

**AN EVALUATION OF SMALL SCALE FORESTRY
IN THE KWAMBONAMBI REGION
OF KWAZULU-NATAL**

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ABSTRACT

South Africa is a country poorly endowed with natural forests, which account for less than 1% of the total land area. Due to the increase in the demand for forest products in the 1970's and 1980's, which could not be met by the natural forests, the two South African pulp and paper giants, Sappi and Mondi, started the Project Grow and Khulanathi schemes respectively. One of their objectives was to encourage rural communities, through financial assistance, to plant trees on their farms for sale to the forestry companies. Planting of trees by farmers on their own land for their economic, social and environmental (reafforestation) benefits is called social forestry. Social forestry should bring economic activity, capacity building and community empowerment.


The benefits from social forestry are two dimensional. The growers benefit from the financial assistance and the readily available market provided by the company, while the company satisfies its demand for timber (pulpwood). The primary objective of this study is therefore to identify factors that influence the choice of trees as a land use in communal areas, and to recommend ways of improving benefits accruing to the growers in particular and the community in general.

The factors were determined through structured face to face interviews consisting of both closed and open-ended questions. The results of the study show that the major motivating factor in tree planting is the perceived financial benefits while lack of land is the major limiting factor. Even though tree planting contributes to social upliftment, it was found that there is insufficient capacity building, community empowerment and environmental awareness among growers. Cooperatives are recommended as institutions that will enhance growers' participation in tree planting and maximise the grower benefits from trees. As institutions, cooperatives will be better placed to access relevant information in areas such as marketing and have more bargaining power than individual growers. It is further recommended that the afforestation permit system should be reformulated to include permits for communally owned areas.

PREFACE

This research was carried out between August 1996 and August 1997 under the supervision of Jenny Mander, Nevil Quinn and Myles Mander. The field work described in this dissertation was carried out in Kwazulu-Natal, in the areas of Sokhulu, Mbonambi, eNgudwini and Mfekayi during November 1996.

Unless otherwise specified, this study is the original work of the author. It has not been previously submitted in any form for any degree or diploma to any other University.

Signed, 

Botshabelo Othusitse

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND AND JUSTIFICATION OF THE RESEARCH

The pulp and paper industry is one of the largest global industries, ranking fourth in terms of value of output and seventh in terms of employment (Dabas & Bhatia 1996), while in South Africa the timber industry is considered to be one of the fastest growing sectors of the South African economy (Breen 1994). In a bid to promote and facilitate the planting of trees by subsistence farmers, the two major South African timber growing companies, Sappi and Mondi, started small grower schemes known as the Project Grow (1983) and Khulanathi (1989) schemes respectively. These schemes provide seedlings, finance, training and other necessary materials such as fertilizers, as well as a guaranteed market to the farmers. One objective of these ventures was to produce pulpwood to provide for the companies' expanding need to meet the demand for pulp which arose during the late 1970's and early 1980's. At the end of 1995, Khulanathi had nearly 3 600 growers (Boake 1996) and Sappi had approximately 4 300 growers (Gumede 1996). Currently Sappi has over 5 000 small scale farmers recruited into the business through the Project Grow scheme. The projects are also directed towards stimulating rural economies, and to alleviating unemployment which in turn result in the empowerment of the rural community (Sappi 1995). Under both the Sappi and Mondi schemes, the costs of forest production are considered loans to farmers and are deducted at the time of harvest. Farmers receive the balance of the market price for the timber (Cellier 1994; Scotcher 1995).

Trees have the capacity to grow in marginal land which may be unproductive for most other agricultural purposes and will also survive under very harsh conditions. For this reason, Calder *et al.* (1992) described tree crops as an “*insurance against drought*” and as “*a store against future cash needs*”. Trees, seen as saving banks and cashable assets for poor people, have the advantages of cheap establishment, high rates of appreciation where water supply is adequate and tree survival rate is high, divisibility on sale and the ability to regenerate through coppicing when cut (Chambers 1989). Divisibility on sale refers to the possibility of harvest and sale of a portion of the tree crop at a time, saving the other portion for future use.

One disadvantage of timber production is a lack of flexibility in the time at which benefits can be obtained since they have to reach a certain age for their returns to justify their production costs. The long maturation period for trees to yield income or capital, along with the problem of marketing and price and the risk of loss of the crop to fire can make them unattractive to economically disadvantaged families (Chambers 1989). In India for example, many farmers were found to turn to vegetable crops after the first harvest of tree crops. This has been attributed to dissatisfaction with the benefits obtained from selling tree products (Chambers 1989).

If farmers have financial support to plant trees, and small scale timber production leads to social upliftment as indicated in the objectives of Sappi and Mondi schemes, why is it that not everybody is embarking on small scale forest production in their farms? Why is it that farmers elsewhere (e.g. India) move away from plantation silviculture after the first harvest? This study investigates factors which are at play in the decision making process of the rural farmers regarding small scale financially supported tree planting as a land use. The perceptions of growers towards planting trees in future (after harvest) are also investigated to evaluate the future of social forestry as a land use in South Africa. Furthermore, the study assesses the extent to which social forestry is being practised in South Africa. The research was conducted in Sokhulu, Mbonambi, eNgudwini and Mfekayi regions of Kwazulu-Natal (see Figure 1).

1.2 CONTRIBUTION OF FORESTRY TO THE NATIONAL ECONOMY

In South Africa, the forestry sector generates about 2% of the Gross Domestic Product from 1.2% of the land area (Christie & Gandar 1995). Forestry is also an important foreign exchange earner. Moreover, it is important in employment creation and has been described by van Staden (1996) as a slumbering economic giant which has great potential. A total of 122 000 persons were employed in the forest industry and the forest products industry by the end of 1991 (Christie & Gandar 1995). In 1994, over 500 000 people were dependent on the forestry industry for economic support resulting from direct employment, and about 70 000 of those employed were from rural communities (Edwards 1994). According to Edwards (1994), many more were employed through contracts at that time. These figures represent a significant proportion of the South African work force, especially in rural areas.

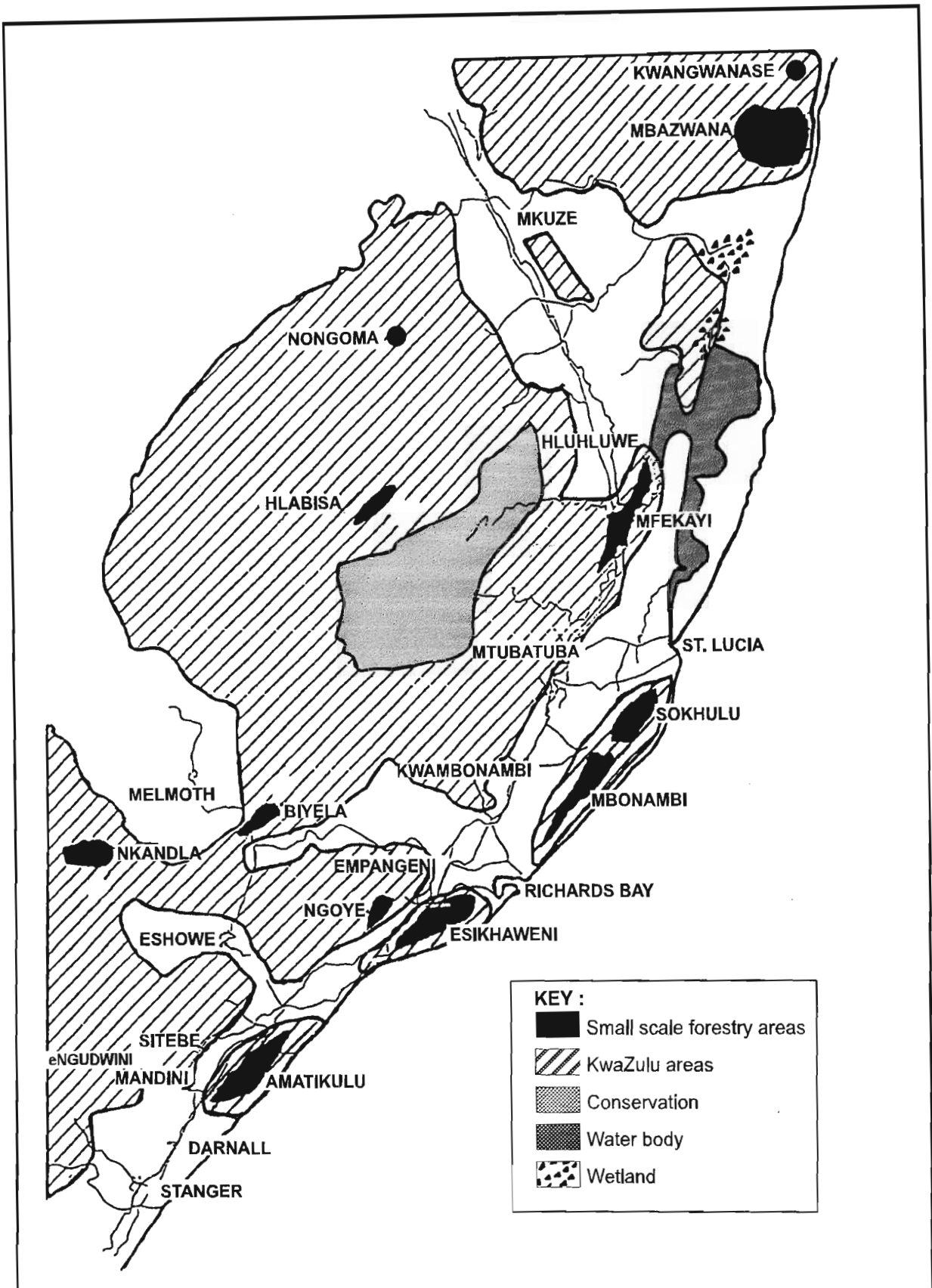


Figure 1: Schematic map of the study area

1.3 THE IMPORTANCE OF SOCIAL FORESTRY TO THE FORESTRY COMPANIES

Raw material requirement projections for the forestry industry in South Africa indicates a growth rate of 70% over a period of 20 years from 1990 which will require an additional 500 000 hectares of land to be planted with trees (Christie & Gandar 1995). The role of KwaZulu-Natal in meeting this demand cannot be underestimated. Social forestry is and will probably continue to be an integral part of the forestry industry because it is an important source of timber for the production of wood products. The companies are therefore likely to try to attract as many farmers as possible into the schemes for maximum tree production. With increased demand, timber companies may even extend to the agriculturally productive areas, taking advantage of their economic muscle and driven by the higher profit margin of pulp and paper production.

1.4 THE ROLE OF SOCIAL FORESTRY IN RURAL DEVELOPMENT

Rural development is a series of integrated measures promoting the economic, institutional and social development of the rural population thus improving the productive capacity and the standard of living of the community (Dedekind 1992). Erskine *et al.* (1994) define the objective of rural development as the improvement of the quality of life of the rural dwellers through increasing production and productivity rather than through the provision of welfare. They further indicate that successful implementation of rural development initiatives requires participation of the beneficiaries in the formulation and implementation of the project, as well as human resources development through appropriate training. Fox & Webber (1981) and Douglas (1983) indicate that contemporary rural development should be directed primarily towards promoting change so as to simultaneously affect the distribution and growth of income, employment, nutrition, health and other dimensions of the quality of life in rural areas. Community development has both economic and socio-cultural dimensions. Abbott and Makeham (1979) identified the following as major indicators of rural development :

- income per person;
- life expectancy;

- infant mortality;
- food supplies in terms of calories available per person in relation to calorific requirements;
- proportion of children between the age of 5 and 15 years attending school; and
- literacy level and employment of the economically active populations.

These indicators, with exception of infant mortality, usually have a positive correlation with the income level of the household (Abbott 1987).

Apart from infant mortality, development can be seen as the enhancement of the above mentioned factors. Social forestry can significantly aid rural development, both economically and socially if properly planned and targeted. Social forestry can be a vehicle to long term social upliftment and development through promotion of welfare, provision of, and access to social infrastructure as well as the development of a skill base (Cortez (undated)). Forestry also has the potential to play a major role in the employment of the rural population as indicated by Edwards (1994). It was further indicated that through extensive facilities provided by the forestry industry, people are empowered through training and education which enables them to be part of the economic system. According to Edwards (1994), the availability of wood from forestry projects encourages development of other small scale industries such as craft work with benefits accruing directly to the local people. Furthermore, Edwards (1994) concluded that the promotion of small scale forestry leads to community participation in the forestry industry. This allows community members to have control over their land and forest resources.

According to Dudley (1993), the greater the degree of community control over resources on which it relies, the greater the incentive for economic and human resource development. Breen (1994) showed social forestry bringing increased economic activity and rural prosperity to the Southern Cape and KwaZulu-Natal. It was further recommended by Breen (1994) that to transform forestry into an industry that better serves the needs of South Africa, it should be geared towards greater participation by individuals on their own land. This will in turn lead to

an increase in rural prosperity, and an increase in the number of people who are stakeholders in the industry, generating a sense of belonging and ownership.

Forestry is also important in the rural economy because trees can serve as a source of food, providing the community with fruits, and as a source of construction material, shade and wind breaks (Foley & Barnard 1984). All these are possible at the same time if multi-purpose trees are used (Douglas *et al.* 1984). By planting trees, marginal land that has very little value for agricultural purposes can be used to generate family income (Gregersen *et al.* 1989). Social forestry therefore aims not only to produce tree products which are in almost all cases required by the commercial companies, but also to serve as an integral part of sustainable development in rural areas. Social forestry should not be seen to be orientated towards encouragement of industrial wood production in the interests of national economic growth and company profit margins, but rather as a broader economic, social and environmental initiative, thus contributing to sustainable development.

Evans (1984) noted that any development in the rural tropics which is not related to the needs and receptive to the attitudes of the local communities is failing in one of its most important roles, i.e. :

“...a failure to acknowledge, a failure to seek to understand, and a failure to respond sympathetically to the ideals and wishes of the community whose land and life are being encroached by development will not only be bad economics but irresponsible and unethical.”

It is clear from the above that social forestry needs to be considered in an integrated manner. As listed by Christie and Gandar (1995), the following are important components of an integrated social forestry strategy :

- local empowerment and decision making cannot be isolated from one another. Social forestry is thus connected with capacity building whether in an organisational or an individual entrepreneurial sense;



- the role of governmental/ non-governmental organisations (NGO's) in social forestry should be concerned mainly with facilitation, provision of technical support and expertise, and co-ordination of activities and participants from different sectors;
- support and enablement of community based organisations (CBO's) and non governmental organisations (NGO's) with community links ; and
- for the presence a more generalist extension service in rural areas, incorporating both agriculture and forestry expertise.

Agriculture and forestry are complementary land uses, and therefore as indicated by Christie and Gandar (1995), it is very important that extension services departments are in a position to provide expert advice on both of them to contribute to improved productivity and sustainable development. Sustainable development refers to development that yields the highest benefits to the present generation while maintaining the potential to meet the needs and aspirations of future generations (Senaca & Taussig 1984). Sustainable development must take into consideration social, ecological and economic factors.

If appropriately administered, the small grower schemes (Project Grow and Khulanathi) can be seen to address some of the requirements of South Africa's Reconstruction and Development Programme (RDP) which requires that the land use policy takes into consideration the following aspects :

"...the policy should be integrated to make sure that the development is sustainable, the process should be people driven resulting in empowerment, the programmes should promote peace and security for all and should be Nation Building, reducing division" (RDP 1994).

