDES EMPLOYMENT / DIRECT INCOME TO
106,844 PEOPLE MOSTLY IN LOW-INCOME RURAL AREAS

**Plantation employment
is between 6% and 9%
of agricultural
employment.**

We find that the total employment impact of forestry is 106,844: some 67,469 people are formally employed, and a further 39,375 are small growers and their helpers. The share of plantation forestry in *agricultural* employment is 8.9% for the total figure and 5.6% if small growers and their employees are excluded. These beneficiaries tend to be unskilled, in low-income areas, and with a low opportunity cost (i.e., alternative income opportunities for the time spent in plantation activities) for their participation in the sector. Often the income from plantation activities for small growers is one of a number of sources of income, although an important one.

Estimated plantation forestry employment	
Direct formal	37,469
Contractors	30,000
Small growers	
Formal	24,000
Independent	7,500
Total	31,500
Small-grower employees	7,875
Total plantation forestry	106,844

Table 7. Estimated total direct employment generation by plantation forestry.

Sources: FSA, 2004; Khosa, 2000, SAFCA, 2004, FSA, 2005.

31,500 SMALL GROWERS PLUS 7,800 HELPERS

It is estimated that there are 24,000 small growers in formal schemes, and between 5,000 and 10,000 independent small growers (Ngubane, 2005). For the purpose of this analysis, an average of 7,500 small growers was assumed, bringing the total to 31 500.

Without completely tying up labour, small growing supplements household income in poor rural areas with few alternatives.

The informal contractors or labourers (often family members) employed by small growers are also not included in the direct employment figure. It is estimated (FSA, 2000) that 1 job is created over and above the small grower herself for every 8ha planted. Given an estimated 2ha per small grower, this would imply that an additional 7,875 employment opportunities are created by small growers.

A qualification is however called for concerning small growers and the contractors/labourers they employ. As is apparent from the number of man-days of labour required to maintain a small plantation, quoted in Table 8, plantation forestry may not be the sole economic activity in which small growers or their labourers are involved. It is generally accepted that growing trees on a small scale does not manage to lift people out of poverty, but should rather be seen as an important way in which rural households can supplement their incomes generated from subsistence farming or other activities.

Our research indicates that there are few, if any, feasible economic alternatives for small growers other than subsistence farming/grazing. Forestry often serves the purpose of a "savings policy" for such growers, more than 80% of whom are black females, the poorest, most vulnerable section of the population. FSA (2000) estimates small growing to result in an average of R9,100/ha average income for a small grower, accruing at the end of the rotation period. Sappi (2004b) however estimates much higher incomes to accrue to its Project Grow small growers:

Project Grow regions	Ave plot size	Income after loan over rotation (R)	Income/ha (R/ha)	Man-days of labour required per year
Northern Zululand	7.5	139 980	18 664	125
Central Zululand	4.5	86 535	19 230	81
Southern Zululand	1.7	33 286	19 580	25
Southern Natal	0.6	5 816	9 693	9.6
Eastern Cape (projected)	7.5	142 455	18 994	132

Table 8. Case study: income accruing to Project Grow small growers.

Source: Sappi (2004b).

In all of these areas, more than 70% of households survive on less than R1,000 per month. How much of this income is profit would depend on the way the small grower manages her trees and the extent to which own labour is used. Cairns (2000:3) estimated net profit to be about 33% of gross profit. The balance is however used to pay informal labourers or contractors, and the total amount can thus be regarded as spent in the local economy. If, based on the above, one assumes the more conservative FSA estimate to be representative of the industry, and an average rotation of 8 years is assumed, it would imply that R72 million in income is generated annually for the approximately 31,500 small growers with their average plots of 2ha each.

67,500 MOSTLY UNSKILLED EMPLOYEES IN THE SECTOR

Employment (about 80% unskilled) is concentrated in KwaZulu-Natal and Mpumalanga.

FSA (2004) estimates direct and contract employment in plantations to have totalled 67 469 in 2003 (Godsmark, 2004). FSA and NCT (Godsmark, 2004; Jones, 2004) estimate that, as at 2003, 80% of this workforce³⁷ was unskilled, 10% semi-skilled and 10% skilled. Based on this, it can be estimated that plantation forestry employs about 53,975 unskilled workers, 6,747 semi-skilled workers, and the same number skilled employees. The regional distribution of employment is shown in Table 9:

Province	Hectares	% of total area	Employees	% of total forestry employment
Limpopo	64,326	4.7%	3,200	4.7%
Mpumalanga	553,252	40.3%	25,223	37.4%
Kwazulu-Natal	543,210	39.6%	31,203	46.3%
Eastern Cape	150,364	11%	5,713	8.5%
Western Cape	60,473	4.4%	2,130	3.2%
Total	1,371,625	100.00%	67,469	100.00%

Table 9. Direct employment in plantation forestry by region, 2003.

Source: Godsmark, 2004.

These employment figures include estimates of independent contractors and their employees. Khosa (2000) finds that 80-90% of all harvesting, 60% of all transport and 33% of silviculture and fire services are outsourced. He estimated a total of 35,000 people to be employed (formally as well as informally) by independent plantation forestry contractors. SAFCA (2004) however estimates the figure to have dropped to between 26,000 and 30,000 employees, largely due to the effects of mechanisation.

1.3.4.

BETWEEN 390,000 AND 560,000 PEOPLE ARE DEPENDENT ON PLANTATION FORESTRY FOR THEIR LIVELIHOOD

As is the case with all other industries, plantation forestry does not only impact the economy through the *direct* value it creates, but also *indirectly*. There are two mechanisms through which plantation forestry contributes indirectly to economic activity. One is the multiplier effect plantation forestry has through its downstream activities (which we will call *indirect value added* for the purpose of this analysis) and a second is through the stimulatory effect it has on local communities through employees' dependents, the spending power of employees and the income generated for suppliers to the industry (so-called parallel industries). This is known as the *induced impact* of plantation forestry.

While the concept is generally accepted, the quantification of multipliers are often controversial as it ascribes value generated in downstream or parallel industries to

³⁷ Including contractors.

a single input or resource (in this case timber). In this way, it does not account for the fact that multiple resources (from various upstream industries) are combined in the value generated. If all resource multipliers are aggregated, it will, therefore, result in an estimate of economic value that exceeds the total South African economy. In light of the criticism of multipliers mentioned above and the limited information available, the scope of this study did not allow for, or consider useful, the quantification of induced value multipliers for the forestry industry. Nonetheless, it remains useful to consider the first order impacts of plantation forestry on the economy.

INDIRECT VALUE ADDED

Based on the current analysis, the forestry value chain added approximately R12.3 bn to GDP in 2003. The analysis also finds that the bulk of downstream activities (and hence the value generated by these activities) is dependent on the existence of domestic plantation forestry for their existence. Plantation forestry, therefore, facilitates an additional R9.4bn of value generation through its downstream activities. Although the total value cannot be attributed to plantation forestry, it can be said that the bulk of this value would not have been generated in the absence of domestic plantations as products would then have been imported in final (or near final) form.

Through the value chain, plantation forestry indirectly adds another R9bn of value to the economy.

INDUCED VALUE ADDED

Employment and income dependency: The size and impact of this aspect of the induced value multiplier will depend on a number of factors which are found to be in forestry's favour:

- *To whom wages are paid/employment demographics:* The analysis shows that particularly plantation forestry, recycling and components of solid wood processing such as sawmilling and timberboard employ a substantial number of low-skilled workers. In our view, such employment carries a high value as unemployment is concentrated amongst the low-skilled and they have a high reliance on monthly income (as they do not own substantial assets and usually support a larger group of people).
- *Geographical location of the impact.* The review of the various value chain components shows that a large proportion of forestry value chain production is located in rural areas with high unemployment rates, few economic alternatives and, therefore, a substantial dependency on the income and employment generated by forestry related activities (both for individual households and the regional economy).

The fact that the contribution is made to rural areas with few economic alternatives and that a substantial number of low-skilled workers are employed, increases the impact of forestry related activities. This is especially the case in the Eastern Cape (the province with the most potential for additional afforestation) where the analysis revealed that there are few feasible alternatives that provide comparable returns to that of plantation forestry. Concerns raised over the potential crowding out of

Income generated by forestry multiplies in rural economies to induce additional value. Employment dependency brings the number of people directly affected by forestry to between 390,000 and 580,000.

traditional activities such as cattle farming were found to be manageable through community management of land use and the allocation of specific areas to grazing. Though the income generated by small grower schemes is often not enough to lift households out of poverty, it complements low-income households' earnings and stimulates asset formation.

Employment dependency can be illustrated by considering the ratio of the total population to the total number of people employed in a specific province, the following picture of the number of people dependent on an income earner can be outlined:

Province	Population to employment dependency ratio	Plantation forestry employment	Number of people dependent on forestry
Limpopo	7.9	3,200	25,421
Mpumalanga	5.0	25,223	124,999
Kwazulu Natal	5.9	31,203	183,565
Eastern Cape	8.5	5,713	48,749
Western Cape	3.0	2,130	6,469
Total	n/a	67,469	389,202

Table 10. Ratio: total population to total number of employees in the five main plantation forestry provinces.

Source: StatsSA, Census 2001 figures quoted on www.demarcation.org.za. Accessed 4 February 2005.

In Table 10, an employment dependency ratio³⁸ was used to calculate the number of people dependent on the income generated by one forestry employee. When the employment dependency ratio is multiplied by the number of plantation forestry workers in each province, we see that almost 390,000³⁹ people are dependent on income generated through plantation forestry. If one adds the approximately 31,500 small growers (who are located mostly in KwaZulu-Natal) to that province's total plantation forestry employment, the total dependency figure rises to almost 576,000.

These values need to be interpreted with some caution. In the case of small growers, the ratio may overstate the dependency as small growing may not be the sole source of income. The ratio furthermore does not take into account those people dependent on pensions or disability grants or those that receive remittances from family members in other provinces. It does however give an indication of *private-sector* dependence and provides an idea of the number of people indirectly affected by income generated from plantation forestry.

Income generated for suppliers and the impact of wages spent: The impact on parallel industries providing the industry with goods and services and the second-order effect on the economy more generally (i.e. multiplier effects) needs to be estimated with the help of a full-blown Social Accounting Matrix (SAM) exercise. Such an exercise would be based on a static analysis of 1998 data (the date of the

³⁸This ratio is defined as the number of people in the province divided by the total number employed.

³⁹ As the ratio expresses the total population over the working population, the resultant figure will include those directly employed by forestry.

most recent available SAM) and subject to very strict assumptions. For the purpose of this analysis, the usefulness of such an exercise is not clear, particularly due to the inaccuracy of information on forestry (and downstream activities) available for use in such models. Most importantly, the impact of plantation forestry is sufficiently clear considering only first order impacts and further analysis is therefore not required.

1.3.5.

PLANTATION FORESTRY RESULTED IN AN ESTIMATED NET COST OF R508 MILLION TO THE ENVIRONMENT IN 2003

The environmental analysis conducted by the CSIR-Environmentek⁴⁰ for the present study found that plantation forestry resulted in a net environmental *benefit* of R54.5 million in 2003. The quantifiable impacts were the carbon sequestration benefit (R89.8m) and the environmental cost incurred to the transport air emissions (-R34.8m). Plantation waste, fertiliser (impact on water quality) use and the impact on soil erosion were evaluated but found not to be significant. In the case of fertiliser use and soil erosion, the review also found that the impact as a result of plantation forestry is lower than that expected from other agricultural activities. The assessment suggested the impact of stream flow reduction by plantations to be fully internalised through the administrative charges applied by DWAF and, therefore, did not allocate an environmental charge to this characteristic of plantations. The main findings are shown below:

Impact	Estimated net cost (R)
Streamflow reduction (CSIR assessment)	Fully internalised
Plantation waste	Not significant
Carbon sequestration	-89,264,281
Air emissions: forestry transport	34,772,856
Biodiversity	Not quantified. Lower than annual agricultural crops
Water quality (as affected by fertiliser use)	Not significant
Soil (fertiliser)	Not significant
Soil erosion	Not quantified. Lower than annual agricultural crops
Total benefit	-54,491,425

Table 11. Environmental impact of plantation forestry (2003)⁴¹.

Source: CSIR-Environmentek research

In the nature of such assessments, not all impacts could be quantified and quantified impacts are often contested. For the present analysis the following should be noted:

The impact of stream flow reduction by plantation forestry: The CSIR environmental assessment used administrative water tariffs as a proxy for the environmental cost of water use and the total cost of plantation water use is,

⁴⁰ The full CSIR-Environmentek environmental impacts assessment prepared as input into this analysis (and summarised here) is available on request. A more detailed summary of the underlying calculations is available in Section 2 of the technical appendices (Part III of this report).

⁴¹ See Section 2 of the technical appendices for details of the calculations.

therefore, considered to be internalised by the tariffs paid. This methodology assumes that water charges reflect externalities resulting from water use whereas, in fact, it only reflects the cost of managing and developing the water resource. Below, Genesis provides a first order estimate and framework for the consideration of the potential impact of water use by plantations.

Though forestry uses much less water than irrigation agriculture and new afforestation occurs in a regulated environment, it was assumed that some of its water use is excessive.

The perceived cost of water use by plantation forestry is central to the current debate on the desirability of plantation forestry in South Africa. Those opposing forestry consider plantation water use to be excessive and at the cost of other (implied to be more appropriate or efficient) economic activities and with substantial environmental costs. Before evaluating the estimated impact of plantation water use, it is necessary to raise a number of issues:

- Considering only the use of water, the value added per m³ of water used in plantation forestry alone (i.e. excluding downstream processing) has been shown to be comparable or higher than other agricultural activities. The studies conducted do not cover all plantation areas, but provide some indication of economic efficiency of water use.
- Irrigation agriculture requires up to ten times more water than plantation forestry per hectare cultivated. In addition, the annual nature of such crops and the extent and nature of fertiliser use have been shown to result in higher environmental costs than is the case for plantations.
- In addition, new afforestation occurs within a highly regulated environment (more so than for other agricultural activities), in which SFRA water licences are allocated within the limits of the available water resource (allowing for social and environmental reserves as well as equity considerations) and where environmental impacts (including the impact on biodiversity) is controlled through extensive environmental assessments.

Although not conclusively in favour of plantation forestry or negating the nature and extent of water use by plantations, these observations place the debate in context. This analysis, however, accepts that all the existing plantations did not undergo the scrutiny of the current water licensing system and may, therefore, be considered to be excessive to what would have been allocated under the current licensing system. In addition, the invasive character of species used in plantations means that the impact sometimes spreads beyond the licensed plantation areas.

In order to attach a quantifiable value to the impact of water use by plantations, two pieces of information were required⁴²:

- The *extent of 'excessive' water use* (i.e. the volume of water that would be considered to be excessive under the current licensing system as well as that used by, for example, wattle jungles). In this analysis a conservative approach was followed by considering 'excessive' water use by forestry to equal the total plantation water requirement (i.e. over and above natural state) in deficit

⁴² A comprehensive overview of the method employed, assumptions applied and calculations to determine the opportunity cost of the water used by plantation forestry is contained in Section 3.1 of the technical volume (Part III of the report). The literature reviewed and justification for the per unit cost estimate applied are also made explicit.

catchments up to a maximum of the total deficit (as it is the estimated water deficit that results in costs to the environment and other water users). The implication is that the total deficit is ascribed to plantation forestry, which is clearly not the case.

- The *cost of such water use*. The approach followed in this analysis was to evaluate the cost of 'excessive' water use relative to the cost of remedying the impact. The most likely remedy on which costs estimates were available as the cost to construct dams and transfer schemes to improve water management and increase the water balance that can be allocated. The available cost estimates to achieve this did not include the environmental costs of such schemes but this has to be offset against the environmental damage remedied due to the removal of the deficit. For the purpose of this analysis, the cost of constructing dams or transfer schemes to remedy the deficit is estimated to be R1 per m³, which is based on the highest case study value reported by DWAF in the Kwazulu-Natal area (Ward, 2005). The total value amounted to R254 million.

Under a "worst case scenario" estimation, the cost of forestry's excessive water use amounts to R562m. This reduces to R270m if the total Working for Water budget is not to be ascribed to plantation forestry.

In addition to the above, the cost of controlling the spread of invasive tree species was estimated by means of two scenarios:

- (i) **Including the full annual cost of the Working for Water (WfW) programme (R308 million in 2003).** As information was not available on the proportion of the WfW budget allocated to controlling the impact of commercial plantations, it was assumed (for the sake of being overly conservative and sketching a worst case scenario) that the full WfW annual budget of R308 million is used to combat forestry-related alien invasion. *Based on these results, the total impact of excessive water use by plantations is estimated to be R562 million.*
- (ii) Applying a less extreme (but still highly conservative) estimate of the proportion of the Working for Water budget that is dedicated to combating invasive aliens stemming from plantation forestry. Hypothesising 70% of the WfW budget to be added to the "environmental cost" of plantation forestry results in an amount of R216m. *Based on this result, the total impact of excessive water use by plantations is estimated to be R270 million.*

It has to be re-iterated that the above presents a conservative estimate, as it is unreasonable to allocate the full deficit to plantation forestry⁴³, the remedy value is conservative and the calculation assumes that catchments currently in deficit were not already in deficit at the time plantations were established, and indications are that the full or largest part of the WfW budget should not be ascribed to plantation forestry, as government introduced some of the species, many invasive species are not commercially planted, and the regulation of the industry to some extent serves to control the spread of invasive species from plantations.

⁴³ This is confirmed by the compulsory licensing system which intends to re-allocate water in stressed catchments in proportion to the existing water use (i.e. re-allocating water from all existing users and not only specific sectors).

The impact of plantation forestry on biodiversity: The impact of plantation forestry on biodiversity could not be quantified due to insufficient data and is thus not accounted for in the overall quantified impact. The study, however, found that the impact of plantations on biodiversity is similar or lower than other agricultural activities. In order to assess the impact, two debates need to be separated: (i) the biodiversity impact of plantation forestry relative to natural state and (ii) the impact of plantation forestry activities relative to other agricultural activities.

Biodiversity is best considered in a national debate. The former debate is centred on the trade-off between plantation forestry and natural state. It is irrefutable that economic development results in environmental costs and the question at the basis of this debate is what environmental cost a country is prepared to accept in pursuit of development. Although the current analysis agrees that it is a critical question for government to consider, it is debatable whether this argument is appropriately made at the level of specific crop development projects (particularly as it is not applied even-handedly across different projects) or whether it should rather be made at the level of national or provincial debate. Instead of restricting specific developments, the appropriate debate may consider the necessity to declare additional government (or private) reserve areas, which should be removed from the area available for commercial use. If the case can be made for the value of such areas, a value that accrues to society as a whole, it will be more appropriate to allocate the cost of such conservation activities to society as a whole (through the tax base) than 'taxing' specific land owners. In the case of private initiatives, the establishment of such reserves reflects the value attached to such areas through the willingness to pay principle. The risk identified in the current debate is that the particular requirements and processes applied to plantation forestry may allow it to be hijacked (more so than for other agricultural activities with similar impacts) by environmental concerns that are frustrated by inaction on the part of national government and that have little incentive to consider the cost of the development trade-off.

Plantations impact biodiversity, but this impact is lower than that of all other agricultural activities other than grazing.

Biodiversity impact of plantations relative to other agricultural activities may be exaggerated. Based on the above, it is argued that the second debate that focuses on the relative impact of plantations versus other agriculture is more relevant to the current analysis. Although it was, therefore, not possible to quantify the impact, the findings of this analysis suggest that impact of plantations on biodiversity may be overstated relative to that of other agricultural activities. Furthermore, the licensing process exercises appropriate control over new afforestation. It is, therefore, argued that plantation forestry's biodiversity impact should continue to be monitored and controlled (as should that of all other agricultural activities), but that the lack of quantification of the biodiversity impact should not weigh up significantly against the positive economic impact of plantations.

- *Biodiversity impact of plantations similar or lower than other agriculture.* The environmental assessment conducted for this study found that the biodiversity impact of plantations forestry is similar or lower than that of other agricultural activities (excluding cattle grazing). That is, an area of plantation is expected to

have a lower impact on biodiversity than the same area of another agricultural activity.

- *Stricter biodiversity controls and conditionality is implemented on plantations through water licences.* Plantation activities are subjected to stricter controls than other agricultural activities. A rule of thumb with allocating the earlier afforestation permits was that the area planted may not exceed 70% of the area available. Although it is argued that much of this area was taken up by housing, roads or areas unviable for plantations, no such controls were exercised over other agricultural activities. In addition, current SFRA licences are often issued with conditions whereby the applicant is required to clear certain areas of invasive species or to change the planting plan to accommodate environmentally sensitive areas. Again, no similar controls are exercised over other agricultural activities.

The net environmental cost due to plantation forestry thus brings the industry's total economic impact for 2003 to R2,413 million.

1.3.6.

CONDITIONS UNDER CONTRACTING MAY JEOPARDISE INDUSTRY DEVELOPMENT

Although the industry is seen as a substantial employer of (particularly low-skilled) labour, a large proportion of formal employment (particularly low-skilled) positions have been moved to contracting companies that have taken over the management of the bulk of plantations. Although contracting is not unique to forestry and not a problem in itself, the manner in which it is done (as labour broking rather than outsourcing) may have dire consequences for the employees involved as well as the industry.

Based on limited secondary data available on contracting in the forestry industry, as well the perspectives of key informants, the review of the social impact of plantation forestry conducted as part of this study⁴⁴ (Morajele, 2005), highlights the following impacts of contracting:

- The bulk of low-skilled jobs have been moved to contractors over the past two decades. This was done mainly to reduce costs. By contracting labour and operational issues out to independent parties, companies feel that they can focus on their core business activities.
- Whilst the emergence of contractors has created new income, ownership and employment opportunities, the conditions under which these opportunities operate often do not meet national labour and health and safety standards. The limited information available suggests that wages and labour conditions for employees have deteriorated when they were moved from permanent employment to contract employment.
- Relations between forestry firms and contractors (and the contractor umbrella organisation) are unequal, almost adversarial and based on the relative power of the former vis-à-vis the latter.

⁴⁴ The full report is available on request and includes observations based on a brief visit to various small grower and community forestry sites in the EC and KZN.

The bulk of low-skilled forestry employment has moved to contractors – a move which has resulted in some concerns due to the nature of contracts and labour conditions prevailing.

- Contractors exist and operate in a “first economy” to service the formal plantations and in a “second economy”, to provide silviculture and harvesting services to small growers. According to “first economy” contractors, they operate under very difficult conditions in which contracts are rigid and not negotiable and provide few opportunities for sustainability (e.g. contracts commit contractors to meet minimum wage and health and safety standards, yet provide year-on-year increases, which contractors consider to be inadequate).
- The majority of contracts are of 3 years duration, insufficient to enable contractors to lease or purchase equipment. Whilst labour intensity contributes positively to labour absorption, equipment is still required to maintain efficiencies and modernization.
- “First economy” contractors and their representative organisation describe the de-professionalisation of forestry due to contracting. Business managers with no prior exposure to forestry now manage forests, with considerable implications for the industry’s future. It also requires forestry companies to still employ foresters and management staff to oversee the contractors. On their part, many former foresters who are now engaged as contractors indicate their intentions to leave the industry due to difficult relations with forest companies. Furthermore, due to service delivery and bottom line demands, neither the large firms nor contractors engage in any meaningful training, an assertion supported by low claims against Sector Education and Training Authority (SETA) skills development allocations⁴⁵.
- “Second economy” contractors operate under informal sector conditions, in highly competitive markets and with poor access to finance and training. All the contractors interviewed used their own funds to start their enterprises and had no assistance either from the forestry firms or government or other agencies in establishing and maintaining their businesses. Contracts with small growers were informal and too small to serve as the basis for acquiring loans.
- No assistance was rendered by the forestry firms to consolidate existing informal contractors. In cases of sudden increases in demand, forestry firms did not seek to expand the capacity of existing contractors, but rather sought services from other individuals, resulting in growing numbers of highly competitive but unsustainable firms.
- The most urgent requirement of informal contractors is for assistance in securing public liability cover against the risk of fire, which is the highest barrier to their formalisation.
- The second most urgent requirement of informal contractors is for business training. Many contractors do not know how to manage their enterprises (to the point of not knowing if they had made profits or losses at any given period of time).
- The costs of compliance to minimum wages and health and safety standards render most informal contractors unsustainable.

⁴⁵ FSA (2005) claims that low SETA claiming is mainly a characteristic of small and medium sized contractors, who regards the skills levy as a tax and find the bureaucratic claiming processes too complex. According to FSA (2005), FIETA’s Forestry Chamber however uses unclaimed grants to support training in the industry, especially for contractor employees. Over the past three years, R1m per annum was allocated to free of charge training, for which the uptake has been very good.

A labour broking situation has developed that could possibly jeopardise industry development.

The result of this is not only an untenable labour situation but also a labour broking system that could possibly jeopardise the development of the industry as a whole. The manner in which contracting is currently managed results in a systematic loss of skills in the industry as experienced individuals exit the industry due to the untenable situation. In addition, the nature of contracts and the low margins resulting from the unequal negotiation powers of contractors versus the larger companies result in a deterioration of the capital base of the industry that cannot be maintained or developed under current conditions. The tenuous nature of the current situation is acknowledged by the industry, but as yet, no solutions have been forthcoming⁴⁶.

FSA (2005) consider it likely that the situation will develop to one where forestry companies contract large, professionally run contractors to manage whole forestry regions. This may positively impact employment conditions, but employment numbers may decline.

1.3.7.

SMALL GROWER SCHEMES PROVIDE DEVELOPMENT AND EMPOWERMENT OPPORTUNITIES, BUT NOT WITHOUT RISKS

Small grower schemes are “second economy” instruments that contribute to income and asset building in rural areas with few economic alternatives. They may however lock up land use, and are concentrated in the lowest value end of the value chain, with little formal organisation or representation of small growers’ interests.

It is clear that the bulk of potential expansion in the plantation area will take place on communal land and, therefore, through community or corporate small grower schemes. Small grower schemes have, in the past, mostly been established by pulp processing companies and have been suggested to have substantial development and empowerment impact on the communities involved. In order to assess the socio-economic impact of such schemes, a high level assessment of corporate small grower schemes was conducted as part of this study. This was done through review of the existing literature on small growers as well as engagement with a number of role players and brief site visits to the EC and KZN. The review of the secondary data and the outcomes of interviews with company agents and small growers suggest that (Morajele, 2005)⁴⁷:

- Corporate small grower schemes operate within South Africa’s “second economy” and exhibit all the characteristics of second economy” of informal sector firms, but exist to service a highly developed, global “first economy”. Participants in the schemes are challenged by typical informal sector constraints, including lack of access to finance and to business education and training other than that supplied by sponsoring companies.
- Small grower schemes can and do contribute significantly to the incomes of poor rural communities, without requiring the extensive contribution of own labour. Located in rural areas with high levels of poverty and unemployment and with limited alternative land uses, small grower schemes increase and diversify household incomes, but cannot generally lift households out of poverty. There are of course exceptions and cases where significant

⁴⁶ The industry has since initiated programmes to address this issue, most notably the Contractor Upliftment Programme (CUP) and the Forestry Contractor Productivity Initiative (FCPI) (FSA, 2005). The present analysis however reflects information gathered through contractor interaction and secondary data as available at the time.

⁴⁷ The full report is available on request.

plantations of up to 50 hectares have enabled households to make sizeable investments and purchases.

- Small grower schemes contribute to the acquisition of physical, financial and social assets by households. Households involved acquire or solidify their claims to land, acquire capital and investments in the form of small plantations and acquire planting, silviculture and harvesting skills and exposure to formal sector enterprise activities. However, the quality of social capital acquired does not appear to be significant and there remains considerable scope for organisation development and individual capacity building.
- With the possible exception of sugar cane planting, there are currently no realistic alternative land use activities that would generate the sorts of returns that plantations do. In the absence of large government and private sector investments and the product organisational chains required for efficient markets, sustainable alternative agricultural products are not feasible in the short to medium term.
- Considerable opportunity exists for the expansion of small grower schemes into large areas of the Eastern Cape⁴⁸. With few sustainable land use alternatives, the schemes could make significant contributions to household incomes and to provincial gross product. However, there appears to be lack of awareness of the benefits of such expansions. Also, whilst the outlines of a coherent strategy exist, it is not widely shared and does not seem to have captured provincial or municipal imaginations. A strongly held provincial view is that large land investments in forestry must be accompanied by infrastructure for the local beneficiation of forestry products.
- Many mineworkers were traditionally drawn from poor areas of KwaZulu-Natal and the Eastern Cape where forestry is now based. With the decline of mining, migration has come to offer fewer opportunities, such that men are increasingly forced to seek rural income opportunities. Anecdotal reports suggest that small grower schemes are the basis of some of these rural income opportunities, though this is somewhat at odds with the high employment of women in the schemes. The play of increasing unemployment in urban areas against growing opportunities in rural areas on the back of the forestry industry is perhaps at this stage, too inchoate to offer real findings.
- Small grower schemes do have their costs, including the locking up of land for extended periods of time and increased water usage and potential reductions in fuel wood availability, both of which can increase costs to women in particular. They have also been demonstrated to generate conflict within some communities.
- Small grower schemes have not caused the emergence of self-interested associations seeking to improve the terms of their existence. Members of schemes generally do not have formal organisations to represent them in their dealings with the forestry companies or with government or other stakeholders.
- A few communal forestry ownership models exist as alternatives to corporate small grower schemes based on individualised participation. Such communal ownership schemes benefit from economies of scale, can build social capital and result in further communal development activities. However, they appear

⁴⁸ See section 10 for a more detailed discussion of the Eastern Cape situation.

to be difficult to establish and maintain and may not be easily replicable across all communities.

- Corporate small grower schemes have provided opportunities for the emergence of a secondary market of service providers or contractors. The schemes have generated new income and employment opportunities, which would not have existed in their absence. However, conditions under which these contractors operate are unregulated and generally fail to meet national labour and health and safety standards. Very little if any support is currently being provided to these contractors.
- Whereas corporate small grower schemes are marketed as part of empowerment strategies in the context of Black Economic Empowerment, (BEE), they are located at the lowest value end of the forestry value chain. The NCT model where all members benefit from group profits is perhaps more truly about empowerment.
- The secondary data suggests that plantations tend to displace indigenous woodlots and other local land use practices. The results are purported to include the decreasing availability of fuel wood, and with it, probable decreases in the availability of traditional medicines and other products of cultural value. In addition, growing plantations may come to exacerbate tensions with the primarily social functions associated with the rearing of cattle.

Although substantial success has been achieved in establishing small grower plantations, risks on both sides of the contract should be noted.

As non-integrated entities, market volatility (price fluctuations) may impact small growers.

Risk to small growers of exposure to market volatility. The international pulp and paper markets are volatile and vertical integration between fibre production and processing activities is seen as inevitable to manage this risk. This leaves the non-integrated components of the value chain with substantial exposure to market risk. One of these exposed components is the small grower or community schemes. The small and informal nature of these operations means that they are also particularly vulnerable to price shocks and may not be able to cope with it.

Under such circumstances, it may not be in the interest of the small grower to be completely dependent on large company growing schemes. Although such schemes provide critical finance and management support, growers do not share in the processing profits and are, therefore, exposed to market volatility without access to alternative buyers (e.g. woodchip exports). If alternative solutions could be found for the finance and management support (as was the case for the Mzimkulu community), it may be better for the communities to develop the resource independently and sell to the highest bidder. Although a number of existing government grants could potentially be used, the uncertainty over the use and availability of government grants for forestry development on communal land complicates development and would have to be resolved. Agreements that allow for sharing in processing profits (e.g. those of cooperative nature) will also reduce the impact of market instability and increase the return to plantation owners.

Uncertainty of fibre supply to companies. Much effort is required from companies to establish and manage small grower schemes and, in the absence of other

Companies also incur some risks in securing supply from small growers.

alternatives, companies have to provide finance and advance payments based on the expected harvest in order to smooth cash flow for the grower. Contracts generally bind the grower to supplying fibre to the sponsor company for the first two rotations. Due to the difficulty of monitoring a large number of small plantations, companies often found in the past that the wood is sold to other buyers (breaking the contract) and it is unable to recover the cost of supporting the grower. In addition, the company has no guarantee that the grower will continue to supply fibre to it after the second rotation, as it has to compete with prices offered through woodchip exports. If the firms are concerned about their ability to compete with the export prices, it is unlikely that they will invest large amounts of capital in expanding production capacity based on small grower inputs.

There seems to be at least two options for addressing the above-mentioned risks:

Cooperative small growing or profit sharing supply contracts with processors would serve to lower risk.

- Growers can join existing cooperatives (or establish their own) to process chips for export or supply to the domestic pulp companies. The shared capacity of the cooperative will improve the bargaining position of small growers and the cooperative can also seek to improve member returns by entering new markets or extending into processing activities (e.g. NCT's investigation into establishing an independent pulp mill). By using the cooperative income to address cash flow and capital problems, a cooperative structure could even allow small growers to establish long rotation softwood plantations. This will diversify the risk for small growers and open up new areas of beneficiation. It must be noted, however, that incorporating and managing a large number of small growers in such a structure poses significant challenges and may require substantial government support.
- Processing companies can adapt the supply contracts to allow the grower to share in processing profits. This will increase the return to growers and the certainty of supply for processing companies. As the ceiling of the integrated fibre supply is reached, processing companies will be forced to consider such options or simply compete with the export price of woodchips.

The conclusion from the above is that, although small grower and community schemes hold substantial development and empowerment potential, the attraction is not unqualified. Substantial effort on government, community and corporate side will be required in order to realise the potential plantation development in the EC and KZN and to ensure that this is to the benefit of all parties involved. A particular onus will rest on government or other cooperative initiatives as it is not clear that the areas available for community development is within reach of existing processing companies or whether such companies will have the appetite for small grower development on such a scale

1.3.8.

OTHER IMPACTS

Owners of plantations contribute to their communities in the form of corporate social investment programmes. The firms that are able to support such programmes are usually the larger firms that are also involved in downstream activities such as pulp and paper production or solid wood processing. In order to

prevent repetition, the corporate social investment programmes will be discussed under the downstream value chain components.

Furthermore, plantation forestry generates substantial foreign exchange earnings through the export of wood and paper products. About R60 million of this results from roundwood exports. The foreign exchange earnings of processed products will be discussed under the relevant downstream processing components of the value chain.

2. NET CONTRIBUTION OF PULP AND PAPER

2.1. SUMMARY OF FINDINGS

The pulp and paper industry in South Africa originated in the first half of the twentieth century in reaction to large-scale afforestation projects by government and encouraged by a regulatory environment in which domestic manufacturing was promoted. These two industries are highly integrated and their contribution to the economy will, therefore, be discussed as a whole in this section. As a basis, a separate overview will be provided for each sector.