Due to the fact that social forestry requires that trees are planted with the people to meet local needs for produce, income and environmental improvement under social forestry (Noronha & Spears 1985), integrated planning should be an integral part of social forestry. Integrated planning requires the involvement of the community residents in order to incorporate their

knowledge, experience, ideas, concerns, needs and wishes into land use planning (Gibbons & Schroeder 1983; Mitchell-Banks 1996). This involvement of community members generates a sense of ownership among the community (Breen 1994) and is what makes the difference between integrated planning and the more conventional planning process under which there is excessive centralisation of decision making by high level personnel of the project agency. Table 1 summarises the differences between the two forms of planning.

Table 1 : Distinguishing features of conventional planning and integrated planning
(Mitchell-Banks 1996)

CONVENTIONAL PLANNING	INTEGRATED PLANNING
centralised decision-making	decentralised decision-making
planning for the people	planning with the people
formalised process	flexible adaptive process
rigidly defined rules	jointly defined rules
formal impersonal relations	informal relations
centrality of technical experts	centrality of affected parties
positivist mode of inquiry	phenomenological inquiry mode
adversarial	consensus
win-lose, minimise costs	win-win, maximise joint gains
planner as manager	planner as facilitator

1.5 AIMS AND OBJECTIVES

Aim

The purpose of this study is to describe and explain the attitude of selected small scale farmers in KwaZulu-Natal towards forestry as a land use option, as well as identify factors that influence land use decisions with a view to recommending steps which will result in an increase in benefit to the growers in particular and the community in general.

Objectives of the study

- i. identification of communities that have made decisions to adopt forestry as a land use option;
- ii. identification of farmers in these communities who have planted trees and those who have not planted trees;
- iii. identification of factors that have influenced household decision making regarding the choice of forestry as a land use option;
- iv. evaluation of the factors in terms of existing alternative land uses and the weighting given to these factors and to alternative land uses at the time of decision making;
- v. appraisal of the communities' perception regarding social forestry and identify factors that will be of significance to future decision making by community members;
- vi. identification of concerns growers have regarding social forestry and the schemes implemented by Sappi and Mondi; and
- vii. recommend alternative measures to improve growers' benefits as well as ensure sustainability of forestry projects.

Organisation of the chapters

Chapter 2 contextualizes social forestry development in South Africa, briefly discussing its origins and highlighting some of the factors that led to the development of the small grower schemes. A definition of social forestry is presented and the various criteria used by different authors to describe social forestry are brought to light. Finally, the two grower schemes, Khulanathi of Mondi and Project Grow of Sappi are considered and their progress and operational differences are analysed.

Chapter 3 considers some of the factors that have led to the success of social forestry in other parts of the world.

Chapter 4 introduces the research questions to be addressed by the study. The various methods that can be used to gather the information necessary to understand the factors that influence the choice of forestry as a land use by farmers are discussed, giving their strengths and weaknesses. The rationale for adopting the structured interview method of data collection in this research is also explained. Constraints to the research are highlighted. Chapter 4 further discusses the locations in which the study was conducted. Differences between the areas in terms of soils and suitability for crop production are briefly discussed.

In chapter 5, the research results are presented and analysed. This chapter is followed by the discussion of the results, and conclusions and recommendations in chapters 6 and 7 respectively.

CHAPTER 2

SOCIAL FORESTRY DEVELOPMENT IN SOUTH AFRICA

2.1 BACKGROUND

Indigenous forests cover less than 1% of South Africa's land area (ZAI 1994) which is not sufficient to satisfy the timber requirements of the growing South Africa population. In order to meet the ever growing demand for wood products, commercial plantations of pine, gum, and wattle were initially established in 1896 when the State planted trees in the Knysna area and the Eastern Cape (DWAF 1995). Forestry is therefore a century-old practice in South Africa even though no attention was accorded to its socio-political and environmental impacts until recently.

Today a total of 1 382 261 hectares (1.2% of the country's surface area) is used for commercial forestry with the timber used for pulp, sawn timber, mining timber, panel products, poles, charcoal and firewood (Scotcher 1995). Scotcher (1995) believes that the quantity of timber products used by a country can be used as a measure of economic growth, giving the example of Korea which experienced rapid growth during the period 1970 to 1990 and where the *per capita* consumption of paper and board increased from 13 kg to 100 kg per person; in Sweden the *per capita* consumption of paper boards increased from 195 kg to 225 kg per person over the same period. This is an indication that economic growth in South Africa is likely to bring with it an increase in the consumption of wood products in all forms and the possibility of an increase in the land area under afforestation to satisfy the demand for such products. Schemes such as Sappi Grow and Khulanathi might be important vehicles in facilitating such growth.

2.2 DEFINITIONS OF SOCIAL FORESTRY

The term *social forestry* is sometimes used interchangeably with *farm forestry*, *community forestry* and *forestry for community development* (FAO 1978). For the purposes of this research the term social forestry will be adopted. FAO (1985) defines social forestry as any situation which immediately involves local people in a forestry activity to provide products for their own use, and generate local income. This embraces a spectrum of activities which range from woodlots, through growing of trees at farm level to provide cash crops and processing of forest products at the household level, artisan or small industry level to generate income, to

activities of forest dwelling communities such as hunting and gathering. Social forestry therefore aims to :

- provide means to enable rural communities to supply or have access to essential forest and tree products thereby satisfying some of their basic needs;
- increase the participation of rural people in the management of trees as a means of increasing their self reliance; and
- contribute to the socio-economic development of communities through employment creation, institution building and promoting economic growth as well as to increase production of timber and other tree products.

Social forestry can also be carried out by governments and private companies planting trees on public land to meet the needs of local communities. Christie and Gandar (1994) indicate that *social forestry* is mostly concerned with the planting and/or management of trees by local communities, groups or individuals to meet local needs, whether for produce, income or environmental improvement. It is therefore very important to distinguish between *social forestry* and *conventional production forestry*. The two types of forestry do overlap because in both cases trees are used to meet local needs, however, they differ in the sense that social forestry focuses on people, on community involvement and on the trees that offer direct and indirect benefits, while conventional production forestry focuses on the wood the trees produce (Gregersen *et al.* 1989). Social forestry can therefore be described as driven by local communities' needs and this should be the basis for the recruitment of rural farmers into social forestry projects such as Khulanathi or Project Grow. This is further supported by Rocheleau (1987), who emphasises the user perspective in agroforestry research and action programmes. This requires research and development workers to incorporate the needs, experiences and contributions of rural land users. D'Archy (1989) states that in Kenya participation of rural communities was found to be useful because :

“Local experts could adapt new methods to local conditions better than outsiders; local control of change was found to be more important than rapid

transformation and that building upon and branching from existing technologies was more easily accepted by the farmers than introducing entirely new technologies”.

D’Archy (1989) suggests that participation of insiders and outsiders implies dialogue which establishes trust and shared goals, and that people can be influenced to adopt forestry by successful members of the disadvantaged groups. The idea that development consists of a transfer of skills or information creates a role for experts as the only people capable of mediating the transfer of these skills from one person or society to another (Edwards 1989). Kotze and Kotze (1996) highlight the fact that the data, knowledge and insights that could be obtained from rural communities (who in most cases are poor and illiterate) are often ignored by the experts. This results in lack of progress because things such as people’s needs, questions related to the transfer of technology and local maintenance capacity are overlooked. Van Staden (1996) also indicates that through participative practices, the community is enabled to harness its own systems, structures and expertise to address relevant needs and problems. These indicate the importance of community involvement and participation in the planning and implementation of development projects. The local participation component of the social forestry equation can only come to fruition when some local level control of the project is recognised (Lai & Khan 1992). Emphasis should therefore be placed on both local participation in and control of the forestry projects. Cornea (1989) believes that social forestry programmes should motivate people to plant trees, promote the kind of trees that will provide fuelwood, timber, grass for livestock, thatching and income, and increase benefits to the poorer groups. According to Christie & Gandar (1995), the extent of forestry should reflect the optimum land use mix for the country as a whole, bearing in mind the social, economic and environmental effects of the various land use options. Forestry should be practised where its potential benefits are comparable to or in excess of alternative land use options. The benefits may come in the form of income earnings, secondary micro-enterprises, employment, integrated small-farm systems and environmental rehabilitation (Christie & Gandar 1995).

The criteria for social forestry used by authors in this field are summarised in Table 2.

Table 2 : Authors and key criteria used to describe social forestry

AUTHOR	KEY CRITERIA USED IN SOCIAL FORESTRY
FAO (1985)	<ul style="list-style-type: none"> • involvement of local people in forestry activities, e.g. woodlots, farm level planting of trees • activities of farm dwelling communities e.g. harvesting gathering and hunting from the forest • generate income and processing at household level • benefits accrue to the local people
D'Archy (1989)	<ul style="list-style-type: none"> • participation of rural communities in tree planting • benefits accrue back to members of the community
Gregersen <i>et al.</i> (1989)	<ul style="list-style-type: none"> • participation of the community members in raising of trees on their own land for their own benefit
Cornea (1992)	<ul style="list-style-type: none"> • motivation to plant trees • promotion of trees that provide basic necessities for a rural household, e.g. fuelwood, timber, grass, and income • extent of forestry should reflect optimum land use mix
Christie & Gandar (1995)	<ul style="list-style-type: none"> • planting and or management of trees by local people • meet local needs (income, produce or environmental)

Social forestry is centred around the concept of local control and decision making in the management of the trees and land. The common criteria associated with social forestry are the participation of members of the community in the raising of trees on their own land, and that the trees should be planted to serve the community either by generating income through small scale industry or by providing some forest based resources such as firewood and construction timber. Based on these criteria, the forestry based industry's (Sappi and Mondi) schemes need to factor in the importance of trees to the community for them to meet social forestry scheme characteristics.

2.3 SOCIAL FORESTRY AS A LAND USE OPTION

In general, forest management is geared towards addressing the increasing demand for forest products from a growing number of users. Through financial interventions, forestry companies encourage the planting of particular species of trees based on their performance for a particular

use, e.g. Sappi and Mondi encourage use of *Eucalyptus* which they use in the pulp and paper industry because of its rapid growth rate and high yields to increase their profits and competitiveness. The benefits that accrue to the local communities are only valued in terms of economic gain as reflected in the Sappi Annual Report of 1995 and in Boake's unpublished report of 1996 on Khulanathi. No mention is made of how the projects contribute to environmental improvement.

- ✍ Since high yielding tree species bring more revenue to the national economy, the government is likely to support planting of such trees, which mobilise the economic potential of renewable resources to generate revenues and employment. However, for the local communities, planting of these trees is limited because they are alien to them and their preparedness to take risks is limited. Gregersen *et al.* (1989) comment that risk aversion is high among poor rural people who live from hand to mouth and for whom the margin between starvation and subsistence is narrow.

2.4 SAPPI AND ITS GROW SCHEME

According to Scotcher (1995), Sappi started promoting social forestry as far back as the 1950's when it issued seedlings to its employees and neighbours to plant in their homesteads as windbreaks and as shelter for their livestock. The value of the trees to both Sappi (for pulp) and the owners (for sale) increased as they grew and matured. In 1983 following consultation with the KwaZulu Department of Agriculture, Project Grow was initiated under the auspices of Sappi Forests, the KwaZulu Department of Agriculture and the Gencor Development Fund. Project Grow is currently funded by Sappi alone (Scotcher 1995). Project Grow is a scheme which is targeted at assisting subsistence farmers in areas where the return per hectare from other agricultural production systems, such as maize and livestock, on the same piece of land are low compared with the production of tree crops. The scheme does the following :

- provides the farmer with seedlings free of charge;
- provides technical advice free of charge;
- actively helps the farmer manage the plantation (e.g. give advice on weeding, firebreaks and coppicing);

- guarantees the farmer a market when the trees are felled; and
- pays advances to farmers for work carried out, namely, land preparation, planting, weeding and fire protection.

In return, the farmer contracts to sell the first crop to Sappi and pays back the advances after selling the crop. This provides a reliable source of timber for the company while at the same time generating income for the farmer. Other products such as fuel wood are also obtained from the waste products of harvesting and add to the farmers benefits by alleviating the fuelwood requirements problem (Scotcher 1995; Gumede 1996, *pers. comm.*¹).

“...Project Grow involves people in the decision making process, employs local people in its implementation, empowers people to manage and administer the projects, stimulates the economy through increased demand for the end products and focuses on new job opportunities requiring new skills. The scheme also ensures a full and active role for women, involves the state, the private sector and civil society in its implementation, empowers people in social and economic issues and involves processes and forms of participation that are different from past practices; all these meet the objectives of the RDP” (Scotcher 1995).

No interest is charged on the grants given to farmers. In Zululand, the scheme currently operates in Mandini, Sokhulu, Mtubatuba, KwaMbonambi, KwaNgwanase, Mbazwana and Nongoma (Figure 1 shows the locations of the areas).

Progress of Project Grow in Zululand since 1983 is graphically presented in Figure 2, indicating that there has been progressive increase in the number of people joining the scheme and the total area planted with trees in Zululand.

¹ Mr Gumede, H. Sappi Forest, KwaMbonambi Area

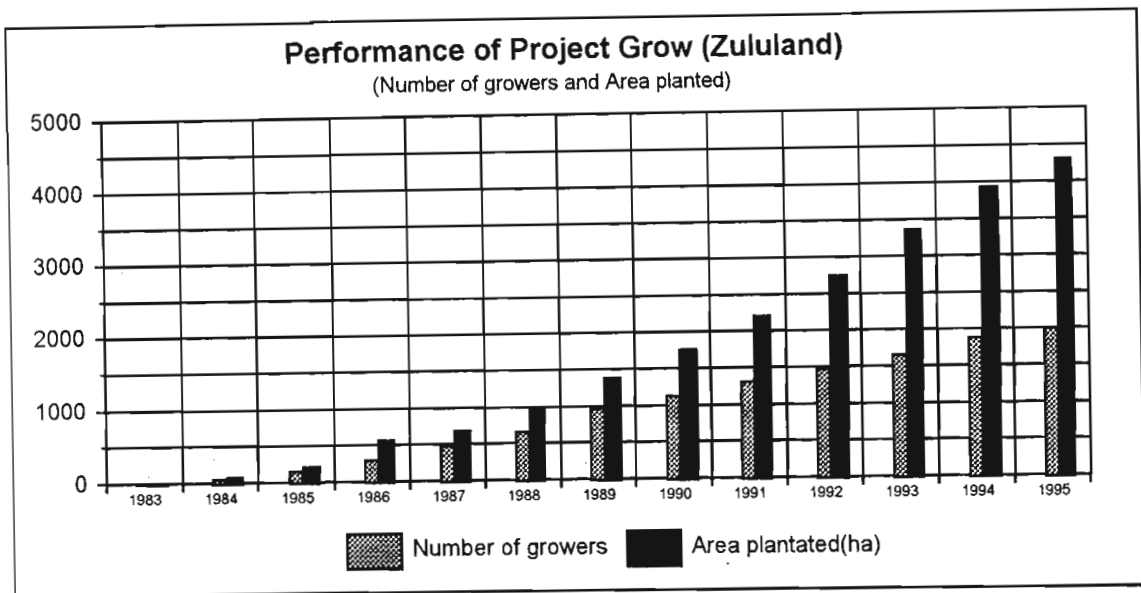


Figure 2 : Performance of the Project Grow scheme in Zululand in terms of total area planted and number of growers in the scheme (1983 - 1995) (Sappi 1996; Scotcher 1995)

No data specific to the two areas where the survey was conducted (namely, Mfekayi and eNgudwini) were available which make it difficult to assess performance of the scheme in the two areas in isolation of the larger Zululand area.

Harvesting and transportation of timber, which is usually done by contractors, constitutes the major cost to growers. Transport costs can be as high as 45% of the total income from trees, while the cost of harvesting also constitutes about 45% (Sappi 1993). Under this extreme situation, harvesting and transportation charges comprise 90% of the income from trees. Since the back payment to Sappi constitutes approximately 8 % of the income (Figure 3), the grower's net income will be only 2% of the total income at the harvest time. Under such circumstances, it is the few who own harvesting machinery and transport vehicles who benefit most from the schemes at the expense of the target group, the rural poor. This defeats one of the objectives of social forestry schemes; social and economic upliftment of the rural poor. A breakdown of the average cost for the year 1995 is presented in Figure 3.

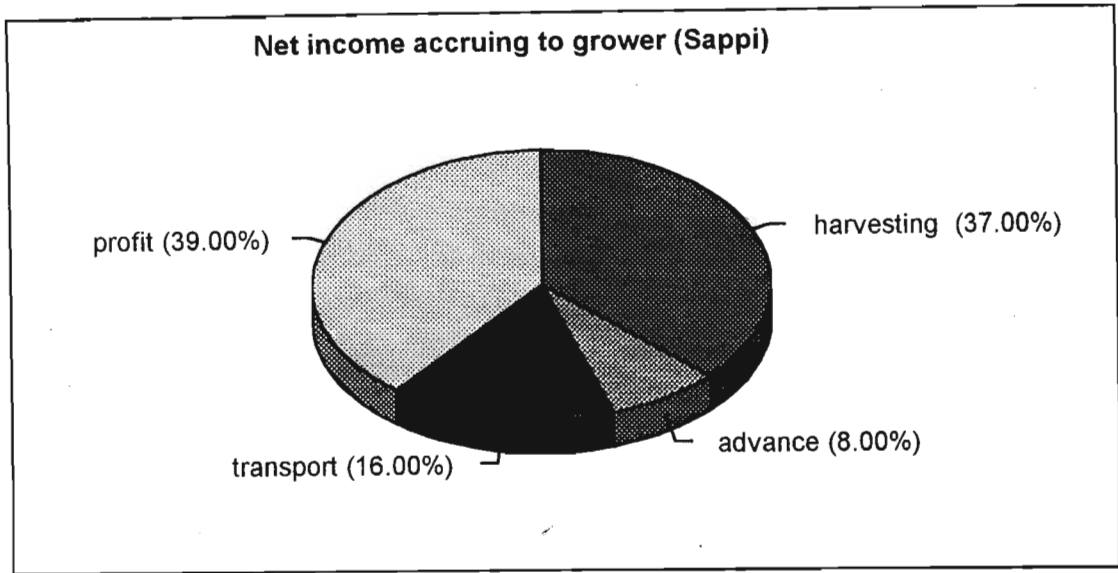


Figure 3 : Income accruing to the growers as a percentage of total expenditure under the Sappi scheme (Sappi 1995)

In an attempt to bridge the transport cost problem, Sappi and Mondi entered into an agreement that permits their growers to sell to either company on condition that they obtain permission from the company that provided money for the establishment of the timber plantations. This agreement was called The Timber Exchange Agreement (Gumede 1996, *pers. comm.*¹). Under this agreement, Sappi growers in Mfekayi can sell their timber to the Mondi Richards Bay mill, while those in Mbonambi and Sokhulu can sell to the Mondi weighbridges in the two areas under this agreement. According to Gumede (1996, *pers. comm.*¹), the growers have to get written permission which allows them to sell a specified amount of timber to the nearest timber weighbridge of the other company. This agreement aims to reduce the transport cost incurred by growers when they take their timber to the market. According to Gumede (1996, *pers. comm.*¹) there is no written documentation on the agreement.

Contrary to article 1.5 of the Sappi Agreement (Appendix 3) which stipulates that the grower who has planted through Sappi Grow will not sell the timber to any other buyer but to Sappi when the trees reach maturity, Gumede (1996) mentioned that some growers under the Sappi scheme prematurely harvest their timber without the consent of the company and sell to Mondi as private growers. This results in the company incurring a loss because it does not recover the money that was given to the farmers as grants to establish the plantations. Despite the fact that

a memorandum of agreement is signed at the beginning of the contract (see Appendix 3 for Sappi contract) that the farmer will not sell to any other buyer but to the company that has provided the grant, Sappi has not taken anybody to court for violating the agreement in order to preserve good public relations. Sappi feels that other growers will be intimidated if the culprits are taken to court, which may result in loss of popularity of the scheme. Also, Sappi feels that the individual grants are small and there are few such defaulters, and so do not justify the cost of taking the defaulters to court or the possible loss of potential growers (Gumede 1996 *pers. comm.*¹).

2.5 MONDI AND THE KHULANATHI SCHEME

Khulanathi was started by Mondi in 1989 as a source of additional fibre for the Richards Bay mill (Boake 1996). Currently the scheme operates in twelve areas of northern KwaZulu, namely Biyela, Amatikulu, Esikhaweni, Ngoye, Mbonambi, Sokhulu, Mfekayi, Mbazwana, Nkandla, Kwamthe, Manguzi and Manzeng (Boake 1996). Refer to Figure 1 for the location of these areas. Individual land right holders are encouraged to grow commercial *Eucalyptus* in their land with advice and inputs from Mondi. Even though growers are encouraged to do the work themselves, contractors are hired to do the work when the growers are not in a position to do it themselves. Trees are grown on a rotation period of 6 to 8 years and sold back to Mondi. Payments which are made for the work done are treated as loans to the grower payable at the time of harvest of that particular wood crop with an added 10% interest per year.

Khulanathi is more profit oriented, emphasising use of the best sites in terms of tree growth potential for the establishment of woodlots (Cellier 1994; Boake 1996, *pers. comm.*²). Christie and Gandar (1995) described it as more of a commercial undertaking than a social responsibility programme. This brings in an element of competition between food crops and tree crops for the more productive land which can undermine one principle of social forestry; producing trees in marginally productive land for the benefits of the community. Khulanathi also charges the farmers interest at 10% on the loans, and seedlings are provided at a cost of R40 per tray for the growers and R62.50 for farmers outside the scheme. One tray contains 125 seedlings, but

² Mr Boake, J. Mondi Forest, KwaMbonambi Area

1600 are required to plant 1 hectare (Makhanya 1996, *pers. comm.*³). The total cost of seedlings per hectare is therefore R512 for the growers and R800 for farmers outside the scheme. The growers are obliged by Articles 2.1.2 and 2.1.3 of the agreement (see Appendix 4 for Mondi contract) to sell the Timber to Mondi at harvest. Mondi promotes higher levels of inputs such as clones instead of seedlings, more fertiliser and intensive land preparation which result in both Mondi and farmers taking more risks in planting trees to try to achieve high growth rates and maximise output. Figure 4 illustrates the progress of the scheme in Zululand from 1987 to 1996.

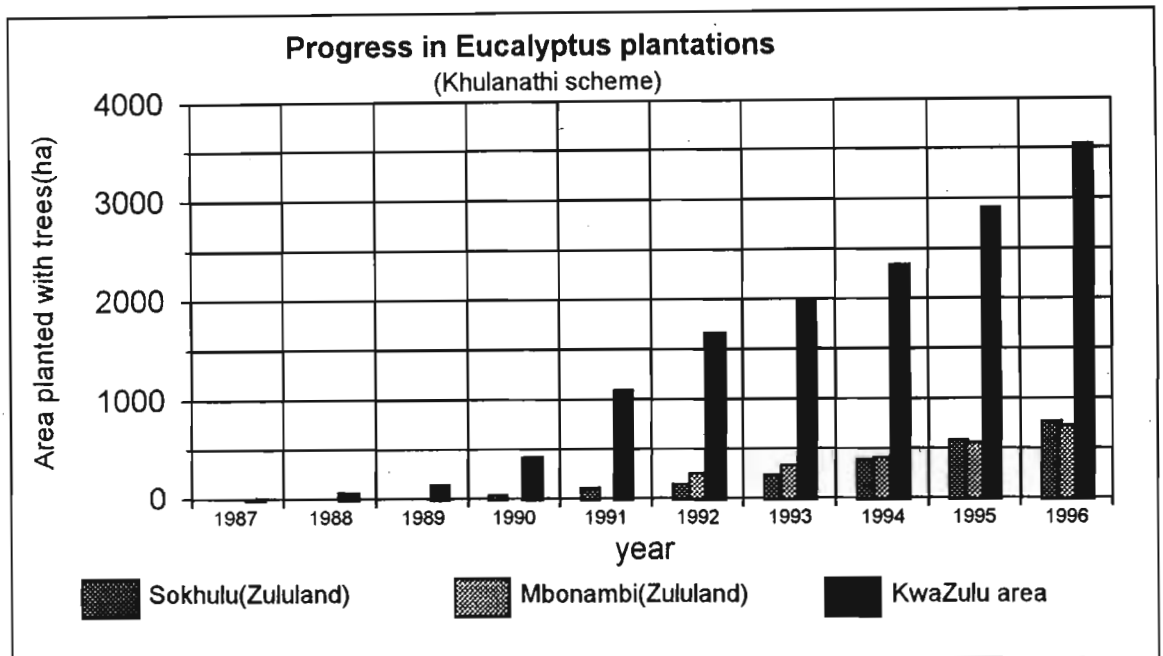


Figure 4 : Progression in *Eucalyptus* plantation in Zululand Area under the Kwa-Mbonambi office as well as in the two study sites under the Khulanathi Scheme (Boake 1996)

It shows a continuous annual increase in the land area under *Eucalyptus* plantation under the Mondi scheme. Despite the high inputs required in tree production under the Mondi scheme, projected costs and benefits suggests that a larger proportion of income goes to the grower as compared to Sappi. A breakdown of projected costs and benefits for Mondi growers for the year 1995 is presented in Figure 5.

³ Mr Makhanya, Mondi Forest, KwaMbonambi Area

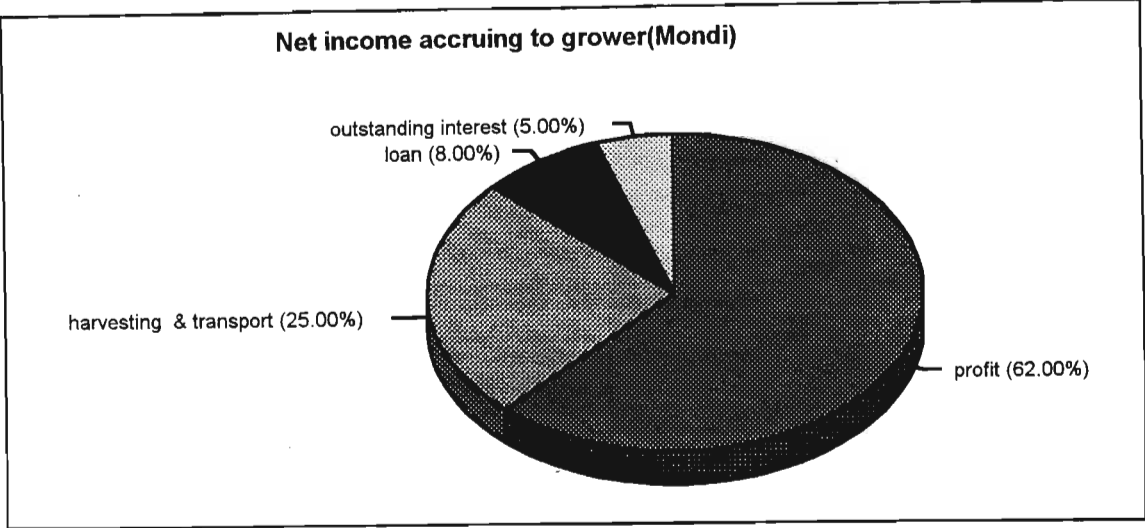


Figure 5 : Income accruing to the growers under the Mondi scheme for the year 1995.
Data adopted from Boake, 1996

A comparison of the Sappi and the Mondi schemes is given in Table 3.

Table 3 : Comparison of Sappi Grow and Khulanathi schemes

KHULANATHI (Mondi)	SAPPI GROW SCHEME (SAPPI)
Encourages growers to do work in their own land (planting, weeding, coppicing, fire protection and harvesting).	Encourages growers to do work in their own land (planting, weeding, coppicing, fire protection and harvesting).
Will arrange a contractor to do the work if the grower is not able to do it .	Will arrange a contractor to do the work if the grower is not able to do it .
Seedlings are provided to the growers at a price (R512 per hectare).	Seedlings provided free of charge.
Pay advances to growers for work carried out, that is land preparation, planting, weeding, coppicing, fire protection and harvesting. The advances are treated as a loan to the growers repayable at harvest.	Pay advances to growers for work carried out, that is land preparation, planting, weeding, coppicing, fire protection and harvesting. The advances are treated as a loan to the growers repayable at harvest.
Interest at 10% per annum is charged on the advances paid to the growers.	The grants are interest free.

KHULANATHI (Mondi)	SAPPI GROW SCHEME (SAPPI)
Technical advice provided free of charge by the company.	Technical advice provided free of charge by the company.
Guarantees the grower a market when trees are felled.	Guarantees the grower a market when trees are felled.
Emphasises the use of best sites in terms of tree growth potential.	Encourages growers to raise trees in marginally productive areas not useable for other crops.
Pays R120 per tonne of timber (1996 price).	Pays R98 per tonne of timber (1996 price).
Projected income to grower 62% (1995).	Projected income to growers 39% (1995).
Two weighbridges, one in Sokhulu and one in Mbonambi.	One weighbridge in Mandini (approximately 150 km from KwaMbonambi).

Project Grow had larger areas planted with *Eucalyptus* at the end of 1995 (4302 ha) as compared to Khulanathi (2908.6 ha) during the same period. Three reasons may explain the difference in the area planted under the two schemes :

- the interest charged by Khulanathi to its growers might serve as a deterrent for people who know that they can alternatively plant the same trees under the Sappi scheme without paying interest on the grant;
- the Khulanathi scheme only started operating in Zululand in 1987, four years after Project Grow. Project Grow was already well established in the area with 468 growers having planted an area of 670 hectares at that time. The familiarity of the programme to most people in the area due to its long term existence might lead people to join Sappi while they have some fears in joining the Mondi scheme which is still not very familiar to them; and
- most rural households have small pieces of land and once they have joined one scheme there will be no other land that can be allocated to tree planting by the same household.

The two companies are currently competing for the remaining land resources, and each scheme has its advantages and disadvantages some of which are outlined above. Sappi also has an

advantage in that it distributes seedlings to growers free of charge, however their trees take much longer to mature and the company pays a lower price for timber at harvest which may act as a disincentive for people to join the scheme. Mondi on the other hand, has fast growing trees but seedlings are distributed to the growers at a price and there is interest charged on the grants used by growers in tree establishment, which could be a disincentive

The choice of company by growers therefore involves more complex decision making which is governed by a multitude of factors.

CHAPTER 3

FACTORS INFLUENCING LANDUSE DECISION MAKING IN RURAL COMMUNITIES

3.1 OVERVIEW

For any land use planning or development scheme to be successful, it should not overlook the existing occupier or user of the land. However, with many development projects including social forestry, this occurs frequently because local communities are only involved at the implementation stage of the project and not before. The selection of species in forestry schemes is made by the forestry companies. Communities should be involved so that they do not become passive spectators in the raising of trees on their land. The “top down” approach has resulted in failure of many agricultural projects (Gibbons & Schroeder 1983). In contrast, community involvement results in the farmers assuming full ownership of the plantation. This may be a factor in determining decisions made by farmers regarding forestry.

Rural communities normally select species that are very familiar to them (Singh 1981). This observation is substantiated by Ffoliott, Brooks, Gregersen and Lundgren (1995) who stipulates that the process of adopting new practices in rural communities moves from a level of need, to awareness, to interest, to understanding, to a trial period when the proposed change is put into practice before the threshold of acceptance is crossed and the new practice is actually implemented. The many barriers that have to be overcome by extension officers before growers can fully understand and appreciate tree planting as a viable land use option requires proper training and patience on the part of the field officers.