In 2003, the pulp and paper industry:

- contributed R6bn⁴⁹ to GDP with estimated environmental costs of R1.6bn (i.e. R4.4bn net contribution);
- directly employed about 13,200 workers as well as creating an additional 10,781 informal opportunities for paper collectors (recycling);
- earned net foreign exchange to the value of R4.87 billion;
- spent R57m on corporate social investment programmes

Impact component	Pulp and paper (including recycling)
Economic impact by counterparty (Rm)	5,999
Owners of capital/company profit (Rm)	3,191
Government (Rm)	685
Labour (Rm)	2,123
Rest of Society (Rm)	n/a
Maximum quantifiable environmental impact (CSIR estimate) (impact on rest of society) (Rm)	-1,630
Energy use (Rm)	-859
Landfilled waste (Rm)	-78
Air emissions (Rm)	-487
Water quality (combined CSIR-Genesis estimate) (Rm)	-206
Net economic impact (Rm)	4,369
Employment generated	23,981
Permanent	13,200
Informal waste paper collectors	10,781
Net foreign exchange earned (Rm)	4,900
Social impact	R57m in corporate social investment
	Not a large employer, but employment generally generated in poorer areas
	Dedicated industry-developed employee training programme
	Wage levels generally high in formal part of industry - affects trickle down effect on the economy (through dependency rate, spending power, as well as income generated in supplier industries)
	Recycling provides income to large number of hawkers and facilitates small business development for waste collectors
Environmental notes	Impact of water quality on salinity not quantified but cost shown to be limited
	Recycling reduces virgin fibre requirement and environmental impact of paper production

Table 12. Overview of the contribution to the South African economy by the pulp and paper industry

Source: Genesis research.

⁴⁹ Including an estimated R146m paid to hawkers collecting paper for recycling.

2.2. OVERVIEW OF THE MARKET

The pulp and paper industry in South Africa originated in the first half of the twentieth century in reaction to large-scale afforestation projects by government and encouraged by a regulatory environment in which domestic manufacturing was promoted.

Pulp manufacturing in South Africa

Production and products. South Africa has nine pulp mills which, in 2003, produced 2.3 million tons of pulp, making South Africa the 18th largest producer of pulp internationally (Pamsa, 2004b, PWC, 2004). Two pulp mills employ a mechanical process to manufacture mainly newsprint from softwood, while the rest use some kind of *chemical process*, which produces a higher quality paper, but has a lower yield of paper from a unit of fibre used. One mill, Sappi Saiccor, produces chemical cellulose, or dissolving pulp, which is used in a variety of applications in e.g. the textile industry, but is not an ingredient in paper-making. In 2003, only 12% of pulp produced was mechanical. With the exception of Saiccor, all pulp mills are integrated with paper production facilities on site.

SA has nine largely virgin fibre based pulp mills, two of which are mechanical. The rest are chemical, of which one has a dissolving pulp process.

Inputs. Pulp mills require virgin (wood) fibre as primary input, sometimes augmented by waste paper. Two mills (Felixton and Stanger) use a sugar cane residue, bagasse, as primary fibre input. The type of fibre input used to produce pulp depends on the characteristics and quality of pulp required. The same goes for the preference for soft or hardwood. Of the roundwood consumed by pulp mills in 2003, the majority (55%) was hardwood, mostly eucalyptus, which was mostly applied in the (chemical) *kraft* process to produce pulp for packaging (cartonboard) manufacturing purposes.

Main non-fibre inputs include *water* (up to 72m³ of water is required to produce one ton of paper in an integrated pulp and paper mill) (CSIR analysis, based on Steffen *et al*, 1991) and *energy*. Chemical (*kraft*) mills use biomass waste products to generate a proportion of their energy requirements. *Capital* is also a major input – as a highly capital intensive industry, South African pulp plants had fixed assets to the value of R17.2 billion in 2003 (FES, 2004a). The last main non-fibre input is *labour* – in 2004, the pulp and paper industry employed an estimated 13 200 mostly semi- or skilled people, who earned a wage bill of about R3 billion (Pamsa, 2005). A lack of appropriately skilled labour can be identified as a constraint to the industry.

The industry employs 13,200 mostly skilled people and is dominated by two players (Sappi and Mondi).

Market players. The industry is dominated by two players (Mondi and Sappi), who are the only producers of virgin fibre pulp in South Africa and who are both highly integrated with their own paper and plantation operations. Sappi has a 62% share of the pulp production capacity (5 mills), with Mondi comprising the remaining 38% (4 mills) (Pamsa, 2004a). Both have developed into global role players and are internationally listed (Mondi as part of its parent-company – Anglo American). Mondi dominates the production of *mechanical pulp*, whereas Sappi is the only producer of *dissolving pulp*, and also slightly dominates the rest of the chemically

produced segment. A new pulp mill (to be a joint venture between forestry cooperative NCT and Swedish Firm Sodra Cell) is also under investigation. Should this project materialise, an additional semi-chemical player will enter the market by the end of 2007, with a capacity of 300 000 ton per annum which will mostly be destined for the export market.

Market definition. Of total pulp production, 32% (744 000 t) was exported in 2003 at a value of R2.6 billion (Pamsa, 2004b). Of this, 538 000t was dissolving pulp. Due to the high level of vertical integration with paper production, the biggest proportion of annual pulp production is not sold on the market at all. Whereas all *dissolving* pulp is traded (on the international market), no mechanical pulp was traded in 2003. Only about 20% of total chemical (including semi-chemical) pulp production was traded within South Africa (i.e. sold to other pulp mills or to non-integrated paper mills), a figure which increases to 29% if exports are included.

The industry is highly integrated. Exports are largely limited to dissolving pulp. Internationally determined prices are applied at import parity domestically.

The integrated nature of the industry is partly explained by the necessity of secure raw fibre supply and the capital intensive nature of pulping. Due to the integrated nature, high capital requirements and a limited pool of virgin fibre resources, the industry is also characterised by high barriers to entry and expansion.

Pricing mechanism. Pulp is a tradable commodity and prices (determined by global demand and supply trends) are published internationally and directly applied in South Africa (Pamsa, 2004a). This essentially implies pricing at import parity. As prices are set in Rand, domestic prices are sensitive to exchange rate movements and subject to fluctuations.

Paper manufacturing in South Africa

Players and products. Although more diversified than the pulp component in terms of the products and players operating in the market, the paper industry remains highly concentrated. The four largest paper producers in South Africa are: Sappi; Mondi; Nampak; Kimberly-Clark and Gayatri (until its recent takeover named Unicell) (Pamsa, 2004a). Together, the various mills owned by the biggest five companies accounted for about 96% of the total paper production capacity in South Africa in 2003. The remaining 4.1% is produced by a number of smaller companies (with a capacity of 3 000 to 15 000 t/a). These smaller producers largely (or often completely) depend on waste paper for raw material and produce mainly tissue paper products.

Paper manufacturing is also highly integrated and five firms dominate production.

There are 30 paper and paperboard mills in South Africa (including the 8 integrated pulp and paper mills). The four main categories of paper produced are *printing and writing papers, newsprint, packaging* and *tissue paper*. Sappi and Mondi dominate the (virgin fibre based) printing and writing paper market, as well as the (softwood virgin based) newsprint market (where Mondi is the largest player). Nampak and Kimberly-Clark have a combined 50% market share in the (mostly waste paper reliant) *tissue* paper market, with the smaller players comprising the rest of the market. In the packaging paper sub-market, Sappi and Mondi once again dominate, followed by three smaller companies (Gayatri, Lothlorien and SA Paper

Mills). A combination of waste paper and virgin fibre is employed for packaging grades. It is the most prominent category, representing 54% of total paper production in 2003.

In additional to virgin fibre pulp, recovered paper is an important input.

Inputs. For paper mills, wood pulp (produced in an integrated pulp mill, or sourced externally) and, in two cases, bagasse pulp, are the only virgin fibre inputs. Recovered paper also represents an important input into the paper manufacturing process. In 2003, it was responsible for about 39% of paper manufacturing's fibre inputs. The relative proportion used by each mill depends on the grade of paper produced. It can be expected that the recycled component of fibre inputs will increase in the future – particularly as virgin fibre availability becomes a constraint and the furnish of paper changes to accommodate more recycled fibre.

As with pulp production, water, energy, capital and labour are the main *non-fibre inputs*. Non-integrated paper mills require significantly less water (27m³) per ton of paper produced than their integrated counterparts (discussed above). Unlike integrated pulp and paper mills, such mills can however not generate any energy from biomass. No disaggregated employment figure is available for paper production per se, as the 13 200 employees quoted above apply to the pulp and paper industry as a whole.

Almost 30% of production is exported, mostly in the form of corrugated paper. Imports are limited to specialty products not manufactured locally.

Trade. With the exception of the export-focused packaging paper sub-market, the markets for South Africa's paper products are mostly domestic. Except where production is integrated with conversion operations, paper is sold to converters, who then manufacture final products for the packaging, printing and publishing retail market. In 2003, 692 000t (almost 30%) of paper production was exported (to the value of R2.75 billion), while imports amounted to 16% of production (371 000t) (Pamsa, 2004b). Imports mainly consist of speciality paper and board products for which local demand is insufficient to justify domestic production.

Vertical integration and fibre supply are the main barriers to entry. As with the pulp industry, paper production entry for products that require a substantial proportion of virgin fibre inputs (i.e. printing and writing, newsprint and to some categories of packaging) are restricted by the level of vertical integration in the market. Mondi and Sappi are the only producers of virgin pulp in South Africa and own a substantial proportion of plantations as well as their own paper manufacturing operations.

Prices are fixed by short term contracts based on import parity.

Pricing mechanism. Paper prices in the domestic market are fixed in Rand and determined through negotiations around short term (six months to one year) supply contracts. At the time of negotiation, world market prices are used as a benchmark and prices are set at import parity (Pamsa, 2004a, Industry role players, 2004/2005). The price of fine paper was R6 919 per ton during the last quarter of 2003, which is significantly lower than the R7 999 per ton price of 2002. In dollar terms, the price however rose from \$763 per ton to \$937 per ton (JP Morgan, quoted in IDC, 2004). This reflects the importance of the exchange rate in local price determination, and the influence it can have on trade propensities.

2.3. CONTRIBUTION TO THE ECONOMY

This section provides more details on the main economic, social and environmental impacts identified for the pulp and paper sector.

2.3.1. THE PULP AND PAPER INDUSTRY DIRECTLY CONTRIBUTED R5.9 BILLION TO GDP IN 2003

Pulp and paper production accounts for 0.5% of GDP and almost 3% of manufacturing GDP.

Industry data on cost structures and profitability of the pulp and paper industry is at best insufficient to obtain accurate contribution to GDP estimates and at worst completely unavailable. As part of this study a survey of industry players was conducted through Pamsa through which the information required for this calculation was requested directly from the players. Pamsa received this information and aggregated it to industry aggregates. Unfortunately, some of the players were unable to provide sufficiently detailed information to allow analysis by product categories and to split pulp and paper operations. Accordingly, only the totals for the overall pulp and paper industry were released for use in this analysis. The calculations below are, therefore, based on the most detailed and accurate information made available by the industry.

Based on this information, Table 13 shows that the pulp and paper industry contributed an estimated R5.9 billion (0.5%) to GDP in 2003. As a percentage of manufacturing GDP, the figure rises to 2.7%.

Pulp and paper contribution to GDP⁵⁰, 2003	R million
Operating profit	3 191
Total people costs (including PAYE)	1 977
Net VAT payments	234
Other tax paid	451
Total contribution to GDP	5 853
SA GDP (at market prices)	1 248 730
Manufacturing GDP	219 234
Pulp & paper as % of SA GDP	0.5%
Pulp & paper as % of manufacturing GDP	2.7%

Table 13. Pulp and paper value added and contribution to SA and manufacturing GDP, 2003.

Source: Industry data gathered for Genesis by Pamsa. SA and manufacturing GDP data from StatsSA's P0441, Third Quarter 2004, Tables 8 and 12.

Of R5.9bn, approximately R2bn accrued to labour in the form of remuneration, more than R685m⁵¹ accrued to government in the form of direct and indirect taxes and the balance of R3.2 billion was in the form of company profits. In addition,

⁵⁰ The dataset is representative of about 94% of the industry's capacity. The contribution to GDP was, therefore, scaled up to 100%. This assumes the rest of the industry has the same cost and profit structures as the larger players included in the survey, but the sample was representative enough to make such a generalisation acceptable.

⁵¹ PAYE was not reported separately from remuneration and could, therefore, not be separated. The remuneration figure will, therefore, overstate the value received by labour and the taxes component will understate the value received by Government.

R146m paid to recycled paper collectors are not included in the above estimates increasing the total contribution to GDP to R6bn.

2.3.2.

THE PULP AND PAPER INDUSTRY CONTRIBUTES SUBSTANTIALLY TO REGIONAL ECONOMIES

The economic impact was mostly felt in KwaZulu-Natal, Gauteng and Mpumalanga.

Most pulp and paper mills are concentrated in Kwazulu-Natal, Gauteng and Mpumalanga. With the exception of Gauteng, these are some of South Africa's poorer provinces. If it is assumed (in the absence of data on which to base provincial GGP value added calculations) that the industry's provincial contribution to GDP is proportionate to production (that is, that a province's share in total value added equals its share in total pulp and paper production capacity), the pulp and paper industry accounted for 1.9% of KZN's GGP (gross geographic product) in 2003 and 1.4% of that of Mpumalanga. For Gauteng the figure drops to about 0.2%, which is to be expected given the fact that Gauteng represents about a third of South Africa's GDP.

Province	Regional GGP (R million) ⁵²	Provincial pulp and paper GDP (R million) ⁵³	Share of pulp and paper GDP in provincial GGP
Mpumalanga	87 461	1 228	1.4%
KwaZulu-Natal	206 766	3 855	1.9%
Gauteng	413 554	770	0.2%

Table 14. Share of pulp and paper value added in provincial GGP.

Source: Genesis research, based on StatsSA P0441 data, Table 16, as well as mill capacity data as contained in Section 5.9 of the Technical volume

The industry thus makes contributions to employment and industrial development in the local communities where it is situated. Local communities are also targeted in corporate social investment programmes (discussed below).

2.3.3.

THE PULP AND PAPER INDUSTRY EMPLOYED APPROXIMATELY 13,200 EMPLOYEES IN 2003

Pamsa (2004c) estimates direct employment in the pulp and paper industry to amount to 13 200. The skills distribution of direct employees in the pulp and paper industry as estimated by Pamsa was included in Section 3 of the market analysis document (Part II of this report).

Although outnumbered by their smaller counterparts, large companies (defined as those with more than 200 employees) accounted for 83% of the employment in the pulp and paper industry (Erasmus, 2004). The HSRC (Erasmus, 2004) estimates more than two thirds of the employees to be black, with male workers being predominant. Less than one percent of skilled workers are female (Erasmus, 2004).

⁵² At market prices.

⁵³ At market prices.

Most unskilled positions have been outsourced by the industry.

It must be noted that the above estimate does not include an estimate of independent contractors. It will, therefore, underestimate the employment generated by the industry. In particular, it will underestimate the unskilled component of the workforce as companies have largely outsourced unskilled jobs and do not keep track of how many people are employed in this way. Even though the unskilled labour will be undercounted, the large number of skilled employees in direct employment of the pulp and paper companies is a clear indication of the extent of skilled labour required by the industry. At the same time, South Africa's skill levels on junior management and skilled level are still relatively low compared to European pulp and paper companies. This necessitates a "middle management" level, which does not exist in similar European pulp and paper companies (Hunt, 2005).

Aggregate employment has declined and the propensity to employ is likely to decline with the expansion of the industry.

The trend in employment over the longer term is negative: jobs are being shed due to restructurings and the pursuit of efficiency (Hunt, 2005). The industry is also involved in an "Enhanced Skills Initiative" and invests heavily in employee training and development in order to achieve higher levels of worker accountability and efficiency. The downside is however that this makes more and more workers redundant (Truelock, 2005) and the outlook is that capacity expansions will continue to be more efficient and require less labour. The propensity to employ will, therefore, decrease as production increases (Truelock, 2005, Hunt, 2005). Though realising the unfortunate impact of the situation, the industry feels that that is what is expected of them, should they wish to be globally competitive.

Due to higher productivity achieved through training, the propensity to employ will decrease as production increases.

SA is still labour intensive relative to its international counterparts.

In spite of the negative trend in employment, the South African pulp and paper industry is however still relatively labour intensive in international terms. For example, the Piet Retief mill, with its production of about 150 000 tons per annum, employs 264 people. The same type of mill in Australia, but with double the capacity, employs only 180 people (Hunt, 2005).

At the provincial level, the industry directly employs an estimated 5 373 people in Kwazulu-Natal, 1 894 in Mpumalanga and about 2 785 in Gauteng⁵⁴. This does not represent a large proportion of total provincial employment:

	Total provincial employment	Provincial pulp and paper employment	Pulp and paper as % of total employment
KwaZulu-Natal	2,185,000	5,373	0.2%
Mpumalanga	780,000	1,894	0.2%
Gauteng	3,230,000	2,785	0.1%

Table 15. Direct contribution of pulp and paper to provincial employment (employment in mills).

Source: StatsSA, 2004: Labour Force Survey, Sept 2003; Rough approximation of provincial pulp and paper employment based on individual mill employment figures as summarised in Section 5.9 of the Technical volume

⁵⁴ This refers to direct employment at the mills and does not include head office staff. Hence, the discrepancy with the Pamsa estimate.

2.3.4.

ALMOST 10,781 PEOPLE EARNED A LIVELIHOOD FROM PAPER RECOVERY IN 2003 AND RECEIVED AN ESTIMATED R146 MILLION IN PAYMENT FOR PAPER DELIVERED

Apart from company employees and outsourced owner-drivers involved in the collection of recycled fibre, recycling's main area of employment creation lies in the so-called "buy-back centres". In 2003, approximately 1,733 people were directly employed by the 280 centres in operation nationally. In addition, these centres provided an income to 654 hawkers/collectors that were supplied with a barrow and a further 8394 informal hawkers. This brings the total employment in the buy-back centre recovery industry to 10 781 (PRASA, 2004).

The proportions of the various grades of recovered paper according to PRASA (2004) are: newsprint and magazine papers, 13.6% of total; corrugated and kraft papers, 56.5%; office and graphic papers, 20.3%; mixed and other papers, 9.7%. Applying these proportions to the total amount of paper recovered from businesses (retail and wholesale – i.e. the type of collection that is usually conducted by hawkers), which totalled 513 000t in 2003, and assuming (based on discussions with industry role players) average prices currently paid to hawkers to be R170/ton for common mixed papers and newspapers, R200/ton for corrugated papers and R650/ton for office grades, an estimated R146m is paid for paper collected.

Dividing this amount by the estimated 10 781 people involved in the recovery of this paper, it can be inferred that an average income of about R13 530 per person per year (or just more than R37 per person per day) is generated. This is in line with the information on estimated income provided by waste recovery industry role players, namely that hawkers get up to R30 per barrow for cardboard and, depending on the availability of paper, can collect between one and two barrows a day, should they wish to. For white paper the amount can rise to R60/barrow (Hunter, 2004).

The above is however only a rough approximation and can be distorted due to the fact that the prices paid may not reflect actual market prices at the time of publishing of this report, as well as due to the fact that the proportion of corrugated paper versus other types of paper is probably higher within the retail/wholesale collection segment than for the overall picture (which was used to calculate the proportions of the various grades).

As insufficient information was available, the full contribution of recycling to GDP could not be calculated. Part of this will be captured by the GDP estimates for the pulp and paper companies where recycling units form part of such companies. However, this will not apply for independent recyclers. For both of these, the only component that could be estimated was the R146m remuneration paid to collectors. The contribution to GDP of this sector is, therefore, at least R146m.

2.3.5. THE PULP AND PAPER INDUSTRY EARNED R4.87 BILLION IN FOREIGN EXCHANGE IN 2003

In 2003, the pulp and paper industry, through its exports, earned foreign exchange to the value of R4.87 billion. For the forestry, wood, paper, printing and publishing industry as a whole, the figure rises to R25.2 billion (Pamsa, 2004c). This implies that the industry “generated” spending power/money for the economy from outside its own boundaries.

In addition, the industry is a substantial investor in capital with capital investment in the segment amounting to R17.8 billion in 2002 (Pamsa, 2004c).

2.3.6. PULP AND PAPER PRODUCTION RESULTED IN ENVIRONMENTAL COSTS OF R1.6 BILLION IN 2003

91% of environmental costs incurred in the FTTP industry results from the pulp and paper industry. This stems from the impact of energy use (electricity and biomass), air pollution, landfilled waste and the impact of effluent discharges on the water system. Table 16 provides the total baseline monetary values for the various environmental impacts associated with the pulp and paper industry (including recycling), as estimated by the CSIR-Environmentek⁵⁵.

Environmental cost	Estimated impact (R million)
Electricity (national grid)	138.43
Energy (fossil fuels)	720.60
Water quality: COD	157.67
Total landfilled waste	77.75
Air emissions	486.93
Total	1,581.38

Table 16: Environmental impact of pulp and paper mills.

Source: CSIR-Environmentek calculations.

A key problem in deriving these estimates was the absence of shadow prices for some of the identified impacts. As a result, the impact of water quality in terms of total suspended solids (TSS - 75.8 tons) and total dissolved salts or solids (TDS - 242.5 tons) were not quantified as shadow prices were not available. However, a part of the TSS cost is covered by the price of Chemical Oxygen Demand (COD) and should thus have a limited impact on the environmental cost of the industry.

From the studies by Urban Econ (2000) and Herold and le Roux (2004) for the Water Research Commission, it is clear that TDS does not have “significant (incremental) costs⁵⁶” on the environment and on feeder systems. The impact on the environment was found to be insignificant within the author’s specified salinity range of 200mg/l to 1200mg/l of Total Dissolved Solids (TDS) and was not even

⁵⁵ The full report is available on request and a more detailed summary of results is provided in the technical appendices (Part III of this report).

⁵⁶ From Urban Econ (2000: vi).

included into the integrated model presented in the study by Urban Econ (2000). However, both studies found that TDS does have a significant impact on water quality in economic terms. This impact can be regarded as a negative externality since downstream users of water will be adversely affected by higher salinity levels caused by upstream activities. Further, the cost incurred by downstream users is unlikely to be covered by the upstream polluters.

**Genesis estimates
water quality impacts
not quantified above to
amount to about R48m.**

The study by Urban Econ (2000) found that, if TDS were to increase from 500mg/l to 600mg/l, the direct and indirect costs of TDS amounted to R128.14m in 1995⁵⁷. Note that this value would represent the total national impact on the economy since input-output tables were used to determine the impact of the increase in TDS levels on the whole national economy. Adjusting this value for inflation, the total costs of TDS for the levels mentioned above amount to R220.26m in 2003. Table 17 below shows the impact of if TDS were to increase from 500mg/l to 600mg/l, as well as the extreme scenario created by Urban Econ where TDS levels increase from 500 mg/l to 1200mg/l.⁵⁸

Using TDS output data per pulp and paper mill data, coupled with the total water requirements data of the catchments where pulp and paper mills are located (see the Technical volume for more details on the calculations), the magnitude of the TDS impact by pulp and paper mills were found to be 21.89mg/l. In other words, pulp and paper mills increase TDS levels by 21.89mg/l per annum. Ceteris paribus, the impact of the pulp and paper mills production would thus be less than 22% of R220.26m at **R48.22m**.⁵⁹ This value is negligible when the positive impact of pulp and paper production is considered, but brings the total environmental cost of the industry to R1 630 million.

Increase from 500mg/l to:	Descriptor	1995 R/m Values	2003 (R/m) Values
600mg/l	Regional value (direct costs)	26.64	45.79
	National Value (all indirect costs)	101.5	174.47
	Total costs	128.14	220.26
1200mg/l	Regional value (direct costs)	183.5	315.35
	National Value (all indirect costs)	647.5	1112.99
	Total costs	830.96	1428.34

Table 17: Impact of an increase in TDS concentration levels for 1995 and 2003 with adjustments for inflation

Source: Urban Econ 2000 and Genesis Analytics

Additionally, the impact is diminished by the fact that several pulp mills are located close to the coast, and as such would not impact downstream activities. Other

⁵⁷ It was assumed that the national indirect costs include the regional indirect costs as presented in table 3 of Urban Econ (2000:ix).

⁵⁸ Urban Econ (2000) reports that the most prevalent level of salinity is 500mg/l, and uses this level as a starting point.

⁵⁹ Using the extreme values if TDS were to increase to 1200mg/l, the total impact of pulp and paper mills amount to a very similar figure of R44.7m. Note that this calculation is based on the study of the Middle Vaal area, and is not based on the all catchments where pulp and paper mills are located. As such, cost data may differ. However, data limitations did not allow for more accurate calculations and further research is required to determine a more accurate economic impact figure for TDS pollution by pulp and paper mills.

impacts of high salinity levels include negative health impacts. However, health implications only occur at levels in excess of 1100 mg/l and only after some exposure to TDS polluted water.

Net of environmental costs, the overall economic impact of the pulp and paper industry for 2003 thus amounted to R4.42 billion (excluding TDS estimate) or R4.37 billion (including TDS estimate).

2.3.7.

PAPER RECOVERY REDUCES THE ENVIRONMENTAL IMPACT OF PAPER PRODUCTION

The use of recycled fibre in paper production impacts on the environmental impact of pulp and paper mills as well as the volume of virgin fibre required per year.

PRASA estimates recycling based paper to require 70% less emissions and 40% less energy in its production. Land fill space is reduced by 3m³ and 17 trees are replaced in paper production if 1 ton of waste paper is used. This means that 8% of total plantation area is "saved" due to recycling.

The pulp and paper environmental costs shown above are based on impacts reported in Mondi and Sappi sustainability reports. Such reports were not available for other mills and the Mondi and Sappi reports were, therefore used to derive industry estimates. The Mondi and Sappi mills will, however, use a higher proportion of virgin fibre (in aggregate) than other mills which are mostly based on recycled fibre with some virgin fibre inputs. According to the Paper Recyclers' Association of South Africa (PRASA, 2004), the air emissions of a recycling based paper manufacturing process is up to 70% lower than that of a purely virgin fibre based pulp and paper production process. Additionally, it consumes 50% less water and 40% less energy (PRASA, 2004). The data does not allow the separation of production based on virgin and recycled fibre but it is clear that, in the absence of recycling, the impacts of the energy and air emission estimates contained in the environmental analysis would have been significantly higher.

On the plantation side, every ton of paper recovered is also claimed to reduce land fill space by 3 m³ and to replace 17 trees in paper production (PRASA, 2004). If the 922,000t of paper recovered in 2003 (see Section 5.10 of the Technical Volume – Part III of this report) is multiplied by 17, it seems that the plantation forestry industry would have needed to harvest an additional 15.7 million trees annually to meet paper demand, had there been no recycling. Assuming an average stand density of 1,200 trees per hectare (Van Zyl, 2005), this translates into 13,062ha per annum that companies would have needed to harvest in the absence of recycling. For that area to be harvested, it would have been necessary to have an area about 8 times that size planted under trees (to achieve an optimal rotation), that is: an extra 105,000ha (8% of the current total plantation area). Should the 17 trees per ton estimate provided by PRASA (2004) be correct, it thus means that recycling seriously impacts the scarcity of wood.

2.3.8.

CORPORATE SOCIAL INVESTMENT AMOUNTED TO R56.7 MILLION IN 2003

Pulp and paper companies have initiated a number of corporate social investment programmes in which charities and development-orientated projects are supported. As a rule, the focus in such corporate social investment (CSI) initiatives falls on the local community where the pulp or paper mill is situated. Such programmes include

education, training, support of schools for employees' children, AIDS counselling and provision of anti-retrovirals, scholarships and contributions to conservation funds. Examples of some of the social initiatives of the biggest four companies in the industry are provided in Box 3 below.

Excluding investment in employee training, development, and Aids programmes, the pulp and paper industry spent about R 56.7 million on CSI in 2003⁶⁰.

Box 3. Examples of corporate social initiatives

Nampak's projects aim specifically at the South African youth in the areas of health, education, the environment and welfare. They also have in-house initiatives, such as a graduate training programme (85% of the recruits are from previously disadvantaged communities), a management development programme and technikon training for selected staff. Where the health and welfare of their workforce is concerned, they have an HIV/AIDS workplace programme.

Kimberly-Clark also regards its social responsibility as twofold: employee development and training on the one hand, and CSI programmes on the other hand (both cash and product based). The focus falls on the local communities of their mills/factories and they support especially children's homes and orphanages.

Sappi has a variety of community programmes, with a strong emphasis on education and training, environmental awareness and social welfare. Initiatives include a local youth centre and support for the Mandini college of education in Sappi Tugela, support for an SOS Children's Village, a community library programme and a teacher development scheme at Ngodwana, AIDS education and condom distribution, as well as anti-retroviral medication supply to infected employees at Enstra, to name just a few examples.

Mondi *inter alia* has extensive employee training, development and AIDS programmes, runs an adopted schools programme, piloted the Amangwe Village programme for HIV positive people, has a community forum and a cholera intervention programme and supports the University of Zululand Science and Technology Centre as well as an adult learning centre in Zululand.

Source: company websites and personal communications with company representatives.

⁶⁰ This figure is based on the total corporate social investment spending data (cash and in-kind contributions) of Mondi, Sappi, Nampak and Kimberly-Clark only. In the case of Nampak and Kimberly-Clark, particularly, this may mean that social spending on the conversion side of the businesses is counted as well, even though conversion falls outside the scope of the present analysis.

3. NET CONTRIBUTION OF WOODCHIP EXPORTS

3.1. SUMMARY OF FINDINGS

The export of woodchips is a controversial market in South Africa. On the one hand it has successfully broken the pricing oligopsony of the large pulp plants in South Africa and by doing this has achieved higher prices for plantation owners. On the other hand, however, it represents the export of a primary commodity where little beneficiation has taken place. It, therefore, represents a loss of value to the country in terms of the potential additional beneficiation that may have taken place.

In addition, the circumstance of this market is also quite unusual. To date, its existence has been based on a single international buyer market, Japan, which has created a very efficient shipping transport system through which it can transport woodchips over large distances cost effectively. Japan is the largest importer of woodchips internationally and sources imports from various countries.

In 2003, woodchip exports:

- contributed R991m to GDP whilst incurring environmental costs of R7.6m (net contribution of R983m);
- employed an estimated 500 people; and
- Earned net foreign exchange to the value of R 2 billion.

Impact component	Woodchip exports (Rm)
Economic impact by counterparty	991
Owners of capital/company profit	955
Government	Included in profit and labour
Labour	36
Rest of Society	n/a
Maximum quantifiable environmental impact (CSIR estimate) (impact on rest of society)	-7.6
Energy use	-1.3
Landfilled waste	-6.0
Air emissions	-0.4
Water quality	n/a
Net impact	983
Employment generated (only permanent)	500
Net foreign exchange earned	R2 bn
Social impact	A very small employer relative to production capacity
Environmental notes	Very limited environmental impact

Table 18. Summary of woodchips contribution to the South African economy

Source: Genesis research

3.2. OVERVIEW OF THE MARKET

South Africa exported approximately 3 million bone dry tons (BDT)⁶¹ of hardwood chips in 2003, with approximately 98% thereof going to the Japanese market (Japanese Import Statistics, 2004; Ishikawa, 2004). This consisted of both wattle and eucalyptus, with a split of 30% wattle and 70% eucalyptus (LHA 2004:13 and Mondi, 2003:18). In 2003 CTC exported 1.302m BDT, Shincell exported 434,000 BDT and Mondi (through Silvacel), exported in 1.31m BDT.

Exporting of woodchips is a medium term strategy for expansion of beneficiation

Woodchip exports as expansion strategy: Due to the large capital requirements of pulp and paper mills, the wood resources (plantations) are established first, followed by some beneficiation through chipping for export. This allows time for the plantations to come to sufficient scale before capital intensive beneficiation plants such as pulp mills are constructed. This process can, for example, be seen in the development of NCT's local chipping mills and the subsequent feasibility study being done to set up a mechanical pulp mill at Richards Bay. In NCT's case, chipping was, in the first instance, used to secure higher returns for the fibre⁶² produced by members but also formed part of a larger plan of extending beneficiation (in an effort to increase returns to members). Mondi also used woodchip exports to build up plantations stocks until capacity at their mills could be expanded.

Early evidence of expansion of beneficiation seen in proposal by NCT to establish new mill at Richards Bay

Woodchips exports impact on market for fibre. Before chips were exported, the only buyers of hardwood fibre were the large pulp and paper mills, which owned substantial plantations of their own and could, therefore, dictate the price paid for additional fibre required (over and above their own fibre production). In addition, the plantation owners did not benefit from profits made on beneficiation by pulp and paper mills. Through the export of chips and the cooperative nature of NCT, plantation owners receive a higher price for their fibre (exports) and benefit from limited beneficiation (share in profits as chipping plant is owned by members). The first mill (CTC) was established in 1970.

Access to export markets broke the pricing oligopsony dictated by Sappi and Mondi

Pricing mechanism: Woodchip prices are driven by Japanese demand that pay higher prices for fibre than the domestic producers of pulp are currently willing or able to pay. Flynn (2004) notes; however, that Japanese woodchip buyers have been successful in reducing international woodchip prices in recent times. This may be due to an increase in suppliers of woodchips worldwide. Prices are negotiated between the Japanese trading house and the woodchip plant operators, with the Australian woodchip price used as a guideline since they are the largest exporter of woodchips to Japan. In South Africa, Mondi and Sappi prices are sometimes used as guide prices, with contracts binding parties for 3 years.

⁶¹ BDT stands for bone dry metric ton, and is equivalent to air dry tons (ADT) minus moisture contained in the wood. BDT is used as the unit for trade transactions, whilst ADT is normally used for commercial purposes in South Africa.

⁶² In the late sixties differences developed between private timber growers and processors. This led to discussions with the Japanese, and CTC was established in 1970.

3.3. CONTRIBUTION TO THE ECONOMY

The main impacts identified for the woodchip sector is discussed in more detail below.

3.3.1. WOODCHIP EXPORTS CONTRIBUTED R2BN TO EXPORT EARNINGS AND R1BN TO GDP IN 2003

Approximately 3 million BDT of hardwood chips were exported from South Africa in 2003. According to Flynn (2004), the 2003 price obtained for South African woodchips was \$103 per BDT, which brings the sales value of the exported woodchips to R2.3billion. However, Pamsa (2004c) places the sales value of exported woodchips at R2 billion. Given the difference and difficulty in obtaining a sales price from other parties, it was decided to employ the more conservative sales value as a basis for further calculations.

Woodchip exports' value added and share in GDP (at market prices)	Rm
Value of sales	2 000
Less: Total input costs ⁶³ (excluding tax)	1 045
Plus: Remuneration	36
GDP generated by woodchip exports, 2002/03	991
Woodchips as % of Manufacturing GDP, 2003	0.45%

Table 19. Contribution to GDP by woodchip exports, 2002/03.

Source: Genesis Analytics calculations based on inputs from Pamsa (2004) and industry

Based on the input cost and estimates of remuneration, it is shown in Table 19 that the export of woodchips contributed R991m (8.1% of FTTP GDP) to GDP in 2003. Relative to the wood inputs used in the process, the value added can be expressed R325.38 per tonne (BDT) of roundwood logs.

3.3.2. WOODCHIP EXPORTS DIRECTLY EMPLOYS 500 PEOPLE

Total remuneration amounts to R36m, with approximately 500 people being employed at the four woodchip mills (DWAF, 2004a). The average wage amounts to R72 000 per annum. Labour is mostly unskilled and semi-skilled.

3.3.3. WOODCHIP PRODUCTION RESULTED IN ENVIRONMENTAL COSTS OF R7.6 MILLION

Environmentally, woodchip mills have a limited impact. The chipping process is characterised by limited noise pollution. The only air emissions stem from CO₂ emissions that occur when the woodchips are transported to its end destination, as

⁶³ Exact data for the calculations could not be obtained. As such, certain assumptions had to be made as described in Section 4.7 of the technical appendices (Part III of this report). The total input costs were determined by calculating timber costs and non-timber costs. Timber costs were determined by multiplying the timber inputs with the pulp price, whilst the non-timber input costs were determined by applying a non-timber input as percentage of total sales proportion provided by a woodchip exporter. This does not include taxation.

well from energy use during the production process (Mondi, 2003). Water usage in the production process is limited. Woodchip producers estimate that they use less than one litre per ton of woodchips produced.