Because of differences in cultural backgrounds and poor communication, forestry personnel may not adequately appreciate local ideas of land tenure nor the wealth of knowledge in the local communities on the productive capacity and limitations of their land. On the other hand, the local community may not fully understand the purpose of planting trees. This whole misunderstanding between the project developers and the supposed project implementers can negatively influence the rate of adoption of the forestry projects by the local communities. Rocheleau, Weber and Field-Jumba (1988) indicates that projects are more readily accepted

if their purpose and value is first described and discussed with those affected. This calls for proper communication with the rural farmers, providing training on tree farming and explaining the value of forestry, and where possible allowing the communities to make their choice regarding the tree species which they feel are more desirable and more beneficial to them. In this way a more positive response can be achieved from communities because they feel party to the project design. This is one of the key issues that forestry companies should consider as role players in determining the decisions taken by farmers regarding the planting of trees. This is supported by Christie and Gandar (1995) who recommended the institution of new extension paradigms in forestry which are based on participation rather than prescription of projects to rural communities. Rocheleau (1987) indicated that tapping farmers' knowledge and experience provides valuable information which can be used in species selection and breeding criteria, as well as for technological design and adoption.

Case studies conducted in sub-Saharan African countries to seek a better understanding of what motivates the farmers to invest land, labour and capital in agroforestry revealed that the major factors governing decision making in rural communities were technical, economic, social, institutional, and research issues (Cook & Grut 1989). Technical issues include species selection, land availability, human population density, the complexity of the new system and management skills requirements. The case studies also acknowledged that indigenous trees are better accepted and more frequently adopted than exotic trees. Multiple-purpose trees were found to be more acceptable than single-purpose trees and trees that yield early benefits were preferred to those with later maturity. Active involvement and support of forestry projects by village chiefs was also found to be an important feature in the success of the projects (Cook & Grut 1989).

According to Johansson (1991) and Johansson and Westman (1992) case studies conducted in the Babati District in Tanzania to evaluate factors that influenced the planting of trees revealed that most farmers started planting their first tree crops after seeing a neighbour harvest and sell timber with good profits. The availability of seedlings was also found to play an important role in influencing the farmers to plant trees because it exposed the farmers to a tree planting experience. Additionally, the provision of extension service was cited as another factor influencing land use decisions in Tanzania. Due to the depletion of natural forests, the

community started planting trees for the following reasons which Johansson (1991) found difficult to rank in order of importance :

“Production of building materials, commercial reasons, securing land tenure, trees as savings accounts for future financial needs, fuelwood production, trees creation of a better home environment, wind shelter for other crops, shade for coffee, erosion control on cultivated land, to make use of deteriorated lands, climate improvement, fertility management on cultivated fields and catchment management”.

In areas where there are conflicts over farm boundaries, it was found that many farmers plant trees to secure the land (Johansson 1991). Most farmers were found to believe strongly that trees are a potential source of income and that they could sell some of their trees if they needed money, even though they planted the trees for their own timber requirements.

A number of factors were also identified as constraints to the planting of trees in Tanzania. These constraints include lack of planting materials, closure of post harvest-grazing, lack of technical knowledge, shortage of land, shortage of time and labour and destruction of plants by termites (Johansson 1991; Johansson & Westman 1992).

Hall and Green (1989) found that in Lesotho various factors impact negatively on choosing tree planting as a land use option. According to Hall and Green (1989), some farmers claimed there was no space to plant trees, some believed that there were already enough trees in the wild, while some thought trees were not needed. The other reasons presented by the farmers for not planting trees were no fences were available to protect trees, no time was available, there was a lack of knowledge of tree planting, trees waste rangeland and there was no money to buy them.

Chambers, Palley and Thrupp (1989) attributed failure in social forestry in various parts of India to a misdiagnosis that given access to land and funds, community members, particularly the poor would prefer to plant trees for fuelwood to other crops. No consultation was made with the community regarding their priorities. This indicates the importance of community

participation at all project stages. Lack of land for other farming activities such as animal grazing was also found to be a major factor in the rejection of tree planting in India. Species selection, which was done at the convenience of the forestry staff and disregarding the needs of the people was also a contributory factor.

These examples represent the diversity of people's perceptions of trees, of their abilities and of their various roles, as well as the importance these can have in influencing the community's decisions. These factors do not exist in isolation of one another, but are complementary in determining the decisions of farmers regarding land use. The influence of each factor on the farmers' decision making in KwaZulu-Natal (South Africa) is the subject of this study and is considered more comprehensively below. In Chapter 4 of this study, however, particular factors influencing decision making are identified and ranked according to their importance as communities decide on tree planting as a land use option.

3.2 LAND AVAILABILITY <

Tree growing as a land use requires that some land be reserved for this purpose for the period of tree planting to maturity (Erskine 1996). In the case of *Eucalyptus*, this is about six years or more. Land availability is one of the major factors that determines whether or not a farmer can grow trees, mainly because food crops may be displaced (FAO 1985; Palin 1995). Erskine (1996) categorised farmers in rural areas into four groups based on the amount of land that they have at their disposal as follows :

- *Landless people who have no land to farm or use for subsistence production.* These people may be willing to grow some trees but the major limiting factor is land. Even if they can lease a piece of land from their fellow farmers, their major concern is to meet immediate food requirements and they will most probably opt for food crops rather than trees. FAO (1985) highlighted the fact that there are important trade-offs between trees and agricultural production if the farmers' landholding is small because trees generally do not produce staple food.
- *People with access to small units of land that they can use for subsistence agricultural production if they have financial resources and labour available to meet the household*

food requirements. With a small piece of land the priority will be to meet the household food requirements rather than generate income through the sale of wood products which have their benefits realised only after a long period. More immediate needs will be addressed first. The chances that people with very small pieces of land will start social forestry are minimal despite the possibility of financial interventions.

- *People with large units of land who can produce sufficient food crops to feed their families and sell the surplus to generate family income.* These are farmers who in most cases can afford to reserve some of their land for tree production. This group of farmers should be the target of forestry schemes because they can allocate some of the land to tree production and still produce sufficient food for their households.
- *Those who have large units of land and can produce marketable surplus.* This group of farmers will in most cases opt for commercial production systems such as large scale afforestation. These are wealthy farmers who can afford to take the risk.

Since the majority of the farmers in the study area have very small pieces of land which makes the last two categories irrelevant for the study, farmers will be categorised into three groups for the purposes of this study; i.e. landless farmers, farmers with small units of land and farmers with large units of land. The most important factor illustrated here is that land availability in terms of quantity and quality is an important factor in determining land use options. Farmers with very small pieces of land will opt for social forestry only if the benefits are very high compared to any other land use alternative (FAO 1985). A farmer with a large piece of land on the other hand will be more prepared to diversify his/her production activities. This observation is supported by Chambers (1989), who stated that in Gujarati, India, farmers with more than 5 hectares of land planted on average twice as many trees as those with less than 5 hectares of land. Havens (1975) also made the same observation in Colombia and concluded that the new technologies are more appropriate to farmers who own most of the land and capital. Palin (1995) further supported this observation when he indicated that initial campaigns of social forestry appeal to the farmers who have already satisfied much of their family needs for food and still have land to spare for a crop that is going to tie up the portion of land for a number of years. This implies that it will appeal more to the larger surplus farmers rather than the poor.

Socially secure people will therefore engage in more profit oriented land uses rather than subsistence agriculture. This observation is supported by FAO (1985) which stipulates that the risk in tree planting is greater for people with small landholdings because it results in diminishing production of food crops, and diminishes their ability to meet their daily needs which would otherwise have been met by farm produce. On the other hand, owners of large landholdings will still have sufficient land on which food crops can be raised during the period of tree growth.

3.3 LAND TENURE AND PROPRIETORSHIP

The question of land tenure is fundamental to any land use decision because it determines ownership, control, access and use of land (Palin 1995). People are reluctant to make long term investment involved in tree growing where they have doubts over the ownership of land they are farming (Foley & Barnard 1984). The FAO (1985) stated that the most economic environment for tree growing exists where trees are clearly for the ultimate benefit of those who planted them or their dependents. Absence of security in land tenure is a constraint to tree planting. Vergara (1987) supports this view suggesting that success in motivating farmers to practice agroforestry depends to a large extent on their perception of the economic rewards from such a practice, which is greatly influenced by the nature of their tenure over land. If the land tenure system has a significant role in influencing the farmers to adopt agroforestry (see Vergara 1987), it must be an important factor in determining whether or not farmers adopt social forestry. Since trees can take a considerable time to reach maturity, secure tenure is necessary in order for a farmer to invest labour and capital in plantation agriculture. This is further supported by Erskine (1991) and van Gelder and O'Keefe (1995) who believe that land tenure is of central importance in tree planting in less developed rural areas, because people will only take the risk of planting trees and protecting them if they are confident they will enjoy the benefits. This will only happen if their claim to the land and the trees is secure. Freehold tenure predisposes a farmer to adopt forestry since it does not involve any lease which can be lost before harvesting the trees.

However, in most African countries, arable land becomes communal grazing land in winter (after harvest), and this means that projects which utilise this land have to involve communal decision making. Under these circumstances, protection of privately planted trees can be an

extremely difficult task because it means infringing upon what other members of the community view as their legitimate rights. This can serve as a disincentive for the farmers to practice any form of forestry and can lead to the failure of forestry schemes to attract as many farmers into the project as required. Secure tenure is therefore one of the most important factors that should be addressed in order for schemes to be successful.

In the case of KwaZulu-Natal, Cellier (1994) summarised the status of land tenure as 2 774 728 hectares communal, 177 000 hectares freehold and 320 000 hectares as trust farms. Even though there is communal utilisation of resources such as pasture, water, fuelwood and building materials, there is security of tenure of arable land as long as the head of the family is alive. Bowman and Marais (1996) noted that communal land, which is held in trust for a particular tribe by the chief, is usually subdivided into zones for residence, commercial activities, grazing and agriculture, and is used by all members of the tribe for grazing of livestock and with consent, sand, medicinal plants and thatch grass can be harvested. The tribal authority (chief or *induna*) is actually responsible for the allocation of land. Ownership under communal land tenure implies that one has usufruct rights of a portion of the tribal land (Gregersen *et al.* 1989) and if he does not utilise it, it can be repossessed and allocated to somebody else (Bowman & Marais 1996). Usufruct refers to the fact that the farmer can enjoy the use and benefits from a piece of land, but the land belongs to the community, not to him. According to Bowman and Marais (1996), agricultural land is only allocated to and inherited by a male member of the tribe and if no suitable male heir can be found, the land becomes available for re-allocation after the owner's death. This limits the participation of women in land use planning decisions. Widows can continue using the land after the death of their husbands until their deaths, and thereafter the land must go to their male heir.

This kind of land tenure can be seen as a disincentive for farmers, and women especially, to have any long term investment on the land, such as tree planting. This is especially true if they do not have male heirs, because in the case of deaths, the land and the tree crop may be allocated to somebody else who may not be a family member. The tendency is to plant crops which mature quickly so that individuals can reap the benefits themselves. On the other hand, planting of trees in land allocated to the farmer may be viewed as having the potential to strengthen ownership because the land under the tree crop will be under production for a period

of at least 6 years as the trees grow to maturity. It is interesting to speculate on the role of land tenure as an influence on the choice of crops planted by farmers. Devolution of strong property rights over trees can serve as an incentive for farmers to plant trees. Murphree (1995) mentioned that tenurial rights of rural people continue to be a paramount issue in rural development throughout the developing world.

3.4 INSTITUTIONAL ARRANGEMENTS ×

The planting of trees supported by forestry companies brings with it statutory laws which result in the expropriation of power and responsibilities away from social structures to law enforcement institutions established by the legislature to control the use of both the land and the tree crop on it (Noronha & Spears 1985; Bruce & Fortmann 1988). Local institutions and modern institutions have different perspectives. Christie and Gandar (1995) observe that the management of common property is a political issue that reflects local power relations since management incorporates the issue of control. They emphasise the need to decentralise control and management to village level institutions and to individual farmers so that it is based on local traditions and practices. For example, under the traditional system, land tenure is determined by land use which in most cases is controlled by the chief. Modern institutions on the other hand, determine land tenure through explicit contractual arrangements and the mode of utilising the land resource is determined by socially acceptable uses as stated in the statutory law and policy. The chiefs normally have considerable influence over the people. Allowing them the power to control the use of land and convincing them that trees are important in rural development can make a significant difference in the way the community perceives plantation forestry (Cook & Grut 1989). Other structures such as the extension services should act as an interface between the local structures and the modern institutional structures, building on the knowledge and experiences of the communities.

3.5 PERCEPTION OF NEIGHBOURS TOWARDS TREE PLANTING ×

Labour investment influences tenure. Tree planting where trees are scarce strengthens tenurial claims to land. Planting of exotics such as *Eucalyptus* may have the same effect even where trees are abundant because planted trees are regarded as the private property of the planter (Lai & Khan 1992). Erskine (1991) observed that the outcome of intensive tree management which is normally the case in any form of forestry is a progressive shift of focus of productions from

open access or communal land to land controlled by the individual. The decision to plant trees may therefore be influenced by the perception of neighbours who may feel that they will be excluded from using the land for the period when the area will be under the tree crop. Communal land, in the traditional setting, is used by all members of the community for many different purposes, particularly collection of fuel wood, thatch grass, construction poles and livestock grazing where animals are allowed to roam freely in farmers' land after harvest. When other members of the community feel that the planting of trees stops them benefiting from the use of land that they have always accessed in the past, they may influence the kind of land uses that can be practised. This can restrict those who wish to plant trees so that they are forced to plant other kinds of crops.

3.6 COMMUNICATION / EXTENSION SERVICES

The manner in which extension services interact with local communities is an important factor in influencing the adoption of any new innovation. There has to be trust between the community and the agent of change (Ffoliott *et al.* 1995). Extension workers aim to make the community realise the value of growing trees before any planting is started. Leading by example is a powerful method of convincing farmers to invest their land, labour and capital in tree planting (see case studies by Johansson (1991); Johansson & Westman (1992)).

3.7 PERCEIVED BENEFITS

Most people, including rural farmers know the importance of trees; what varies is their attitude towards planting them. Planting trees is a new concept and farmers view it with mixed feelings. They have to fully understand its purpose and benefits if they are to be comfortable adopting it in their farms. Evans (1984) indicated that new projects are readily accepted by rural communities if their purpose and value is first discussed with those affected. Erskine (1991) argued that when tree growing is already on the verge of becoming an economically attractive option, farmers will choose tree planting of their own accord. The loan contract offered to the farmers by the companies will facilitate the planting of trees by individuals who would otherwise be limited by financial constraints. Because farmers normally prefer to plant crops that are familiar, it is important to demonstrate that forestry is economically viable using projects that are already in place in their area.

3.8 ALTERNATIVE LAND USES

As has been discussed above, the benefits derived from growing trees on a particular site should exceed those which could be obtained from any alternative land use, in order for the farmers to allocate part of their land to this land use. Trees take a long time to be harvested and if the benefits are not attractive, other land use options will be chosen with more immediate benefits.

On the other hand, the FAO (1985) argues that rural people may be unwilling to plant trees not because of their ignorance of the benefits, but because there are more serious economic, social or cultural and environmental constraints. Gregersen *et al.* (1989) further urges that there must be sufficient land, capital and labour resources available to make the planting of trees possible and to cover the expenses of planting, harvesting and marketing of trees and tree products. Benefits from these activities should exceed benefits from alternative resource and agricultural management strategies both in financial and economic terms (FAO 1985). Social or cultural constraints involve changes in the productive relationships and patterns of resource ownership which might be brought by tree cultivation. For tree planting to be successful and sustainable, it must fall within culturally acceptable strategies of resource utilisation. Furthermore, technical expertise must be culturally sensitive. In the case of environmental constraints, tree planting must be responsive to the availability of water, temperature regimes, soils and other characteristics of the natural environment.

3.9 ECONOMIC STATUS

Cook and Grut (1989) in case studies in sub-Saharan Africa described a positive correlation between wealth and the adoption of forestry projects. Case studies in Rwanda and Nigeria revealed that initial adopters were individuals or groups who could afford to take risks and most people only enter agroforestry when it is widely practised (Cook & Grut 1989). They concluded that wealthier areas are characterised by more intensive and innovative agroforestry practices on individual plots, while poorer areas show less intensive and diversified agroforestry practices.

3.10 DROUGHT CONDITIONS

Drought and other natural disasters such as severe winters can have some influence on the decision of choice of crops planted. Lai and Khan (1992) found that in the Sahelian area most of the forestry projects were started in response to the severe droughts of the 1960's and early 1970's. Crop failure with other species serves as sufficient incentive for the farmers to move towards a tree crop which is more resistant to climatic perturbations.

CHAPTER 4

STUDY AREA OVERVIEW AND RESEARCH SURVEY METHODOLOGY

4.1 OVERVIEW OF THE STUDY AREA

The areas in which the Project Grow and Khulanathi schemes operate have been outlined in Chapter 2. This chapter gives a brief outline of the four areas in which the interviews for this research were conducted. The research was conducted in the KwaMbonambi area of KwaZulu-Natal, and specifically in Sokhulu, Mbonambi, eNgudwini and Mfekayi tribal authority areas (Figure 1). Mondi growers were interviewed in Sokhulu and Mbonambi, while Sappi growers were interviewed in eNgudwini and Mfekayi. The reason for selecting these four areas for the purposes of this research are :

- there are small scale tree farmers supported by the forestry schemes in these four areas;
- the two South African forestry companies, i.e. Sappi and Mondi operate in these four areas which provide some platform for comparison of results between these companies in one geographical location;
- conducting research in four communities could allow the researcher to determine if there is any site specificity in the factors that influence the decisions made by community members regarding planting of trees; and
- their proximity to one another is also an important factor because it reduces travelling costs and the time that is required to commute between the different research sites. A brief description of each area is given below.

Sokhulu

Sokhulu is located about 40km north east of Richards Bay, 18 km south west of St Lucia and 25 km east of KwaMbonambi, south of the Mfolozi river (Figure 1). *Eucalyptus* production has been undertaken in this area for about 20-30 years without the assistance of forestry

companies, the government or any other non-governmental organisation. The growers used to buy seedlings from the KwaZulu Forestry Department at a nominal fee for the establishment of their plantation. The plantations were originally established to safe guard the growers' land from expropriation by the old apartheid government. Due to the extended period over which trees have been planted, forestry has developed into an established land use in the area.

The presence of Sappi and Mondi schemes in the area benefits the growers by securing a market for their timber while the companies have an alternative source of timber to meet their increasing wood demand. Mondi established a weighbridge in Sokhulu in 1991 to serve as a collection point for wood for the Richards Bay mill and to encourage farmers in the area to join the scheme after harvesting the old timber. The introduction of the high yielding, fast growing clonal *Eucalyptus* and Mondi's preference to purchase higher quality, younger plants, motivated many growers to fell their old trees and replace them with Mondi seedlings. This was highlighted by the growers who mentioned that their old timber was no longer fetching a good price because it was too old.

Mbonambi

Mbonambi is located about 15 km south of Sokhulu. As is the case in Sokhulu, tree planting is an old tradition in this area with growers having been involved for the past 20 to 30 years by their own choice and without any financial assistance from any company or government department. Mondi has another weighbridge located in Mbonambi which serves the same purpose as the one in Sokhulu. The introduction of standards on timber required by Mondi for its mill and the availability of the seedlings from Mondi succeeded in attracting growers into the scheme.

eNgudwini

eNgudwini is located about 30 km west of Mandini and supplies timber to the Sappi mill in Mandini. Sappi started operating in this area in 1983. There are more crop production activities in this area than in the other three. eNgudwini for example is the only area of the four where a farmer with 6.5 hectares of land was found to have allocated it all to tree production while another grower with 12 hectares of land allocated 9 hectares to tree production. This is probably because the clay soils in this area are more suitable for crop production as compared to the soils in the other areas.

Mfekayi

Mfekayi is located about 35km north of Mtubatuba. As is the case with Sokhulu and Mbonambi, Mfekayi has a long history of tree planting which started before the introduction of any grower scheme in the area. Both Sappi and Mondi schemes are active in this area. Cellier (1994) attributed the success of small scale forestry to peace and stability in the area, and to the few other land use opportunities that are available in the area (poor soils being the major limiting factor).

4.2 RESEARCH QUESTION

Social forestry has been described as an approach to development which involves community members in forestry activities, and which ultimately generates income for the community and results in capacity building through the participation of farmers in the implementation of the project. This in turn leads to community empowerment and economic development. Social forestry places emphasis on the fact that the project should be driven by local community's needs (FAO 1985; Rocheleau 1987; Gregersen *et al.* 1989). If social forestry contributes to improvement in social welfare, why are there differences within and between communities in their interest to become involved in forestry? This research sets out to answer several questions related to the characteristics of the society which have a bearing in the adoptions of social forestry as a land use. The following are some of the factors to be investigated :

- socio-economic factors such as land availability, alternative sources and level of immediate income, availability of family labour or financial rewards;
- social factors such as acceptability of forestry to community members;
- institutional constraints related to the land tenure system and land and tree ownership;
- the degree of involvement of community members in the hands-on production of trees on their land, given that involvement of rural people in the management of the trees is a condition necessary for capacity building; and
- education and training in forestry management among members of the community which equips them to undertake forestry on their own.

4.3 OVERVIEW OF RESEARCH METHODS

There are many methods of conducting social research and the choice of method employed by any researcher depends on the type of data required, the time available for the research, the availability of human resources, research funds and the socio-economic status of interviewees that are involved in the research. A survey, as defined by May (1993), is an encounter between a researcher and a respondent in which the latter is asked a series of questions relevant to the subject of the research and the respondents' answers provide the raw data which is analysed at a later stage by the researcher. This research methods include structured interviews, semi-structured interviews, group interviews and unstructured or focused interviews. Each of the methods outlined above will be discussed briefly, indicating its advantages and disadvantages. The reasons for selecting particular approaches in this research will be outlined. Triangulation, which is the use of more than one research method improves the reliability of the information collected from the field (Theis & Grady 1991).

Structured interviews

Structured interviews or surveys involve the use of questionnaires which can be classified into two categories, namely, open ended questionnaires and closed questionnaires. The purpose of questionnaires in research is to measure some characteristics or opinions of the respondents (Dane 1990; May 1993). This method involves the gathering of information from a number of individuals, a sample, in order to learn something about the population from which the sample is drawn. Questionnaire surveys can be divided into :

1. Mailed or self completion questionnaires :- a research technique involves the mailing of questionnaires to the target group or a sample of the target population to fill in and send back to the researcher. This method has a wider geographical coverage at lower cost compared to the other two forms of questionnaire surveys and provide the respondents with the opportunity to take their time to fill in the questionnaires themselves and consider their responses, and provide a medium of anonymity which can be an advantage for sensitive issues. The mailed questionnaires also reduce the bias caused by the way the interviewer would have asked the questions. Disadvantages of mailed questionnaires include is lack of researchers' control over the completion of the questionnaire, no possibility of the researcher probing beyond the answers that people give, lack of control over who answers the questions and low response rate.

2. Face to face interviews:-a research technique which involves a physical interaction between the interviewer and the interviewee. The interviewer has to locate and secure cooperation from the interviewee, guide the respondent through the questionnaire, ask questions in a clear, standardized and concise manner, record answers and maintain a rapport. The advantages of face to face interviews include high response rate and good control of the interview situation.
3. Telephone interviews:-a technique which involves interviewing a respondent over the phone. Telephonic interviews will not be considered further as the study focuses on rural areas where most people do not have telephones. Relying on a telephonic interview approach would bias the research to a minority of affluent farmers and would not be a representative sample of the community.

Semi structured interviews

Semi-structured interviews involve the administration of a few predetermined questions by the interviewer. This allows for considerable flexibility on follow-up questions (Dane 1990). Participatory Rural Appraisal (PRA), a research technique developed in the late 1970's and early 1980's as an alternative to complement conventional surveys, is one example of semi-structured interviews. The origin of the research method is well described in Theis and Grady (1991).

Participatory Rural Appraisal is a way of learning from, and with, community members to investigate, analyse, and evaluate the constraints and opportunities and make informed and timely decisions regarding development projects. Its purpose is to gain an understanding of the complexities of a topic rather than to gather highly accurate statistics on a list of variables (Theis & Grady 1991). The method allows a researcher to systematically and rapidly collect information for the purposes of a general analysis of a problem. This method of data collection is used because traditional surveys often take too long for data to be collected, analysed and disseminated to be useful for community members and development workers in decision making. According to Theis & Grady (1991), PRA resulted from the disenchantment with conventional information-collection methods which give all responsibility to outsiders rather than members of the community.

The main features of PRA as described by Theis and Grady (1991) are triangulation, a multidisciplinary team, mixture of techniques, flexibility and informality, community involvement, optimal ignorance (all parties involved are learning something) and appropriate impression, on the spot analysis and offsetting biases, and self-criticism. Participatory Rural Appraisal supplements sample surveys using questionnaires giving more accurate results within the limitations of time and money.

Questionnaires used in both structured and semi structured interviews can be either open-ended or closed questions with each type offering some advantages and disadvantages. Open questions give the respondent a greater freedom to answer the questions because they answer in a way that suits their interpretation. The interviewer records as much as possible of the answers and undertakes the analysis after the interview.

Closed questions limit the number of possible answers to the responses given by the researcher in the questionnaire. The questions therefore compartmentalize people into fixed responses permitting comparability between people. The responses can, therefore, be pre-coded so that each answer can be given a specific number for the purposes of analysis. Pre-coding makes the questionnaire much easier to analyse. Closed questionnaires have a limitation because they cannot capture any factors that the researcher has omitted.

Unstructured or focused interviews

Use of focus groups is a data collection technique which uses group interactions to produce data and insights around a specific topic which is not accessible outside groups. Focused interviews differ from other interviews because the people interviewed are known to have been involved in a particular situation that is being researched and because hypothetically important elements, patterns, process and the subject being researched have already been provisionally analysed by the researcher giving a set of hypothesis concerning the determinate aspects of the situation (Merton, Fiskie & Kendall 1990). The interview is directed towards the experiences of the people interviewed to ascertain their own perception of the pre-analysed situation. This research method is important in investigating what participants think about a particular subject or problem and why they think as they do. The technique gives the researcher the opportunity to observe concentrated interactions on a topic in a limited time and talk directly to

respondents, thus attaining clarification, elaboration and a better understanding of the community's ideas (Dane 1990; Merton *et al.* 1990; Fowler 1995). Furthermore, some of the insights which may not have been anticipated by the researcher are explored.

The advantage of this research method is that people use their own language and their own vocabulary in the discussion of the issues around the subject of research and are therefore, in a much better position to express their own perspectives on the issues. It also has the advantage of flexibility, which allows the interviewer to explore more fully the opinions of the respondent resulting in more and varied information than that which would arise from structured interviews. Due to the fact that not every respondent is asked exactly the same questions, comparison of responses is difficult and is limited only to predetermined questions.

4.4 RATIONALE FOR ADOPTING RESEARCH METHODS USED IN THIS RESEARCH

The method adopted in the collection of information relating to community decision making must provide the opportunity for members of the community to express their own feelings about the factors they regard as important in land use selection, as well as provide certain quantitative data which can easily be analysed. Consequently, this suggests the adoption of the structured interview approach with both opened ended and closed questions. Closed questionnaires produce quantitative data that is easy to analyse. One of the strong points of the closed questions is the ease of analysis and the comparability of the information obtained from different respondents. To allow the respondents the opportunity to express their own perceptions of the forestry projects in their own frame of reference, some open-ended questions should also included. These will provide for more detailed and varied responses therefore allowing the researcher the opportunity to understand the diversity of community perceptions towards the forestry issues.

4.5 METHODOLOGY AND CONSTRAINTS

Methodology

An interview based questionnaire survey including both open ended and closed questions was adopted in gathering data. A questionnaire was formulated based on the information gathered from an extensive literature survey on social forestry and community decision making

(Appendix 1). Individuals in communities who have decided to join one of the forestry schemes were identified with the help of the forestry companies. It was easy to identify the growers, because the forestry companies' extension officers had records of all their growers.

The questionnaires were administered to 31 households selected at random in the study area. Twenty two growers and 9 non-growers were interviewed. The initial plan was to interview equal numbers of growers and non-growers but it turned out to be very difficult to find non-growers. This was due to the fact that the area which was selected for the research is mainly a forestry area, with most residents having been involved in tree planting for at least 20 years without support from any company.

Of the 31 interviewees, 12 were interviewed in Sokhulu, 6 in Mbonambi, 7 in eNgudwini and 6 in Mfekayi. The target interviewees were household heads and in their absence their wives were interviewed.

The interviews were conducted in the form of structured in-depth dialogues (Dane 1990) and the questionnaires were completed immediately, as delays in recording may result in inaccuracies in the information provided by the interviewees. The objective was to identify the variables that influence community members' decision to plant or not to plant trees in their fields. It should be emphasised that this study focused on community perceptions of tree planting. For this reason interviews with managers within forestry companies were not part of the study methodology. The questionnaire was structured to capture demographic information of the respondents, information on land allocation and utilisation, extent to which tree farming is being carried out as well as communities' level of understanding of social forestry schemes. The questionnaires also captured information on the attitudes and perceptions of the members of the community towards social forestry. The questionnaire comprised both closed questions to capture quantitative data and open-ended questions to allow the respondents to express their feelings without restrictions.

To evaluate the extent to which some factors influence community decisions in social forestry, the growers were presented with a set of variables and allowed the opportunity to indicate the extent to which each variable influenced their decisions to plant trees (see question 79,

Appendix 1). In order to determine the influence of the various factors on community decisions regarding the planting of trees, the various responses were allocated scores as follows :

- | | |
|---------------------|---|
| • strongly agree | 5 |
| • agree | 4 |
| • indifferent | 3 |
| • disagree | 2 |
| • strongly disagree | 1 |

These enabled the aggregate score for each factor to be calculated and compared. The method of ranking factors was adapted from Sokal and Rohlf (1987). The average scores were then graphed in descending order to give the factors in their order of importance in influencing the community to plant trees.

Constraints to the research

Language barrier

This research was conducted in rural KwaZulu-Natal and the people interviewed were predominantly illiterate to semi literate Zulu-speaking farmers who do not speak English. Communication with the growers was through an interpreter. This limited follow-up questions that could have been asked to probe for more information.

Financial constraints

Financial constraints limited the number of days that could be spent in the field and the number of trips made to the study area.

Time constraints

The research was to be completed within a period of six months. It is very important when working with communities to build trust and understanding in the community before conducting a questionnaire based survey. The time available only allowed the researcher to go into the community, introduce himself and define the purpose of his presence in the area and try to obtain as much information from the community as possible within the shortest possible space of time.