As Mondi's Sustainable Development Report was the only information available on the woodchip industry, the results were extrapolated to derive the environmental impact of R7.6 million for the whole industry. The resultant impact estimates are shown below:

Impact	Units	Impact per ton of woodchips produced	Shadow price per unit	Total impact (Rand)
Energy use				
Energy (excl electricity from national grid)	kWh/ton	2.46	0.033	394,117
Electricity (national grid)	kWh/ton	5.605	0.033	897,979
Waste				
Total landfilled	ton/ton	0.0117	105	5,964,192
Air emissions				
CO2	kg/ton	0.555	0.1365	367,792
Total environmental cost				7,624,080

Table 20. Summary of environmental impact of woodchips production

Source: CSIR Environmentek

Based on the above quantifiable costs and benefits of the industry, the woodchips component of the value chain contributes a net value of R983 million to the economy.

4. NET CONTRIBUTION OF SAWMILLING

4.1. SUMMARY OF FINDINGS

The sawmilling sector is characterised by a large number of players with the five biggest players contributing 51% of total production. Past government intervention (in the form of so-called evergreen supply contracts from state-owned plantations at favourable prices) has led to mills being less efficient. With the privatisation of Safcol, however, government is moving out of the industry and firms appear to be adjusting to a more competitive environment. Demand for sawn timber is set to increase; given the limited supply of timber from plantations it is expected that prices will increase, subsequently the importation of sawn timber may become a reality⁶⁴.

Further, the industry does have significant impacts on rural communities, creating employment opportunities for relatively unskilled labour in areas with high unemployment levels. It is estimated that 100 000 people benefit from sawmilling activities. This production occurs with a relatively small cost to the environment.

In 2003, sawmilling:

- contributed R1,332m to GDP whilst incurring environmental costs of R133.8m (net contribution of R,197.5m);
- employed more than 20,000 people; and
- Contributed substantially to the income of rural households through 380 micro mills. These micro mills alone employ more than 1,800 people.

In addition, it supplied critical inputs to the furniture, building and construction industry. The contribution of the sawmilling sector to the South African economy is summarised in Table 21.

⁶⁴ Indeed, sawn timber is already being imported from Zimbabwe.

Impact component	Sawmilling
Economic impact by counterparty (Rm)	1,332
Owners of capital/company profit	1,028
Government	included in profit and labour
Labour	304
Rest of Society	n/a
Maximum quantifiable environmental impact (CSIR estimate) (impact on rest of society) (Rm)	-133.8
Net economic impact (Rm)	1,198
Employment generated	20,000
Net foreign exchange earned	Not significant
Social impact	Particularly smaller mills operate in deep rural areas with few economic alternatives
	Small business (and thus broad based BEE) potential
	Large number of small and micro mills employing more labour per cubic metre produced than larger mills
Environmental notes	Impact on water quality not quantified but expected to be limited
	Large proportion of wood waste generated supplied as input into other process (e.g. pulping) or used for energy creation

Table 21. Summary of saw mill contribution to the South African economy

Source: Genesis research

4.2.

OVERVIEW OF THE MARKET

The sawmilling segment of the value chain is geared towards manufacturing of sawn timber which is used in the production of solid wood products, such as lumber for construction purposes (roof timbers, flooring, etc.) and consumer products (furniture and DIY). In order to produce sawn timber planks of appropriate dimensions and to obtain sufficient yield from timber inputs, sawmilling firms require timber with a wider diameter and, therefore, grown over longer rotation periods (usually between 27 and 30 years). The timber required is grown on specialised sawlog plantations⁶⁵, with the main genera grown being pine (96%) and eucalyptus (3.7%).

Long rotation plantations, largely pine, provide inputs into sawmilling. There are a large number of players, but 5 dominate.

Major players: Unlike the rest of the value chain, the South African sawmill market is categorised by a large number of market players. In addition, none of the individual market players have a market share in excess of 20% and the biggest 5 players in the industry (Global Forest Products, Hans Merensky, Safcol, Yorkcor and Steinhoff) have a joint market share of 51%. Safcol is the only public company in the sector and have traditionally owned both plantation and sawmilling concerns. As part of the privatisation process that commenced in 1996, Safcol has leased the plantations under its control with Komatiland Forests being the only remaining state owned forestry entity.

⁶⁵ The silviculture process for sawn timber plantations is quite different to that of pulp plantations (e.g. pruning to prevent knots).

Log prices were historically low, but have recently increased. This places pressure on non-integrated sawmillers.

Due to government intervention in the industry, log input prices were quite low historically, which led to disincentives to invest in new capital equipment and technology. The result is outmoded and outdated equipment in the industry, which, in turn, lead to lower recovery rates than what is currently possible. With the recent commercialisation and privatisation of government forestry concerns (from 1992 and 1996 respectively), prices of log inputs have increased substantially to market determined levels. This is problematic for mills that have to invest substantial amounts in capital improvements in order to remain profitable.

A number of different categories of sawmills can be identified in South Africa, ranging from large mills with substantial capital investments to small mobile mills. The three main categories of sawmills found in the South African sawmill industry (Crickmay and Associates 2004a:14-15; Dunne 2000:2) each produce particular quality and types of products that serve different markets

- *Large sawmills* produce both high quality sawn timber (used for furniture) as well as low quality sawn timber, which are used for crates, cable drums and other industrial applications. Large sawmills have drying facilities that allows the mill to produce wood that is more durable and easier to work with (does not warp). Drying facilities are quite expensive to set up and maintain and are, therefore, generally only found with large mills. These mills tend to charge higher prices than small and micro mills due to the better quality sawn timber produced.
- *Small mills* generally produce sawn timber of lesser quality than the large mills; although some small mills do have drying facilities. Prices charged tend to be lower than that of large sawmills; this is probably due to quality differences.
- *Micro mills* typically produce low cost wet or air dried timber and pallets and cable drum timber. They tend to charge less for timber, and are seen to be more flexible where price negotiations are concerned (Dunne 2000:12). It is estimated that the price that micro mills obtain for their products may be as much as 30% lower than the average sawn timber prices in the more formal industry (Heyl 2004).

Large, small and micro mills serve different markets. Large and small mills are mostly concentrated in Mpumalanga, with micro mills more concentrated in the Eastern Cape. KZN is also an important sawmilling province.

Regionally, Mpumalanga contributes close to 51.87% of the overall total volume produced, with KwaZulu-Natal the next biggest regional producer of sawn timber with 18.5% of overall production. Large mills in the Mpumalanga region are the mainstay of sawn timber production in South Africa, and account for 38% of the overall volume produced in the whole country. Both Large and Small mill categories are most active in the Mpumalanga region. Micro mills, on the other hand, are most active in the Eastern Cape, with more than 52% of all micro mill production occurring in this region.

Prices are expected to rise significantly in reaction to a demand-supply discrepancy.

Demand and supply: Due to growth in the building and construction sectors, it is expected that the demand for sawn timber will increase in the future. Since supply is not expected to increase, the price of sawn timber is expected to increase. Current prices are approximately R1 300m³ and are expected to increase even further; import parity will be achieved at a price of R2 200m³ (Crickmay and

Associates 2004a). If South African industry dimensions were to be converted to international standards, the import parity price would be reduced to R1 600m³. The current industry dimensions therefore serve as an effective import barrier.

4.3.

CONTRIBUTION TO THE ECONOMY

This section discusses the value add for the sawmilling sector. The value add was determined for the different categories of sawmills.

Each component of the contribution is discussed in more detail below.

4.3.1.

SAWMILLING CONTRIBUTED R1.3 BILLION TO GDP IN 2003

The estimated contribution of sawmills to GDP presented in this section was derived from a number of data sources (the South African Lumber Index, Crickmay and Associates (2004a), LHA (2004), Horn (2000), Heyl *et al* (2000)) and numerous discussions with industry experts. Based on this data, the direct⁶⁶ contribution of sawmilling to GDP in 2003/4 is estimated at R1 331m.⁶⁷ The outline of the calculation of overall contribution to GDP is shown in Table 22.

Sawmilling value added and share in GDP (at basic prices)	R/m
Value of production ⁶⁸	3 218
Less: Total input costs ⁶⁹	2 190
Plus: Remuneration ⁷⁰	304
Sawmilling GDP, 2003/04	1 331
Sawmilling as % of Manufacturing GDP, 2003	0.6%

Table 22. Contribution to GDP by sawmilling, 2003/04.

Source: Genesis's own calculations based on various data sources⁷¹

Sawmilling represents 0.6% of manufacturing GDP. Large mills account for the biggest proportion of value added – mostly concentrated in Mpumalanga and KZN. Micro and small mills contribute the largest proportion of their GDP in the Eastern Cape

Of the R1 331m contribution to GDP, approximately R304m is estimated to accrue to labour in the form of remuneration. The available data did not allow the separation of the value paid to government in the form of taxes from remuneration or the overall value accruing to company profits and owners of capital.

Table 23 below shows the breakdown of contribution to GDP by region and mill category⁷². It is interesting to note that these estimates suggest that micro and small mills contribute a larger proportion of GDP to the Eastern Cape than for the other provinces. This corresponds with the findings of our research, which suggests that the micro mill industry in the Eastern Cape is more active than in the other provinces. The additional benefit of this is that these micro mills are in a position to utilise wood from DWAF category B plantations as it may overcome some of the transport and infrastructure problems. This, in turn, may open up opportunities to use waste fibre for the production of charcoal (not currently the case in these plantations). This opportunity is explored in the growth scenarios for the Eastern Cape discussed in Section 12.

⁶⁶ This does not take into account indirect or induced contributions to GDP.

⁶⁷ See Section 4.4 in the Technical volume for details of the calculation and underlying estimates.

⁶⁸ Value of production is estimated by multiplying total production with the sales price of sawn timber. The value of woodchip sales to pulp mills was also included. See Section 4.4 in the Technical volume for details of this calculation.

⁶⁹ Total inputs costs were derived by multiplying timber inputs with log prices. Additionally, an estimate of non-timber inputs was calculated and added. See Section 4.4 in the Technical volume for details of this calculation.

⁷⁰ Wage per day data was obtained and multiplied with employment data obtained from Crickmay and Associates – see Section 4.4 in the Technical volume (Part III of this report) for more details.

⁷¹ See the Section 4.4 in the Technical volume for more information on the various data sources used.

⁷² See Section 4.4 in the Technical volume for details of the calculations.

Region	Category			Total
	Micro	Small	Large	
Mpumalanga, Limpopo & North West	8.04	144.22	486.66	638.92
KwaZulu-Natal	7.14	80.26	227.01	314.41
W. Cape & N. Cape	4.46	25.43	167.54	197.43
E. Cape, S. Cape and Border	21.43	59.19	99.96	180.58
Total	41.07	309.10	981.17	1 331.34

Table 23. Regional contribution to GDP in R/m for sawmills by mill category (2003)

Source: Genesis Analytics calculations based on industry data and interviews

4.3.2.

SAWMILLING DIRECTLY EMPLOYS 20 000 MOSTLY UNSKILLED WORKERS

Different estimates on employment exist for the sawmilling industry. Whilst Crickmay and Associates report over 20 000 workers, DWAF (2004a) reports that 30 000 people are employed in the industry. In this analysis it was decided to use the Crickmay data and it is important to note that the remuneration level for the industry would be substantially higher if DWAF employment data were used (and by implication the total contribution to GDP calculated would also be higher). The average wage per day in large mills is R85⁷³, which amounts to R255m per year in salaries for mostly low to semi-skilled workers. Adding wages of close to R50m for small and micro mills brings the total wage bill to more than R300m. If the DWAF employment data was applied, remuneration increases to R550m⁷⁴. Importantly, the labour employed in this sector is mainly unskilled or semi-skilled, who tend to have limited opportunities for employment.

4.3.3.

SAWMILLING CONTRIBUTES SUBSTANTIALLY TO REGIONAL ECONOMIES

Sawmilling contributes substantially to regional development as can be seen from the regions in which this sector is active. Production occurs in areas in need of development such as the Eastern Cape, Border and the Northern Cape. Table 23 highlights this involvement, and provides an indication as to the extent to which sawmilling contributes to regional economies.

The social impact of the sawmilling sector is immensely important. In many instances, sawmilling, and especially small scale sawmilling, is the only source of employment in rural areas and provides the only source of income to households (Horn 2000). Horn (2000) estimates that in the Eastern Cape alone, small scale sawmilling provides direct benefits to almost 15 000 people⁷⁵.

⁷³ Industry expert.

⁷⁴ See Section 4.4 in the Technical volume for details of these estimates.

⁷⁵ Section 12 provides more detail on development of the Eastern Cape and related issues.

4.3.4. MORE THAN 100 000 PEOPLE ARE DEPENDENT ON SAWMILLING FOR THEIR LIVELIHOOD

As defined for plantation forestry in Section 1.3.4, a rough estimate of an employment dependency ratio (defined as the number of people in a province divided by the number of employed⁷⁶) is applied to derive the approximate number of people dependent on sawmilling employment for their livelihood. In the absence of regional employment data, a conservative employment dependency ratio of 5⁷⁷ is assumed and applied to the total employment data provided in the Lumber Milling Index. This suggests that the total number of people dependent on sawmilling for the livelihood exceeds 100 000.

4.3.5. SAWMILLING INCURRED AN ENVIRONMENTAL COST OF R133.8 MILLION IN 2003

The main impacts identified for sawmilling are related to the energy use from kiln drying, water pollution, air pollution from dust and generated energy, solid waste and the risk of using preservatives (Du Toit and Gibbs 2000, Currie 2000, Wessels 2004). According to the CIR-Environmentek analysis, the net environmental costs associated with solid wood processing amount to R133.8m. This represents 10% of the total value added calculated for sawmilling.

Impact of sawmills	Estimated net environmental cost (Rm)
Energy total	34.5
Water quality	Not Quantifiable
Landfilled waste	92.2
Total air emissions	7.2
Total environmental cost	133.8

Table 24: Baseline results for sawmills in Rm
Source: CSIR-Environmentek research.

The biggest quantified impact is that of landfilled waste. Not all waste is landfilled as much of the wood waste is provided as inputs into pulping or timber board or used for energy creation. The impact calculated here is based on the remaining amount of waste to be landfilled.

Impacts not quantified: A short-coming of the environmental analysis was the inability to quantify the impact on water quality as shadow prices were not available. It has been argued that sawdust leaches from sawmills and runs into rivers, subsequently releasing compounds such as cresols and phenols that can increase the acidity of soil and water and affect the biological functioning of both terrestrial and aquatic organisms if the level of pollution is significant (South African

⁷⁶ See section 1.3.4 for a discussion on this measure.

⁷⁷ As shown in Section 1.3.4 most of the provinces in which sawmilling occurs has higher dependency ratios.

River Health Programme 2001)⁷⁸. Potential effects on aquatic organisms include the effects of toxicity and oxygen depletion on fish mortality (Joubert 2005).

DWAF has recognised that sawdust leaching into water bodies may impact on water quality (Gravelet-Blondin, 2005)⁷⁹. However, it is not known whether sawdust leaching into rivers from sawmills occurs in the industry in general, or whether it has only occurred in isolated cases. Since legislation controls where sawmills are allowed to dispose of their waste, it is expected that the environmental impact of leaching of sawdust into water bodies will be limited.

Subtracting the environmental costs from the value added as calculated for sawmilling, the net benefits (excluding unquantifiable social costs and benefits) amount to R1.2bn.

⁷⁸ Upon breaking down, sawdust produces a brown leachate, indicating the presence of lignin, which affects the quality of both ground and surface water by increasing COD levels. Whether this impact is significant is unclear.

⁷⁹ As far as could determine, DWAF has not attempted quantifying this impact.

5. NET CONTRIBUTION OF TIMBER BOARD

5.1. SUMMARY OF FINDINGS

The timber board market plays an important role in the building and furniture industry. It is highly concentrated with only a few players. However, opportunities for growth exist, and entry barriers are not insurmountable, as shown by the high likelihood of a new entrant into the market. Furthermore, a significant amount of people are employed in the industry at a relatively high industry average wage, with most employment opportunities created outside of metropolitan areas.

Due to data limitations, the extent of the environmental impact of the timber board industry was limited and had to employ shadow prices and impact coefficients from the solid wood processing sector. Some impacts were adjusted for timber board production, but not all possible impacts (such as chemicals used as binding agents) for the timber board production were included in the analysis due to a lack of data. However, even if these unmeasured impact values were included, it is not foreseen that the industry's environmental impact will negate the large economic contribution in GDP terms as well as employment (with subsequent positive social impacts) by the industry.

In 2003, timber board production:

- contributed R848m to GDP at an estimated environmental cost of R15.6m (net contribution of R832.4m);
- contributed 0.39% to manufacturing GDP;
- employed an estimated 6 000 people.

Impact component	Timber board
Economic impact by counterparty	848
Owners of capital/company profit	384
Government	16
Labour	448
Rest of Society	n/a
Maximum quantifiable environmental impact (CSIR estimate) (impact on rest of society)	-15.6
Net impact	833
Employment generated	6,000
Net foreign exchange earned	Not significant
Social impact	Relatively large wage bill with high wages paid
	Involved in corporate social investment supporting schools and constructing a creche
	Very high recovery rate; thus limited solid waste costs to the environment
Environmental notes	Impact on water quality not quantified but expected to be limited
	Utilises wood waste

Table 25. Summary of timber board contribution to the South African economy

Source: Genesis research

5.2.

OVERVIEW OF THE MARKET

Sawmilling wood waste and woodchips are used to manufacture timber board, of which the two main products are particle board and fibre board.

Timber board refers to a wide range of products that are made by compressing woodchips and other wood waste products into a condensed panel by using heat and pressure. The fibre inputs for timber board production are received from various sources, with sawmilling wood waste and woodchips being the main sources. In addition, two major fibreboard producers (Masonite and PG Bison⁸⁰) have access to plantations which are used as a source of virgin fibre in the production process, whilst other firms source virgin fibre from other plantations close to their production plants.

Types of Products: Two main types of timber board products can be identified. These are particle board (also known as chipboard) and fibre board, with the latter being subdivided into medium density fibreboard (MDF), hardboard and insulation board (Forestry Insights, 2004). Particle board is produced from wood processing waste and are mainly used for structural purposes such as wall bracing and flooring. Larger particle boards are also used for wall lining and café tabletops. MDF is principally used in the furniture and joinery industry. Hardboards are used for exterior cladding (e.g. outer walls of buildings), panelling and furniture whilst insulation boards are used for cladding in buildings for thermal insulation.

Market players. Four main producers of timber board products can be identified (LHA, 2004:14): Masonite, PG Bison (100% owned by Steinhoff), Sonae Novobord and Chipboard Industries (CIT)⁸¹. Three of these produce particle board (PG Bison, Sonae and CIT), PG Bison and Sonae are the only producers of MDF and Masonite is the only producer of hardboard and insulation board in South Africa (Competition Tribunal, 2004).

There are 4 main producers and vertical integration with fibre supplies as well as downstream buyers is common. Prices are set annually and import parity pricing is implicit.

Vertical integration: PG Bison and Masonite are vertically integrated with upstream providers of inputs as well as downstream buyers of products. The recent merger between PG Bison and Steinhoff has increased the extent of vertical integration. Before the merger, Steinhoff owned approximately 7 000 ha of plantations (mostly located in the Southern Cape); four sawmills which produces sawn timber, treated poles, cable drums, furniture and doors from high quality timber as well as bedding bases and furniture frames from lower quality timber. Steinhoff is also regarded as the largest furniture manufacturer in South Africa (PG Bison, 2004 and Steinhoff, 2004). In addition to timber board manufacturing, PG Bison, in turn, also have shares in Timbercity (70%) and Pennypinchers (100%), both of whom are distributors of board and other timber products. Following the investigation into the merger by the Competition Commission, it was found that despite the fact that the merger increases vertical integration, it does not negatively impact on the competitiveness of the market (see Section 4.6 in the Technical volume for details of the Commission's findings).

Pricing Mechanism: Prices between individual suppliers and buyers are set annually by negotiation between the various role-players, ranging from timber

⁸⁰ Through PG Bison's parent company Steinhoff, who owns plantations.

⁸¹ CIT is also known as Magna Board.

board manufactures to the users of timber board products such as furniture producers. Furthermore, volume based discounts are viewed as important in ensuring competitive pricing by market participants (Competition Tribunal, 2004). It appears that the industry sets prices at close to import parity levels (imported particle board and MDF have been reported as being “within cents of the going PG Bison price” (Competition Tribunal, 2004).⁸². Discussions with various industry experts also confirmed that domestic and imported prices are similar.

5.3. CONTRIBUTION TO THE ECONOMY

The size and impact of the timber board sector on the South African economy is relatively high, given the limited nature of domestic production.

5.3.1. THE TIMBER BOARD INDUSTRY CONTRIBUTED AN ESTIMATED R848M TO GDP IN 2003

Sufficient information to estimate contribution to GDP was only found for one firm. In order to derive a rough approximation of the contribution to GDP by the industry, the assumption was made that the costs structures are similar for all firms in the industry and, therefore, that the value added as a percentage of total sales would be similar for other firms in the industry.

Timber Board value added and share in GDP (at market prices)	R/m
Value of production ⁸³	1 074.47
Less: Total input costs ⁸⁴	690.41
Plus: Remuneration ⁸⁵	447.78
Plus: Taxes	16.35
Timber board GDP, 2002/03	848.18
Timber board as % of Manufacturing GDP, 2003	0.4%

Table 26: Timber board Value added and share in GDP for 2003

Source: Genesis Analytics Research

Using FES (2004a:112) data⁸⁶ for 2002/2003 that provides the value of sales for the timber board industry, the aforementioned proportion data was applied to determine the value add for the industry. Based on this the contribution to GDP by the timber board industry for 2003 is estimated to be R848m. It is important to note that remuneration forms almost 53% of this value.

⁸² It is thought that the imported price referred to here is the landed import price, i.e. including transportation costs. Enquiries from timber board sellers also indicated that imported products are generally cheaper than domestically produced products.

⁸³ Value of production is estimated by multiplying total production with the sales price of sawn timber. The value of woodchip sales to pulp mills was also included. See Section 4.6 in the Technical volume for details of this calculation.

⁸⁴ Total inputs costs were derived by multiplying timber inputs with log prices. Additionally, an estimate of non-timber inputs was calculated and added. See Section 4.6 in the Technical volume for details of this calculation.

⁸⁵ Wage per day data was obtained and multiplied with employment data obtained from the South African Lumber Mill Index by Crickmay and Associates – see Section 4.6 in the Technical volume (Part III of this report) for more details.

⁸⁶ FES (2004a) reports that they include the whole timber board industry in the data provided.

This may be overestimated if the firm used as basis for the calculations produces timber board products of a higher value than the average industry product. This is possible since the firm on which the calculations are based produces higher quality timber board products. Unfortunately it is difficult to estimate the extent to which this happens, but it is believed that the error margin is relatively minor since most firms (bar Chipboard Industries) in this industry provide higher value added timber board products.

5.3.2. THE TIMBER BOARD INDUSTRY EMPLOYED BETWEEN 5 400 AND 6 000 MOSTLY LOW-SKILLED LABOUR

It is estimated that between 5 400 and 6 000 people are employed in the timber board industry of which most jobs are outside of the major metropolitan areas. The bulk of this figure is comprised of low skilled labourers with a smaller number of relatively skilled labourers employed to operate the machinery (e.g. forklifts) within timber board plants. The overall wage bill is estimated to be between R400m and R450m per year⁸⁷. This reflects quite a high proportion of the total VAD calculated at almost 53%. The reason for this is the high wages and the high level of employment, given the limited amount of timber board plants. On average, each plant employs 600 labourers.

5.3.3. OTHER CONTRIBUTIONS TO THE ECONOMY AND THE ENVIRONMENTAL IMPACT

In addition to the above, some timber board firms are involved with community projects. Masonite, for instance, have provided communities with classrooms, boreholes, crèches, computer equipment and clinics (Masonite, 2003a). Masonite also gave a light duty vehicle or van (LDV) to a chief of a tribe as a "sign of goodwill between neighbours" (Masonite, 2003b).

Impact of Timber Board processing	Estimated net environmental cost (Rm)
Energy total	6.7
Water quality	Not Quantifiable
Landfilled waste	7.1
Total air emissions	1.8
Total environmental cost (Rand)	15.6

Table 27: Baseline results for timber board production in Rm

Source: CSIR-Environmentek and Genesis Analytics research

Due to data limitations, the extent of the environmental impact of the timber board industry was limited and shadow prices and impact coefficients from the solid wood processing sector had to be employed in the analysis. Some impacts were

⁸⁷ Note that the wage bill was calculated using the average wage bill for one of the firms in the industry and the timber board employment figures as found by DWAF (2004a) and Crickmay and Associates (2004b:6). If the average wage for the aforementioned firm is higher than the industry average, then the industry wage bill should be adjusted downwards.

adjusted for timber board production (such as energy use), but not all possible impacts (such as chemicals used as binding agents) for the timber board production were included in the analysis due to a lack of data. However, even if these values were included, it is not foreseen that the industry's environmental impact will negate the large economic contribution in GDP terms as well as employment (with subsequent positive social impacts) by the industry. The net impact on the environment is estimated to be R15.6m, with the main results presented in Table 27 above.

Subtracting the environmental costs from the value added as calculated for timber board production, the net benefits (excluding unquantifiable social costs and benefits) amount to R832m.

6. NET CONTRIBUTION OF MINING TIMBER

6.1. SUMMARY OF FINDINGS

The mining timber sector operates in a similar manner to the sawmilling sector. The industry has declined in importance in the recent past due to improvements in substitute products and mining technologies, as well as a decline in the number of shafts. Improvements to traditional timber based underground mining support products have reduced the demand of mining timber. This is reflected in the decline in the number of mining timber mills in South Africa. The environmental impact of mining timber is similar to that of the sawmilling industry, but on a smaller scale due to the size of the industry.

In 2003, mining timber production:

- Contributed R75.4m to GDP at an estimated environmental cost of R25.4m (net benefit of R50m);
- Contributed 0.035% to manufacturing GDP; and
- Employed between 500 and 2200 people

Impact component	Mining timber
Economic impact by counterparty	90
Owners of capital/company profit	71
Government	included in profit and labour
Labour	18
Rest of Society	n/a
Maximum quantifiable environmental impact (CSIR estimate) (impact on rest of society)	-25.4
Net impact	64
Employment generated	2,200
Net foreign exchange earned	Not significant
Social impact	Employs relatively unskilled labour
	Industry declining with potential negative social impacts
	Some mills provide their waste products free of charge as inputs to other community production process (firewood, inputs for pallets, etc.)
Environmental notes	Impact on water quality not quantified but expected to be limited

Table 28. Impact of the mining timber industry on the South African economy.

Source: Genesis research.

6.2. OVERVIEW OF THE MARKET

The mining timber industry is very similar to the sawmilling industry with regard to processes and it played an important role in the initial stages of plantation development in South Africa. Currently, the sector is stagnant, and presents no opportunity for growth.

Though historically an important industry, demand for mining timber has decreased recently.

The mining industry requires timber as structural supports in mines, creating the opportunity for mining timber mills and, in fact, was one of the primary reasons for the initial establishment of plantation forestry in South Africa by the government. However, mining timber applications have declined substantially during the past two decades. Intake volume by the primary processing plants peaked in 1984/85 at 3 149 098 m³, but this has dropped to 564 922 m³ in 2001/02 (FSA, 2003). The main reason for this is that timber props and packs have been replaced with hydraulic and mechanical props (LHA, 2004:13). The mining industry is also making greater use of backfilling techniques and, therefore, has less need for mining timber. The bulk of timber that was previously used for mining purposes is now exported as woodchips.

The industry can subsequently be described as a stagnating. However, the optimisation of waste products from mining timber mills may still represent an area of growth for related industries such as charcoal producers and pallet producers.

6.3. CONTRIBUTION TO THE ECONOMY

In this section, the size and impact of the mining timber industry is determined by analysing the nature of employment and the contribution to GDP by the industry. Total sales and total value of timber input data was obtained from FES (2004a) for 2002/2003, whilst the non-timber data was obtained by applying the same cost structure applicable for small sawmills onto mining timber mills⁸⁸ and using employment data provided by DWAF (2004a) and Crickmay and Associates (2004b).

Estimates of average wages for mining timber employees as well as the number of employees varied substantially between DWAF and Crickmay. This resulted in the estimates of total remuneration varying between R4.2 million and R18.5 million per annum. As there was not reliable basis to judge accuracy, the contribution to GDP was estimated for both figures.

⁸⁸ Note that a recovery rate of 82% was applied where applicable. This average was obtained from FSA's Forestry and Forestry Products Industry Facts (2003). Industry experts concurred with this view.

Mining timber contribution to GDP	R million (using DWAF employment data)	R million (using Crickmay employment data)
Total Value of output-total value of inputs	71.20	71.20
Remuneration	4.20	18.48
Total contribution to GDP	75.40	89.68
Mining timber as % of Manufacturing GDP, 2003	0.04%	0.04%

Table 29: Mining Timber Industry contribution to GDP for 2002/2003

Source: Genesis Analytics Research

Mining timber contributes between R75m and R90m to GDP and comes at an environmental cost of R25m.

Employment: In terms of total numbers, two disparate estimates were obtained. DWAF (2004a) reports that 500 people are employed in the mining timber industry, whereas Crickmay and Associates (2004b) report that 2 200 people are employed in the aforementioned industry. Skill levels required in this industry is similar to that of the sawmilling industry. In addition, mining timber mills employ people in areas where few alternative employment opportunities exist.

From Table 29 above, the contribution to GDP by the mining timber industry is estimated to range between R75 million and R90 million, depending on the employment data used in the calculation.

Impact of mining timber processing	Estimated net environmental cost (Rm)
Energy total	8.9
Water quality	Not Quantifiable
Landfilled waste	14.6
Total air emissions	1.9
Total environmental cost	25.4

Table 30: Baseline results for mining timber in Rm

Source: CSIR-Environmentek

The impact of the industry on the environment is similar to that of the sawmilling industry; subsequently the impact coefficients and shadow process for sawmilling were applied to the mining timber industry, with the total environmental cost estimated to be R25.4m (see Table 30 above).

Subtracting the environmental costs from the value added as calculated for mining timber production, the net benefits (excluding unquantifiable social costs and benefits) amount to R50m.

7. NET CONTRIBUTION OF TREATED POLES

7.1. SUMMARY OF FINDINGS

Poles are one of the more valuable smaller and lesser known roundwood products. Poles are used in a variety of ways including retaining walls, marina poles, building foundations, transmission, telephone, agricultural and electricity poles. A number of treating plants are found throughout South Africa, with three large players. Pole treating plants can potentially create employment opportunities in rural areas if local communities can gain access to timber and capital to start processing plants⁸⁹. Environmental costs were calculated, and even though it was relatively large, it was found that pole production still has a net benefit to the economy.

In 2003, pole production:

- Contributed R80.49m to GDP at an environmental cost of R32.1m (net benefit of R48.38m);
- Contributed 0.022% to manufacturing GDP;
- Employed 5 000 people

Impact component	Treated poles
Economic impact by counterparty (Rm)	
Owners of capital/company profit	80.49
Government	n/a
Labour	30.25
Rest of Society	n/a
Maximum quantifiable environmental impact (CSIR estimate) (impact on rest of society) (Rm)	-32.1
Net impact (Rm)	48.38
Employment generated	5000
Net foreign exchange earned	Not significant
Social impact	Can operate in rural areas
	Relatively large employer relative to output.
	Small business (and thus broad based BEE) potential, BUT capital requirements may prevent new plants from developing in rural areas
Environmental notes	Impact on water quality not quantified but due to size of industry impact on industry impact is expected to be limited

Table 31. Impact of the treated pole industry on the South African economy.

Source: Genesis research

⁸⁹ LHA (2003a) reports that demand for poles will potentially increase in the foreseeable future.

7.2. OVERVIEW OF THE MARKET

There are 41 pole treating plants in SA. The largest players do not dominate the market.

According to FSA (2003), there were 41 pole treating plants in South Africa in 2001/2002. The three largest players are Thesens, Woodline (owned by Steinhoff) and Boland Wood Industries (LHA, 2003a). The market is highly competitive with the big suppliers under pressure from large customers and alternative pole products made from concrete and steel.

Furthermore, the three largest players face competition at a regional level, and are not always the dominant player in specific regions. For example, Shefeera Timbers is the largest pole manufacturer in the Limpopo province, whilst Natal Forest Products is the largest pole manufacturer in KZN. In the EC, there are two large players, namely Highbury Treated Timbers and Harding Treated Timbers. Although these firms may not be large national players, they are competitive in their specific regions (LHA, 2003a).

7.3. CONTRIBUTION TO THE ECONOMY

In this section, the size and impact of the pole industry is determined by analysing the nature of employment and the value added of the industry. Various data sources were used. Labour employment data was acquired from DWAF (2004a) and Crickmay and Associates (2004b). The labour data, although different, were similar enough for the VAD to be calculated only using the official data as presented by DWAF. LHA (2003a) provided timber input data for both national and regional levels. The remaining revenue and cost data proportions were obtained from LHA (2003a)⁹⁰ and the South African Wood Preservers Association (Sawpa)⁹¹. These proportions were then simply applied to the national and regional level input data. The assumption was thus made that the cost structures of pole manufacturers across regions are similar.

7.3.1. TREATED POLES EMPLOYED 5,000 MOSTLY LOW-SKILLED PEOPLE IN 2003

According to DWAF (2004a), the pole industry employs 5,000 people⁹². Skills levels required are fairly low, and employment in rural areas can be achieved through pole production. The average wage paid to employees is R6,050 per annum. In total, remuneration for the industry amounts to R30.25m. Although small relative to other industries, the importance of the low skill employment creation adds weight to the impact that employment in this sector has. Regionally, the Western and Southern Cape appears to be the most important region in terms of remuneration.

⁹⁰ The recovery rate applied in the analysis was obtained from LHA (2003a). The figure compared favourably with the historic recovery rate calculated using FSA's Forest and Forest Products Industry Facts 2003. However, the recovery rate used can be viewed as conservative since the recovery rate for the past few years

⁹¹ The average sales price of poles (R831 for 2003) was provided by Sawpa.

⁹² Crickmay and Associates (2004b) report that 5,800 people are employed in the pole industry.

7.3.2.

TREATED POLES CONTRIBUTED R80M TO GDP IN 2003

The value added by pole manufacturers is presented in Table 32 below. National value added for the pole industry amounted to R80m, whilst the region where the greatest value addition in net terms took place was the region with the greatest pole supply, namely the Western and Southern Cape. Given that DWAF plantations are underutilised and since it has been reported that there is an undersupply of poles (LHA 2003a), it can be expected that regions with DWAF plantations will increase their supply of poles if the aforementioned plantations are run more productively. This bodes well for regions such as the EC, Limpopo and KZN where DWAF plantations are located.

VAD for Pole Manufacturing	National	Limpopo	Mpumalanga	KZN	EC	W.&S. Cape	Other
Total value of outputs- total value of inputs	50.24	4.35	9.65	5.76	9.51	20.23	0.74
Employees	5000	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Remuneration	30.25	2.62	5.81	3.47	5.73	12.18	0.44
Total VAD	80.49	6.98	15.45	9.23	15.24	32.41	1.18

Table 32: VAD for the Pole market on a National and Regional level 2003

Source: Genesis Analytics Research

7.3.3.