4.6 WEAKNESSES OF THE RESEARCH

- The findings of this study may be biased because the areas selected for the study have a long history of forestry.
- As the sample size used in the research was small, there is a chance generalising these findings to reflect the situation in KwaZulu-Natal. A larger sample of interviewees would have provided more accurate information about the performance of the schemes in KwaZulu-Natal. Despite the fact that the author recognised the limitations brought about by the sample size, time and financial constraints dictated against working with more interviews than were covered. Due to the small sample size and preliminary nature of this work, the proportion of the sample responding to a questionnaire was converted to a percentage, and rounded off to the nearest unit.
- Growers from Sappi and Mondi were interviewed at different locations, which are located at varying distances from the point of sale. Transport costs, which are directly related to distance, have a negative impact on the gross profit of the growers. This therefore made it difficult to compare the two schemes equitably.

CHAPTER 5

RESULTS AND ANALYSIS

5.1 OVERVIEW

This chapter describes and interprets the research findings of the survey. Demographic data is analysed to provide general information on the kind of respondents present in the area and assesses the role demographic factors play in tree planting decisions. Social and economic factors that influence members of the community to plant trees are also brought forth. This chapter also provides insights on how members of the community feel about tree planting, which is further evaluated in the light of adoption of social forestry as a land use. The influence of economic factors on tree planting is also evaluated.

In view of the scarcity of land in rural South Africa, the concept of agroforestry was introduced to evaluate the extent to which the forestry companies are committed to assisting communities make most efficient use of the available land. Agroforestry is a farming system which offers ways of introducing trees as a complement to food crops and livestock, thereby increasing total land productivity as well as expanding the variety of outputs. This also provided information on the quality of the extension services accessible to community members. Growers complaints are interpreted and their administrative implications highlighted.

5.2 DEMOGRAPHICS

Gender distribution of interviewees

Household heads' gender distribution was assessed to get the general picture of the family structures in the area of study, as well as assess the variability in land use preference due to gender. Most of the households (represented by 23 of the 31 interviewees) in the area have male household heads, but because some of the male household heads work away from home, only 17 of the interviewees were males. Of the 6 households heads working away from home, 5 (83%) are not members of any grower scheme. The ratio of male to female headed families in the study area is 3:1.

Age distribution of the interviewees

Tree planting entails a long term investment of labour in related production activities. Age, being a major factor in the agility of individuals, was evaluated as a possible factor influencing community land use decisions. The modal age group was found to be 46-55 years for growers and 26-35 for non-growers. The respondents are predominantly of the less economically active age (more than 45 years old).

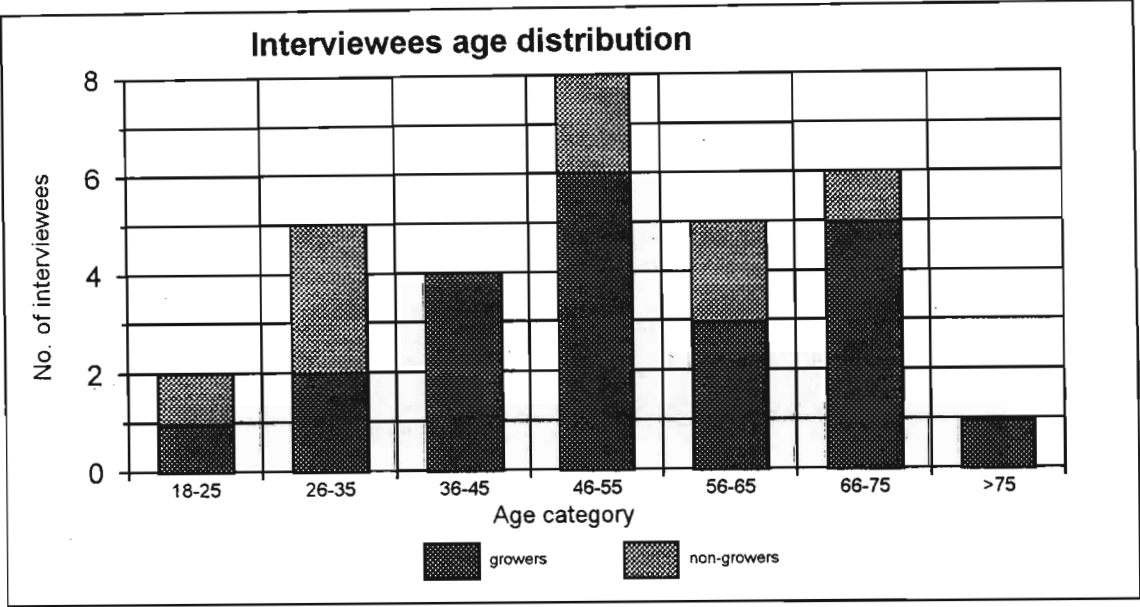


Figure 6 : Graphical representation of respondents age group distribution in the study area

Interviewees education level (growers)

Level of education was evaluated as a factor influencing community members to plant trees because education empowers the community to make land use decisions. Thirty two percent (32%) of the growers had no formal education, 45% had primary education and 23% had secondary education. Of the non-growers, 22% had no formal education, 33% had primary education and 44% had secondary education. None of the respondents had education beyond secondary level. Fifty eight percent (58%) of respondents who had no formal education were growers, and only 34% of respondents with secondary education were growers. The distribution of growers and non-growers according to their educational level is presented graphically in Figures 7.

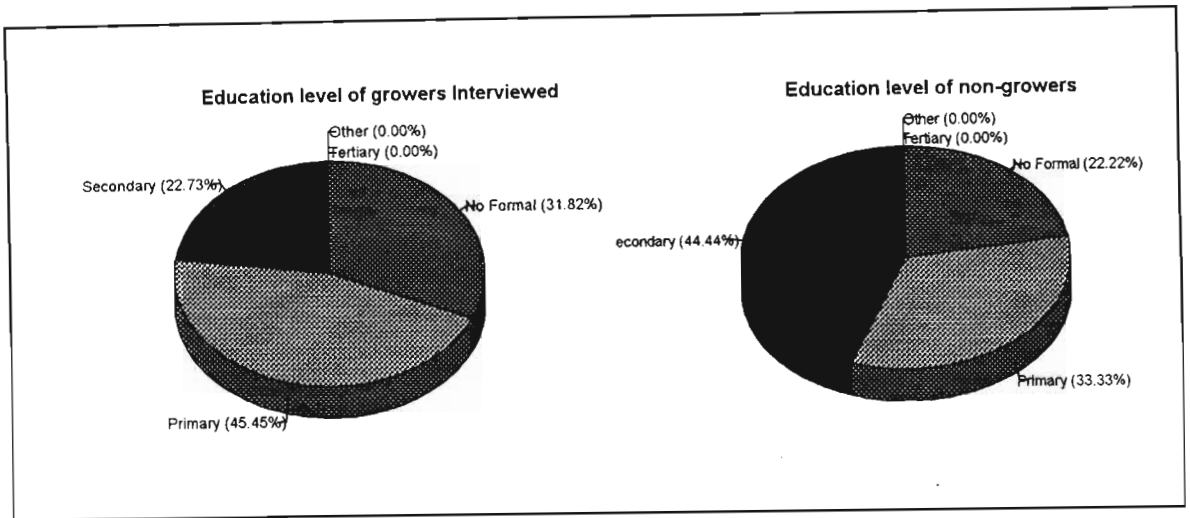


Figure 7 : Distribution of growers and non-growers according to their education level

Household income

As tree production takes a long time before the benefits are realised, there may be a relationship between willingness to adopt forestry and financial security. Financial security was evaluated on the bases of households' monthly incomes. Sixteen of the 22 (73%) growers fall within the household income range of R401 to over R2000 with a large portion (7 of the 16) having an income of over R2000. In contrast, of the 9 non-growers interviewed, 6 (67%) have a household income of less than R500, one has a household income of R1001 -R1500, 1 of R1501-R2000 and 1 of above R2000. The income of those in the higher income brackets is generated through both self-employment and formal employment. Figure 8 below is a graphical representation of the distribution of household income levels of both growers and non-growers.

Advanced planning indicators

As timber production requires a longer period for the benefits to be received, there may be a relationship between the willingness to adopt forestry and the willingness to invest in other long term income generating opportunities. Advanced planning is evaluated on the basis of the interviewee having either an insurance policy, a bank account or membership of a stokvel. The results for both growers and non-growers are displayed in Figure 9. Sixteen (73%) of the 22 growers interviewed have at least one of the indicators, while 8 (89%) of the 9 non-growers were found to have at least one of the indicators. Possession of a bank account was found to constitute the most common indicator. Only 5 (23%) of the 22 growers were found to have

either or both insurance policy and stokvel membership, while this was the case for 3 (33%) of the 9 non-growers in same group. The proportions of both growers and non-growers with and without any advanced planning indicators are presented below.

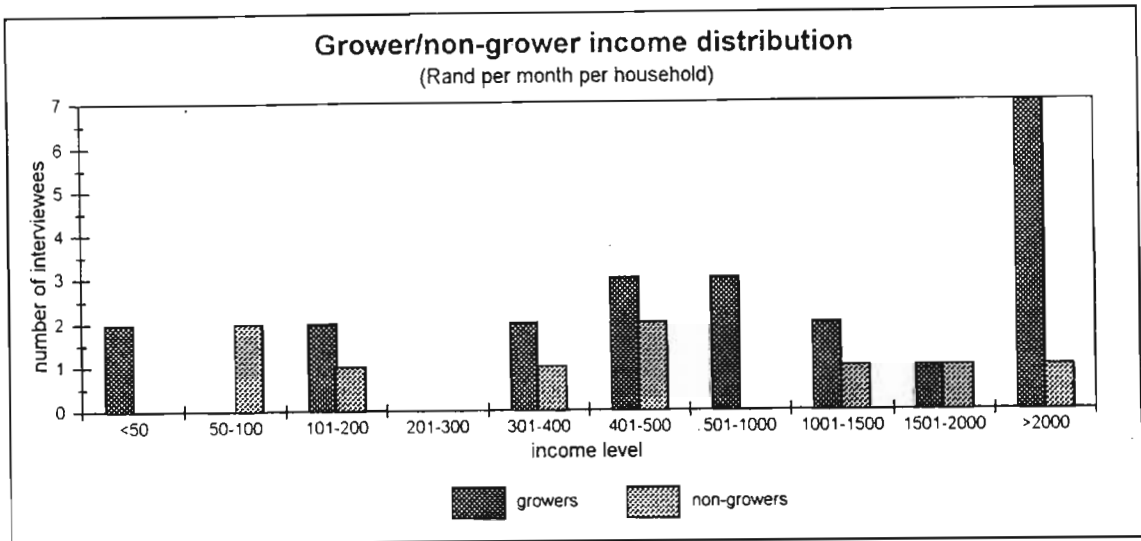


Figure 8 : Distribution of growers and non-growers according to household income

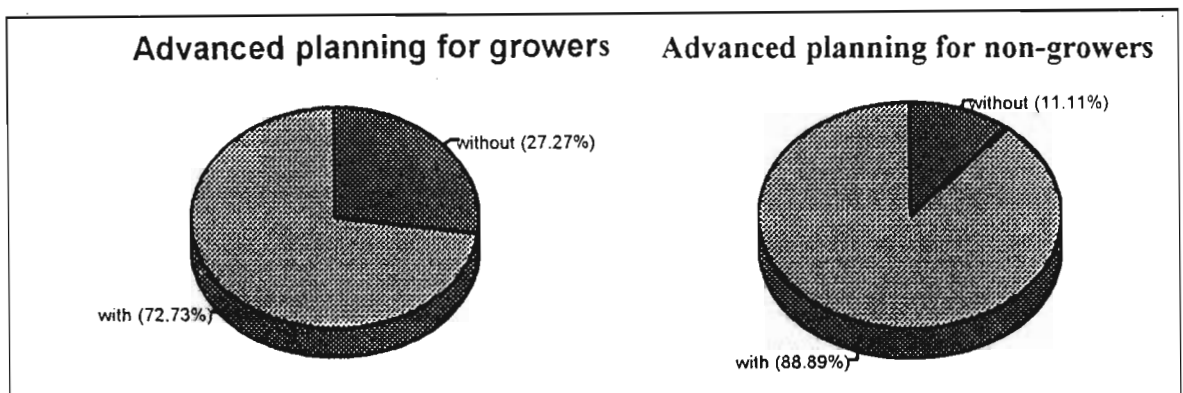


Figure 9 : Distribution of growers and non-growers according to presence or absence of advanced planning indicators

Previous farm work experience

As timber production is a form of farm business, commercial farm work experience such as in sugar cane farms or plantations may influence members of the community to adopt forestry as a land use. Of the growers, 55% have commercial farm work experience while 56% of the non-growers have worked in commercial farms previously (Figure 10).

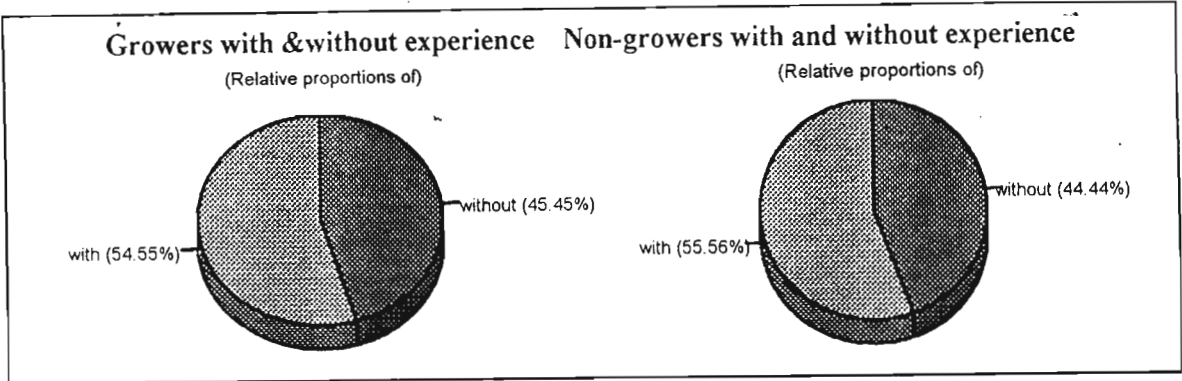


Figure 10 : Relative proportions of growers and non-growers with and without commercial farm work experience

Training in forestry

Forestry training was evaluated as a factor influencing land use decisions of community members as it is reasonable to assume that previous training in forestry would positively influence a respondent to participate in a forestry scheme. Of the 22 growers interviewed, 4 (18%) have undergone some forestry training, while only 1 (11%) of the 9 non-growers had trained in forestry. Figure 11 is a graphical representation of this information for both growers and non-growers.

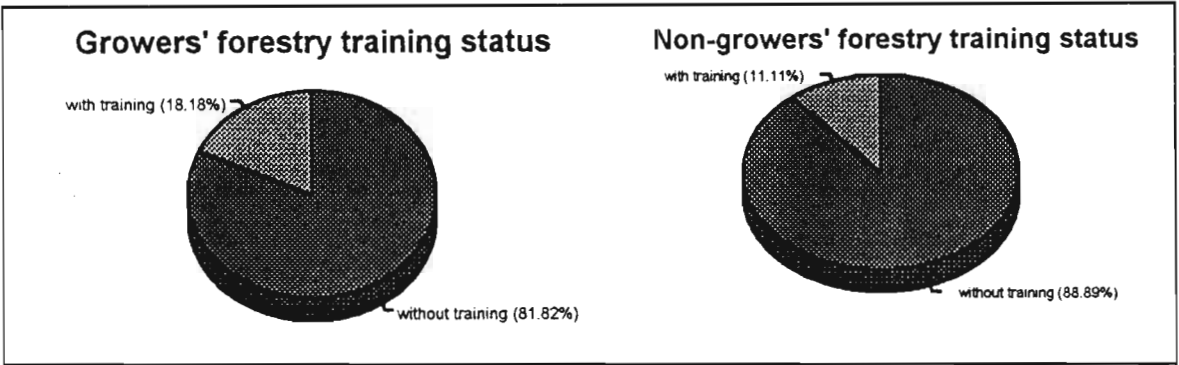


Figure 11 : Proportions of growers and non-growers with and without forestry training

5.3 BIOPHYSICAL FACTORS

Influence of climatic history on the planting of trees

To evaluate whether rainfall condition influences farmers to plant trees, the growers were asked whether at the time of tree planting, there was severe drought, mild drought, normal rain or good rain. Growers cited various rainfall conditions at the time of planting trees. Of the 22

growers interviewed, 3 (14%) started planting trees during good years, 13 (59%) during normal years, 5 (23%) when there was mild drought and 1 (4%) when there was severe drought. Figure 12 below shows the percentage distribution of the growers according to the rainfall condition at the time of tree planting.