ENVIRONMENTAL COST

The environmental cost, estimated at R32m, does not include water quality impacts, but the CSIR found that these impacts can be minimised.

The environmental costs for pole manufacturing can be split into two different components; firstly, the environmental costs attached to producing poles, and secondly, the exposure of the treating chemicals used in pole production (creosote and CCA) to aquatic environments (note that this exposure refers to a point in time after the treated pole has been sold). As found by the CSIR, risk of exposure can be minimised through the proper treatment and sealing of wood products. The first environmental cost component is presented in Table 33 below; with the total environmental cost for the treated pole sector amounting to R32.1m.

Impact of treated pole production	Estimated net environmental cost (Rm)
Energy total	7.0
Water quality	Not Quantifiable
Landfilled waste	23.6
Total air emissions	1.5
Total environmental cost	32.1

Table 33: Baseline results for treated pole production in Rm

Source: CSIR-Environmentek

Subtracting the environmental costs from the value added as calculated for treated poles, the net benefits (excluding unquantifiable social costs and benefits) amount to R48.38m.

8. NET CONTRIBUTION OF CHARCOAL

8.1. SUMMARY OF FINDINGS

Although the charcoal market is minor in comparison with other segment of the commercial plantation value chain, it does hold potential since it is ideal for SMME development. Low levels of capital inputs, limited technical knowledge and the use of unskilled labour requirements make it possible that charcoal can be produced in rural areas. Furthermore, timber inputs can be sourced from non-commercial plantations and waste timber from activities such as sawmilling can also be used to make charcoal. Charcoal production does have an impact on the environment, but this impact varies and is dependent on the type of equipment employed in the manufacturing process.

In 2003, charcoal production:

- Contributed R45m to GDP
- Contributed 0.02% to manufacturing GDP
- Employed between 3,000 and 6,000 people

Impact component	Charcoal
Economic impact by counterparty (Rm)	45.75
Maximum quantifiable environmental impact (CSIR estimate) (Rm)	Not quantified
Net impact (Rm)	45.75
Employment generated	5500
Net foreign exchange earned	Not significant
Social impact	Community development projects such as Mondi's "black gold" (value included under pulp and paper corporate social investment)
	Employment-intensive relative to output Small business (and thus broad based BEE) potential; with limited capital requirements
Environmental notes	Environmental impact not quantified
	Utilises wood waste as well as other waste products (that contain carbon)

Table 34. The impact of the charcoal industry on the South African economy.

Source: Genesis research.

8.2. OVERVIEW OF THE MARKET

The charcoal industry is characterised by numerous small scale producers, a few brand name producers of household charcoal and a dominant industrial user of charcoal. Even though charcoal contributes only 0.02% to the manufacturing GDP⁹³ of South Africa, it could potentially become a source of income for low skilled, unemployed individuals in areas with high unemployment.

Charcoal results when wood, often waste wood products, or bagasse is partially burned. It is used for industrial and household purposes.

Charcoal is produced when material containing carbon such as wood, bamboo and bagasse is partially burnt or heated while airflow to the charcoal is controlled to prevent the charcoal itself from burning. It is dependent on plantation forestry for the bulk of its inputs, but this link can be described as indirect since charcoal producers do not purchase timber from plantation, preferring to use timber from wild growing sources⁹⁴. It has been estimated that between 136 000 and 205 000 tons of charcoal are produced per year in South Africa.

Outputs: It is estimated that between 136 000 and 205 000 tons of charcoal is produced per annum (Crickmay and Associates, 2004b:27 and LHA, 2004:12). This can be used as an end product itself by both the industrial users and households. The main industrial use is in the production of non-ferrous metals where charcoal is used as a reduction agent. In addition, certain manufacturers convert charcoal to briquettes⁹⁵ and brand them before distribution. In this way, further value is added to the product. It is estimated that the household charcoal market uses 120 000 tons per annum and the industrial market about 85 000 tons per annum. The balance is exported.

8.3. CONTRIBUTION TO THE ECONOMY⁹⁶

Charcoal makes a small relative economic contribution, but has much employment creation potential.

The only data available for the charcoal sector was total sales and volumes of production (LHA, 2003b; LHA, 2004) and it was, therefore, not possible to derive accurate estimates of the contribution to GDP by this sector. As an illustration, Table 35 below provides an indication of the potential contribution of this sector to GDP based on assumptions on proportion of value added relative to total sales. Based on this analysis the contribution to GDP falls between R30 million and R90 million or between R15 and R45 per cubic metre of wood inputs.

⁹³ Using R45m as the contribution to GDP for charcoal production.

⁹⁴ Mainly due to fact that inputs from this source can be obtained with limited costs.

⁹⁵ Charcoal briquettes are produced by crushing charcoal and mixing in additives, such as nitrates (to make them burn better), and clays and starches (as binders to allow pressing into the traditional shape) and other materials.

⁹⁶ No environmental impact was quantified, as preliminary investigations by the CSIR-Environmentek showed the South African charcoal industry's environmental impact to be negligible.

Estimate of value added as proportion of total sales	Total Value Add (Rm)	Rand per cubic metre of wood inputs
10%	30.50	15.25
15%	45.75	22.88
20%	61.00	30.50
25%	76.25	38.13
30%	91.50	45.75

Table 35. Estimated contribution to GDP by the charcoal industry for 2003

Source: Genesis Analytics Research

In terms of contribution to employment, a typical small-scale contractor employs between 30 and 40 people (LHA 2004). This leads one to conclude that small-scale contractors alone employ between 4800 and 6400 people, which is in line with other industry estimates of 5 500 (Crickmay and Associates 2004b) but higher than the DWAF estimate of 3000 (2004a) for the charcoal segment of the forestry industry. Applying the labourers required per ton produced measure on other industry sources and individual firms (between 30 and 40 tons per labourer) indicated that the LHA employment data at 34 tons per labourer could be more accurate than that of DWAF at 68 tons per labourer, whilst the Crickmay and Associates data may be overly pessimistic on the output produced, resulting in a figure of 25 tons per labourer. However, further investigation may be required to provide a more accurate employment figure. No data was available on wages in this sector.

PART B: OPPORTUNITIES,
OBSTACLES AND REGULATORY
REGIMES

9. THE OPPORTUNITIES FOR AND POTENTIAL IMPACT OF FURTHER DEVELOPMENT

Demand for wood fibre and wood-based products will increase in line with economic growth. The analysis of the market dynamics in each value chain component suggests that the demand for wood-based products will continue to increase in line with domestic and international economic growth and that there are, therefore, opportunities for expansion. In addition, specific opportunities exist where new markets are opening up for specific products (e.g. woodchips to China) and South Africa is in a good position to tap into the increased world demand for certified fibre. In terms of sawn timber, a shortage is expected due to increased demand in the construction and furniture sectors.

Domestic processing relies largely on domestic plantations⁹⁷. Even though some imports of inputs are possible, it is unlikely that the industry can exist only on imports. It certainly would not have been established in its current form in the absence of a domestic fibre base as production efficiencies demand that production be located close the fibre source or close to the market. Beyond production for the domestic market, a model of importing fibre and exporting final products would, therefore, be inefficient.

For the current established pulp and paper industry, it may be possible to supplement production with imported fibre in order to fully utilise capital investments. Analysis of the various value chain components and discussions with industry players, however, suggest that supporting a domestic industry with imported wood or fibre is not feasible under the current market conditions and pricing. Although imported fibre can, therefore, be used to supplement the domestic inputs, it is questionable whether this will result in a substantial permanent production expansion as it would be more efficient to move the production closer to the source of fibre in the longer term. This is particularly the case as the pulp and paper companies in South Africa form part of global operations and, therefore, consider investment decisions in the global context⁹⁸.

Domestic plantation expansion. The domestic virgin fibre resource can be expanded by improving yields and/or extending the plantation area. Although some improvements in yields on existing plantations are still possible, industry players suggest that the bulk of improvements have been realised. In terms of plantation area, forestry has grown rapidly in South Africa in the past, but there has been a marked decrease in the expansion of plantation area over the last 10 years and land availability for further afforestation is limited. Although it may be argued that

⁹⁷ Conversely, domestic plantation forestry also relies on the domestic processing industry. In short, the two segments of the value chain are intricately linked and interdependent and strategies to promote the one cannot be regarded in isolation of the other.

⁹⁸ Other factors impacting the growth potential of the South African pulp and paper industry, such as skilled labour availability, water quality considerations and the potential for technological improvements that will make more recycled fibre based production possible, are discussed in the Market Analysis document (Part II of this study), Section 3.

this is partly due to regulatory barriers, the fact remains that, even without such barriers, economically viable plantation expansions would ultimately be constrained.

- Climatic conditions limit the area suitable for plantation expansion. Of the possible area (with rainfall in excess of 80mm per annum), large parts are topographically unsuitable due to the steep gradient at which plantations would have to be established and the associated high costs of planting and harvesting;
- Sufficient water for establishing a plantation may not be available in a specific area;
- Areas suitable to forestry may not be within cost efficient reach of processing facilities, partly due to a lack of proper infrastructure; and
- Even if the above conditions are met, land may be tied up in other uses, it may be environmentally sensitive, better suited to agriculture or the land owners may simply choose not to establish plantations.

The result is that the only provinces identified for further new afforestation is Kwazulu-Natal (KZN) and the Eastern Cape (EC). Current estimates suggest that approximately 100,000 ha (7% increase of the existing plantation area) is available for afforestation in these provinces. This section will, therefore, focus on the development opportunities stemming from an expansion of plantation areas in the EC and KZN.

Although it is argued that importing fibre from neighbouring countries is a viable basis for long-term expansion in the South African processing industry, it does present some opportunities and this will be reviewed as well.

10. THE EASTERN CAPE OPPORTUNITY

10.1. INTRODUCTION

The Eastern Cape (EC) is one of the poorest and least developed provinces in South Africa. Rural unemployment is high and job opportunities are limited. It is therefore reasoned that forestry can potentially be strategically important for development in the region since it can facilitate development as well as create job opportunities in rural areas.

According to DWAF (2004), the EC has approximately 175,000ha of commercial forestry plantations. 90% of all plantations in the EC are estimated to be pine, whilst the remaining 10% are hardwoods⁹⁹. In terms of ownership, Singisi Forest Products has the greatest share of afforested area at 32%, followed by North East Cape Forests (20%), Mountain to Ocean and DWAF category B and C plantations (18%), and Amatola Forestry (9%). Except for the DWAF plantations these plantations are mostly focused on sawmilling and timber board production and grow long rotation pine. The dominance of pine is explained by the fact that Singisi Forest Products, Mountain to Ocean and Amatola were all three SAFCOL and DWAF packages that were privatised in the last 5 years or are in the final stages of being privatised.

The Eastern Cape hosts about 13% of SA's plantations. 90% of all current EC plantations are pine and most plantations have a state-owned legacy. It is estimated that about 60,000ha is available for new afforestation.

Based on the area of land available, the EC has been identified as the region with the largest potential for commercial forestry plantation expansion. Three potential areas of expansion have been identified:

- New afforestation on between 40,000ha and 80,000ha of land that has been identified as suitable to plantation forestry;
- Conversion of 10,000ha of wattle jungle areas to managed plantations through the yield enhancement programme; and
- Rehabilitation and improved utilisation of DWAF Category B plantations.

The next sections will review each of these opportunities, consider the most likely scenarios for development, quantify the potential impact on the economy and review the obstacles faced.

Expected environmental impacts. The scope of the current study did not allow a full environmental analysis of the proposed development opportunities. However, the findings of the industry's impact suggest that it is unlikely to result in environmental costs disproportional to the benefits provided. In addition, the process through which the potential plantation areas in the EC and KZN were defined included a preliminary assessment of environmental impacts. The result is that the areas identified are those where environmental costs are considered to be acceptable. In addition, the process of establishing the plantations still includes checks on the environmental impact before the plantations may be established.

⁹⁹ According to the ECDC (2003:4), the EC currently has 169 000ha of forestry plantations, of which 151 000ha (89%) is pine, with remaining 18 000ha being eucalyptus and wattle (11%).

It must be noted that the scenarios discussed for the EC and KZN are not based on a full business case analysis but simply provide indicative figures of the potential impact of development. Furthermore, the specific scenarios selected are not based on the preferences of the authors but on what is most likely to happen under current conditions. Estimates of impact are calculated at full utilisation (i.e. at the point at which the full area has been developed and is in some form of rotation)

In total, the analysis shows that the utilisation of all three opportunities could create 26,250 employment opportunities at plantation level, 1,708 jobs at processing level and could generate value added of R278m at plantation level and R215m at processing level¹⁰⁰.

10.2.

NEW AFFORESTATION

Based on water availability, current land use and environmental management, the Eastern Cape Development Corporation (ECDC, 2003) estimated that an area of between 40,000ha and 80,000ha is available for new afforestation. As a conservative estimate, this analysis will use 60,000ha in the development of the scenarios¹⁰¹.

In their analysis of the potential opportunity, DWAF identified the following three areas for new afforestation, each with a proposed specie distribution (2004f):

- Mzimkulu – Mzimvubu: estimated total area 35,000ha; with 5,000ha allocated to pine, 25,000ha to eucalyptus (20,000ha long rotation) and 5,000ha to wattle¹⁰²;
- Mzimvubu – Mbashe: estimated total area 15,000ha; with 5,000ha allocated to pine, 5,000ha to eucalyptus and 5,000ha to wattle; and
- Mbashe – Fish: estimated total area 10,000ha; with 5,000ha allocated to pine and 5,000ha to wattle.

DWAF foresees the bulk of new afforestation to be long rotation pine, occurring on communal land. The present analysis however suggests that short rotation hardwood is more likely.

From the above plantation allocation, it is clear that DWAF foresee the bulk of new afforestation to be in long rotation softwood plantations. From conversations with DWAF provincial officials, the preference for long rotation plantations stem from the view that this will facilitate a longer processing value chain in the province and, therefore, create more employment opportunities compared to short rotation plantations. However, this analysis suggests that, under the current market conditions, the establishment of long rotation plantations is unlikely to occur:

- The bulk of expansion will occur on communal land and will, therefore, be achieved through community or small grower schemes. New small or community growers¹⁰³ are not likely or able to wait for 28 years for a return on

¹⁰⁰ R47m of this will actually accrue to KZN processors as it refers to EC fibre supplied to pulp mills in KZN.

¹⁰¹ DWAF uses the same mid-range figure in their review of the opportunities in the EC.

¹⁰² This allocation of land to specific tree species need not be the ultimate allocation. The current allocation was used by DWAF (2004f) and was retained for simplicity. Note that the allocation of specific tree species has implications for beneficiation possibilities.

¹⁰³ It is highly unlikely (the analysis follows in the main text) that the above specie distribution as provided by DWAF will occur if the areas allocated to long rotation species are not sold or leased to sawmilling concerns. Selling to

their investment, nor are they likely or able to accept the risk that such an investment creates.

- The capital investment required for such a long term project may in itself be an insurmountable hurdle. It is unlikely that the small or community growers will be able to generate sufficient capital to fund long rotation plantations.
- The ECDC (2003) reports that the smaller plantations will only be a few hectares in size. Ideally, the size of plantations must be large enough so that an optimal rotation can be obtained. The size of plantation required is directly related to the length of the rotation (i.e. longer rotations will require larger areas)¹⁰⁴. Short rotation hardwood may, therefore, be more appropriate to the smaller plantation areas.
- Under current market conditions, long rotation plantations seem to be less profitable than short rotation plantations¹⁰⁵ (as determined by annual profit potential measures estimated by FES, 2004b).
- Currently, pine plantations are threatened by pests and diseases such as the Sirex Woodwasp and Fusarium. This increases the risk profile of long rotation plantations vis-à-vis short rotation plantations.

Given the problems with long rotation plantations noted above, short rotation plantations reduce the risks of plantation forestry investment and shorten the investment horizon. Short rotation *pine* does however not appear to be a viable option as the rotation age is still quite long at 18 years¹⁰⁶, the national annual profit potential for short rotation pine is currently shown to be negative (FES, 2004b) and some of the pine plantations feeding Sappi Ngodwana are being converted to hardwoods implying that the demand for pine pulpwood from the closest pulping market is declining.

The result of the above is that *short rotation hardwoods* are the most likely to be established. This option has the shortest rotation and has a relatively high annual profit potential (for both eucalyptus and wattle). Additionally, several markets (in the EC and KZN) are available for short rotation timber. It is also more likely that Sappi and Mondi will be willing to establish short rotation hardwood small grower schemes (provided such schemes are within an economical distance of their pulp mills).

10.3.

CONVERSION OF WATTLE JUNGLE TO COMMERCIAL PLANTATIONS

Due to its invasive nature, wattle jungles have formed in areas where it was informally introduced 40 years ago. In order to gain some control over these jungles and reduce its impact on available water, the Forestry Yield Enhancement Guidelines published by DWAF (2005), makes it possible for these wattle jungles to

sawmilling concerns, in turn, does not appear to be a possibility for new afforestation since the only available land is communal land. Hence the implicit assumption is that new afforestation will be run by community grower schemes.

¹⁰⁴ If we assume that the yield of one hectare would provide sufficient income in a year, the optimal size of long rotation pine would be 28ha since the rotation age is 28 years. For *Eucalyptus grandis*, the optimal size would be 10ha.

¹⁰⁵ The profitability of pine production is, however, likely to improve given predicted pine shortages (FSA, 2005).

¹⁰⁶ The rotation age for softwood as pulpwood is 18 years; if softwood were grown to be used for pole production the rotation age is 20 years.

Some 10,000ha of wattle jungles have the potential to be put to sustainable commercial use.

be converted to commercial plantations¹⁰⁷. The rationale behind this initiative is that wattle jungles are already using water, with little or no return. By converting wattle jungles to commercial plantations, some areas of wattle jungle will be removed¹⁰⁸, and this will bring an increase in the water yield (DWAF, 2005). Additionally, the licensing of wattle jungle areas would also provide poor communities with a sustainable wood resource and could provide them with a source of income. Accordingly, special principles have been noted that would facilitate community applications for licences to convert wattle jungles into commercial plantations.

In total, approximately 18,000ha of wattle jungle exist in the EC (Crickmay and Associates, 2004b:11)¹⁰⁹. For the first rotation, approximately ten years, it is estimated that the annual yield would be 64,260m³. Thereafter, as the wattle jungle areas are managed as commercial plantations, Crickmay and Associates estimate that the size would decrease to 10,000ha, yielding an annual crop of 59,500m³.¹¹⁰ Unfortunately, the exact location of the wattle jungle areas in the EC was not ascertained, which limits the analysis of processing options and infrastructure.

10.4.

REHABILITATION AND EFFICIENT USE OF DWAF PLANTATIONS

DWAF still has 27,000ha of mostly pine plantations in the EC. About 7,650ha of DWAF plantation area is currently unplanted and management practices are inadequate. Potential thus exists for yield increases.

DWAF is a relatively large player in the EC, with total plantation holdings amounting to 18% of all current afforestation. The species distribution of the approximately 27,000ha of Category B plantations in the EC is as follows: 16,665ha pines, approximately 3,000ha eucalyptus and 7,650ha are temporarily unplanted. Category C plantations in the EC amount to a total of 7,200ha, of which 6,650ha are eucalyptus¹¹¹.

According to several role players, however, the DWAF plantations are in a poor condition. Rehabilitation costs could, unfortunately, not be determined¹¹². As an indication of management condition, the fact that the unutilised area represents 28% of total plantation area compared with the industry norm of approximately 4%¹¹³ suggests that costs may be substantial.

Improved management could, therefore, increase yields on these plantations substantially. For long rotation pine, the average MAI (mean annual increment) in the EC on DWAF plantations is between 13 and 14¹¹⁴. However, private firms in

¹⁰⁷ Potential buyers will still have to comply with legislation and DWAF protocols.

¹⁰⁸ Trees that are in riparian and other no-plant zones will have to be cleared according to current legislation and best practise.

¹⁰⁹ Crickmay and Associates (2004b) indicate that approximately 47 000ha of wattle jungle exists nationally. After the first rotation of ten years, it is expected that this area will decline to approximately 26 000ha.

¹¹⁰ Crickmay and Associates (2004b) provide the annually yield in tons. Standard industry conversions for wattle pulpwood provided by FSA were used to convert the measurement units from tons to cubic metres.

¹¹¹ Category C plantations were designed to supply the local communities with firewood, building timber and other uses as deemed appropriate. The aim was to reduce the pressure on indigenous forests.

¹¹² DWAF officials noted that they were in the process of determining total rehabilitation costs.

¹¹³ FSA suggested that the proportion of unplanted area should be roughly equivalent to the rotation age; thus for Eucalyptus pulpwood on a ten year rotation would be approximately 10%, whilst pine on a 25 year rotation would be 4%.

¹¹⁴ LHA (2004) reports a MAI of 13 for the Eastern Cape, whilst DWAF (data set provided by DWAF) reports an average MAI of 14.

the Eastern Cape report average MAIs of 15 for pine¹¹⁵. The difference in the pine MAI may be due to site specific factors that impact on growth, but the same explanation cannot be forwarded for eucalyptus. For short rotation eucalyptus, the DWAF plantation average is 10¹¹⁶, whereas the national average for short rotation eucalyptus is 21 (FES, 2004b). As exact information on the annual production was not available, it is estimated that, if MAI is optimised and if the total unplanted area is planted with pine, total annual pine timber yield will amount to approximately 360 000m³ (see Table 36, Section 10.5.2).

Category B and C plantations are to be transferred to communities or companies, but this has not been done yet.

Transfer Policy and Strategy: At this stage, no formal policy has been developed regarding the transfer of DWAF plantations and DWAF is in the process of restructuring their plantations to facilitate the transfer process. In an attempt to improve the commercial viability of DWAF plantations (and thus improve the chances of leasing these plantations as commercial entities), a new classification method was adopted. The reclassification combined Category B and C plantations, with 3 new category types being identified¹¹⁷:

- Group 1 (12,500ha¹¹⁸) – little investment needed to make these commercially viable and, in some cases, an existing customer base is in place;
- Group 2 (10,500ha) – up front investment needed to get into a commercially viable condition and work needed to set up a customer base; and
- Group 3 (9,500ha) – very little commercial value; however, local communities may value these plantations as a source of firewood and building material.

It was suggested that the plantations could even be transferred to local municipalities. This option would only be considered for Group 3 plantations. Some concerns have however been raised regarding transfers to local municipalities¹¹⁹. Local municipalities may not have the capacity and technical expertise to manage the plantations and this may result in even less efficient use of the plantations than is currently the case. On the flipside, it is believed that it would be easier for local communities to hold local municipalities accountable. Some local municipalities have shown interest in DWAF plantations, and the local municipalities that control local plantations may be able to manage the plantations efficiently. However, criteria would have to be established before this option can be considered.

115 Information provided by plantation managers in the region.

116 DWAF data set.

117 In other words, category B and C plantations that are close enough together are lumped together. This increases the financial viability of the package since it is possible to manage the large plantation area in an optimal rotation, even though the whole package may not be continuous.

118 The acreage in brackets refers to the total size of the new category plantation packages for the Eastern Cape only.

119 Through discussions Harrison (2005).

10.5. ESTIMATING IMPACT

10.5.1. POTENTIAL IMPACT OF 60,000HA OF NEW AFFORESTATION AND THE INCORPORATION OF 10,000HA OF WATTLE JUNGLES

Based on the above discussion, it is assumed that new afforestation will occur by using short rotation hardwoods and that 10,000ha of wattle will be converted to managed plantations. In addition, infrastructure constraints and the availability of processing capacity were taken into account in determining the most likely allocation of fibre to various processing options. The following assumptions were made:

- Areas close to the KZN border will sell their timber in KZN rather than in the EC due to a smaller distance and the available market. This means that 17,500ha of the 35,000ha identified in the Umzimkulu and Umzimbuvu area will produce pulpwood for processing at Mondi and Sappi mills in KZN.
- A woodchip plant will likely be built to process a large proportion of the fibre produced. As it is unlikely that these sectors will expand to absorb all the fibre, it was assumed that new processing capacity will be installed and the most likely option is a chipping plant. Due to the volume of wood and capital investment required, it is unlikely that a pulp mill will be established in the near future. The chips may be exported or shipped to processing plants in KZN.
- Of the wood processed in the EC, 80% will be processed by the woodchip plant and 10% each by timber board and treated poles production. This estimate is based on the capacity of timber board (existing and expansions in process) and pole production.
- Site species selection would not preclude hardwoods from being planted¹²⁰;
- Most of the remaining 25,000ha would be within reach of Mthatha, where processing will occur. From the desktop assessment, this seems possible.
- Employment in the small grower schemes/community schemes are based on an average plot size (or effective plot size per individual involved if done in a community scheme) of 4ha and that an additional employment opportunity will be created for every 8ha planted.
- The current output/area ratio will hold for new afforestation.
- The 10,000ha of wattle jungle that has been identified as sustainable by Crickmay and Associates (2004b) would be fully utilised and that similar beneficiation processes would take place.

Based on these assumptions, the total output from new afforestation¹²¹ in the EC will amount to 242,561tons, with the GDP¹²² contribution from afforestation amounting to R127.8million¹²³. An estimated 26,250 jobs will be created at the plantation level.

¹²⁰ This point is only relevant for the 15,000ha of new afforestation that DWAF(2004f) indicated would be available for pine plantations.

¹²¹ Note that this includes the wattle jungle area.

¹²² At basic prices.

¹²³ See Section 4.9 of the technical appendices for details on the methodology employed.

Processing facility	Employment created	Total inputs (tons)	GDP contribution (Rm)
Woodchip plants	11	145,537	60.64
Timber Board Plants	130	18,192	18.37
Poles	121	18,192	3.03
Pulp and paper plants ¹²⁴	49 ¹²⁵	60,640	47.1
Total	311	242,561	129.1

Table 36: Possible Beneficiation Impact on the EC

Source: Genesis Analytics Research

In terms of processing, a total of 311 jobs will be created with a contribution to GDP¹²⁶ of approximately R129m (see Table 36). The employment figure includes 49 jobs that will be created *in KZN* due to the expanded plantation area in the Eastern Cape. The processing of EC fibre in KZN is expected to add R47m of value to the KZN economy through the additional pulp and paper production that will be facilitated¹²⁷. Thus, the net effect of the plantation expansion on the processing side in the Eastern Cape will be 262 jobs created and R82.4m value added.

10.5.2.

THE POTENTIAL ECONOMIC IMPACT OF OPTIMISED DWAF PLANTATIONS

Impact at commercial plantation level. In order to assess the impact of efficiently run DWAF plantations, the annual yield of these plantations needs to be estimated. As actual production data is not available, an estimate of current production is calculated by using the average MAI and planted area¹²⁸ suggesting a current total production of **263,310m³ per annum**, of which 233,310m³ is pine and 30,000m³ is hardwood.

The rehabilitation of DWAF plantations can lead to increased production in two ways: (i) by improving yields of current productions; and (ii) by afforesting current unplanted plantation areas. For the latter, the increased production figure will depend on whether the unplanted area is planted to eucalyptus (which may happen if the plantations are transferred to non-sawmilling concerns) or to pine. The decision on which species to use will depend on the outcome of the transfer process. If the land is transferred to a sawmilling company, the area will be utilised for long rotation softwood. If the land, however, is transferred to communities or other processing concerns, it is less clear. Given the above discussion on the challenges of managing long rotation plantations, it is likely that at least part of the

¹²⁴ This depicts the additional value likely to be added in KZN pulp and paper plants due to the additional plantation area in the Eastern Cape.

¹²⁵ This figure assumes that the same production to employment ratio that is currently valid will apply. This is however unlikely, as the propensity to employ is likely to not increase proportionally to production increase in pulp and paper mills.

¹²⁶ See Section 4.9, Technical manual, for a full explanation of the methodology.

¹²⁷ The fibre that is transported to the KZN is expected to increase growth in pulp and paper production in KZN by 1.2%. Of the total fibre produced by the new afforested areas, 60 640tons is expected to be transported to KZN, with almost 25,000tons of pulp being produced.

¹²⁸ Nonetheless, this does not represent actual production and the estimated current production presented in table 2 below is likely to be an overestimation of actual production given the apparent poor management practises at DWAF plantations.

unplanted area may go to short rotation plantations if it is not sold to sawmilling concerns.

Given DWAF's desire to develop long rotation plantations in the EC, the existing category B provides the best opportunity to do so as it already consist of a substantial stock in some form of rotation. For the receiving party, it may, therefore, be easier to expand the area under long rotation than it will be to establish a completely greenfield plantations. To ensure that this occurs, DWAF could possibly develop or support the development of long rotation plantations in the unutilised area, or as part of the transfer process (particularly, if it is not transferred to a sawmilling concern). For the current analysis (and given DWAF's preferences in the EC) it is assumed that the most likely scenarios for development will be that the area will be utilised for long rotation plantations and this will be used in the rest of the discussion.

Table 37 shows the total increase in production on DWAF plantation based on the increased yield on existing plantations and assuming that the unplanted land will be utilised for long rotation softwood.

Annual Production Category B	Estimated Potential production (m³)
Increased pine production if MAI of current areas is improved	249,975
Increased eucalyptus production if MAI of current areas is improved	63,000
Potential new production based on utilisation of unplanted area under each scenario	114,750
Potential total increase in production	427,725
Increased GDP	R150m

Table 37: Estimated potential annual yield of DWAF Category B plantations

Source: Genesis Analytics; employing DWAF data

Under this scenario (pine afforestation and yield enhancement), current production grows by 62% contributing an additional R150m to GDP. It must be noted that this is the impact once the full development objective has been achieved and will only be realised over the longer term, as yield increases and phase-in of plantation areas into an optimal rotation will take time to implement.

Exact information on the current employment situation on the DWAF plantations is not available but it has been indicated that it is likely to be overstaffed and may, therefore, reduce if management of the plantations is improved. As this is not definite and the potential extent of such a reduction is not clear (no data is available on DWAF employment on these plantations), it will be assumed that employment will remain the same.

Impact on beneficiation. Since the primary assumption is that DWAF long rotation plantations will produce sawn timber, the beneficiation impact focuses on the impact that the fibre from fully planted DWAF pine plantations will have on the sawmilling industry. It is furthermore assumed that the different categories of mills

(micro, small and large) will share in the processing of fibre in the same proportion as their current share of processing in the EC.

	Sawmill category			
	Micro	Small	Large	Total
Quantity Log Inputs (m ³)	84540	111343	148461	340410
Quantity Outputs - Sawn timber (m ³)	37935	53489	71331	162755
Additional Employment	400	480	517	1397
Additional Annual Remuneration (Rm)	0.80	4.03	10.55	15.38

Table 38: Summary of the improved efficiency impact of DWAF plantations on beneficiation

Source: Genesis Analytics Research

Table 38 summarises the impact of the net addition to fibre production if unplanted areas in DWAF plantations are planted and yields are increased to levels similar to that of current private sector plantations in the EC. In total, it is estimated that the annual timber production will increase by 131,415m³ (see Appendix D, Section 4.7 of Volume III of this study for a full explanation of the methodology employed). Based on the assumed beneficiation profile (in proportion to current processing), the quantity of inputs and outputs were determined for each mill category. In total, the DWAF fibre inputs are estimated to lead to almost 163,000m³ of additional sawn timber production. Of this, close to 38,000m³ of sawn timber will be produced by micro mills, almost 53,500m³ by small mills and more than 71,000m³ will be produced by large mills.

Furthermore, 1,397 processing employment opportunities can potentially be created, with 400 of these opportunities occurring in the micro mill category. 480 jobs will be created in the small mill category, as well as 517 jobs in the large mill category. In total, additional annual remuneration will amount to about R15m. The net additional value added will amount to R86m.

10.6.

OBSTACLES TO DEVELOPMENT

The discussion thus far has shown that scope exists to increase timber production in the Eastern Cape by (i) establishing new plantations, (ii), converting wattle jungles to sustainable commercial plantations and (iii) developing and transferring existing state-owned plantations. There are however a number of obstacles facing such developments, the main ones being funding and implementation difficulties, inadequate infrastructure, water scarcity and delays in the SFRA licensing process.

10.6.1.

FUNDING

Funding to support the development of new afforestation and the transfer of category B and C business units, is critical to the development of commercial plantations in the Eastern Cape. At this stage there is no clear strategy as to how new afforestation in communal areas and the transfer of B and C business units will be funded.

EC new afforestation will require upstart funding. Sponsoring forestry companies or government funding, rather than bank loans, seem the most viable options.

Funding required for new plantations. As an indication of the cost of developing 60,000 hectares of new afforestation in the Eastern Cape, DWAF estimated that it will cost approximately R840m over a ten year period¹²⁹ (DWAF, 2004d). It must be noted, however, that this overstates the costs relative to the potential value creation estimated above, as much of the costs included have been factored in to the estimate of value added (e.g. planting costs). Table 39 provides a breakdown of these costs.

Activity	Rm
Facilitation ¹³⁰	60
Planting ¹³¹	300
Operations ¹³²	336
Management	144
Total	840

Table 39: Costs for 60,000 hectares of new afforestation in the Eastern Cape over ten years

Source: DWAF (2004d)

Three options have been identified for the funding of new afforestation in the Eastern Cape:

- *Private companies:* Although small grower schemes funded by corporates (i.e. Sappi and Mondi)¹³³ are a likely option for some of the areas identified, these will most likely be limited (at least initially) to areas that are within reach of processing plants in KZN¹³⁴. In addition, the schemes would be similar to their small-grower initiatives in other areas,¹³⁵ focusing on species required for pulping purposes (i.e. short-rotation hardwood). Corporate small grower schemes for long rotation softwood plantations do not exist currently. It must also be noted that the appetite of the corporates for such schemes (determining the scale to which it will take place) has not been tested.
- *Bank loans:* Loans from the Land Bank have been used in the past (see Box 4). Applications for a loan will however be assessed like any normal application. Given that potential growers have no plantation experience or any forestry capabilities, such a loan may be difficult to secure. Where Land Bank loans have been used in the past, the community were supported by

129 DWAF (2004, September) notes that the costs in Table 39 should be seen as an investment in the Eastern Cape and not as expenditure.

130 It is estimated that facilitation will cost about R1000/ha. These costs include marketing plantations as a land use, community consultation, institutional development, afforestation licensing and business planning (DWAF Strategy for New Afforestation).

131 It is estimated that planting will cost R5000/ha and includes the cost of new roads.

132 Includes costs associated with land preparation, planting, road construction and maintenance, fire-fighting and management (DWAF Strategy for New Afforestation).

133 NCT is not considered at this stage as their focus is currently on supporting existing members and not to growing their membership base. Sawmilling firms such as Hans Merensky may not have the need to finance new afforestation projects through a community or small grower scheme.

134 The Umzimkulu region of the Eastern Cape, though politically and administratively belonging to the Eastern Cape is, interestingly, situated completely within the KZN borders. The northern parts of the Umzimvubu catchment (within 80km of the KZN border) are also generally within reach of KZN processing plants. Further south, however, the distance will most likely be too far for a private company to be interested.

135 Unlike most of other small-grower schemes in KZN, where contracts are formed with individuals, dealings in the Eastern Cape are likely to be with the entire community given the communal nature of land use.

experienced foresters who acted as management agents and helped the community develop a feasible and complete business plan. In addition, Land Bank funding was used in conjunction with government grants. The Land Bank is, therefore, unlikely to provide full funding for a plantation initiative and will, at best, support alternative funding and only in a situation where there is adequate plantation experience and capabilities. From conversations with Land Bank officials the bank's appetite for funding of projects on communal land may be questioned.

- *Government funding:* Given the limitations of private small grower schemes and the partial funding support provided by the Land Bank (conditional on other funding being available), government funding will be essential. Department of Land Affairs funding through the so-called SLAG (*settlement and land acquisition grants*), has already been successfully applied (see Box 4) in funding forestry initiatives¹³⁶. However, confusingly, there are mixed opinions as to whether this is an appropriate use of the SLAG grant. On the one hand, the application of SLAGs for plantation initiatives on communal land is seen as an appropriate means of improving tenure security of the occupants (one of the fundamental aims of SLAG funding). However, in conversation with the national Department of Land Affairs it was categorically stated that SLAG grants are not to be used in communal areas (Van der Merwe, 2005).

This is an important issue to resolve, as there are no clear alternative government funding options beyond SLAGs. The Department of Agriculture offers Comprehensive Agricultural Support Packages (CASP's), but has indicated that these are not to be used for plantation forestry developments as it is not defined as an agricultural activity. DWAF itself does not have its own grant to support emerging growers. If it is true that SLAG cannot be used in communal areas, serious consideration needs to be given to developing a dedicated fund to support plantation developments in the Eastern Cape.

Inefficiencies may arise when SFRA licences are granted but not used in time due to a lack of funding.

A final point, which emphasises the importance of creating a clear funding strategy, is that an inability to secure funding has, in a number of cases¹³⁷, resulted in afforestation licences expiring¹³⁸ (the environmental record of decision is valid for two years and the water licence for 5 years). This is a substantial waste of resources for an applicant and creates an unnecessary burden for LAAC officials in terms of time and resources exhausted in evaluating the application¹³⁹. In such cases, the applicants will have to go through the full evaluation process again.

Funding for transfer of Category B and C business units. As discussed in Section 10.4, the more viable business units will be put up for tender, while the less viable are to be transferred to communities or municipalities. Funding will probably not be a problem where an existing operation (i.e. sawmilling company) bids for the unit.

¹³⁶ According to discussions with DWAF in the Eastern Cape (Harrison, 2005), DLA have, using SLAG, successfully invested more than R20m in plantation forestry ventures.

¹³⁷ According to DWAF (2004d).

¹³⁸ The DWAF water use licence is valid for five years and the Environmental Affairs Record of Decision is only valid for two years

¹³⁹ This has led to the recommendation that if "...project funds are not available from national, provincial or local government or an alternative source then communities who cannot demonstrate a financial means will have to be discouraged from applying for an afforestation licence until financial means have been found" (DWAF 2004d).

However, in cases where the unit is transferred to the community or municipality, no adequate financing plan is in place. Once again, government support may be required if private sector funding could not be facilitated. In cases where the unit is totally unviable from a commercial perspective, transfers may occur, if approved by National Treasury, without the need for funding.

10.7.

IMPLEMENTATION AND MANAGEMENT SKILLS

A further hurdle to plantation forestry development in the Eastern Cape is the lack of expertise by growers to successfully *implement* afforestation ventures.

The majority of potential growers in the Eastern Cape will have no experience or capabilities¹⁴⁰ with regard to plantation development. As a result, the probability of such growers successfully implementing a plantation development without assistance is very low. This assistance is necessary for at least the first two rotations and would need to start from the initial steps of assessing forestry potential, through planning and licensing, up until harvesting and transporting of the timber for beneficiation.

Growers mostly lack the business skills/expertise to successfully implement afforestation. This highlights the need for private, community or government sponsored implementing agents.

The form of assistance will be related to the source of financing. This is especially so for private company funded schemes, where the companies, through extension officers, will help with the implementation. Where alternative means of funding can be found for community schemes (i.e. through government loans, bank loans or a combination of the two), the form of assistance is less clear. Box 4 mentions an example where an 'implementing agent' provides continual support to a community grower scheme. Discussions with a number of individuals familiar with the particular case (Mzimkulu community)¹⁴¹ indicated that the 'implementing agents' were vital to this successful community grower scheme.

¹⁴⁰ Business skills etc.

¹⁴¹ Mack (2004), Harrison (2005).

Box 4 Community forestry in the Umzimkulu area – key drivers of success

One community plantation project that seems to be running very successfully is in the Umzimkulu area (see Sisitka, 2000 and Lima, 2001 for further discussion). There are three communities involved at present with the potential for more to join. The communities are Mabandla, Zintwala and Sigidi. The project was initiated in 1995 by Mondi who supplied the initial funding. However, the community has since sourced alternative funding and runs the plantation as an independent operation.

The success of the project has been mostly due to four factors:

- Committed and experienced ‘implementing agents’ who have worked closely with the community from the beginning
- Thorough financial and operational planning, drawing on the knowledge of the ‘implementing agents’
- A competent local committee backed by the chief, local leaders and a committed community
- Innovative means to raise the funds required¹⁴²

The probability that this “success story” will be replicated on the 60,000ha available for new afforestation, as well as on the Category B and C plantations to be transferred to communities and municipalities, is debatable. One suggestion is that DWAF could act as an agency that can either provide the implementation support¹⁴³ or co-ordinate a pool of suitably qualified implementing agents.

10.7.1.

INFRASTRUCTURE

Poor infrastructure prevents market access and can thus hamper afforestation development. The Kei Rail project aims to overcome this hurdle for some areas.

Infrastructure development is a key obstacle to afforestation development in the EC, as poor infrastructure could prevent growers to access markets to sell their timber. In typical small grower schemes, the grower is responsible for the cost of transporting wood to the processing facility (they are paid a ‘delivered mill’ price for the wood) and the condition of infrastructure, therefore, impacts on the returns received. To facilitate the discussion, the EC is subdivided into two regions:

- *Mthatha, its surrounding areas and areas south of Mthatha:* Discussions with the Kei Rail Working Manager revealed that the road and rail links for forestry areas close to Mthatha are being developed, and that the infrastructure within the Mthatha development node is being upgraded (see Kei Rail box below)¹⁴⁴, to be completed by 2008. As such, infrastructure for the new afforestation areas surrounding Mthatha should not be problematic (assuming that it will be at a reasonable cost). Areas such as Maclear and Ugie are being linked to Mthatha with new road links, which will reduce transportation costs.¹⁴⁵ The plantation forestry industry regards the resurrection of the Maclear/Ugie rail line as pivotal. It is uncertain whether other afforestation areas south of Mthatha will require new link roads to the Kei Rail line between Mthatha and East

142 “Within each community a high proportion (80-90%) of households have committed a proportion of their R16,000 RDP grants, through the Settlement and Land Acquisition Grant (SLAG) funding, to the projects. The amount they have contributed has varied according to the number of households involved in each community, in order that sufficient capital is raised for each Trust, through the Development Companies, to provide adequate funds for the project development and access sufficient loans from the Land Bank. The amount required was calculated after financial forecasts and budgets were prepared giving details of the capital requirements for each project. Initially households were asked to contribute R3000 of their grants, but this was seen to be insufficient, and the contributions now stand at Mabandla R5000/household, Zintwala R9000/household, Sigidi R6000/household” (Sisitka, 2000).

143 Where there is excess capacity, ex-DWAF plantation employees (whose skills are no longer needed as a result of the transfer of DWAF plantations) can be involved.

144 East London will also be developed as an industrial node; however, no indication has been given as to whether commercial plantation related industries will be investing in this area.

145 These road links will be particularly important for the Mondi Forests near Maclear, Singisi near Langeni and the DWAF plantations south of Langeni.

London, but it is assumed that the rail line itself could reduce transportation costs to processing areas such as those in Mthatha.

- *The area north of Mthatha and south of KZN:* The infrastructure in the area between Mthatha and KZN, and specifically the Umzimkulu area, has not been improved with the Kei Rail project. It has also been noted that the link roads used in the area north of Mthatha towards Kokstad are in need of repair¹⁴⁶. Further, the processing areas in KZN (such as Sappi Saiccor and Merebank) would be closer than those in Mthatha for plantations in the Umzimkulu area and on the EC/KZN border. Processing of sawn timber could occur relatively close to the plantations within the Umzimkulu area, but this likelihood is muted, as discussed above.

Box 5: Kei Rail Project

The Kei Rail project is an integrated development plan designed to link Mthatha with East London. The project is jointly funded by the provincial Eastern Cape government (ECPG), as well as national government, and is perceived to be a "provincial flagship project" that forms a "critical component of the Provincial Growth and Development Plan" (ECPG, 2004). The project started in 1998, and is expected to be completed by 2008, with total costs estimated to be R7.8 billion.

During the initial assessment, key socio-economic benefits that were identified included the creation of 700 jobs during the initial period of refurbishment (i.e. upgrading of existing roads), the creation of 28 000 jobs over 20 years¹⁴⁷, as well as savings in terms of haulage costs, road maintenance costs and road accident costs (ECPG, 2004). Some of the Kei Rail Project's objectives include:

- Addressing rail traffic and feeder roads
- Creating an integrated freight and public transport dispensation
- Create a cost effective alternative mode of transport in regard to freight and passenger services between East London and Mthatha.

In terms of forestry, the Kei Rail project holds much potential. Firstly, the refurbishment of existing rail lines and the creation of good transport linkages will facilitate commercial forestry plantation development in rural areas¹⁴⁸. Secondly, the creation of better transport systems will reduce costs for commercial forestry plantations, as well as other downstream activities, which could lead to further investments in the region. Thirdly, the Kei Rail project is highly likely to facilitate down-stream timber processing in the Mthatha industrial node and other areas, such as East London where an industrial development node is also planned. Fourthly, the ability of farmers and manufacturers to access larger markets will be improved.

The next phase of the project that will have an impact of the commercial forestry plantation industry is the design and refurbishment of the existing railway lines in the EC. Siding facilities will also be developed at the Zamakulungisia Industrial Node near Mthatha (where new forestry investments will occur). In addition to these two developments, a shorter road link between Ugie and the Langeni forests near Mthatha is being built to improve accessibility of products towards markets (beneficial for forestry).

New roads are planned, of which some construction has already started, for link roads between Ugie and Langeni, Langeni and Nyibeni and Nyibeni and Ugie. The development of these roads is critical, since the proposed development of down stream processing facilities by Hans Merensky and possibly PG Bison is dependent thereon. According to ECPG (2004), the investments by the private sector in the Langeni area will amount to R890 million. Note that this figure includes additional investments in the sawmilling sector, the timber board industry, as well as other down stream processing facilities. During the construction phase of alone, ECPG estimates that up to 2000 jobs will be created.

¹⁴⁶ Discussions with the ECPG and DoT officials have revealed that the lack of a rail link between Kokstad and Mthatha has been identified, and that plans are being drawn up to facilitate this development.

¹⁴⁷ The ECPG (2004) reports that unemployment in the corridor will decline by 10%.

¹⁴⁸ ECPG (2004) reports that the Kei Rail refurbishment programme should be completed by the end of 2004.

10.7.2. WATER AVAILABILITY

It is still uncertain whether enough water will be available in the EC to enable the full 60,000ha to be afforested.

Although the basic assessment in deriving the potential area suitable to plantations in the EC were also based on the likelihood of water being available, the availability of water for new afforestation has not been confirmed and may pose an obstacle to new afforestation in certain areas (see Section 13). However, given the need for socio-economic development and the ability to position plantations in less water sensitive areas of the landscape (i.e. away from riparian zones and sensitive catchment areas), the limited amount of water should not be an obstacle to new afforestation in general.

The main issue with regards to water availability is the impact of plantation forestry¹⁴⁹ on the low flow reserve and the impact this may have on certain important and ecologically sensitive estuarine areas along the Eastern Cape coast (SEA draft report)¹⁵⁰. Further research is however being undertaken into the actual Reserve requirements and the positioning of plantations in the landscape to reduce the impact on stream flow. This is done in an attempt to try and work out a way forward for plantation developments. In addition, the need for socio-economic development in the Eastern Cape may mean sacrificing, to an extent, the requirements of the Reserve. As pointed out in the SEA draft report¹⁵¹, the creation of sustainable employment opportunities may be the best approach to improve the ecology of the whole area.

10.7.3. SFRA LICENSING

The long time period required to issue an SFRA licence may hamper new afforestation.

A major concern for new afforestation is the SFRA licensing process. Given that it takes, on average, almost two years to issue an SFRA licence in the Eastern Cape, the process may severely limit the plantation opportunities going forward¹⁵².

As discussed in Section 13, the SFRA licensing process is complex and involves a number of different parties, which results in a lengthy process compared to other water use licensing. Ideally, areas need to be identified where SFRA licences can be streamlined and issued with little effort on behalf of applicants and LAAC members (i.e. similar to the KZN small-grower maps).

The SEA (see Box 6) is a step in this direction, although in practice it will not be effective in streamlining the licensing process, as applicants, even from areas identified as suitable for plantation forestry, will still have to apply and go through all the relevant licensing steps (i.e. conducting EIAs, etc.).

149 Given its ability to draw 100% of supply.

150 See Box 6.

151 "It should be pointed out that the zero development option is not necessarily the best option for the ecology. The lack of jobs in this impoverished area has led to large scale degradation of the land, so while the rivers may be pristine, the surrounding environment is not. Creation of sustainable employment to replace subsistence farming could be the best approach to improving the overall ecology of the area. The cost in terms of decreased river flow would be negligible" – taken from the SEA scoping report (p.62).

152 Potential growers may not be prepared to wait that long for a licence and may look to other activities for a livelihood.

Box 6 Strategic Environmental Assessment (SEA) in the Eastern Cape

Prompted by a need to improve decision-making with regards to SFRA licensing, DWAF has conducted a number of SFRA SEAs. Although the SEAs were initially for the forestry sector alone, they attempt to take account of all water users.

An extensive SEA is currently being undertaken by DWAF in the Eastern Cape in order to identify suitable areas for new afforestation in WMA 12. The purpose of the SEA is to provide a guide to decision makers. With the SEA results, decision makers will be better informed regarding the suitability and benefits of new afforestation. Features of the SEA include an assessment of:

- biophysical constraints
- market opportunities
- infrastructural capacity
- alternative land uses
- economic and social impacts (assessed through an issue driven approach)
- water availability
- provision for future water demands (emerging farmers who may expand agricultural operations once tenure rights on communal land area secured)

Although the SEA will identify suitable areas for new afforestation applicants from these areas will still need to go through the full SFRA licensing process.

10.7.4.

LAND TENURE SECURITY

Land tenure does not pose an obstacle to EC afforestation, but dictates community-based afforestation schemes.

With the implementation of CLRA, as discussed in Section 14, there will be a process of tenure reform whereby community and subsequently individual land rights will be secured. Although CLRA has been enacted, discussions with relevant government and interested parties revealed that it may not be implemented for a while, as it is both a complicated and difficult process (Cousins, 2003).

In the interim, which at this stage is an indefinite amount of time, there will be a degree of uncertainty over the use of land in the Eastern Cape. This uncertainty is however not sufficient so as to create an obstacle to new afforestation. Existing structures, as discussed in Section 10 will continue to allocate the use of land and it is not improbable that land will be made available for plantations. This use will be confirmed once CLRA is implemented, as one of the main aims of CLRA is to enforce existing use rights. By planting trees, a community's, or individual's, use rights are made clear.

Thus the land tenure system and uncertainties regarding land tenure security will not be obstacles to afforestation development in the EC. The principles and process followed for land allocation in the Eastern Cape, as well of characteristics of the system favourable to new afforestation, were discussed in Section 1.1.

10.8.

CONCLUSION

This discussion has shown that, while several obstacles may hamper the development of afforestation in the Eastern Cape, it is the province with the single biggest plantation development potential. Potentially large employment and economic benefits can be reaped, but will require dedicated government or private sector support, in tandem with beneficiation initiatives.

11. KWAZULU-NATAL DEVELOPMENT

11.1. INTRODUCTION

In conjunction with the Eastern Cape, KwaZulu-Natal has been identified as a potential province for new afforestation¹⁵³. This potential is focused particularly in the 40,000 hectares identified by the KZN small-grower afforestation maps and, to a lesser extent, with the rehabilitation and transfer of category B and C business units¹⁵⁴. **The present analysis shows that almost R500 million of value can be added to the provincial economy, should this expansion happen at current production to area ratios, and that as much as 15,430 income earning opportunities can be generated.**

This section will begin with a brief description of the KZN small-grower maps, followed by an assessment of the potential obstacles to development in the areas identified by the maps. Finally, the impact of developing 40,000 hectares of plantations will be estimated.

11.2. KZN SMALL-GROWER MAPS

KZN small grower afforestation maps greatly simplify the licensing process and it is expected that it will lead to the additional afforestation of about 40,000ha in the province, facilitated by good infrastructure and the proximity of processing activities.

Through the KZN small-grower maps, about 40,000 hectares¹⁵⁵ have been identified, primarily in tribal areas, where plantation developments can go ahead with low environmental, biodiversity and stream flow reduction impact. The maps have been developed to identify suitable areas for forestry that require a less stringent assessment in the water licensing process. In effect, no scoping report or EIA is necessary for an application from an area identified in the maps and only a site visit and one LAAC meeting is required to issue an SFRA licence.

Although no applications have been made in areas identified by the maps¹⁵⁶, discussions with FSA (Ngubane, 2005) seem to indicate that companies are busy organising applications for these areas. The nature of land ownership in the areas identified by the maps suggests that additional afforestation will mostly take place through small-grower schemes.

There are two key factors supporting the development of plantations in the areas identified by the small-grower maps. The first is the proximity, in general, of most of these areas to beneficiation opportunities (i.e. pulp and paper mills and woodchipping plants) in KZN. In addition, a new pulp mill is envisioned in Richards Bay, the Mondi Richards Bay mill is expanding and the new NCT chipping plant

¹⁵³ Currently, the province has 543,210 ha of plantations, which is almost 40% of the total national plantation area. These plantations are predominantly pulpwood and feed into the five pulp and paper mills and one dissolving pulp mill situated in KZN. In addition, there are four chipping plants focused on the export market, and an additional pulp mill is planned for the Richards Bay area. KZN is thus the province with the largest pulpwood processing capacity.

¹⁵⁴ There are about 30,000 hectares of category B and C plantations in KZN. Of these, the largest business unit at Mbazwana and Manzengwenya (20,000 hectares) holds much potential. According to DWAF, an agreement whereby Mbazwana and Manzengwenya is transferred to the local community, with support from a private company, is close to being finalised.

¹⁵⁵ In open catchments, a conservative 25,000 ha were authorized, of an identified 61,000 ha, for afforestation. In restricted catchments with water constraints, 15,000 ha were authorized, of an identified 77,000 ha, for afforestation.

¹⁵⁶ According to DWAF KZN the maps were finalised in October 2004

has started production in Durban. It can be expected that other pulp mills will also consider expansion, should additional fibre be available.

The **second** is the relatively good condition of road infrastructure in KZN. However, certain secondary/service roads may need to be upgraded in order to support extraction of timber from rural areas. Unfortunately, the rail system in KZN is inefficient (Edwards, 2005) and will not help in lowering costs of long haul¹⁵⁷.

11.3. THE IMPACT OF 40,000 HECTARES OF NEW AFFORESTATION

Based on current yields, production structures, input cost structures and beneficiation splits, a model was developed to estimate the economic impact of this additional afforestation on processing activities specifically and the KZN economy more generally. A complete discussion of the methodology followed, assumptions made and calculations applied is contained in the technical volume. The results suggest that an additional 40,000 hectares of plantation area in KZN will result in:

- 529,493 tons per annum of additional harvested pulpwood
- 216,096 tons per annum of additional paper and exported pulp production, which represents 10.7% growth in current total paper and exported pulp production
- R72.6 million additional value added in plantation forestry
- R411 million additional value added in processing
- 15,429 additional employment opportunities (includes an additional 10,000 small-growers, 5,000 informal plantation workers and 429 mill employees)

Though of little absolute value relevance (considering that the KwaZulu-Natal GDP was close to R207 billion in 2003), the fact that the estimates suggest that R484 million of additional value will be added cannot be ignored. Relative to the value created, the employment creation potential – about 15,500 people – is also of significance, especially taking into account that the nature of this development will be such as to target a rural, poor, black and, according to current trends, mostly female segment of the population.

11.4. POTENTIAL OBSTACLES

Potential hurdles for new afforestation (in areas identified by the KZN small-grower maps) are funding, implementation support and problems associated with developing plantations on tribal lands. As shall be discussed, none of these present an insurmountable obstacle to new afforestation. Water availability and SFRA licensing may present obstacles to new afforestation in areas outside of those identified by the small-grower maps.

¹⁵⁷ Transportation of timber via rail is generally cheaper than by road.

11.4.1. FUNDING AND IMPLEMENTATION

Corporate funded afforestation schemes seem likely.

Funding and implementation, to support the development of new afforestation, is critical to the development of commercial plantations in KZN. Although small-growers are generally unable to access finance through the financial sector, funding does not seem to present an obstacle. Sappi and Mondi¹⁵⁸ have indicated a need for increased fibre supply for their pulp mills and seem most likely, through their small-grower schemes, to provide the financing for the afforestation of the 40,000 hectares.

Sappi and Mondi intervention could also provide growers with the necessary implementation support such as extension services, business skills education, a guaranteed market and an income stream over the rotation period. It is also realistic to assume that the whole area will be afforested with short rotation pulpwood, of which eucalyptus seems the most feasible option given current demand trends.

11.4.2. LAND TENURE STRUCTURE

As discussed in Section 14.3, land tenure is not an obstacle to new afforestation in KZN, as the allocation of land by traditional leaders is clear and uncontested. Once the Communal Land Rights Act (11 of 2004) is implemented, it will merely re-enforce the decisions made by traditional leaders concerning land use. Due to current small-growing schemes, most Chiefs and communities are also aware of the benefits of plantations and will already be favourably inclined to the notion.

11.4.3. AREAS OUTSIDE THOSE IDENTIFIED BY KZN SMALL-GROWER MAPS

Plantation forestry developments that take place outside of the suitable areas identified by the KZN small-grower maps may face obstacles in the form of water availability and SFRA licensing.

It is unlikely that areas not identified by the maps will see new afforestation.

Water availability. Given the discussion in Section 13, it is clear that WMA 11 and WMA 7¹⁵⁹ are, according to the NWRS, in deficit. As a result, licences for new afforestation in these areas may be problematic to obtain. However, as has been emphasised already, water may be available in specific, localised quaternary catchments.

SFRA licensing. According to DWAF KZN, SFRA licensing takes, on average, about two years¹⁶⁰. This may severely limit the plantation opportunities that happen¹⁶¹. In the case of the KZN small-grower maps, this hurdle is however effectively removed by the fact that the maps greatly streamline the process.

¹⁵⁸ NCT is not considered at this stage as their focus is currently on supporting existing members and not to growing their membership base.

¹⁵⁹ The Thukela catchment is mentioned for completeness. However, the potential for afforestation in this area, outside areas identified by the KZN maps, is unknown.

¹⁶⁰ Although, according to DWAF KZN, this average is falling

¹⁶¹ Potential growers may not be prepared to wait that long for a licence and may look to other activities for a livelihood

12. DEVELOPMENT OPPORTUNITIES IN SOUTHERN AFRICA

As new afforestation in South Africa becomes constrained by land and water availability, South African forestry companies increasingly look to the rest of Africa, most notably fellow SADC countries, for growth opportunities.

Given the terms of reference, the purpose of the present section is to provide a brief overview (based on existing literature) of the *status quo* of plantation forestry in Southern Africa, point out where possible opportunities lie, and voice some industry views in this regard. It was not attempted to conduct a full cost benefit analysis of options or to draw up a business plan for expansion in these areas. A more in depth analysis would also require interaction with the governments of these countries to assess the availability of land and the viability of plantation forestry investment, as well as the infrastructure conditions in these countries.

South African pulp and paper companies may pursue afforestation opportunities in neighbouring countries.

SADC fibre unlikely to result in substantial permanent expansion. Based on the preliminary analysis, it seems unlikely that imported fibre will form the basis of a long-term expansion in the South African processing industry. In the case of SADC, it is possible that fibre may, in future, be imported from neighbouring countries if infrastructural and other regulatory issues can be resolved. It is furthermore possible that the fibre may be available for a substantial period of time as domestic beneficiation (in the neighbouring country) may take some time to develop. It is, however, expected that SADC governments will eventually insist on domestic beneficiation in order to maximise domestic gain. In addition, the emergence of such a fibre resource for South Africa seems unlikely unless the plantations are established and owned by South African pulp and paper companies (i.e. vertically integrated). Firstly, it is unlikely that domestic farmers will undertake the investment to establish plantations without a domestic or contractually bound market. Secondly, if plantations are established that are not directly owned or contractually bound to the South African pulp and paper companies, it is unlikely that (at least under the current market conditions), South Africa will be able to compete for that fibre. At the moment, a large proportion of South African pulp fibre is exported to Japan as the domestic companies cannot compete with the prices offered (even with the strengthening of the Rand). If these firms cannot compete for the domestic fibre, it is unlikely that they will be able to compete on the open market for potential SADC (or any other) fibre. In order for imports to become a reality, prices for pulp and paper will have to rise significantly so as to overcome the transport cost considerations currently preventing fibre imports.

In the solid wood processing components, imports are mostly limited to particular wood types not available in South Africa. The current market conditions and transport cost (and inefficiencies of transporting roundwood) make a sawmilling expansion based on imported roundwood unlikely and it will be more efficient to import sawn timber. The expected shortage and concomitant increase in domestic sawn timber prices may result in imports becoming feasible.

12.1.

SCOPE FOR AFFORESTATION IN SOUTHERN AFRICA

SA currently hosts 70% of all plantations in Southern Africa.

According to the Southern African sub-study of the Forest Outlook Study for Africa (FOSA) conducted by the United Nations' Food and Agricultural Organisation in 2003, Southern Africa has about 2.2 million hectares of plantations, of which almost two thirds are planted in South Africa, with the rest spread between Swaziland, Zimbabwe, Malawi, Zambia, Mozambique and Angola. SA, Swaziland and Zimbabwe are the only countries in which plantations are industrially utilised (that is, not merely for firewood and informal construction purposes) and in which the majority of plantation ownership is in private hands. The scope for further afforestation in Swaziland and South Africa is however limited, and political and economic instability in Zimbabwe clouds the investment environment there. In Mozambique, Malawi, Zambia and Angola, the industrial use of plantations was hitherto limited by some combination of civil war/political instability, weak institutional arrangements, an unfavourable investment environment (due to the above reasons), the absence of links with the processing sector, limited markets and inaccessibility.

Countries	Plantation area ('000ha)
Angola	141
Botswana	1
Lesotho	14
Malawi	112
Mozambique	50
South Africa	1554 ¹⁶²
Swaziland	161
Zambia	75
Zimbabwe	141
Total Southern Africa	2249
SA share in total	69%

Table 40. Plantation areas in Southern African countries, 2000.

Source: FAO, 2003.

Plantation development in SADC will depend inter alia on political stability and infrastructure.

As in South Africa, plantation expansion in Southern Africa will ultimately be constrained by climatic conditions (FAO, 2003). New afforestation will be driven by the private sector (in order to expand existing companies' global competitiveness), and will be guided by global changes in supply and demand. Growth in industrial afforestation in Southern Africa will be facilitated should the right political, social and institutional factors be in place, such as greater political stability, the wider acceptance of democratic processes and a trend towards decentralisation and the involvement of local communities. Given the nature of these economies, poverty alleviation, strengthening the informal sector, community involvement, small farmer support and protecting the environment will be necessary elements of success. Land ownership and reform are important factors to take into account when making investment decisions and the most feasible model for afforestation has become the

¹⁶² This total area differs from the 1.371 million ha quoted in the FES (2004) industry survey.

Mozambique, Angola, Zambia and Tanzania are suitable to new afforestation, with Mozambique seeming the most immediate option for SA firms to consider.

outgrower scheme (through partnerships between industry and land owners/farmers) (FAO, 2003). Central to any new afforestation, however, will be the development of transport and other infrastructure to improve the accessibility of these countries for trade purposes (FAO, 2003).

Countries identified by the FAO as most suitable for *further* commercial afforestation are Mozambique, Zambia, Angola and Tanzania¹⁶³. If growing demand, technological improvements and good management practices were to prevail, new afforestation could be followed by processing activities. The current situation is as follows (FAO, 2003):

- **Swaziland** possesses a pulp mill, as well as a few board and sawmills.
- **Zimbabwe** has pulp, paper, board and sawmills. Sawmilling expansion is currently mainly constrained by political uncertainty and the country does not have the necessary raw-material to expand board, pulp and paper production for export.
- **Angola** has been identified as a country with much afforestation potential. Though it was in the past prohibited by the civil war, this potential could now be unlocked.
- **Malawi** has a few smaller sawmills, a few board mills and some furniture factories. The informal sector, in the form of pitsawmilling, dominates. Population pressure however limits the scope for the expansion of industrial plantations.
- **Mozambique** possesses a few sawmills, a board mill and one recycling-based paper mill. Inputs are at the moment largely sourced from natural forests.

12.2.

SOUTH AFRICAN COMPANIES' VIEW OF REGIONAL EXPANSION

SADC can be a source of raw material for SA processors, but companies' long term plans are for beneficiation in the countries themselves.

The large South African forestry and processing companies regard SADC primarily as a growth opportunity for fibre and processing facilities, but also as a market opportunity for South African production:

- *SADC as production growth opportunity.* South African forestry companies regard regional expansion in especially Mozambique¹⁶⁴, Angola and Tanzania as an opportunity for growth, should fibre availability become a constraint on the domestic industry. The regulatory environment in other SADC countries is regarded as more favourable than in South Africa, but companies realise that they would have to follow the route of sustainable forest management, as demanded by consumers, in investing in these countries. Even though companies are investigating expansion possibilities, no large developments (other than trial plantations) have come off the ground yet. The main reason quoted is a lack of infrastructure in these countries. It also seems as if the need, in terms of fibre supply, has not yet become so pressing. Ultimately, the political environment in which investment is to take place, as well as cost

¹⁶³ The prevalence of anti-personnel mines in Angola and Mozambique still renders many areas inaccessible and it will require some costs to secure these areas.

¹⁶⁴ It is estimated that up to 500 000ha is available for afforestation in Mozambique (De Jongh, 2004).

efficiency and return to investment concerns, will determine the feasibility of afforestation growth in SADC (De Jongh, Barton, Van der Merwe, 2004/05).

SADC is also a potential export market for SA, should the region experience significant growth.

- *SADC as market.* If the continent were to witness significant growth and development into the future, Africa, with its currently very low per capita consumption of paper¹⁶⁵, could prove a valuable market for South African produced paper and paper products. This potential is however not a reality yet and is likely to take substantial time to unlock. The same holds for lumber and other wood products.

12.3.

IMPACT OF REGIONAL EXPANSION ON THE SOUTH AFRICAN MARKET

There are two possible scenarios for the impact that afforestation in Southern African (by South African companies) will have on South African production:

1. *Local pulp production expansion could be facilitated by SADC raw fibre inputs into South African pulp mills* (via shipments from e.g. Maputo or Beira to Richards Bay). Thus, wood or wood-based imports from these countries could become more of a reality. This seems the most likely course of action, at least over the short to medium term.
2. *Additional growth in primary processing may take place in the countries themselves rather than in SA.* South African mills will be unaffected and will continue to operate at the capacity they were at given local fibre constraints. Initial indications are that regional expansion, if it were to take place, would follow this route (Barton, De Jongh, 2004). Local beneficiation is however likely to be a possibility only over the long term, preceded by afforestation and, later, initial processing. Through these stages, it is likely that South African skills will be used, and that South Africa's trade pattern in wood with these countries will change (as described above). Ultimately, however, the cost of doing business in these countries will determine the investments made. Factors influencing the cost of doing business include: regulatory costs (and the certainty that the regulatory framework will not change at random), infrastructure and electricity costs, and costs associated with marketing products. It seems likely that companies wishing to expand plantations in SADC countries still face significant constraints where the cost of doing business is concerned.

¹⁶⁵ Africa's annual per capita consumption of paper is 6.4kg, versus a worldwide average of 51.7 kg per capita per annum. The corresponding figure is 44.6kg/capita/annum in South Africa, 31.4kg in Asia, 127kg in Europe and 293kg in North America (Pamsa, 2004b).

13. WATER REGULATION AND THE FTTP CLUSTER

13.1. INTRODUCTION

Water regulation informs the future of the FTTP cluster.

Water regulation¹⁶⁶ of the forestry value chain is a complex and controversial issue that, more than any other factor, will influence the future of the industry in South Africa. In a water-stressed country like South Africa¹⁶⁷, the case for regulation of significant water users – of which forestry is one, as is evident from Box 8 is compelling. The Department of Water Affairs and Forestry has over the last decade with dedication and intellectual energy revamped the water regime, culminating in the National Water Act of 1998 (NWA).

This chapter assesses the specifics of the regulations and how they have affected the FTTP cluster. Water regulation impacts plantation forestry through the allocation and pricing of water, as well as by, in effect, creating a licensing regime for land usage. Not all other land uses require licensing on a case-by-case basis, and for those that do, the licensing process and requirements are different from those applied to forestry. The analysis below sheds light on the impact of this on forestry.

Box 7: The institutional framework for water resource management in South Africa

The **Minister of Water Affairs and Forestry** has overall responsibility for all aspects of water resource management.

The **Department of Water Affairs and Forestry** (DWAf) is responsible for administering all aspects of the NWA on behalf of the Minister. DWAf's role will change as more and more management tasks are devolved and assigned to regional and local water management institutions. DWAf's eventual role will be to "provide the national policy and regulatory framework within which other institutions will directly manage water resources" and to oversee the "activities and performance of these institutions" (DWAf, 2004b:92). One such regional institution is the Catchment Management Agencies (CMA's).

CMA's are statutory bodies that have jurisdiction in defined WMAs and represent all relevant stakeholders. Their purpose is to manage water resources and "co-ordinate the water related activities of water users" (DWAf, 2004b:94) in their catchment area. At present only one CMA has been set-up, however, it is only engaging in a limited number of activities until staffing requirements are sorted out. Until such time as the CMAs are fully-functional, DWAf regional offices will manage the activities relating to WMAs (i.e. authorisation of new afforestation).

The Act empowers the minister to establish advisory committees with different functions and goals. One such advisory committee, with relevance to the plantation forestry industry, are the licensing, assessment and advisory committees (LAACs). The aim of the LAACs is to facilitate co-operative governance with regard to the issuing of SFRA licences. National administration of the licensing of SFRA's is the responsibility of the DWAf Sub-directorate: Stream Flow Reduction Allocations.

Finally, there is the **Water Tribunal**, which is an independent body set up to hear and adjudicate appeals on a wide range of water related issues. For example, appeals from parties who have been denied water licences through the licensing process.

¹⁶⁶ The Water Services Act (Act 108 of 1997) deals with the regulation of water services at the municipal level. The National Water Act (NWA) (Act 35 of 1998) addresses the development, management and protection of water resources, and the allocation of water from those resources (Reed & De Wit, 2003).

¹⁶⁷ The point must be noted that as South Africa is a water-stressed country, the same volumes of water used and the same concentrations of effluents discharged would have a greater impact on South Africa's water resources than would be the case in a non-water stressed country.

As the water regulation process in effect governs the usage of land, the regulations have an impact on the holders of usage and other rights over land. Therefore this chapter needs to be read in conjunction with Section 14, which deals with the overall thrust of land policy in South Africa, and its objectives of land restitution, redistribution and tenure reform in favour of previously disadvantaged South Africans.