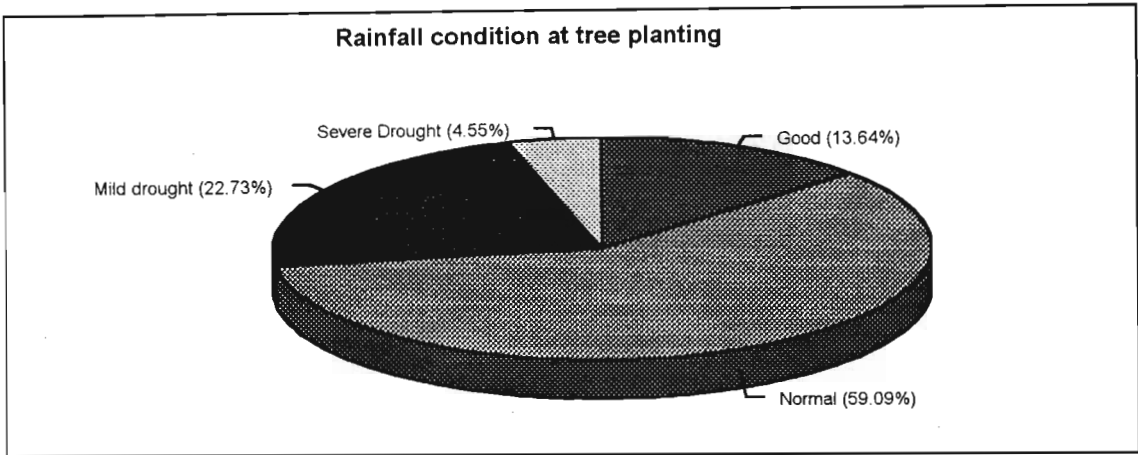


Figure 12 : Distribution of growers by rainfall condition at the time of planting trees

Choice of trees versus agricultural crops

The Sokhulu, Mbonambi and Mfekayi areas are characterised by light, deep sandy soils while eNgudwini has dark clay soils. The low fertility of soils in these areas may militate against the production of food crops. Of the 22 growers interviewed, more than half (13) indicated that their land was not suitable for the production of food crops while the rest believed their land can be used for the production of crops. Eight of the 9 non-growers interviewed indicated that they are interested in planting trees but are limited by land availability, whilst 1 (in eNgudwini) did not join initially because of fear of losing land to Sappi. At the time of the interview, the non-grower was in the process of joining the Sappi scheme.

5.4 SOCIAL FACTORS

Community attitudes towards gum trees

Attitudes of community members towards tree planting as a land use were assessed to determine whether community attitudes have any influence in the adoption of forestry. One respondent declined to comment on this issue. Figure 13 shows that 80% (24 of 30) of the family members (both growers and non-growers) support planting of gum trees, 40% (12 of

30) support replacing other land uses with gum trees, and 93% (28 of 30) support their neighbours planting trees. Community members believe that land can be used in a way that owner finds most suitable. For more details on the responses, refer to Figure 13 below.

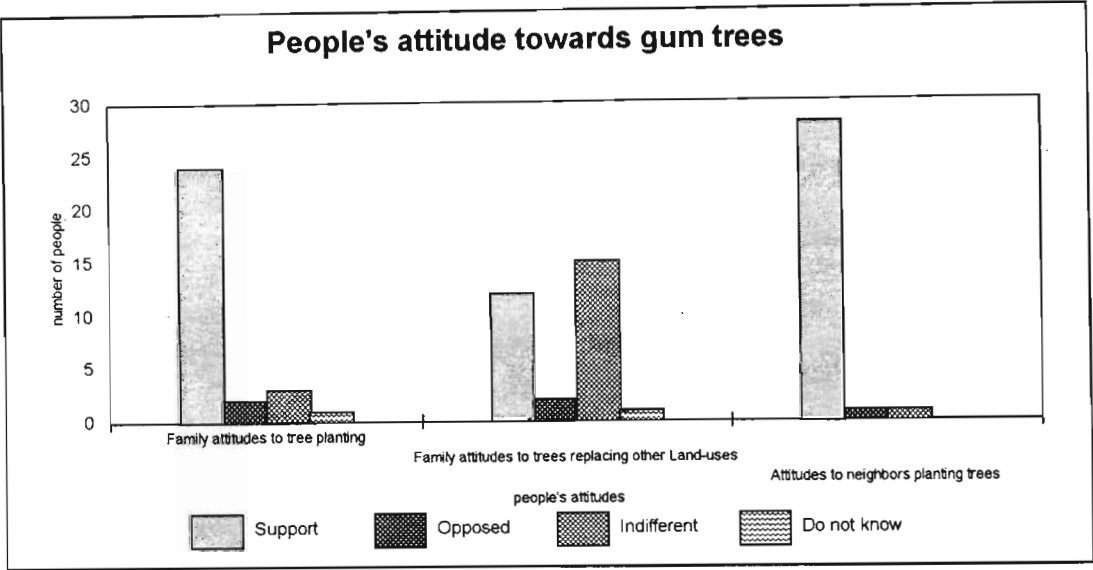


Figure 13 : Attitudes of family members to the family planting trees, to the family replacing other land uses with trees and towards neighbours planting trees

Non-growers perceptions towards growers

In the four areas where the survey was conducted, the study revealed that almost all (89%) non-growers are in favour of tree planting, believing that tree planting is a good development initiative which generates income for the households. Seven of the 9 (78%) non-growers indicated that the growers should not have to seek permission from their neighbours when they want to plant trees because they use their own land. The remaining 2 thought the growers need to seek consent of the neighbours only to make sure that they do not use any land that does not belong to them. The study also revealed that the chiefs of the four sample villages were actively involved in tree planting.

Asked whether they will consider planting gum trees in future, 89% of non-growers indicated that if they could acquire land they would also start planting gum trees because of the perceived financial benefits. The general feeling among non-growers is that planting of trees is a good land use option because it provides an opportunity to generate income for the households and also creates employment for other members of the community.

5.5 SOCIO-ECONOMIC FACTORS

Comparison of income at time of tree planting with current income levels.

To evaluate the extent to which trees contribute to household income and to establish whether the financial status at the time of decision making had a bearing on the decision to plant trees, the growers were asked whether their current income was less, the same or more than before planting trees. Sixteen (73%) of the 22 growers indicated that at the time of tree planting their household income was less than at present, 4 (18%) indicated that their income was the same as now and 2 (9%) believe that their income had decreased since they planted trees (Figure 14).

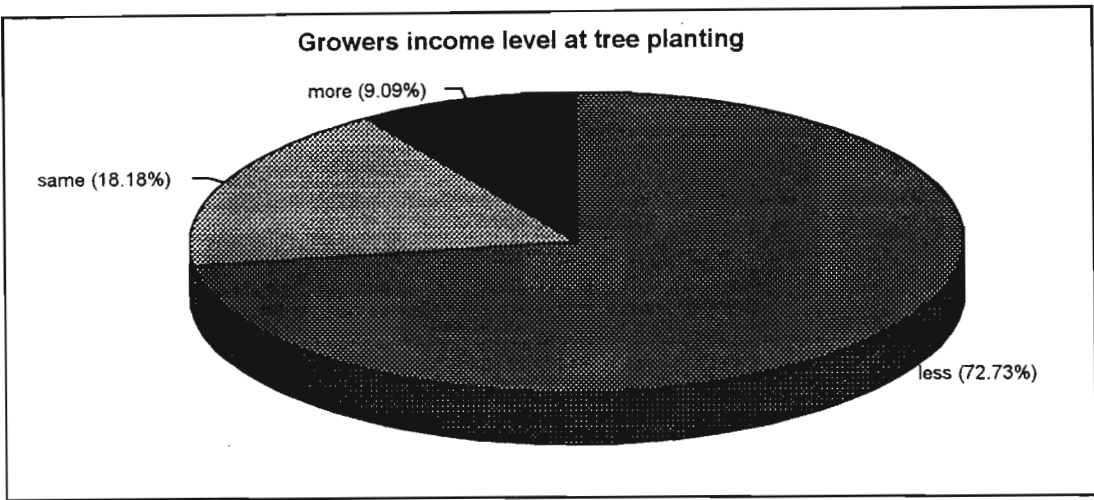


Figure 14 : Qualitative comparison of general growers household income at and after tree planting

Comparison of the growers by company

Figure 15 gives a breakdown of Sappi and Mondi growers according to whether they believe their incomes were less, same or more at the time of joining the forestry schemes. Seventy eight (78%) percent of the Sappi growers indicated that their household incomes increased subsequent to joining the scheme, 11% believed that their income level had not changed and the other 11% believe that their income has declined. In the case of Mondi growers, 69% felt their income had increased, 23% believed their income had not changed and 7% indicated that their income had declined.

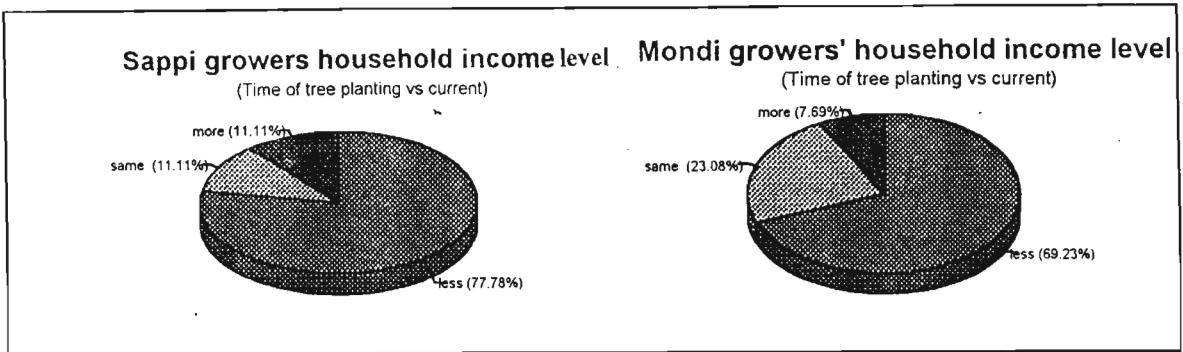


Figure 15 : Growers’ perceptions on the status of their levels income at tree planting and the current income

Growers who had previously harvested were asked to provide the information relating to the amount of money paid to them for the timber and size of the area harvested. Two growers under the Sappi scheme indicated that they obtained R700 each, one from an area of 2 hectares and the other from an area slightly over 1 hectare. Another grower indicated that the overall payment for 3 hectares of timber was R12000 suggesting payment of R4000 per hectare. In total, 8 growers who had harvested timber under the Sappi scheme were interviewed in eNgudwini and Mfekayi, but only three were able to provide this information. Of these 8 growers, 5 expressed their concern over the amount of money charged by contractors for harvesting and transporting timber. There were no such complaints in Sokhulu and Mbonambi, where Mondi has its weighbridges. The only grower under the Mondi scheme who was able to provide a figure for the money obtained from trees quoted R30000 from 2.1 hectares, and those who could not give a specific figure indicated that they got a lot of money, which demonstrated their satisfaction with the money they got.

Land size as a factor in tree planting decision

Data correlation and a test of significance performed using a table of critical values for correlation coefficients (Sokal & Rohlf 1987; 332-333) indicated that there is a positive correlation between total land area owned by a farmer and the area planted with trees at 99% significance level ($r=0.97$, $df=21$). The tabulated correlation coefficients $r_c=0.41$ and 0.53 at 1% and 5% critical levels respectively. Since the calculated correlation coefficient (r) is greater than the critical correlation coefficient (r_c), there is significant positive correlation between total land area and area planted with trees. The equation below is a relationship between total afforested land and total landholding.

$$\gamma = 0.898\chi - 1.53$$

Where: γ = Area planted with trees (hectares)
 χ = Total area of landholding (hectares)

The information is presented graphically in Figure 16.

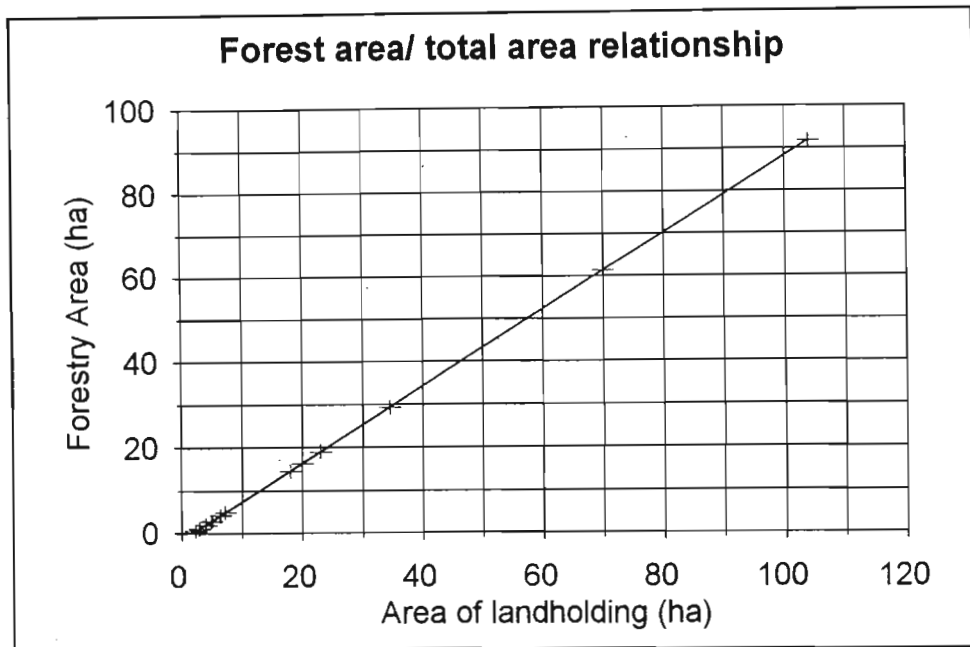


Figure 16 : Linear relationship of total land area owned by a growers and forestry area

The relation suggests that if a farmer has a total land area of 10 ha for example, the predicted forestry area that he/she may develop is approximately 8 ha, while a farmer with a total land area of 100 ha will develop 88 ha.

Growers as beneficiaries in social forestry

Of the 22 growers interviewed in the study area, 15 indicated that they had benefited from planting trees while 7 responded negatively. Table 4 gives a breakdown of the responses given by growers in different villages in the study area. Note the distribution of the growers who feel they have benefited from planting trees and those who feel they have not in Sokhulu and Mbonambi villages.

Table 4 : Number of growers in different locations who feel they have benefited or not benefited from tree planting

RESPONSE	OVERALL	SOKHULU	MBONAMBI	eNGUDWINI	MFEKAYI
benefited	(68%) 15	5	2	4	4
no benefits	(32%) 7	4	2	1	0
Totals	22	9	4	5	4

Growers' perceptions towards tree planting after harvest

Table 5 below presents the growers' responses as to whether they will plant trees again after the first harvest in the four sample villages. Responses show that 20 of the 22 growers interviewed will continue planting trees after harvest, 1 will not plant trees again and 1 is not sure because the grower has just joined the scheme and is not certain about the benefits. Refer to Table 5 for details on the growers responses in each sample area.