Downstream activities in the cluster, particularly pulp and paper plants, have in the past been significant dischargers of contaminated effluent, and are therefore rightly within the purview of water quality regulations. This has been an area of significant change in recent years, with regulatory renewal and technological improvements, resulting in a reduction in effluent discharge. Inevitably, perhaps, regulators and industry are at loggerheads about the desirability and affordability of further reductions in contamination.

We now turn to an overview of the allocation and pricing systems for water, after which the application process for forestry is reviewed and compared to that of other water usage activities. The impact of water quality regulation on the pulp and paper industry will be considered, followed by our findings.

Box 8: Plantation forestry water use

Plantations use substantial amounts of water. Most recent estimates (taken from DWAF, 2001, originally sourced from Gush et al, 2002) suggest that plantations use some 700m³/annum water. At this reduced estimate, plantation forestry is an incremental user of approximately 1.3% of the country's total mean annual runoff (MAR). This is down from earlier DWAF estimates of incremental plantation use of 1,400m³/annum more water than would otherwise have been used by the natural vegetation (DWAF, 2001).

Plantation water use is not controllable: A large percentage of South African plantations are positioned relatively high up in the catchment area and, therefore, near the start of the water production chain. As a result, plantations have first right of use and can reduce the amount of water available for other downstream users. This is particularly critical in dry periods where water in rivers is reduced to critically low levels, causing environmental harm and reducing the availability of water for other users. As with all other dry land agriculture, it is impossible to control plantation water use (as could, for example, be done by 'turning off the tap' and reducing irrigation), it is necessary to determine the extent of plantation water use in terms of the water available during low flow periods. In areas where there are storage dams, these dams can be used to reduce the detrimental effect of plantations on the low flow reserve.

13.2. THE WATER ALLOCATION PROCESS

The water regulation debate cannot be followed without understanding how the authorities go about the process of allocating water. Authorities follow a process in which water availability is assessed, water users are defined and allocation priorities are set out. Each of these steps is discussed below.

13.2.1. ASSESSMENT OF WATER AVAILABILITY

Water management areas. South Africa, a semi-arid country, has limited water resources overall, but the extent of water stress or surplus differs from region to region. To take this into account, the authorities have divided the country into 19

Water availability is assessed on the basis of 19 Water Management Areas.

water management areas (WMAs) listed in Table 41. This division derives its coherence from the fact that the WMAs are in effect main catchment areas (i.e. areas in which the various sources of water availability and usage are closely inter-related). The WMA areas can in turn be divided into smaller, so-called quaternary, catchments.

The Reserve. It is an important policy objective that in each catchment enough water of the right quality be available downstream to satisfy (i) the human needs reserve, which are the requirements posed by basic human needs¹⁶⁸, and (ii) the ecological reserve, which are the requirements of the natural environment¹⁶⁹ as estimated by DWAF. Together these needs are referred to as the Reserve.

Only 8 WMAs have water available after the Reserve requirement is taken into account.

Classification of WMA status. Within each WMA¹⁷⁰ the amount of water available during the dry season is estimated and the amount of water currently used by other users¹⁷¹, subtracted. If the volume of water thus available is less than the Reserve requirement, a catchment will be classified as **stressed/in deficit**. If it exceeds the Reserve requirement, the catchment is classified as having water **available**, i.e., a balance of water remains for allocation to other economic activities. These assessments have not been formally completed for each WMA and will take some time to complete (see discussion in section 13.2.3). Table 41 reports preliminary desktop classifications as cited in the National Water Resources Strategy (NWRS) (DWAF, 2004b).

Water management area	Status ¹⁷²
1 Limpopo	Fully utilised
2 Luvuvhu and Letaba	Deficit
3 Crocodile (west) and Marico	Fully utilised
4 Olifants	Deficit
5 Inkomati	Deficit
6 Usutu to Mhlatuze	Available
7 Thukela	Deficit
8 Upper Vaal	Available
9 Middle Vaal	Available
10 Lower Vaal	Available
11 Mvoti to Umzimkulu	Deficit
12 Mzimvubu to Keiskamma	Available
13 Upper Orange	Available
14 Lower Orange	Fully utilised
15 Fish to Tsitsikama	Available
16 Gouritz	Deficit
17 Olifants/Doorn	Fully utilised
18 Breede	Available
19 Berg	Deficit

Table 41: Status of the 19 WMA's

Source: DWAF (2004b) and Genesis interpretation

¹⁶⁸ In terms of current policy, a quantity of 25 litres per person per day, of a suitable quality, has been determined as sufficient to meet the basic human needs requirement. Should this quantity be increased in future, the Reserve will be re-determined.

¹⁶⁹ The natural environment requirement is necessary to safeguard and sustain healthy ecosystems "in order to secure ecologically sustainable development and use of relevant water resources" (DWAF 2000a:22). The ecological reserve for each WMA is determined through a number of scientific studies and experiments.

¹⁷⁰ See Section 6.3 in the Technical appendices for an overview of the Catchment Management Agencies and how these fit into the broader DWAF structure.

¹⁷¹ Including transfers in and out of the WMA.

¹⁷² Taking into account the Reserve requirement and transfers in and out of the WMA

Of the nineteen WMAs, eight WMAs still have water available, four are fully utilised¹⁷³ and seven are estimated to be in deficit, i.e. are areas where existing use leaves insufficient water to provide for the Reserve. If this situation were to continue the condition of the ecological reserve, which in practice is often the recipient of the water left over after all other uses, will deteriorate (in some cases this in may comprise the water resource itself). The principle is therefore that in stressed catchments other water usage needs to be reduced over time to allow the Reserve to return to its appropriate level.

Two caveats. Some qualifications to the classification scheme are important. Firstly, the classifications shown below are indicative of the over-all condition of the WMA and that conditions in localised areas may differ from those of the WMA overall. For example, a WMA with water available may contain quaternary catchments that are in deficit, and in stressed WMAs there may be water available in specific areas. Secondly, these assessments are preliminary, and may be open to debate. Nonetheless, being the only assessment available, they do in practice impact on water allocation decisions (see Section 13.2).

Water availability in areas of potential new afforestation. In Table 41, those WMAs that have been identified as potential areas for new afforestation have been bolded: these are Northern KwaZulu-Natal (WMA 6), Southern KwaZulu-Natal (WMA 11) and, importantly, Northern Eastern Cape (WMA12). According to the desk-top estimates, there is water **available** at the WMA level in Northern KwaZulu-Natal (WMA 6)) and Northern Eastern Cape (WMA12). Southern KwaZulu-Natal (WMA 11) is estimated to be **in deficit** and any new afforestation will be restricted to specific areas where water is available. (We note, for further discussion in Chapter 10 that in the preliminary phases of the Strategic Environmental Impact Assessment process in the Eastern Cape, the availability of water for new afforestation has arisen at this point without finalisation).

13.2.2.

THE LICENSING SYSTEM AND DWAF'S POWERS

A powerful licensing system. The main purpose of the NWA is to ensure that water is conserved and used more efficiently. To this end, the NWA enables DWAF to regulate, by a system of licensing, the various activities that affect the quantity or quality of water available in a catchment (any activity that draws water from rivers, dams, ground-water or precipitation reduces the overall amount of water available).

Box 9: Water uses according to the NWA

Section 21 of the NWA defines water uses that are permissible and need to be registered and granted a licence. These uses are then also subject to charges as discussed in Section 13.3. Permissible water use includes:

- a) Taking water from a water resource
- b) Storing water
- c) Impeding or diverting the flow in a watercourse
- d) Engaging in a stream flow reduction activity (i.e. land-based activities which significantly reduce stream flow)

¹⁷³ Fully utilised is where a WMA has a slight surplus or deficit, but, according to the NWRS, the situation is stable and does not seem likely to deteriorate in the immediate future

- e) Engaging in a controlled activity (i.e. activities having a detrimental impact on water resources)
- f) Discharging waste or water containing waste into a water resource
- g) Disposing of waste in a manner which may detrimentally impact on a water resource
- h) Disposing of water which contains waste from any industrial or power generation process
- i) Altering the bed, banks, course or characteristics of a watercourse
- j) Removing, discharging or disposing of water found underground
- k) Using water for recreational purposes

The NWA defines a comprehensive list of water uses on which DWAF may impose a system of licensing (see Box 10). Of particular interest are categories **a**, **b** and **d**, all of which are consumers of water.

The power to licence effectively implies the power to direct land use.

The power to licence is an extensive one, as it implicitly includes the power to prohibit any of the water uses listed, to allow the use subject to limitation or condition, and/or to impose fees for use. Given the necessity of water use in a large number of important activities ranging from all forms of agriculture to many forms of industry, the water use licensing process is, in effect, a system of licensing of land use and economic activity more broadly, with ramifications not only for water, but for the shape and quantum of economic activity, and hence development, in water-stressed areas. Therefore it is important that the criteria applied by the entity exercising these powers be clear, generally accepted within government, and that decisions ultimately either reflect all considerations, or do not unnecessarily impede non-water objectives.

Users with general authorisations do not need a licence, but only need to register water use.

General authorisations as an alternative to per-case licensing. The purpose of a general authorisation is to expedite access to water for the water uses specified. Uses in these categories only need to register their use and do not need to apply for a licence. General authorisations can be tailored to each quaternary catchment according to the amount of water available. This mechanism may offer a way to sharply reduce the regulatory burden for, for example, small growers in specified areas – but no general authorisations have yet applied to plantation forestry.

As the only SFRA, forestry is subject to a unique licensing process.

How plantation forestry is dealt with in the licensing regime. The purpose of the water use classifications in the NWA is two-fold: to set the ambit of the activities that can be subjected to the licence process; and to set out different categories of water use, so as to allow for different regulatory standards for the different categories. Given its water use characteristics (see Box 8), plantation forestry has been declared as a stream flow reduction activity (SFRA) as it uses a substantial amount of precipitation and groundwater. Plantation forestry is at present the only declared SFRA, which puts forestry into a category of its own. Therefore the impact of water regulation on forestry is to a large extent determined by the details and actual workings of SFRA regulation, to which we turn in Section 13.3.1.

13.2.3.

DWAF'S PRINCIPLES OF WATER ALLOCATION

Economic activities can only be allocated water after the reserve requirements have been satisfied.

The licensing system enables DWAF to decide who is allowed to use water in stressed catchments, or *to allocate water*. In principle, DWAF's approach will be the following: in a particular WMA, the highest priority will be given to satisfy the requirements of the **Reserve**, the next priority will be to ensure that all **international obligations** are honoured, followed by (in unusual cases) water set aside for **strategic reasons**¹⁷⁴ or for contingency **reserves** to meet changes in any of the preceding priorities. All of these are considered to take absolute precedence over economic activities, as only the balance left over once these allocations are met is made available to **economic activities**.

We say that this is the approach 'in principle', because DWAF of course never encounters a tabula rasa or clean sheet when it seeks to apply its approach: in all WMAs there are existing users of water for economic activities; hence the possibility that a WMA can be in deficit, i.e., that there is not enough water left to meet the Reserve requirements as estimated by DWAF. If the WMA is in deficit, a process of **reallocation**¹⁷⁵ or proportional reduction of water rights (and hence usage of existing users) take place.

Initial application. Using preliminary assessments, DWAF has divided the WMAs into three groups (DWAF, 2005b):

- *Group A.* The balance of water available is sufficient to meet the demands in the foreseeable future. Applications for water will be evaluated on a first come first served basis with encouragement and preference for applications from previously disadvantaged individuals (PDIs).
- *Group B.* Current applications may exceed the allocable water and licence applications that are beneficial¹⁷⁶ in the public interest will be prioritised. A compulsory licensing system will be initiated to free up additional water. Preliminary Reserve estimates could, theoretically, be reduced if a water use application is substantially in the public interest.
- *Group C.* The water resource is already over-allocated and will be prioritised for the compulsory licensing process in order to reduce water use.

Compulsory licensing attempts to remedy deficits by reallocating water use and decreasing allocations where necessary.

Compulsory licensing. Compulsory licensing is a process whereby: (i) all water users in a catchment area are to be verified and registered and, (ii) in certain cases, a reallocation of water will be made to the Reserve and previously disadvantaged individuals to reconcile availability and facilitate equity. Initially, compulsory licensing will focus on those WMAs that are in deficit (i.e. group C) but

¹⁷⁴ One of these may be the supply of water for the generation of electricity. Electricity is of great importance to the functioning of a modern economy and it is important to ensure that sufficient water is set aside for electricity generation.

¹⁷⁵ Aligned to the process of reallocation and allocation of water is the inter-catchment transfers of water. Due to the uneven distribution of water resources across South Africa, DWAF is responsible for ensuring that sufficient water is available to support the continued socio and economic wellbeing and growth of the country. As a result, when decisions are being made on how to allocate water between competing users, cognisance must be made of users in other catchments, whose use of the water may lead to greater benefits for the country as a whole.

¹⁷⁶ Mechanisms still need to be worked out to determine beneficial use

will eventually be completed for all WMAs. In WMAs showing a deficit, reallocation will happen in two stages. Firstly, illegal uses and uses that are not making use of their full permit allotment will have their water allocation taken away or reduced. Secondly¹⁷⁷, if still required, all legal water users will have their allocations “decreased by a pro rata amount each year over a period of several years until total water use decreases to a level equivalent to the available, allocable water” (Reed and De Wit, 2003:73) and where equity considerations are met. Where existing lawful use is curtailed on the basis of the preliminary reserve, affected parties will have the opportunity to comment on the Reserve¹⁷⁸ (DWAF, 2005b).

From discussions with DWAF, it is clear that very few new water licences will be allocated in group C catchments until compulsory licensing is complete¹⁷⁹. One exception is where water licences are allocated through the yield enhancement guidelines as described in Box 10.

Allocation of water available for economic activity. At present, the allocation of the ‘balance’ (i.e. where water is available) is done on a first-come-first-served basis, with applications encouraged from previously disadvantaged individuals.

Wide, undirected regulatory discretion. Whilst this approach is reasonably clear, the NWA creates the possibility of unlimited and vaguely directed discretion on the part of the regulator through the sheer number and breadth of licensing factors stipulated in section 27 (1), including:

- Existing lawful water uses
- The need to redress the results of past racial and gender discrimination
- Efficient and beneficial use of water in the public interest
- The socio-economic impact of (i) the water use or uses if authorised or, (ii) the failure to authorise the water use or uses
- Any catchment management strategy applicable to the relevant water resource
- The likely effect of the water use to be authorised on the water resource and on other water users
- The class and the resource quality objectives of the water resource
- Investments already made and to be made by the water user in respect of the water use in question
- The strategic importance of the water use to be authorised
- The quality of water in the water resource which may be required for the Reserve and for meeting international obligations
- The probable duration of any undertaking for which a water use is to be authorised.

¹⁷⁷ Although there are a number of options before allocating water away from legal users. These include ending unlawful use, removal of alien vegetation, promoting use of groundwater where possible, promoting water conservation and demand management and promoting water trading (DWAF, 2005b).

¹⁷⁸ This is part of the classification process, whereby individuals and groups living along a water course can give their input concerning their preference for the state (quantity and quality) of the river

¹⁷⁹ Water licences may be allocated to historically disadvantaged individuals through the licensing process as discussed in Section **Error! Reference source not found.**

Box 10 Yield enhancement guidelines

The yield enhancement guidelines are an incentive for people, especially in stressed catchments, to remove invasive alien plants (IAPs) and thereby make more water available to the whole catchment. According to DWAF (2005g), "users cannot be granted licences for additional water use in stressed catchments unless they can find that water in a way that does not impact on allocations to other users". One way of finding this water is by clearing IAPs. Applicants are not going to gain the full amount of water freed up, but will be allocated a share, with the rest being made available to the catchment. That amount made available to the catchment may be reserved for the Reserve or allocated to other users.

Although yield enhancement guidelines can make water available to any water use, there is particular relevance for SFRA licences. If a landowner is unable to afford the costs of clearing jungle wattle (an IAP), another option would be to bring the invasive jungle areas under control, by converting them to better managed plantations (DWAF, 2005d). The benefits of awarding a water licence to such an activity (which already makes use of the water) is that socio-economic benefits can now accrue from the wattle plantation and the spread of the jungle can be controlled and, in environmentally sensitive areas like riparian zones or wetlands, reduced.

Using areas of jungle wattle in such a way will create an incentive for landowners to help in the process of clearing IAPs. The end result will be more water made available to the catchment. One important application of the yield enhancement guidelines are for communities in the Eastern Cape (see chapter 10).

Efficiency rather than optimality. Although the water use being licensed must be 'efficient and beneficial', it does not have to be the best and optimal use of the water. Thus water licensing does not require a comparison between the water use that is being applied for and an alternative water use.

13.2.4.

TRADING OF WATER ALLOCATIONS

DWAF intends ultimately allowing regulated trading in water licences following the completion of compulsory licensing processes. In the meanwhile, however, specific applications for trade are allowed if the trade occurred within the same quaternary catchment area.¹⁸⁰ As a result, water service authorities, industrial users, agricultural users and plantation forestry users can trade amongst themselves and with users from any other sector. Currently trade is taking place on a very small scale and being approved on a case by case basis.

13.3.

REGULATION AND PROCESSES SPECIFIC TO FORESTRY

Plantation forestry currently faces a licensing process unique to itself as it is the only activity hitherto classified in the SFRA category. This treatment creates two risks. The first is the risk of an inappropriate level of regulation, which may either result in a risk to water availability and other environmental factors, or to the speed of economic development in rural areas. The second risk is that of a differential regulatory burden between plantation forestry and other land uses that is not commensurate with the relative nature of the activities: that may result in a skewed usage of land that leaves the country and communities poorer off.

¹⁸⁰ A conversion formula will be applied where trades take place between water uses with different assurances of supply.

In this section, these risks are explored by describing the regulatory process for plantation forestry in detail, and by comparing the regulatory process with that for irrigation.

13.3.1. THE SFRA LICENSING PROCESS FOR FORESTRY¹⁸¹

LAACs have the task of facilitating cooperative governance to issue SFRA licences.

The role of LAACs. All plantation forestry needs to be licensed as SFRA water users. SFRA licences require the consideration of a licence assessment advisory committee (LAAC). LAACs were set up under the NWA and are an extension of the old afforestation permit review committees. Their aim is to facilitate co-operative governance with regard to the issuing of SFRA licences. The only water use evaluated by LAACs is SFRA, that is, plantation forestry. LAACs are nominated in each major forestry province and are comprised of officials from national and provincial government departments (DWAF¹⁸², DEAT¹⁸³ and the Department of Agriculture¹⁸⁴), industry and concerned NGO representatives. Table 42 provides an overview of the SFRA licensing process, including current time frames and minimum times with proposed changes.

Phase	Role-players	Purpose	<10 hectares		>10 hectares	
			Current minimum time ¹⁸⁵	Minimum time with proposed changes	Current minimum time	Minimum time with proposed changes
Initial water use application	Applicant, DWAF: PRO ¹⁸⁶		7	7	7	7
Application registration and water investigation	DWAF: PRO, SD:G & SD:WQ ¹⁸⁷	To determine whether there is water available in the quaternary catchment	58	14	58	14
Preparation of supporting documentation, application to, and review by other departments	LAAC (DWAF, DEAT, DAgri)	Scoping report, EIA	80	60	80	60
Recommendation and licensing ¹⁸⁸	LAAC (DWAF, DEAT, DAgri, Industry, Parks Board, Environmentalists)	Record of Decision, Consent, Objections	14	14	36	36
Total	Working days		159	95	181	117
Calendar months¹⁸⁹			7.2	4.3	8.2	5.3

Table 42: SFRA licensing process

Source: DWAF (2004d) and Genesis interpretations

¹⁸¹ This process will generally only happen in catchments that fall in group A and possibly group B (see section 13.2)

¹⁸² Represented by provincial officials acting on behalf of the national department

¹⁸³ Represented by provincial officials who are delegated authorities of the national Department of Environmental Affairs. As a result, the provincial officials can make decisions, which do not have to be authorized by the national department.

¹⁸⁴ Represented by both provincial and national officials. The provincial officials are responsible for undertaking the investigations, after which the national officials make the decision.

¹⁸⁵ Includes publication periods whereby different government departments need to allow time, after decision making, for objections

¹⁸⁶ Primary responsibility officer

¹⁸⁷ Sub-directorate Geohydrology and Water Quality

¹⁸⁸ The time taken for less-than-10-hectares is shorter, as the recommendation does not have to be authorised on a national level

¹⁸⁹ Assuming there are 22 working days in a month

A few points to note concerning the process:

- The application is only presented to the LAAC once it has been determined whether there is water available in the quaternary catchment (usually taking about three months). At this point provincial DEAT and provincial and national Department of Agriculture (DAgri) begin their investigations.
- The provincial DEAT investigations focus on estimating the impact that plantations might have on biodiversity and whether there is environmental risk to endangered (i.e. red-book) species¹⁹⁰. The Environmental Affairs investigations begin with a scoping report and may then require a full EIA. The EIA is costly (i.e. R10,000 to R50,000 depending on the size of the application) and applicants are in most cases obliged to use a recognised forestry consultant. Proposed regulations, under the NEMA Amendment Act, make it mandatory for any activities that will transform indigenous vegetation and which are more than 3ha and less than 20ha in extent to undertake an environmental screening exercise as a first step. In addition, this screening exercise needs to be undertaken by an external consultant. At minimum, a scoping report and site visit is required in order for the provincial DEAT to issue their Record of Decision (RoD). The RoD will, however, only be issued if a reasonable assessment of alternative land-uses has been made¹⁹¹ and environmentalists and the Parks Board have had a chance to comment. The RoD may include conditions (i.e. planting in certain places on the farm or clearing of a wattle jungle), which need to be met by the applicant if the licence is to be granted.
- Authorisation from national DAagri is necessary if, (i) new ground is broken; (ii) the slope is more than 15% and (iii) planting of weeds or invader plants will occur¹⁹². This authorisation takes into account the soil type, species¹⁹³, rotation length, positioning in the landscape, thinning and pruning practices and potential for soil erosion¹⁹⁴.
- Once Environmental Affairs and Agriculture have finished their investigations, the application is discussed when the LAAC next convenes. This is an opportunity for any of the regulatory authorities and civil society to contest an application and these LAACs attempt, as far as possible, to rule by consensus. However, if consensus cannot be reached, the chairperson will adopt the majority view, but carefully note the minority objections. In addition, although this varies between LAACs, the socio-economic impact of issuing or not issuing the licence is considered at the LAAC meeting. Information from the scoping report or EIA will feed into this discussion. Discussions of alternative land uses, especially in the case of community applications, may also happen¹⁹⁵.

Water availability, as well as permission from the departments of Agriculture and Environmental Affairs, are prerequisites to the granting of licences.

¹⁹⁰ As per the National Environmental Management Act (NEMA) (Act 107 of 1998)

¹⁹¹ This is required by the NEMA, under which DEAT operates.

¹⁹² Currently, the three major tree species used in plantations are all classified as invader plants

¹⁹³ Although each pine tree uses more water than each eucalyptus tree, over time, the use by eucalyptus plantations is higher, as there are more rotations than for typical pine plantations.

¹⁹⁴ This is all in accordance with the Conservation of Agricultural Resources Act (CARA) (Act 43 of 1983).

¹⁹⁵ As discussed, Environmental Affairs normally considers this prior to issuing a RoD. In addition, one LAAC chair mentioned that Agriculture usually considers this in their investigations. However, in his experience this has not blocked a licence from being awarded.

- The recommendation of the LAAC is forwarded to the national DWAF for acceptance. Though the LAAC is the forum that makes the decision, it is technically not an advisory body or council. Their recommendations, though important, therefore technically do not have legal status. The licence is issued by the Chief Director: Water Use and Conservation where the area of afforestation is greater than 10ha, but can be issued by the Regional Director if the area is 10ha and less, although all such licences are reported to the Chief Director: Water Use¹⁹⁶.
- If an application is rejected, the applicant can approach the Water Tribunal for possible recourse. For SFR licensing, quite a number of appeals have gone to the Water Tribunal and, in most cases, the Tribunal has favoured the applicant on the basis of technicalities¹⁹⁷. This is problematic in that the Tribunal decision is overturning a cooperative governance decision on the basis of a DWAF technicality. However, processes and technical inputs are now in place to prevent a repeat of these types of decisions.

Once a water use licence is issued it needs to be used within five years, otherwise the water will be re-allocated. The Environmental Affairs RoD is, however, only valid for two years, which may result in problems for small growers struggling to obtain finance for developing their land.

Costs. The cost of applying for a SFRA licence can vary between about R8,000 and R50,000 depending on whether a full EIA and soil surveys are required or not and on the size of the area applied for. Smaller licences (<10 hectares) often do not need an EIA or soil survey and a scoping report (about R8,400¹⁹⁸) will suffice. In addition, small administrative charges apply. The application fee is currently R114. Use of environmental consultants or lawyers to fill out the application form could range between about R300 and R500.

In most cases, the application fee will be waived for previously disadvantaged individuals. However, they will be liable for the costs associated with the environmental consultant or lawyer and the scoping report, unless they are part of a company scheme (i.e. Sappi small-grower scheme). In some cases, DWAF does much of the work in helping prepare a licence application and the scoping report for previously disadvantaged individuals, which reduces the financial burden for the applicant substantially.

Timing. According to statistics from the Eastern Cape¹⁹⁹ and discussions with DWAF in KZN, the average time it takes to issue a licence, from date of application, is 677 days (just less than two years) and 730 days (two years) respectively²⁰⁰. Looking at Table 42 it is clear that a substantial proportion of time

Previously disadvantaged individuals are subject to lesser costs in SFRA applications.

The environmental affairs and agricultural assessments comprise 50% of the licensing time, which is prolonged inter alia by sequential processes and site visits.

¹⁹⁶ The SFRA Water Use Licensing System captures the history or record (in digital format) of where the plantations are, what kind of species the plantation has, the size of the planted area, when the licence(s) was issued, the personal details of the applicant and other attributes which are included in the application.

¹⁹⁷ FSA notes that DWAF has, to date, not abided by the Tribunal's rulings and has not issued the licences that it was instructed to issue.

¹⁹⁸ According to discussions with DWAF, the scoping report takes about three days for an environmental specialist (at about R350 an hour) to complete

¹⁹⁹ For the last seven years

²⁰⁰ However, according to DWAF (2004d), this average has been falling and, in some instances, reduced to eight months. This reduction in the time to issue licences is due to an increasing awareness of the SFRA licensing in other

(about 50%²⁰¹) is allocated to the Environment Affairs and Agriculture assessment processes. According to discussions with both parties, it is agreed that the Environmental Affairs process is complex, with much information and stakeholder (i.e. environmentalists and parks board) participation required. This all takes time. The environmental assessment process is particularly long for plantation forestry due to its classification as an 'invasive species' and the resultant additional factors to consider.

Obstacles and delays. The major causes of delays in the application process are listed below:

- *Sequential processes.* In practice, Environmental Affairs and Agricultural officials only begin their investigations once DWAF has determined the availability of water. If these processes were to start at the same time, this would shorten the licensing time. However, no-one is prepared to invest resources and time before the availability of water is cleared.
- *Site visits.* As part of the licensing process site visits are necessary. This is often where the licensing process gets slowed up, as coordination between different officials to make a site visit is difficult. A suggestion to ease the process is for one person from the LAAC to make the site visit and if there is an obvious problem (i.e. existence of an endangered species or new ground being broken) then for the other relevant officials to be called out.
- *Issuing.* Once a recommendation has been given by the LAAC for a licence to be issued there is often a delay in the actual issuing of this licence. This is especially problematic when licences are issued at a National level (see Table 42).
- *Applicant.* Licensing delays are often as a result of applicants not providing relevant information timeously. Questions may need to be asked concerning the complexity of information required, especially concerning small-growers, who may not have the personnel and know-how of a larger company.
- *LAAC.* The LAAC convenes every six weeks to two months. Waiting for this meeting may cause delays.

In order to reduce licensing delays for small growers, maps of areas suitable for forestry were developed in KZN (see Section XX – 11). In areas identified in the map as suitable to forestry, only a site visit is necessary to allocate a water licence. At present, a Strategic Environmental Assessment (SEA) is being undertaken in the Eastern Cape to assess the viability of forestry in the Eastern Cape. By identifying areas suitable for forestry it aims to reduce licensing delays but applicants still need to go through the full application process and it will therefore, not have the same impact as the KZN small grower maps (see Section 10).

departments, better coordination between departments and greater capacity to support and link the different parts of the licensing process. According to Table 42, with certain changes, this could be reduced even further to about four to five months. The proposed changes to support this reduction in time include: (i) the Reserve determination being worked out, per quaternary catchment, prior to the application, (ii) general authorisations applying, to some extent, to SFRA licensing and, (iii) licence recommendations, especially for applications of less than 10ha, to be allowed prior to the LAAC meeting, so long as all the documentation is in order (i.e. DWAF authorisation, Environmental Affairs RoD, Agriculture authorisation etc.)

201 80 days of 159 days for an application of less than 10ha.

13.3.2.

IRRIGATION LICENSING PROCESS

Overview. Irrigators, who do not receive water from government or water management institution waterworks, must register their estimated average annual volumetric water use. This estimate will be based on the water requirements of the crop (see Section 6.3.3 of the Technical volume) and the area under irrigation. According to DWAF (2004e), smaller irrigators operate under a **general authorisation** and need only to register their water use but do not require a licence. If the irrigation requirement exceeds the general authorisation limit, a licence for use will be necessary.

Irrigation licensing is less complex than SFRA licensing. It costs less and it takes only half the time needed for an SFRA licence to issue an irrigation licence.

From discussions with DWAF, individuals involved in the licensing process and according to statistics from the Eastern Cape and KZN, the irrigation (i.e. abstraction) licensing process seems much less complex and difficult than the SFRA licensing process:

- No cooperative governance procedure (i.e. LAAC) is involved, which reduces; (i) the number of parties involved, (ii) the time to come to an agreement and (iii) the possibilities for objection.
- Authorisation is needed from The Department of Agriculture to break new ground but, although authorisation is needed from Environmental Affairs if there is a change in land use, farmers often neglect this requirement if they have authorisation from DWAF and Agriculture²⁰².
- A scoping report is usually not necessary and DWAF will only insist on an EIA in the case where a new dam is built to support the irrigation development.
- Once soil suitability surveys have been completed, the Department of Agriculture often co-ordinates the licensing application process on behalf of the applicant (EC Department of Agriculture, 2005).

Costs. Cost for an abstraction licence will be much lower as, in most cases, a scoping report and EIA is not required.

Timing. According to statistics from the Eastern Cape and KZN²⁰³, the average time it takes to issue a licence for storage and abstraction (i.e. irrigation), from the date of application, is about 405 days (just over a year). Thus, it takes between 67% and 80% longer to issue an SFRA licence as opposed to an abstraction licence.

Obstacles and delays. There are fewer and shorter delays for abstraction licensing than for SFRA licensing. This is due a number of reasons:

- There are fewer parties involved, thus fewer processes that need to take place before a licence can be issued.
- A cooperative governance process is not required, removing the time it may take to reach consensus.
- Co-ordinating site visits are often a problem in the SFRA licensing process. Once again, with fewer parties to co-ordinate (i.e. generally only DWAF and

202 Confirmed in conversations with provincial Departments of Environmental Affairs.

203 This figure includes applications for all abstraction and storage (e.g. constructing dams) water uses. Based on EC data for the last seven years and KZN data (extract) for the last 5 years.

Department of Agriculture), this will not be such a problem for the abstraction licensing process.

- With the **general authorisation** that applies to abstraction, fewer applications need to be considered below a certain size, thus preventing a clog of applications blocking and slowing the licensing process. Thereby, keeping the channels open for bigger applications.
- Although prescriptive conditions are generally attached to the abstraction licence, discussions with role players seemed to indicate that these conditions are not as prescriptive as the conditions attached to the SFRA licence. For example, plantations may only be planted on certain areas of the land in question and this may be conditional on removing other alien invaders such as wattle jungles. No similar restrictions or conditions with regards to location of planting are applied to agriculture.

It is, therefore, clear that the irrigation (i.e. abstraction) licensing process is quicker and far less complex and costly than the SFRA licensing process. This is not to say that it is a *better* process, but that the burden involved in applying for an abstraction licence is less than is the case when applying for an SFRA licence.

13.4.

THE WATER PRICING PROCESS

The principles of equity, sustainability and economic efficiency underlie water pricing in SA

DWAF's strategy for water pricing is still at a fairly early stage of development, and has not yet had a large cost impact. When one considers the objectives underlying the strategy as expressed as far back as 1999 – social equity, ecological sustainability, financial sustainability and economic efficiency – the potential impact of a fully developed water pricing strategy becomes apparent. For example, the objective of economic efficiency implies nothing less than the pricing of water at its opportunity cost²⁰⁴, a measure which by our reckoning would mean an increase in water charges assuming stable production of as much as a hundred-fold, with profound implications for economic activity in South Africa (we generally agree with the principle of charging at opportunity cost; but even supporters of the principle need to acknowledge the scale of change implied before pressing for it in this context).

Water pricing in this context deals with water used directly from raw water resources by so-called **first-tier water users**²⁰⁵, of whom the types currently charged are: municipalities and other water services authorities, industrial users, mining and energy users, irrigation users and forestry, through its classification as a stream flow reduction activity. The discussion does not deal with the charging of so-called **second-tier users**, who obtain their water from government water services.

²⁰⁴ Opportunity cost is defined as "the value of goods foregone (including environmental goods and services), when a scarce resource is used for one purpose instead of for its best alternative use" (DWAF, 1999).

²⁰⁵ According to the water resource pricing strategy (DWAF, 1999) the "database of registered or licenced annual volumetric use, as well as the estimated annual growth in demand of authorised water users supplied from Government waterworks, will form the basis on which unit sectoral charges will be calculated for each water management area, scheme or system"

13.4.1.

DWAF'S CURRENT PRICING PRACTICES

A pricing strategy has been developed for consumers of water whose use can be expressed in volumetric terms (**a**, **b** and **d** in terms of the usage classification in Box 9). Other first-tier users are not subject to the general pricing strategy, but are subject to a general authorisation.

In keeping with the objectives of the water pricing regime, the NWA provides for three types of water use charges to respectively fund *water resource management*, fund *water resource development* and achieve the *equitable and efficient allocation* of water. We consider each charge in turn.

Water resource management charges are levied to cover costs of maintaining water resources.

Water resource management (WRM) charges, currently set by DWAF, are levied to cover expenditure that relates to all those activities that are required to regulate, manage and maintain the water resource and/or catchment²⁰⁶. This pricing strategy is defined per water management area (WMA) and is allocated across all water users that have been registered or licensed. Not all water users have been registered to date, so over time, as more users are registered, the share of the costs will be distributed amongst greater numbers of users. Some things to note:

- The WRM charge is not applied to dry land agriculture (as it currently does not fall in any of the water use categories) and rain-water used by irrigated agriculture is not included in the volume used for allocating charges.
- The WRM charge is subsidised in the case of emerging farmers.
- Sectors that receive no obvious benefit from any specific management activity are exempt from charges related to that activity.
- The WRM charges are currently very small. According to DWAF the estimated total charge to plantation owners in the 2005/06 financial year will be about R5m (Vawda, 2005). WRM charges for the forestry sector are capped at a maximum of R10/ha/annum, with annual increases thereafter restricted to the producer price index.

Water resource development charges should cover the costs of government water schemes. Charges for achieving equitable and efficient water allocation are to be introduced.

Water resource development charges (including for the use of waterworks), set by DWAF, relate to the use of water from government water schemes and for schemes funded by other water management agencies such as catchment management agencies (CMAs). These charges are imposed to cover the cost of planning, designing, operating and maintaining such schemes. These charges do not, for obvious reasons, apply to forestry, as it obtains its water directly from the ground and from precipitation.

Charges for achieving the equitable and efficient allocation of water are economic charges aimed at reflecting the relative scarcity of water. These charges have not yet been applied administratively.

²⁰⁶ These activities include the establishment of the CMA, planning and implementing catchment management strategies, dam safety regulations, pollution control, pollution control (mines), solid waste control, water allocation control, water use control, demand management, hydrology, geohydrology, functional support, working for water programme, 20/20 vision (an educational drive to educate people on the merits of conserving water) and weed control.

13.5.

WATER ALLOCATION AND QUALITY

Water licensing also aims to ensure acceptable water quality levels – these levels may differ between quaternary catchments.

A major focus of water regulation is to ensure that the quality of water resources are protected and managed. Water quality is currently controlled through the NWA, which require activities that result in the pollution of the water resource (including pulp and paper mills) to be registered under a particular discharge category of water users and through the licence conditions which set out the maximum acceptable levels of pollution. In future²⁰⁷ such water uses will also be liable for an additional charge (see section 13.5.1), which is intended to incentivise the adoption of cleaner technology and recover cost of ‘cleaning up’ pollution.

The maximum levels of pollution set in the water licence conditions are determined relative to the current ecological status of the water source affected and the desired level to be achieved/maintained. The current quality of water in different rivers is assessed in terms of a present ecological status category (PESC) measure, which is assigned to each quaternary catchment²⁰⁸ and range from A (natural, unmodified) to F (critically modified). The process of assigning PESC levels allows some community involvement through the catchment forums and theoretically, communities are able to decide on a PESC level with which they are comfortable. In this way, higher levels of pollution (and, therefore, lower PESC grading) may be acceptable to a community in return for economic development. However, the final responsibility and authority of the PESC classification remains with DWAF and it is clear that only limited compromise (if any) will be accepted. The PESC is also taken into account when determining the Reserve requirements, through determining the suitable level of quality that is necessary for basic human use and for sustaining the natural aquatic environment.

The desired PESC assigned to a particular river consequently determines the level of pollution that will be acceptable (which may be higher or lower than the current status). Once particular grades of quality or PESC are accepted for different river systems, a particular environmental threshold is linked to the PESC ranges (i.e. water quality) within which DWAF will manage pollution levels and beyond which they are not willing to compromise²⁰⁹.

13.5.1.

CHARGES FOR DISCHARGE

To ensure water quality, charges for discharge are being developed that will cover administrative costs, mitigating costs, and incorporate a penalty system.

Charges relating to the actual impact on the quality of the water resource are still being developed and will, according to discussions with DWAF, be applied from the beginning of the 2006/07 financial year. These charges will be for uses (E to H and J as defined in Box 9) that involve discharging or disposing of water or waste into a water resource or ground water reserve. The ‘polluter pays’ principle, to encourage minimisation of waste and waste discharge, will be applied to determine the level of the charge.

²⁰⁷ DWAF expects these charges to be implemented in the next three years.

²⁰⁸ In grading water quality in rivers, both in-stream habitat and riparian (river bank) habitats are considered.

²⁰⁹ For example, the environmental threshold for a river in Gauteng may be lower than for a river in the Kruger Park.

At present, users in these categories are only contributing to water resource management costs associated with pollution control and are not being charged for the amount of pollution that they introduce into the system. In future, when the charges for discharge apply, they will face a charge which will consist of three components:

- *administrative charge* to cover the costs of operating the discharge management system
- *mitigating charge* to cover the costs of cleaning the water, i.e. effluent treatment plants; and
- a *penalty* related to the amount of pollution caused. This charge may be difficult to determine, but DWAF is confident that the price will be set at levels, which will incentivise users to pollute less.

13.6.

THE IMPACT OF WATER QUALITY REGULATION ON PULP AND PAPER PRODUCTION

The dispute around non-compliance to water quality standards threatens the future of the pulp and paper industry.

As discussed in section 13.4, pulp and paper mills require a licence for the discharge of effluent into the water resource, which is considered to be one of the major environmental impacts of these activities²¹⁰. These licences are issued for a period of 5 years after which the environmental situation and compliance to conditions are reviewed before the licence is renewed. Renewal is not guaranteed and DWAF may, therefore, withdraw the licence if the review finds that the licence holder has not adhered to the specified conditions.

Conditions required by the licence are often not immediately achievable as, for example, technologies are not available or it may require investment in process changes by the licence holder. In the past, exemptions were granted and the licence was issued on condition that such changes are implemented over a set period of time. According to DWAF, compliance with these conditions has, however, been low and often resulted in exemptions being rolled over.

Since the inception of the NWA in 1998, DWAF has taken the stance that non-compliance will no longer be tolerated and that it will discontinue the issuance of exemptions. Each mill now has an "Integrated Water Management Plan", in which the water quality impact of the mill is made explicit and mitigatory measures together with a specific implementation time frame must be stated. As a number of water licences are coming up for renewal for the first time since 1998, the full impact of this is now emerging with renewal of water licences as well as applications for expansion being withheld due to arguments over compliance.

Industry argues that the standards set, in some cases requiring zero effluent discharge, are too strict and that the technologies do not exist (even internationally) to enable them to achieve these standards. Furthermore, it is argued that the standards are one-sided and do not consider the trade-off between development and environmental impacts. It is also argued that the South African industry

²¹⁰ See Section 2.3 in the Technical volume for a more detailed discussion of the effluent discharged by pulp and paper mills and the resultant environmental impact.

compares favourably with the effluent levels of even industrialised countries (Industry role players, 2004, 2005).

Although the availability of technology argument is not contested by DWAF, their position is that they are not willing to compromise the environment by considering any type of trade-off and that, if the industry cannot even find a solution to its current pollution problems, it cannot be allowed to expand. This may also result in existing mills being forced to shut down, if they are unable to show that they can, within a reasonable time frame, achieve the environmental standards set (Herbst, 2005). With regard to the comparison to international standards, the argument is that, as a semi-arid country (in which the concentration of any pollution is thus higher than in a country where there is an abundance of water), South Africa cannot be compared with other, more water-abundant countries such as those in Europe (Herbst, 2005).

At the moment it seems that this process has achieved a deadlock with neither party willing or able to compromise its position. If this persists, it is expected that the respective positions will be tested in court. The first case in point is the application for expansion at Sappi's Ngodwana mill, which have been delayed for more than 2 years due to compliance issues. The conditions set for this mill require that zero effluent discharge must be achieved before the next renewal.

13.7.

FINDINGS ON THE IMPACT OF WATER REGULATION ON THE FTFP CLUSTER

As a stream flow reduction activity, forestry is an important user of water. It is also often the user with first access to water resources. This happens when it is located high up in catchments and thus the "most upstream" water user. As such, plantation forestry's water usage needs to be regulated.

The picture is however more complex than it seems at first glance. Though forestry uses in excess of 700m m³ of water per annum, its *per hectare* water use is accepted to be only about 10% of the water irrigation agriculture uses per hectare. No reliable national data exists for the total water use, per hectare, of dryland agriculture, as it does not get captured in the water resource management and pricing system. Similarly, agricultural GDP relative to irrigation water use amounts to R4.7 per m³ of water used. This however overestimates value added, as dry land agriculture's water use, as well as the precipitation water use by irrigation agriculture, is not included. The corresponding figure for plantation forestry is about R3.5 per m³ water used. From this, and taking into account the downstream processing of wood versus other agricultural crops, it appears that forestry is not a less efficient water user than agriculture.

The conclusion is thus that plantation forestry's water use does not justify a policy stance in which plantations (as the only SFRA activity) are singled out by water regulation. Under the current regulatory framework, this is however the case. Special measures applying to forestry include:

- A re-application for water licensing is required where water use is changed to a different category. This affects switches from agriculture to forestry, but not crop switches within agriculture.
- As the sole SFRA, forestry is the only water user requiring a public participatory licensing assessment and advisory committee (LAAC) licensing process
- As an “invader plant species” identified under the Conservation of Agricultural Resources Act, special measures apply to forestry in the issuing of a licence.
- New afforestation requires an EIA (under the National Environmental Management Act), which can cost up to R50 000. This is rarely the case for other agricultural activities.
- The average duration to issue an SFRA licence is currently about 2 years, of which 50% is allocated to the Environmental Affairs and Agriculture investigations. The corresponding period for an irrigation licence is 1 year.

The unique nature and duration of forestry’s licensing process as described above, rather than the water tariffs²¹¹ paid by forestry as an SFRA, is what is of concern to the industry. Another concern is that, due to water allocation and the special licensing process required, landowners may be prevented from planting plantations, or may plant unlawfully.

Whereas plantation forestry is the FTTP sector most influenced by regulations pertaining to water *quantity*, water *quality* regulation, through effluent standards and the pending charge for discharge system, informs the future of the pulp and paper industry. The other segments of the value chain are not at present significantly affected by water regulation (be it quantity or quality related).

In conclusion, a number of key findings regarding the current and potential impact of water policy on existing and new afforestation will be highlighted.

13.7.1.

COMPULSORY LICENSING MAY REDUCE THE EXISTING STOCK OF TIMBER

Through the compulsory licensing process, all water users in a catchment are going to be verified and registered. Where catchments are in deficit, reallocations may take place from existing water users to the Reserve and/or to previously disadvantaged individuals (PDIs). The implication is that, for example, a plantation for which the water allocation is reduced will be forced to reduce its plantation area to remain within the new limit. The extent of such reallocations is, however, not clear and will only be determined once the formal assessments are completed. The impact this will have on the stock of timber depends on the proportion that is re-allocated to the Reserve and to PDIs. Where water is reallocated to PDIs they may wish to continue or establish plantation operations themselves (or through a leasing agreement), thereby maintaining the stock of timber. The Inkomati WMA,

²¹¹ This chapter has shown that water tariffs reflect resource management (administrative) costs rather than the economic value of water. The total charge to plantations for 2005/06 will be R5.2m – an insignificant amount considering the value of its annual outputs (R5.1bn for 2002/03). Economic value of water can be provided for in a system of tradable water rights. Trading of water licences is allowed between activities, but the system does not facilitate it and it is rarely practiced at present.

where irrigation and plantation forestry currently use the bulk of water (DWAF, 2004b), is an example of where compulsory licensing may negatively impact on the stock of timber.

However, the compulsory licence process will consider the impact of reallocation on jobs and incomes dependent on the current allocation. These benefits will need to be carefully weighed up against the benefit of meeting Reserve requirements and/or of meeting equity considerations. The framework within which these considerations will be made is not clear.

13.7.2.

REGULATING FOR OPTIMAL WATER USE MAY RESULT IN SUB-OPTIMAL RESOURCE ALLOCATION

The current pricing strategy (and by implication also the allocation policy) provides government with increasing powers to direct resource use. Section 27 (1) of the NWA stipulates the factors that need to be taken into account when issuing a licence. One of these factors is the 'efficient and beneficial use' of water in the public interest. The pricing strategy published in terms of the Act (DWAF, 1999; DWAF, 2002) explicitly states the intention to direct water use to "higher value" uses and to incentivise conservation of the scarce water resource. It is suggested in the strategy that this can be achieved administratively or by using a market-related mechanism. The pricing strategy, furthermore, defines "efficiency" as "*a condition that is achieved when resources are used over a given period of time in such a way as to make it impossible to increase the welfare of any person without harming another*", which describes Pareto optimality rather than efficiency²¹².

By applying administrative charges for this purpose, it is suggested that current water use may not be optimal from an equity or efficiency point of view and that use should, therefore, be redirected to more appropriate activities. In addition, it is suggested that the regulator (through setting appropriate economic charges) is in a position to identify more 'appropriate' opportunities which will achieve higher levels of equity and efficiency. Currently, equity considerations are, to a large extent, achieved through the compulsory licence process and no other charges are levied to compensate for the opportunity cost of water use.

Identifying optimal water use is a complex task, which this analysis suggests to be beyond the capacity of any government or regulator to pursue. Whereas it may be possible for a regulator to ensure that an activity does not result in a net cost to society, the complexity of assessing optimal activities is overwhelming. Even if the capacity was available, the fact that only water use is optimised is highly problematic. Any economic activity combines a number of resources of varying levels of scarcity of which water is only one (others include capital, land, labour, management skills, entrepreneurial skills, etc.). Optimising only water use will systematically result in sub-optimal outcomes (even for water use) due to the inability of any central allocation system to consider the opportunity costs of all resources involved.

²¹² "Efficient" use is usually interpreted to mean that the use of the resource should result in a net gain (and not necessarily the maximum gain) to society if social and environmental impacts are taken into account.

In addition to administrative pricing, the current water regulation also allows for a market-based allocation system. Although this is currently allowed on an ad hoc basis, the necessary institutional and regulatory infrastructure to make this market work has not been created. The experience with water trading is not uncontested internationally, but if done in a managed manner, provides a better alternative to administrative allocation (which is clearly not efficient).

The view based on the preliminary analysis (a full analysis of a market-based water trading system was not possible in the current study), is that it will be in SA's interest to pursue a management market allocation system (i.e. creating the necessary infrastructure and providing the regulatory support for such a market) rather than pursuing administrative systems. Such a system could allow government to continue to price for externality costs, which are not automatically dealt with by the market system.

Irrespective of whether a market-based system is developed, it is inappropriate for the regulator of water to direct the allocation of all resources (i.e. trying to decide between alternative uses of water) as it is incapable of weighing up the full consequences of its interventions and much of this falls beyond its mandate. At the least, it is proposed that water regulation be subjected to explicit regulatory impact assessments to evaluate the development trade-offs resulting from increased regulatory requirements placed on the industry.

13.7.3.

CURRENT APPLICATION OF THE NWA AND DIFFERENT LICENSING PROCESSES BETWEEN WATER USERS MAY RESULT IN DISTORTED LAND USE DECISIONS

Distorted land use decisions can be defined as certain activities going ahead, not because they are necessarily beneficial in the public interest, but because they do not have to go through a number of regulatory hoops like other activities, which may in fact be more beneficial in the public interest. In this instance plantation forestry is the activity having to go through a complex and slow regulatory process.

Firstly, in terms of what the NWA hopes to achieve, defining plantations as the only SFRA is inconsistent. One of the major goals of the NWA is to regulate water uses that impact on any of the defined sources of water. Through allocating water use licences, water will be directed to activities that promote the beneficial and equitable use of water from each of these sources. However, defining plantation forestry as the *only* SFRA is not consistent with this approach. Other activities (e.g. dry land agriculture) need to be regulated as SFRAs in order for the system to operate effectively and to prevent distorted land use decisions from being made.

Secondly, the water licensing process is substantially slower and more complex for plantation forestry than for other water users (e.g. irrigation). The average time to get a SFRA licence is two years as compared to just over a year for an abstraction licence (i.e. irrigation). The SFRA licensing process involves authorisation from a number of government departments, which, although correct in legislation, may not

be applied efficiently in practice. Besides tweaking a number of things²¹³ the major complexities and stumbling blocks will remain. According to discussions with LAAC representatives, these are the involvement of, (a) the Department of Environmental Affairs (provincial) and, (b) the Department of Agriculture (provincial and national):

- A substantial amount of information (i.e. scoping report, EIA) and stakeholder (i.e. environmentalists and parks board) participation is required by Environmental Affairs to issue a RoD. Comparing this to the lack of involvement of Environmental Affairs in the licensing of other changes in land use (i.e. irrigation), highlights the difficulties for plantation forestry²¹⁴.
- Plantation forestry competes with other crops for land. In this respect, there have been indications from the Department of Agriculture in the Eastern Cape that the Department is not keen to give up land for plantations. As a result, the attitude towards plantations of people involved from the Agricultural side in the SFRA licensing process, needs to be questioned, as this may have an impact on the duration of the licensing process.

As a result of the time, complexity and potential barriers faced in the SFRA licensing process, valuable plantation initiatives may be prevented from going ahead – possibly being replaced by land uses that do not offer quite the same level of socio-economic benefits.

One final point that needs to be stressed is that through regulating the allocation of water licences, government is also directing the use of other resources (such as land and entrepreneurship) for all those activities that require water licensing. The significance of this is highlighted when one considers the difficulties faced by SFRA licensing as compared to non-SFRA licensing.

13.8.

SUGGESTIONS FOR THE WAY FORWARD

Plantation forestry makes a significant contribution to the country and it is important that the stock of timber is maintained and expanded in an environmentally sensitive manner. What is clear, however, is that the current SFRA licensing process is complex and creates a larger compliance burden, for plantation owners, than what is expected from other water licences. The fact that SFRA water regulation is more thorough than that of other water users, in effect create a bias against plantations over other land uses.

In this regard, our suggestion is **not to revise or reduce** the current regulations in favour of forestry²¹⁵, but to put in place a plan whereby the burden on both applicants and LAAC representatives is reduced, thereby allowing a quicker and more effective licensing process²¹⁶. What this would involve is a **broad**

²¹³ Authorisation of up to 50 or 100 hectares allowed regionally, authorisation prior to next LAAC meeting in cases where all documentation is in order etc.

²¹⁴ Mention has been made that, as plantation forestry is such an organised and visible land use compared to other land uses, this is why their licensing process is so carefully attended to.

²¹⁵ It is accepted that plantation forestry reduces stream flow and that alien species are involved.

²¹⁶ It has been suggested that when (and if) general authorisations (GA's) apply to plantation forestry; this will contribute to streamlining the SFRA licensing process for applications below a certain size. However, a GA may quicken the process marginally, but will not obviate the need for the involvement of other co-operative governance partners besides DWAF (i.e. Environmental Affairs and Agriculture)

identification of suitable areas for new afforestation²¹⁷ prior to large numbers of applications being submitted. In this process of identifying areas, all relevant stakeholders (DWAF, Environmental Affairs, Agriculture, Parks Board, Environmentalists and Geo-hydrologists) would need to be involved. The outcome (similar to the KZN small-grower maps) would be areas identified where the water and biodiversity impact of plantation forestry is low and, therefore, the SFRA licensing process in these areas much quicker²¹⁸ (i.e. a maximum of three months²¹⁹). As a result, the potential for distorted land use decisions to be made, due to differential licensing processes, will be reduced.

As already discussed, administratively setting a charge for the opportunity cost of water use will be virtually impossible. In this regard, trading of water licences may be an effective way of pricing for the opportunity cost of different water uses. Our suggestion, however, is to pursue the option of water licence trading only **once further research on water trading markets is undertaken**. This may, in turn, require the setting up of some sort of institutional framework to support such a market.

In future, whether DWAF is the appropriate institutional home for plantation forestry may also become an issue to be dealt with. The close government association between the water regulation and forestry functions results in conflicting interests and views and the close association makes it difficult for the forestry department to support appropriate forestry development as its official position is tied to that of water regulation. Through departmental association, forestry is furthermore the easiest “target” for water regulation. Hence, mixed (at best) signals are sent to the industry and potential development opportunities are undermined. In an industry that requires substantial capital investment to operate, the uncertainty created by these signals is problematic.

A further impact of the current regulatory design is that development grants defined for use by ‘agricultural’ activities and managed by the Department of Agriculture are not made available to forestry as it is not defined as an ‘agricultural’ activity. This is the case even though it clearly falls within the intended target market for the grants and have significant pro-poor impacts. These grants would contribute substantially to developing community forestry. In addition, the separation of agriculture and forestry results in conflict between the management of similar industries that utilise the same resources.

The scope of this study does not allow for specific recommendations for restructuring, but it is clear that the current manner in which these government functions are managed is not in the interest of economic development and resource management. At the least, closer cooperation should be facilitated between agricultural and forestry management.

217 An example of where this thinking is currently playing out is in KZN with the release of the small-grower maps

218 All that would be needed is one site visit by a LAAC member to ensure that no local biodiversity or water issues exist

219 An additional benefit for applicants from these areas are that they may be able to secure funding prior to the issuing of a licence, rather than getting a licence and then not having the funding to support a plantation initiative and, thereby, not ever taking up their water

14. THE IMPACT OF LAND REFORM ON THE FORESTRY VALUE CHAIN

14.1. INTRODUCTION

This section is about the impact of land reform on, (i) plantation forestry as a land use, (ii) the users of land for plantation forestry, ranging from forestry companies through to small growers and, (iii) the likely outcome of land reform whereby previously disadvantaged individuals are in a position to benefit from the gains to be made from plantation forestry.

Land ownership in South Africa was historically skewed by law. Land redistribution, restitution and tenure reform aim to rectify the unequal nature of land ownership.

The Native Land Act (NLA) of 1913 began a process of systematically dispossessing African people from their land. The NLA apportioned 8% of the land area in South Africa as reserves for Africans and excluded them from buying land in the rest of the country (Rugege, 2004). Up until the end of Apartheid a number of pieces of legislation contributed to enforcing the NLA, including the Group Areas Act (Act 41 of 1950) and the Prevention of Illegal Squatting Act (Act 52 of 1951).

When the ANC government came into power one of their main aims was to effect land reform that would, to a significant extent, ameliorate injustices of the past and grant access to land for those who had been denied access previously. Equal access to land is considered of such importance that in the 1996 Constitution land matters were treated as matters of rights and included in the Bill of Rights.

The discussion in this section will highlight the impact of land reform on both existing plantations and on new afforestation in South Africa. In terms of existing plantations the discussion will look at the impact on state-owned, company-owned and independent farmer-owned plantations. In terms of new afforestation, the discussion will focus on the impact of land reform in the two areas identified for new afforestation, namely KZN and the Eastern Cape.

A brief description of the three important principles of land reform (redistribution, restitution and tenure reform) will precede the discussion of the impact of land reform on existing and new afforestation.

14.1.1. REDISTRIBUTION

When the state buys land to distribute to those who have previously been denied ownership, it is known as *land redistribution*.

Redistribution refers to the acquisition of land by the state for purposes of distribution to those who have been previously denied access to land. The strategy of redistribution is contained in the Constitution, which states that “the state must take reasonable legislative and other measures, within its available resources, to foster conditions which enable citizens to gain access to land on an equitable basis.”

Two significant redistributive mechanisms are the *settlement land acquisition grant (SLAG)* and the *land redistribution for agricultural development (LRAD)* programmes.

Government used to direct redistribution through SLAG grants of up to R16,000 per household. Nowadays, LRAD grants, that must be matched by an own contribution by the applicant, are granted for the purchase of agricultural land.

SLAG. SLAG grants were the main mechanism for land redistribution until 1999 and, in cases relating to commercial agriculture, have been largely replaced by the LRAD programme. Under SLAG the government provides a subsidy, with an upper limit of R16,000 per household, to be used for “land acquisition, related on-farm capital items, enhancement of tenure rights, and investments in internal infrastructure, top structure and fencing, according to beneficiary plans”²²⁰. Therefore the grant has a dual function: for the acquisition of land and “as a contribution to the capital required to make the land productive”²²¹.

Although small, this amount is intended to be used by the poor to contribute towards the purchase of a dwelling or piece of land²²². Alternatively, it was expected that a group of poor people would pool their subsidies and contribute this combined amount towards the purchase and/or collective management/development of agricultural land. The Umzimkulu community grower scheme (discussed further in Section 10) is an example of households pooling their individual subsidies.

LRAD. The LRAD programme is currently the dominant redistribution mechanism and was introduced due to dissatisfaction with SLAG. The main difference from SLAG is that grants are subject to an own contribution by the applicant and are to be used primarily for the purchase of agricultural land. This contribution can be in the form of money, capital or labour or a combination of the three. In addition, the contribution to grant is not a one to one relationship, but is worked out via complicated charts describing the level of beneficiary input relative to the governments input²²³. LRAD makes more funds available for redistribution and through the contribution of the applicant, it is hoped that the system will be inherently more viable. In addition, there may be opportunity for the Land Bank to support such applications²²⁴.

14.1.2.

RESTITUTION

Restitution aims to restore land rights to rightful owners who had been forcefully removed.

Restitution (see Box 11) is the process whereby land rights will be restored to people whose family members were dispossessed of their rights through discriminatory laws or forced removal since 1913. In the interests of certainty for existing landowners, all restitution claims had to be submitted by the 31 December 1998.

Restitution can take place in three ways, or a combination of the three: (i) restoration of the actual land from which claimants families were dispossessed; (ii) provision of alternative land; (iii) payment of compensation (i.e. money). In urban

²²⁰ Taken from the White Paper on South African Land Policy (DLA, 1997 - Box 4.3).

²²¹ Taken from the White Paper on South African Land Policy (DLA, 1997 - Box 4.4).

²²² Farm workers or former farm workers could also apply for the SLAG grant, for the purpose of financing or partly financing the purchase of equity shares in farms.

²²³ For example, the minimum grant is R20,000 and needs to be met by a contribution of at least R5,000, whereas the maximum amount an applicant can access is R100,000 with a personal contribution of R400,000 (Rugege, 2004)

²²⁴ A Land Bank representative indicated that there is no specific partnership between DLA and Land Bank with regards redistribution, although a number of pointers indicate that the Land Bank plays a role. Firstly, a Land Bank representative sits on the LRAD provincial grants committee's, whose responsibility it is to assess LRAD applications. Secondly, if someone has received a LRAD grant and applies for a Land Bank loan, although they will be evaluated like any other applicant, if successful, they will receive more favourable rates. This is the Land Bank's attempt at supporting redistribution.

areas, the Commission for Restitution of Land Rights (CRLR) and the Land Claims Court (LCC) favour a settlement in cash, however, in rural areas, a settlement in cash is the last resort and preference is given to settling people on the land²²⁵.

Box 11 The Restitution of Land Rights Act (Act 22 of 1994)

This Act entitles a (taken from Rugege, 2004) "person or a community disposed of rights in land or a descendent of a person or a deceased estate of a person dispossessed of rights in land, after 19 June 1913, as a result of racially discriminatory laws or practices, to claim restoration of those rights or equitable relief such as alternative land or compensation."

Under the Act, the CRLR and LCC were set up. The purpose of the CRLR is to verify and evaluate claims, facilitate negotiated settlements and to promote sustainable use of land through the restitution process. According to the strategic direction of the CLRC, the focus should be on rural claims received²²⁶.

The LCC was constituted in 1996 and serves as a specialist court with an independent adjudicatory function with regard to legal disputes arising from the government's land reform programme. If the CRLR is unable to settle a claim through a negotiated settlement then the matter is referred to the LCC. In addition, the LCC has exclusive powers to determine compensation payable upon expropriation or acquisition and to determine a person entitlement to the land.

The restitution process (i.e. lodgement of claims, finalisation of all claims and implementation of all court orders) was to be completed by 2005, however, although the validation of claims has been completed, the verification process confirming the identities of claimants and the size and value of the land involved is still on-going. The 2005 deadline has recently been extended to 2008.

Although the state has the power to expropriate the land subject to payment of "just and equitable" compensation, there is hesitance to pursue this route in the interests of reconciliation, national unity and maintaining an investor friendly environment. The government has preferred to follow the principle of "willing buyer willing seller". However, given the unreasonableness of certain farmers, an amendment²²⁷ to the Restitution of Land Rights Act has been passed giving the Minister the power to expropriate land for restitution without having to get a court order. The purpose of the amendment is to allow the acquisition of land to proceed much faster where the landowner is refusing to negotiate.

14.1.3.

Tenure reform secures the land rights of people living on communal land and is of most direct relevance to new afforestation

TENURE REFORM

Tenure reform (see Box 12) is intended to provide secure tenure to those living on land owned by others and not in the possession of rights. In this way there is also an intended aim of bringing all people who occupy land under a "unitary legally validated system of landholding" (Diomo & Pitcher, 2003) and, as a result, provide for secure forms of land tenure and help to resolve any tenure disputes. Specific groups of people who are a focus of tenure reform are labour tenants, farm workers, former farm workers and people living on communal land without secure rights.

²²⁵ According to discussions with senior people in the Land Claims Commissioners office

²²⁶ Taken from DLA (2004).

²²⁷ Land Restitution and Reform Laws Amendment Act, 1999

In the former homelands, past policies systematically undermined the indigenous land tenure systems and created a land administration system designed to control the rural population through a system of second class rights (i.e. permits to occupy). As a result of these policies, the majority of people living in these areas face insecure tenure rights. Areas where tenure reform will have a significant impact are the former homeland areas of the Eastern Cape and KZN.

Box 12 Communal Land Rights Act (CLRA) (Act 11 of 2004)

People living on communal land in the former homelands do not have secure tenure rights. They have use rights based on customary law or insecure permits derived from government permissions to occupy. These rights do not have legal status. The Interim Protection of Informal Land Rights Act (IPILRA) of 1996 was a temporary measure to provide protection for occupation, pending the introduction of comprehensive and prescriptive legislation that would provide permanent rights. This legislation has now come in the form of CLRA.

CLRA is a framework for the transferral of land held in trust by the government or, as in KZN, the Ingonyama Trust or in the name of a traditional leader or other legal entity to communities and in some cases individuals²²⁸. These are the communities or individuals for whom the land was held or registered in the first place. This will allow communities on communal land the right to acquire title to the land as a group or as individuals. As discussed in Rugege (2004) a “community can register as a juristic person with perpetual succession irrespective of the changing membership of the community and thereafter acquire land and have it registered in its name.” Furthermore, under the Act the²²⁹ “outer boundary of land will be held communally in title in the name of a community and the individual members of a community will be granted registerable Deeds of Communal Land Rights for the land they occupy and use.” This Deed of Communal Land Right will be registered in the Deeds Registry System, and the holders of such a deed will be able to convert it into freehold ownership subject to the consent of the community.

The Act requires that a community establish a **land administration committee** (LAC) to allocate the use of the land within the community. These LAC’s must be persons who do not hold any traditional leadership position, who are elected by the community and who are one third women. The idea behind the LAC is to democratise the process of land allocation and avoid the abuse of power of traditional leadership in allocating land. However, the Act then virtually negates this democratic provision by saying that if (Communal Land Rights Act, 2004) “a community has a recognised traditional council; the powers and duties of the land administration committee of such community may be exercised and performed by such council²³⁰”.

In addition, the Act allows the Minister to establish one or more **Land Rights Boards** to (Communal Land Rights Act, 2004) “advise the Minister and advise and assist a community generally and in particular with regard to matters concerning sustainable land ownership and use”, make sure that access to land is provided on an equitable basis and liaise with all spheres of government. In this regard, the Ingonyama Trust Board in KZN will become a land rights board and be known as the Ingonyama Land Rights Board for Kwazulu-Natal. As a result the Ingonyama Trust will remain in place pending the transfer of all land to the respective communities.

14.2. IMPACT OF LAND REFORM ON EXISTING PLANTATIONS

The impact of land reform on existing plantations will be primarily through the principles of restitution and to a lesser extent tenure reform.

14.2.1. STATE OWNED PLANTATIONS

The privatisation of the SAFCOL forests began before the land reform process was finalised. In this regard the State acknowledged that there were, and are, underlying land rights to plantation land which may be recognised in time through

²²⁸ CLRA also provides for comparable redress if this transfer of title cannot take place. This redress can be in the form of money or alternative land or a mixture of the two.

²²⁹ Taken from DLA 2004b.

²³⁰ The Traditional Leadership and Governance Framework Act (TLGFA) states that traditional councils must have an elected element, however, the majority of the council is still controlled by the traditional leader.

restitution claims (Dlomo and Pitcher, 2003). Thus, it was important that land was not sold off to later become the issue of a land claim. With this in mind, the decision was made not to sell the land to prospective bidders, but to lease the land.

The leasing process involved a phased approach to privatisation where the SAFCOL forests were divided into three general categories (taken from Dlomo & Pitcher, 2003):

- Category A – the entire SAFCOL estate (386,476 ha) combined with distinct elements (amounting to about 70,000 ha) of the former homelands plantations so closely associated with particular SAFCOL assets to make their combination logical
- Category B – the balance of the commercially viable plantations remaining under DWAF's management extending over approximately 70,000 ha
- Category C – approximately 110 small scattered plantations (or woodlots), extending over 17,000 ha established to provide communities with building material and fuelwood

14.2.1.1.

CATEGORY A PLANTATIONS

Category A plantations were divided into five²³¹ packages for leasing, with each package representing a logical business unit. Leases (see Box 13) have been finalised for two of the five and two more are likely to be finalised by April 2005²³², as shown in Table 43. The leasing agreement will prevent widespread resettlement of people into areas that are suitable for forestry, while at the same time compensating these people for their land on which plantations are managed.

Package	Total lease area (ha)	Total planted area (ha)	Present Status (2002)
Eastern Cape North	75,487	57,715	Leased to Singisi Forest Products Consortium August 2001
Komatiland (Mpumalanga and Limpopo)	209,372	139,082	Stalled, pending Competition Tribunal decision.
Amatola (Eastern Cape South)	25,417	4,399	Rance consortium appointed as the preferred bidder. Likely to be finalised by April 2005.
Mountain to Ocean (Western Cape)	161,192	87,978	A 20 year exit strategy established to withdraw forest production in the area. Viable areas ²³³ subject to tender process, which should be finalised by April 2005. Cape Timbers consortium the likely tenant.
Kwazulu-Natal	43,946	32,652	Leased to Siyaqhubeka Consortium September 2001
Total	516,134	321,826	

Table 43 Status of the Category A assets offered to bidders during 2000 to 2002

Source: *Dlomo and Pitcher, 2003*

231 Originally this was seven, but certain packages were combined and re-offered.

232 According to discussions with DWAF.

233 Land which is not being converted to fynbos.

Box 13 Category A leasing agreement

Leases are signed for an indefinite period with a 35 year notice by the government or tenant. Such notice can only be given after the first 35 years, thereby creating a lease with a 70 year minimum duration. Leases are managed by the Forest Land Management Unit (FLMU) in DWAF. Land is leased at market value. Every 5 years there is an assessment by DWAF and the base rate is adjusted. Every other year the lease increases with inflation. The rent does not take account of the condition of the trees, but assumes 'bare afforestable land' value²³⁴.

Investors can bid for a 75% shareholding (at least 10% needs to be black owned) in any combination or all the packages. Minority shareholdings in each company holding a package, or number of packages, are to be held by government (6%), workers (9%) and the National Empowerment Fund (10%). One condition of the lease is that the current SAFCOL management team, of each package, is taken over, for a minimum of three years, into the employ of the successful tenant²³⁵.

The tenant is issued with a licence to operate and gets full undisturbed possession of the land subject to the requirements of the National Forests Act. The tenant has rights almost as strong as freehold. Once a claimant to the land is identified, the claimant receives title to the land and the claim is settled on condition that the claimant allows the lease to remain in place.

There are two ways in which a valid claimant can benefit from the leasing agreement. The first is through rental income from the lease²³⁶ and, secondly, from being part of a group holding shares in the management company²³⁷.

Land claims on leased Category A plantations do not seem to pose problems to companies.

At present it is estimated that there are about 250 land claims on category A plantations²³⁸. It is, however, not possible to gauge the size (i.e. percentage of land area claimed) of these claims as most of them are still under investigation and none have been finalised.

Discussions with forestry companies leasing the land seem to indicate that these companies are happy with the leasing agreement and their position as tenants. They feel that their business operations and right to manage the plantations are, and will be, unaffected by the land reform process.

The one risk to the leasing arrangement is a valid claimant who, not being satisfied with the lease agreement, takes their case to the LCC. There are two points to consider in this regard. Firstly, the probability of a claimant challenging the lease agreement and, secondly, the probability of the LCC awarding in favour of the claimant:

- Very few claimants are going to challenge the leasing agreement in court, as they will have difficulty in proving, and believing, that an alternative land use (or managing the plantation themselves) will generate more income than the leasing agreement. The plantation operation is already set-up, has a customer base and is being run as an operation over a large area and can thus benefit from economies of scale. The claimant would have to believe, and prove, that an alternative land use (or managing the plantation themselves), operated on a

234 The tenant would have to purchase the trees and buildings on the property when the lease is signed.

235 The importance of this, especially for a package like Komatiland, is that in the interim, whilst the lease is being finalised, the management will continue to operate in such a way as to maintain a high value of stock.

236 In cases where there is no claimant to land which is leased, the rental income will be distributed to adjacent communities.

237 This benefit will be derived by virtue of a claimant's status as an adjacent community member and not through their status as a claimant. The shareholding of the National Empowerment Fund is to be directed at communities.

238 Discussions with DWAF.

far smaller scale, would be able to negotiate set-up costs, find a customer base and still generate a greater income. This is unlikely.

- For those claimants who go as far as challenging the lease agreement in court, the case would need to be made that, (a) the claimant can make more of a return out of an alternative land-use (or by managing the plantation themselves) and/or that, (b) government was unreasonable in constructing such a leasing arrangement. The problems with arguing (a) have been highlighted. Concerning (b), it would be difficult to prove that the government was unreasonable and acted in such a way as to disadvantage the claimant. Government was making a loss with the category A plantations and, as a result, only one option²³⁹ was available for present usage of the land and for future prospective land-owners. This involved bringing in outside operators that were efficient, competent and in the business of generating a positive return from plantations. Furthermore, claimants may argue that a minimum of 70 years is an unreasonable amount of time for the leasing agreements. However, in order to attract competent and serious applications for each category A plantation, an appropriate leasing term (i.e. 70 years) had to be offered. Finally, if the claimant is serious about wanting a piece of land, alternative sites will surely be possible that will not disrupt an entire plantation operation²⁴⁰.

In both cases the probabilities are quite low. Therefore, the risk that the leasing agreement will be legally overturned (and disrupt present tenants) is very low.

14.2.1.2.

CATEGORY B AND C PLANTATIONS

Category B and C plantations have recently (October 2004) been reclassified and combined into logical business units. Each unit has been placed into three separate groups as described:

- Group 1 (38,000 hectares) – little investment needed to make these commercially viable and, in some cases, have an existing customer base
- Group 2 (14,000 hectares) – up front investment needed to get into a commercially viable condition and work needed to set up a customer base
- Group 3 (24,000 hectares) – very little commercial value, however, possible value in firewood and building material for local communities

Category B and C plantations will be leased to the benefit of communities, with BEE enjoying priority.

The plan is to organise, in conjunction with community input (i.e. resolutions), leasing agreements²⁴¹ on behalf of communities and/or claimants for each unit in group 1 and 2²⁴². This process has started for Mbazwana and Manzengwenya (20,000 hectares) in northern KZN, which, of all the B and C plantations, is the largest separate business unit. The plan is to finalise a lease by the end of 2005 and with this experience replicate the model for the other units.

²³⁹ There is really no argument that government should have terminated the plantation operation and kept 'idle' land available whilst the land reform process was being finalised.

²⁴⁰ Tenants have the right to revoke the deal if a portion of the whole area is removed (DWAF discussions).

²⁴¹ The value of these leases will be determined on a case by case basis.

²⁴² Similar to category A leases.

BEE is the number one criteria for prospective tenants and, in the case of Mbazwana and Manzengwenya, there is a possibility that the community will put together a plan whereby they take over the plantation and manage it as a commercial venture. However, combined with the BEE criteria is the necessity to put in place tenants that have the capacity and expertise to run a plantation operation. In this regard, DWAF expects to provide implementation support, however, the type and extent of support has not been finalised. In addition, serious questions remain as to the type of funding support that will be available to prospective tenants.

For group 3 units, the situation is less clear. Turning them into commercially viable plantations is unlikely and handing them to communities is the most likely option. Although communities may make use of these plantations for firewood and building materials, a land use plan may be undertaken to assess whether there are better ways to use the land. Municipalities have also indicated interest in taking over these plantations, but this divergence between community and municipal involvement will be assessed on a case by case basis.

According to DWAF, the transfer and finalisation of the fate of category B and C plantations will take place within the next three years.

14.2.2.

COMPANY OWNED PLANTATIONS

Claims on privately-owned plantation areas are still being verified and validated.

At this stage it is difficult to assess the extent of land claims on company owned plantations. The forestry industry is not too sure themselves, with opinions ranging from 'significant' to 'about 10% of plantation area' to 'not that significant', and, although the DLA may have this information, they have been both unable and slow in releasing it. According to discussions with Mondi and Sappi, who combined own 41% of the plantation area in South, there are a fair number of land claims on their plantations covering quite a large area.

Though it is "business as usual" until verification, some uncertainty is created and access to finance or ability to sell land may be influenced by pending claims.

All the claims that have been submitted (i.e. prior to 31 December 1998) need to go through a process of verification and validation. Once validated the plantation owner will be informed of the claim and either a process of negotiated settlement will begin or the plantation owner can, at their own cost, investigate the validity of the claim²⁴³. From this point on the plantation is gazetted, implying that a number of restrictions may apply to the use of the land. Throughout the whole process, there is uncertainty regarding the future of the concerned plantation. This uncertainty may impact on business and investment decisions. However, in general, discussions with larger plantation owners have indicated that this uncertainty is manageable and, at this stage, business is continuing normally.

Although business is continuing normally for the larger plantation owners, there may be problems for some of the smaller players and in particular those that have beneficiation operations on the same properties as their plantations (see Box 14).

²⁴³ There have been isolated reports indicating that, due to a lack of organisation and capacity, land claims offices are not doing proper investigations and are merely validating claims. As a result, there is increased onus on land owners to assess the validity of the claim, as they would rather keep their land and do not want invalid claimants possessing the land when their own staff, who may have worked for many years, lose out.

These problems are generally in the form of indirect costs²⁴⁴. The indirect costs relate to the restrictions²⁴⁵ that may apply to land that has been gazetted. Although normal operations are allowed (i.e. planting of trees), owners are unable to sell the land whilst it is gazetted and to change the property in any way (i.e. expanding processing potential, upgrading of fixed machinery and capital investments of any nature) without giving one month's written notice to the regional land claims commissioner. This notice may, however, be refused by the land claims commissioner through a court order.

Box 14 Indirect costs related to gazetted farms

An example of indirect costs for farms which are gazetted is the position faced by Hans Merensky and their plantations in the Magoebeskloof area. Quite a substantial proportion of the land under plantations has become an object of one or other land claim. Due to the restrictions that may apply once a farm has been gazetted, Hans Merensky feels it is restricted from making any capital improvements. This may become quite a problem on one of their farms where a sawmill is located. Due to increasing yields, the availability of sawn-timber in a few years time will substantially (i.e. by 60% or more) exceed the capacity of the mill. Thus, it is important that the capacity of the mill is expanded to accommodate the increased yield. However, they feel it is unlikely that they will be able to make the expansions, resulting in a substantial amount of revenue forgone – from logs that could not be processed.

Having to give notice creates uncertainty and, in cases where notice is refused, impacts negatively on the functioning of the operation. At this stage there is no evidence that notice for changes to plantation land has been unreasonably refused. According to discussions with senior people in the DLA, activities that complicate the restitution process will be blocked, but those concerned with the functioning of a normal operation should be allowed.

Although the process during land reform is problematic, the final outcome, where claimants are found to be valid, could be encouraging. Industry players have all indicated that once they are paid fair value for the property, they would be prepared to continue managing the plantation under a form of leasing agreement. Thus the claimant would receive benefits from their land and the companies could continue with their operations. However, these leasing agreements are problematic (i.e. dilution effect of rental being spread amongst a number of beneficiaries, ownership of trees etc.) and much work is needed to determine how they will work successfully.

14.2.3.

INDEPENDENT FARMER OWNED PLANTATIONS

The impact of restitution (i.e. land claims) on independent farmers is much the same as for company-owned plantations, however, considering that they are a much smaller operation and that they may have beneficiation on the property (i.e. small sawmills) the related costs and uncertainty could be quite large²⁴⁶. In

²⁴⁴ Direct costs (i.e. research and legal) are faced by those that choose to challenge a claim validated by a land claims office. These are, however, less significant than the indirect costs that are faced.

²⁴⁵ These restrictions are applied to prevent the owner from, (i) selling or re-zoning the land, which may make the process of restitution more complex at a later stage and, (ii) increasing the value of the land and, as a result, increasing the cost that government may have to pay for the land at a future date. At present the issue is still outstanding as to whether government will pay for the land and what is on the land (i.e. trees, machinery, buildings etc.) or will just compensate the land-owner for the land. In all likelihood the government will probably have to compensate the land-owner for the trees and the structures on the land, unless some leasing agreement is entered into.

²⁴⁶ They are unlikely to afford the costs of researching a claim and the time during which the farm is under restrictions could threaten the survival of the operation (e.g. due to the inability to take a bank loan to tide over cash shortages).

addition, the likelihood of an independent farmer entering a lease agreement, where the rental is due each year, is reduced, due to the lumpiness of cash flows associated with plantation operations.

14.3. IMPACT OF LAND REFORM ON NEW AFFORESTATION

As the bulk of areas for new afforestation fall on communal land, where community and individual land tenure rights are insecure, the possible impact of land reform on new afforestation will be through the principle of tenure reform. However, the tenure reform process is yet to begin and, as a result, existing structures will continue to allocate land use.

14.3.1. EXISTING STRUCTURES

Land tenure uncertainty (while tenure reform is being implemented) does not pose insurmountable barriers to new afforestation.

With the implementation of CLRA, as discussed in Section 14.1.3, there will be a process of tenure reform whereby community and subsequently individual land rights will be secured. Securing of land rights in communal areas will undoubtedly be beneficial for any new afforestation. Although CLRA has been enacted, discussions with relevant government and interested parties reveal that it has not been implemented and may not be implemented for a while, as it is both a complicated and difficult process (see Cousins, 2003).

In the interim, which at this stage is an indeterminate amount of time, there will be a degree of uncertainty over the use of land, but this is not an insurmountable uncertainty. Existing structures will continue to allocate the use of land. This use will in turn be confirmed once CLRA is implemented, as one of the main aims of CLRA is to enforce existing use rights. Existing structures are, however, different between KZN and the Eastern Cape.

Existing land tenure structures in KZN. In the tribal areas of KZN, land is held in the name of the Ingonyama Trust, with the Zulu King as the chairperson of the trust. Against this backdrop, it is the responsibility of traditional leaders (i.e. Chiefs), with support from the Ingonyama trust, to manage the use of land. Traditional leadership is strong and uncontested in KZN, which makes the allocation of land unproblematic. In addition, the Ingonyama trust provides stability to the system if there are disputes or conflicts.

As a result, land tenure is not an obstacle to new afforestation in KZN, as the allocation of land by traditional leaders is clear and uncontested. Once CLRA is implemented, it will merely re-enforce the decisions made by traditional leaders concerning land use.

A further point in favour of new afforestation in KZN is that, due to past success by small-growers, most Chiefs and communities are aware of the benefits of plantations and will already be favourably inclined to the notion.

Existing land tenure structures in the Eastern Cape. The situation in the Eastern Cape is a little more complex than in KZN, but, according to discussions with the

DLA, still does not seem to present an impossible obstacle to new afforestation. Allocation of land is fair and, by working with the structures that are in place, land can be made available for plantations even if tenure rights are insecure. Once again, CLRA will generally confirm existing use rights and through planting trees a communities', or individual's, use rights are made clear.

Until CLRA is implemented, interim procedures will continue to control the land allocation process. The interim procedures involve four steps:

- (i) A formal community resolution is needed to support any proposed land project. This involves a democratic process whereby a number of parties (including the community, traditional leaders and municipal and district councillors) meet to discuss the proposal and decide on whether they would be happy allocating land to it. This may involve a number of meetings and usually takes no more than three to four months to complete²⁴⁷.
- (ii) A certificate from a DLA project officer is required, to ensure that the community resolution has been fair and democratic. The Minister of the DLA is the legal owner of the land²⁴⁸ and through the certificate (provincial officials have authority to grant this permission) the developer is given permission to lease the land from the DLA.
- (iii) Although the DLA is the legal holder of the land, a trust or CPA is set up, on behalf of the community, to manage the funds received from the lease.
- (iv) In addition to the rental, the community has to benefit from the development. This will be laid out as part of a joint venture between the developer and the community, where jobs, shareholding and/or profit sharing will be specified. The joint venture is a direct agreement between the community and developer and is separate to the trust or CPA.

According to discussions with the DLA in the Eastern Cape, these steps are a relatively smooth process, which, if followed, should allow land to be made available to new afforestation. Although land is allocated on a freehold basis in KZN which entails individual use rights, the situation in the Eastern Cape is slightly different. In the Eastern Cape land is used in a more communal nature. This communal usage of land is beneficial for new afforestation as it, (i) allows larger tracts of land to be planted, resulting in greater opportunity to benefit from economies of scale and, (ii) reduces the transaction costs of having to negotiate with a number of landowners. These economies of scale are of great importance in contributing to the success of afforestation ventures.

With regard to land usage for new afforestation in the Eastern Cape, three final points need to be made. Firstly, communities in the Eastern Cape are relatively

²⁴⁷ Up to now, according to the DLA, no worthwhile proposal has been turned down through a community resolution.
²⁴⁸ Department of Public Works is the owner of sites where schools, police stations etc. are situated. Department of Agriculture has no authority over land. Historically, the permission to occupy (PTO) was organised through Department of Agriculture, however, in the 1990's this was stopped by the Department of Justice.

easy to identify and most boundaries are well-known and respected. Thus, once a community is identified, the chance of disputes over its land and that of another community will be low. Thus, in general a community resolution to use land will have greater certainty. Secondly, the period of adopting forestry (i.e. demonstration effect) as a new land-use has happened and both communities and municipalities are keen to start planting. Finally, for any plantation developer, a model needs to be followed than allows both grazing land combined with land for plantations. Such a model will allay any fears of community members who see their grazing lands being planted with trees.

14.4.

CONCLUSION

South Africa's land policy requires that where land acquisition can be shown to have been unjustly acquired, through legislation or other such means, this land is subject to possible restitution. In addition, where land is held in trust by government, the Ingonyama Trust or other legal entity, this land is seen to be held on behalf of occupying communities and, as a result, occupants must be treated in law as landowners, pending the eventual transfer of land and title to them. In both cases, legislation prohibits the purchase or transfer of land. The impact this has for plantation forestry is three-fold.

Firstly, the restitution process has influenced the privatisation process of state-owned forests and led to the proposed leasing agreements for category A, B and C plantations.

- *Category A plantations.* Four of the five leases have been finalised, with only Komatiland outstanding. As discussed, the management companies leasing the plantations are happy with the arrangement. The only perceived risk to government is a claimant pursuing a successful court case to have the lease terminated. This risk is, however, very low.
- *Category B and C plantations.* These plantations have been reclassified and combined into logical business units. Each unit has been placed into a separate group according to the viability of the unit. Although the plan is to organise leasing agreements for the more viable units, exactly how this is going to happen is unclear. In addition, the less viable units are going to be handed over to communities or municipalities. Questions remain as to the implementation and funding support that will be offered to prospective bidders and communities or municipalities.

Secondly, although business is continuing normally, restitution is creating a degree of uncertainty with respect to company-owned and independent farmer-owned plantations.

- The uncertainty for company-owned and independent farmer-owned plantations is related to the size of the operation and particularly to the extent of beneficiation taking place on the same property as the plantation operation. Plantations that have been gazetted need to give notice for any changes to the property, which if refused would mean certain restrictions applying. These restrictions (i.e. inability to expand processing capability) could prevent certain

activities from taking place, thereby hindering the efficient operation of the plantation. At this stage there is no evidence that notice for changes to a plantation property have been unreasonably refused, forcing difficult restrictions to be applied.

- Although the process during land reform is uncertain for company-owned plantations, the final outcome is encouraging. Industry players have all indicated that they would be prepared to continue managing the plantation under a leasing agreement. The outcome for independent-owned plantations is a little less certain.

Thirdly, as the bulk of areas for new afforestation fall on communal land, where community and individual land tenure rights are insecure, the possible impact of land reform on new afforestation will be through the principle of tenure reform. However, the tenure reform process (through CLRA) is yet to be implemented and, as a result, existing structures will continue to allocate land use. This use will in turn be confirmed once CLRA is implemented. Existing structures are, however, different between KZN and the Eastern Cape.

- In KZN, land is allocated for individual use by Chiefs in a generally clear and uncontested manner. In the Eastern Cape, land is allocated for communal use through a community resolution with support from the DLA. Communal use of land in the Eastern Cape will reduce the transaction costs of having to negotiate with a number of 'landowners' and will allow larger tracts of land to be afforested, resulting in greater opportunity to benefit from economies of scale.
- In both KZN and the Eastern Cape, allocation of land is not an obstacle to new afforestation and by working carefully with the structures that are in place, land can be made available for new afforestation. The implication for plantation forestry is that the nature of land allocation will in turn dictate the model for afforestation in the areas identified for new afforestation, which will either be small grower-based (KZN) or community-based (Eastern Cape).

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APPENDIX A: LIST OF MEETINGS

Person	Company/Organisation	Position/Department	Date
A.B. Cheche	A.B. Cheche & Sons Waste Paper	Owner	Jan 2005
Dr. U.N. Bhati	Australian National University	Woodchip researcher	Nov 2004
Dlanga Mandla	Bizana Local Municipality	Acting manager	Feb 2005
Lerato Motuang	Competition Tribunal	Web Manager and contact on cases.	Several
Dirk Versveld	Consultant	Industry Expert	Mar 2005
David Crickmay	Crickmay and Associates	Director	Several
R Dosanie	Crystal papers	MD and Chairman of SATMA	Nov 2004
Cindy Snedden	CSIR	Seed Expert	Nov 2004
Dr. Lenie Venter	CSIR	Seed Expert	Nov 2004
Mr. Moatshe	DEAT	Director: Pollution and waste	Nov 2004
Sam Malatje	Department of Agriculture	Director: Farmer settlement and support	Mar 2005
Sarah Allen	Department of Agriculture and Environmental Affairs (KZN)	Director: Environmental Services	Feb 2005
Stuart Armour	Department of Agriculture and Environmental Affairs (KZN)	Director	Feb 2005
Kay Yankey	Department of Agriculture and Land Affairs (EC)	Manager: Projects and Planning	Feb 2005
Mike Coleman	Department of Agriculture and Land Affairs (EC)	Deputy Director: Land Affairs	Feb 2005
Gladstone Ntsikwe	Department of Economic Affairs, Environment and Tourism (EC)	Deputy Director: Environmental Impact Management	Feb 2005
Zanele Mvusi	Department of Environmental Affairs and Tourism	Director: Environmental Economics	Mar 2005
Carmen van der Merwe	Department of Land Affairs	Director: Redistribution Implementation Systems	Several
Daphne Matloa	Department of Land Affairs	Chief Director: Land Claims Commissioners Office	Mar 2005
Mashile Mokono	Department of Land Affairs (Limpopo)	Land Claims Commissioner	Mar 2005
Mawethu Vilana	Department of Transport	Manager Freight Transport Policy	Mar 2005
Themba Simelane	DWAF	Policy and Research	Several
Johan Fourie	DWAF	Assistant director	Several
Johan van Rooyen	DWAF	Manager: National Water Resource Planning	Mar 2005
Linda Mossop-Rousseau	DWAF	Chief Director: Forestry	Several
Manga Mtikulu	DWAF	Deputy Director	Mar 2005
Mike Peter	DWAF	Technical and Information Services manager	Nov 2004
Richard Mashaba	DWAF	Director	Mar 2005
Trevor Balzer	DWAF	Chief Director	Mar 2005
Ashwin Seetal	DWAF	Director: Water Allocation	Feb 2005

Person	Company/Organisation	Position/Department	Date
Bill Rowleston	DWAF	NWRS	Mar 2005
Mahomed Vawda	DWAF	Director: Water Resource Finance and Pricing	Jan 2005
Manda Hinsch	DWAF	Deputy Director Compulsory Licensing	Jan 2005
Mike Warren	DWAF	Manager: SFR and SEA	Several
Neil van Wyk	DWAF	Chief Engineer NWRS Planning	Jan 2005
Paul Herbst	DWAF	Assistant Director Water Quality Management	Several
Piet Pretorius	DWAF	Director: Water Abstraction and Instream Use	Several
Rietha Staasen	DWAF	Water Resource Determination	Feb 2005
Tsepho Malatji	DWAF	Director: Forestry Regulation	Several
Morne Lizamore	DWAF	Water Abstraction and Instream Use	Nov 2004
Dr. Christo Marais	DWAF - WfW	WfW Biological Control Research Manager	Mar 2005
Graeme Harrison	DWAF (Eastern Cape)	Manager: Forestry Development	Several
Henk van Vliet	DWAF (Eastern Cape)	Chief Director: Water and Forestry (Southern Cluster)	Several
Jacqui Murray	DWAF (Eastern Cape)	Water Affairs	Feb 2005
Norman Ward	DWAF (KZN)	Director of water services: KZN	Mar 2005
James Perkins	DWAF (KZN)	Chief Engineer: Water Resource Management	Several
Beverley Vermaak	DWAF (KZN)	Water Services	Feb 2005
Dawn Wakeling	Dynamic Fibre Moulding	Director	Nov 2004
Julius Nobanda	Eastern Cape Development Corporation	Regional Manager	Dec 2004
Nqandeka Pityi	Eastern Cape Provincial Government	Working Director: Kei Rail	Several
John Hoffmeyer	EnviroCharcoal	Director	Dec 2004
Thys Lourens	Etvaal Pine Furniture	Manager	Feb 2005
Dr J. Scotcher	Forestlore	Environmental Consultant	Nov 2004
Mike Howard	Fractal Forests	Consultant	Several
Mike Edwards	FSA	Executive Director	Several
Roger Godsmark	FSA	Assistant director	Several
Steve Ngubane	FSA	Small Business Development Manager	Feb 2005
P Dheda	Gayatri paper Mills	Managing director	Jan 2005
Philip Owen	GEASPHERE	Timberwatch Coalition Member	Several
Vince Erasmus	Hans Merensky	Executive Manager Timber Division	Nov 2004
Louis van Zyl	Hans Merensky	Forestry Manager	Several
Robert de la Borde	Independent consultant	Independent Consultant	Oct 2004

Person	Company/Organisation	Position/Department	Date
Peter Roberts	Independent Consultant	Water Expert	Feb 2005
Brian Aitken	Independent farmer/NCT/FSA member	Independent farmer/NCT/FSA member	Several
Albrecht Marais	Kimberly-Clark	Waste paper manager	Nov 2004
Chris Davison	Kimberly-Clark	Managing director	Nov 2004
Vorinus Coetzee	KLF	Seed Expert	Nov 2004
James Wakelin	KZN Wildlife	Wild life officer	Oct 2004
Jenni Longhorn	KZN Wildlife	Wild life officer	Oct 2004
Marius Nel	Land Bank	Land related issues	Jan 2005
Tessa Cousins	LEAP	Overall Coordinator	Several
Louis Heyl	LHA	Director	Several
Rory Mack	LIMA	Assistant General Manager	Several
Andre Schonfeldt	Mbombela Municipality	IDP Department	Feb 2005
Willy Nthupha	Mkondo Local Municipality	Forestry and Parks Manager	Jan 2005
Andrew Thompson	Mondi	CEO	Oct 2004
Dave Butt	Mondi	Plantation Manager	Mar 2005
Errol Duncan	Mondi	manager	Nov 2004
Russel Morkel	Mondi	Logistics manager	Several
Kevin Cazalet	Mondi	CEO of forests	Mar 2005
Ciska Terblanche	Mondi Business Paper	Environmental Manager	Nov 2004
L. van Zyl	Mondi Business Paper	Working Plans Officer	Mar 2005
J. Barton	Mondi Fine Business papers	Manager	Oct 2004
Schalk Esterhuizen	Mondi Mining	Manager	Dec 2004
Peter Hunter	Mondi Recycling	National Sales and Marketing Manager	Oct 2004
Peter van Niekerk	Mondi:Silvancel	Operating manager	Nov 2004
Srini Naidoo	Nampak Tissue	Recycling division	07-Jan-05
Darryl Weisz	Nampak Tissue	Managing Director	Dec 2004
Wayne Petersen	National Road Agency: Southern office	Regional Manager	Mar 2005
Andy Jones	NCT	Human Resources	Nov 2004
Vusi Dladla	NCT	Development Services Member	Nov 2004
Patrick Kime	NCT	CEO	Several
Ferdi Brauckmann	NCT Durban Woodchips	Mill Manager	Mar 2005
Chuma Sangqu	Ntinga OR Tambo Development Agency	ISRDP Manager	Nov 2004

Person	Company/Organisation	Position/Department	Date
John Hunt	PAMSA	Executive Director	Several
Peter Nixon	Peter Nixon and Associates	Director	Nov 2004
Mike Benjamin	Remade	Owner/manager	19-Jan-05
A Rossi	Sappi	MD: Sappi Kraft	Dec 2004
Anton van Rooyen	Sappi	Waste paper division	18-Jan-05
Bertus van der Merwe	Sappi	Technical Director	Jan 2005
Dutcliff Smith	Sappi	Certification manager	Sept 2004
Hendrik de Jongh	Sappi	Director of Fibre supply	Dec 2004
Mike Truelock	Sappi	Human Resources Development Manager	Mar 2005
Andre Wagenaar	Sappi	Sappi Forest Products CEO	Dec 2004
Dinga Mncube	Sappi	CEO of forests	Mar 2005
Sakkie van der Westhuizen	Sappi	Environmental Manager	Jan-05;Feb-05
Michael Hlengwa	South African Contractors Association	Chairperson	Several
Piet Pretorius	Spectrum Mining timber	Owner/manager	Dec 2004
Stephen Berrisford	Stephen Berrisford	Planning Law and Policy Consultant	Nov 2004
Satoshi Ishikawa	Sumitomo Corporation	Japanese Woodchip Importer	Oct 2004
Ken Lesigang	Sunshine Seedlings	Owner/manager	Several
Anneline Eckersley	TimberSA	Marketing	Oct 2004
Wally Menne	Timberwatch Coalition	Chairperson	Several
Stephan Mallory	Tlou and Mallory	Consultant	Mar 2005
Mike Kruger	Top Crop Nursery	Owner/manager	Oct 2004
Maurice Fox	TWK	Manager	Sept 2004
Mr. Plama	Umzimkulu Local Municipality	Forester	Mar 2005
Rashid Hassan	University of Pretoria	Professor Department of Agricultural Economics	Oct 2004
Robyn Steyn	Water Tribunal	Chair	Feb 2005
Dr. K Sartorius	Wits School of Accountancy	Author of article employed in the study	Jan 2005
Keith Rieseberg	ZAF Contracting	CEO	Nov 2004

Several industry experts consulted requested anonymity

APPENDIX B: ASSESSING MODELS FOR DEVELOPMENT

MODELS FOR AFFORESTATION FACILITATION AND MANAGEMENT

There are a number of likely models that can be considered for new afforestation in the Eastern Cape. These models will be driven by the communal usage of land in the Eastern Cape, which will lead to developments undertaken by the community at large. The likely models are:

- A private-community partnership where the company provides funding and implementation support. The one constraint to this model is the distance of certain parts of the Eastern Cape from pulp plants in KZN. As a result, this model is best suited to the far northern parts of the Eastern Cape, unless beneficiation opportunities within the Eastern Cape become a reality.
- A community-government partnership where government facilitates funding and implementation support.
- A community-cooperative structure similar to the NCT model. This will involve the input of an outside party (i.e. government or NCT²⁴⁹) to set-up the cooperative. The one benefit of such a model will be the ability to achieve some form of rotational cycle, whereby members benefit from other members who are at the end of a rotation. This cooperative may eventually be in a position to set up their own processing facilities (i.e. a chipping plant in Mthatha). Due to the small, informal and unorganised nature of the small grower sector, it will be very difficult to establish such a cooperative.

BENEFICIATION MODELS

This section considers suggestions for realising the possibilities with regard to new afforestation, as well as beneficiation opportunities stemming from existing wattle jungles and state-owned plantations.

New afforestation and wattle jungle beneficiation possibilities. The species and rotation selection implicitly suggests that only certain types of beneficiation will be possible. For short rotation hardwoods, the beneficiation possibilities include timber board production, pole manufacturing, charcoal production and the export of woodchips (either to pulp plants in KZN or to Japan²⁵⁰). The importance of a chip plant if beneficiation is to occur in the EC cannot be overstated for the scenario sketched in the discussion thus far. It is unlikely that the timber board plants and pole producers in Mthatha will be able to absorb all of the fibre produced from the new afforested areas, because the capacity of these processing facilities may not be sufficient. If the fibre produced does not cross the border to KZN, an additional

²⁴⁹ May be able to use this cooperative to supply the chipping plant in Durban.

²⁵⁰ The viability of exporting woodchips to KZN was not investigated. However, it is thought that exporting to Japan would be more feasible than exporting to KZN.

processing facility will be required to provide a market for the excess fibre. This gap can be filled by a woodchip plant²⁵¹.

At this point it is important to note that it would be unlikely that a pulp plant would be set up in the EC. Government officials have noted that exporting pulpwood to KZN would only be acceptable as a short to medium term measure, and that a pulp mill in EC would be an appropriate step thereafter²⁵². However, discussions with pulp industry players revealed that between 60,000 and 70,000ha of sustainable forests are required to set up a pulp mill²⁵³. If all new afforestation, all of the wattle jungle areas, as well as all the DWAF hardwood plantations, were to be used for pulping, the total area would only amount to 80,000ha²⁵⁴. Given that the spatial location of new afforestation in the EC is quite broad (ranging from Mbashe-Fish to Umzimkulu), it would be an expensive exercise to transport the timber to a single site for pulping.

Private firms may also be reluctant to invest in a new pulp mill in the EC for other reasons. The high level of capital investment required and lack of infrastructure (related to transport systems, sustainable power source, etc.) may be seen as prohibitive factors in investing in the EC. Additionally, depending on the location of the new pulp mill, it may still be easier (in terms of cost and distance) to transport timber to Saiccor, south of Durban, for plantations close to the KZN border.

Beneficiation type	Market availability	Timber source	Viability Estimate	Problems	Capital required
Pulp	Yes, but only in KZN	Plantations	Poor for EC, but can occur in KZN	No beneficiation foreseen in EC	Very high
Woodchip plant	Yes, but currently only in KZN	Plantations	Very good for EC, also KZN	No current plant in EC	Medium to high
Poles	Yes	Plantations	Reasonable	Funding	Medium
Timber board	Yes, but size uncertain	Plantations	Good	Limited market	High
Charcoal	Yes	Other	Reasonable	Marketing	Limited

Table 44: Beneficiation possibilities and related issues for short rotation beneficiation from new afforestation

Source: Genesis Analytics Research

Table 44 above provides a summary of the beneficiation possibilities related to short rotation hardwoods. For example, hardwoods can be used as an input into pulp and paper production, but it is unlikely that beneficiation will occur in the EC. Further, the capital required to build a pulp and paper plant is very high.

DWAF plantation beneficiation possibilities. In this section, the beneficiation possibilities surrounding DWAF plantations are discussed. Since the majority (85%) of the DWAF Category B plantations are currently long rotation pine (16

251 The NCT Durban Woodchip plant, with a capacity of 30 000tons per month, was estimated to cost R80million.

252 Some officials described a pulp mill in EC as a necessary step.

253 This is apart from the high capital costs required..

254 60 000ha new afforestation, 10,000ha wattle jungle, 10,000ha DWAF hardwood plantations that comprise of 6 650ha of eucalyptus from Category C plantations and 3 000ha of eucalyptus from Category B plantations.

665ha out of 19,665ha planted); the assumption is made that economically viable DWAF plantations (according to the new categories created) will be leased to sawmilling concerns. As a result, it is fair to assume that sawmilling processing would be the type of beneficiation that would occur, and that processing would take place within the EC province. Pine, of course, could be substituted with short rotation crops, but this possibility is more difficult to assess than in the case of new afforestation. New plantation owners may simply continue with the current crop and rotation if they enter into a leasing agreement with a sawmilling organisation, or they may change to a shorter crop due to the reasons described above²⁵⁵.

Several forms of beneficiation possibilities can be defined for DWAF plantations²⁵⁶. They are:

- Sawmilling,
- timber board production,
- pole manufacturing and
- charcoal production.

Note that some of these additional processing opportunities are complimentary to sawmilling. For instance, waste products from sawmills can be used for charcoal production²⁵⁷, or as inputs in timber board production. Additionally, thinnings of long rotation pine can be used as poles. In fact, it has been noted that poles hold much beneficiation potential, especially if Category C plantations can be used effectively.

Beneficiation type	Market availability	Timber source	Viability	Problems	Capital required for plant
Sawmilling	Yes	Plantations	Very good	Infrastructure	Low to high
Poles	Yes	Thinnings from plantations, other	Fair	Funding	Medium
Timber board	Yes, but size uncertain	Virgin fibre and waste from sawmills	Good	Limited market in EC	High
Charcoal	Yes	Waste from sawmilling, thinnings	Fair	Marketing products	Limited

Table 45: Beneficiation possibilities and related issues for long rotation beneficiation from DWAF plantations

Source: Genesis Analytics

²⁵⁵

Interestingly, DWAF is moving out of long term supply contracts. Annual contracts will replace them. Had DWAF retained these contracts, the new plantation owners would be obliged to service the contracts and retain long rotation crops. Additionally, the sawmilling firms would have a vested interest to ensure that the plantations are run efficiently, which would possibly be to the advantage of the new plantation owners.

²⁵⁶ Note that this discussion refers to Group 1 and Group 2 plantations only. Group 3 plantations are not viable as commercial plantations.

²⁵⁷ Additionally, DWAF officials noted that charcoaling does not occur either; which implies that a dual opportunity exists. The waste products from sawmilling activities by micro mills could be used by the local community to produce charcoal. It must however be noted that charcoal is usually manufactured from hardwood and that softwood charcoal would require more advanced, more expensive technology.

Several DWAF plantations are in hard to reach places, with transportation costs²⁵⁸ making it improbable to get the timber to processing plants cost effectively. This creates an opportunity for micro millers; who can simply move into plantations and cut the timber on site. It is interesting to note that the EC has the greatest number of micro mills, which partly implies that this opportunity is already accessed to some extent. However, since DWAF plantation output can be improved, it is fair to assume that there remains scope for improvement. Micro mills play an important role in the EC through job creation and the generation of income from low skilled people. Dunne (2000) reports that up to 15,000 people benefit from small-scale sawmilling²⁵⁹. Subsequently, the positive impact that added fibre availability for micro mills would have is potentially immense.

Table 45 presents the beneficiation possibilities for DWAF plantations and notes some key issues surrounding each beneficiation type. For instance, although timber board is a viable option as beneficiation process, this option is limited since the timber board plants will have a limited capacity and thus have limited timber input needs.

258 Unfortunately, it does not appear as if the Kei Rail project will provide link roads that would link all plantations to development areas in Mthatha and East London.

259 The reference to small-scale sawmilling includes micro mills and some small mills.