Table 5 : Growers' perceptions towards replanting their land with trees after harvest

RESPONSE	OVERALL	SOKHULU	MBONAMBI	eNGUDWINI	MFEKAYI	TOTAL
will plant trees	20	8	4	4	4	20
will not plant	1	0	0	1	0	1
not sure	1	1	0	0	0	1
Total	22	9	4	5	4	22

Despite the fact that only 5 of the 9 growers in Sokhulu indicated that they have benefited from tree planting, 8 indicated that they will plant trees again after harvest. In Mbonambi, all the 4 growers interviewed indicated that they will plant trees after harvesting, while only 2 indicated that they have benefited from tree planting.

Growers' participation in tree production

Growers involvement in the actual management of trees on their own land as measured by their participation in various tree production activities is presented in Table 6 below. For easy comparison, the number of growers involved in any one activity was converted into percentages.

Table 6 : Growers' participation in the production of trees on their own land

ACTIVITY	SOIL PREPARA- TION	PLANTING	WEEDING	COPPicing	FIRE PROTEC- TION	HARVEST & TRANSPORT
COMPANY						
%Sappi growers	55	89	100	55	89	0
%Mondi growers	23	31	85	15	69	0

The major differences in growers participation in tree growing activities between the two companies are evident in planting and coppicing of trees. Table 5 shows that on the overall, growers under Project Grow of Sappi participate more than those under Khulanathi scheme of Mondi in tree production activities.

5.6 AGROFORESTRY

Agroforestry is a form of social forestry which refers to a mix of trees, crops and even livestock grazing on a single plot (DWAF 1995). This approach increases the diversity of crops involved in the farming system, thereby reducing the risk of crop failure. The study has shown that of the 22 growers interviewed, only 4 were found to be growing trees and food crops together on the same piece of land and 18 planted them separately. Reasons for separating trees from food crops as stated by the growers are given below.

Reason for not practising agroforestry

- Competition between crops and trees for resources

The growers outlined a diversity of reasons for separating food crops from trees which were interpreted to refer to competition for resources. These include no additional benefits are derived because food crops die when planted with trees, trees shade the crops and they do not perform well under the forest. The implication is that respondents understand that trees will out-compete food crops in the competition for the limited resources such as nutrients and moisture available in the soil. They also realise that without the light from the sun due to shading by trees, it will be very unproductive to plant food crops under such conditions. Ten of the 18 (56%) growers shared this view.

One respondent believes that separating the two will allow him the opportunity to monitor the performance of trees on their own. Planting trees and other crops together introduces an element of competition for resources which affects the performance of both the tree crop and food crops. The respondent believes that it is easier for him to make judgement concerning the growth and productivity of the of trees and food crops if they are on their own.

- Avoid disturbance by livestock

One respondent believed that planting trees together with other crops will result in the disturbance of the growth of young trees by livestock. As previously mentioned in the literature review, under a communal land system, land is used communally for livestock grazing after harvest. The respondent believes that planting of food crops together with trees will give other farmers access to his land after harvest and that his young trees will be trampled down by cattle during these periods. For this reason, the grower plants trees and food crops on separate land.

- Land available elsewhere for food crops

Four of the growers presume that since land is available elsewhere for food crops, they do not see any need to plant trees and food crops together. For this reason, they do not practice agroforestry.

- Do not know that it is possible to plant them together

One respondent, indicated that he did not know that it is possible to plant trees and crops together.

- Two respondents indicated that crops are grown separately from trees because the land that is under a tree crop is not suitable for food crops.

- Two of the respondents believed that mono-cultural tree planting makes their work, e.g. weeding, much easier.

Figure 17 below shows the proportions of responses by growers to the factors that the growers consider major in influencing them to plant trees and crops in different areas.

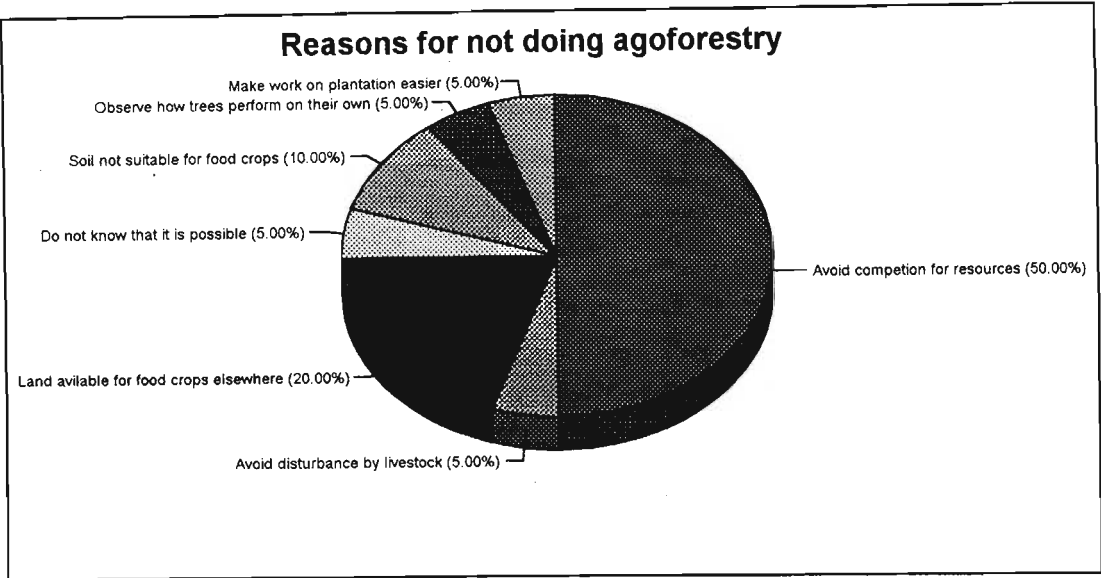


Figure 17 : Various reasons given by respondents for separating gum trees from food crops. Note that 18 of the 22 growers interviewed planted trees separately and only 4 planted them together

5.7 GROWERS’ REASONS FOR PLANTING TREES

A diversity of reasons for joining the company schemes was provided by individual growers. The major reason for planting trees as provided by the growers in this study was the financial benefits which are expected by growers from trees. Of the 22 growers who were interviewed, 20 (91%) revealed that they started planting trees because trees were considered to make more money than other land uses, while non-growers also indicated that they see their grower counterparts making money and therefore expressed their interest in doing likewise. The sample group raised issues which contribute to the adoption of forestry by farmers, and these are listed below in descending order of emphasis. The scores were derived using the ranking adopted from Sokal and Rohlf (1987)

- trees make more money (average score=19.2);
- tree products are easier to sell (average score=18.8);

- trees are easier to manage compared to food crops (average score=17.8) ;
- trees are more reliable as compared to other crops (average score=17.4);
- convinced to plant the trees by forestry extension officers (average score=16);
- no other crops could grow in the area (average score=16);
- influenced by neighbours (average score=15.6);
- availability of funds from Sappi/ Mondi (average score=15.2); and
- land unsuitable for other uses (average score=12.2).

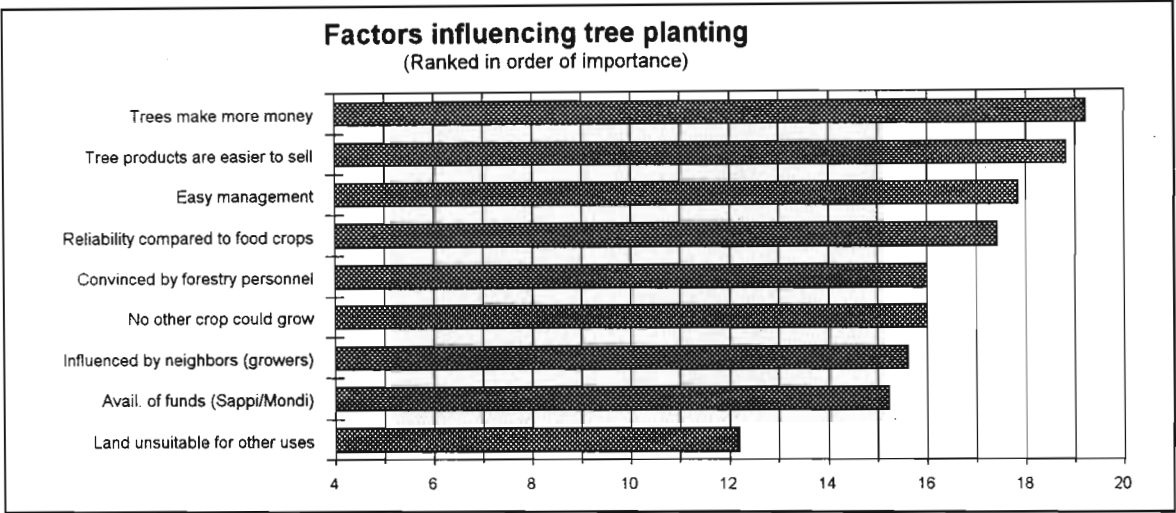


Figure 18 : Graphical representation of factors influencing community decisions in planting trees

5.8 CONCERNS AMONG GROWERS

This study also set out to establish concerns which growers might have regarding tree planting and the forestry schemes implemented by the two timber companies.

Sappi growers

There was general concern among Sappi growers that the contract harvesters were too expensive and take a substantial share of the money that the growers make from the trees through transport charges. Five of the 8 (63%) growers who have previously harvested in eNgudwini and Mfekayi were found to share this view. The growers indicated that they would like Sappi to provide transport for them to move timber to the mills at a cheaper price.

Mondi growers

Six of the 12 (50%) growers indicated that they are satisfied with the scheme and suggested it should remain as it is. On the other hand, 3 (25%) indicated that the assistance is not enough and that Mondi should increase the price of timber, 2 (17%) thought the advice that the company provides to the growers is not adequate, and 3 (25%) were thought that interest charged by Mondi on the grants was too high. These growers expressed the view that interest should be cancelled completely or at the least reduced.

Noteworthy from growers

One grower pointed out that he is very concerned that the future generations will have acute shortage of water because of the current rate of afforestation with *Eucalyptus* which takes a lot of water from the ground. The expressed fears that in the long term the whole area will be afforested which will result in the depletion of the water table. Furthermore, the grower indicated that most people in the area join the forestry schemes because of the low inputs and short term benefits derived from the tree crops at the expense of the environment. Depletion of the water table and drying of wetlands were quoted as examples of possible environmental costs. The grower believed that people in the area do not know the effects of planting gum trees on the environment.

The grower was also concerned that gum trees harbour a pest which bites cattle causing a disease that results in high livestock mortalities. The pest was described as very resistant to pesticides, and of high reproduction rate. According to the grower, KwaZulu Natal Agricultural Department personnel have never attended to this problem.

Giving his perception of the forestry schemes, the respondent observed that Khulanathi scheme is a business enterprise in which Mondi is exploiting the growers rather than providing financial assistance because Mondi charges interest on the grant given to the growers. The respondent further expressed dissatisfaction with timber prices which are set by Sappi and Mondi alone, without any input from the growers. The grower believes that the contract between growers and forestry companies which binds the grower to sell to any one particular company is unfair because growers cannot sell to the company that offers the best price. The grower also thinks more advice should be provided on tree management and that the company should increase payments for timber.

One interviewee complained that some company extension officers claim money on the growers' behalf. Another grower also complained that some extension officers order more seedlings than the grower actually receives, and yet the grower pays for the full number. The respondent also complained that some company employees take the seedlings under the growers' names and plant them elsewhere for themselves.

Both Sappi and Mondi growers indicated that there is a need for the establishment of a loan facility that will provide them with some money before the trees are ready for sale.

CHAPTER 6

DISCUSSION

6.1 OVERVIEW

This study is concerned with the factors influencing land use decisions by farmers, with emphasis on small scale tree planting in KwaZulu-Natal. Chapter 6 provides a detailed discussion of findings of the study and provides alternative measures that can improve the socio-economic benefits to the growers without compromising the welfare of the environment. Furthermore, the chapter provides a discussion of features that characterise a social forestry project, on the basis of which Project Grow and Khulanathi are appraised as social forestry schemes. This chapter therefore, provides some alternative measures for both the forestry companies and policy makers to develop social forestry into a sustainable land use.

6.2 ECONOMIC INCENTIVES

Gregersen *et al.* (1989) stresses that the incentive to grow trees, or to be involved in any developmental project, increases with the profits that the community derive from the project. Grants provided by Sappi and Mondi, with 5 to 8 years grace period as the trees grow, allow for the participation of the poor farmers who would have not been able to invest in forestry because of subsistence reasons. Growers utilise the credit facilities that are provided by the forestry companies for the establishment of the trees. They use the money paid upfront to them for the activities done (e.g. weeding, coppicing and fire protection) on their farms to redress their financial needs. The farmers can only use the money for this purpose if they do the work themselves.

Perceived financial benefits were found in this study to be the major driving force that led to farmers' adoption of forestry as a land use option with other factors acting as complementary driving forces. Figure 18 shows the reasons in the order of their importance in influencing community members to plant trees. The majority of non-growers (8 of 9) also indicated that they would like to plant trees for financial gains, indicating that those who are planting trees are perceived to be making profit.

The growers (particularly Sappi growers) are concerned about the high prices charged by the contractors for the transportation of timber. No monetary figure was attached to this cost by the growers, but Sappi estimated it to be about 16% of the total value of the timber for the year 1995. The net profits for the Sappi growers were estimated to be 39% of the total income derived from the trees while those for Mondi growers were approximately 62% during this period. These estimates suggest that Mondi growers make more money from the sale of timber than Sappi growers, despite the 10% interest charged on the advance and irrespective of the high inputs involved under the Khulanathi scheme. This is probably because Mondi offers a better price for timber than Sappi and hybrids are used together with fertilizers which enhances their output. Furthermore, Mondi has a weighbridge in each of the two areas where its growers were interviewed which cuts down on the transport expenses while Sappi growers have to transport timber over long distances to reach the weighbridges. Even though insufficient information was obtained regarding the financial benefits, the little information available supports the argument. Under the Sappi scheme for example, two growers indicated that they obtained R700 each from areas of 2 hectares and 1 hectare respectively, and another grower got an overall payment of R12 000 for 3 hectares of timber. The only grower under Mondi scheme who was able to provide a figure for the money obtained from trees quoted R30000 from 2.1 hectares. These figures suggest that growers under the Khulanathi scheme realise more financial benefits per hectare than Sappi growers.

The fact that 5 out of 9 growers under the Sappi scheme expressed their concern over the amount of money charged by contractors for harvesting and transporting timber while there were no such complaints in Sokhulu and Mbonambi, where Mondi has its weighbridges, suggests that transport costs can have a major impact on the net revenue accruing to growers. The same observation was made in the Sappi News Letter of 1993 which indicated that harvesting and transport costs can be as high as 45% of the total output each. Any strategy that reduces these cost will result in more financial benefits to the growers.

To determine whether social forestry has any positive financial contribution to the household income, growers were asked whether their household incomes had increased since they planted trees. Of the 22 growers interviewed, 16 (73%) indicated that their annual incomes had increased since they planted trees, while 4 indicated that their incomes were the same as before

planting trees and 2 highlighted that their incomes had declined. This information is presented in Figures 14 and 15. The results suggest that trees contribute positively to the household incomes of the growers, but there seems to be confusion among growers because even those who have never harvested claim that their incomes have increased. The majority of growers interviewed have never harvested, and some who have harvested did not know how much money they received for the area harvested. It was therefore not possible to perform a conclusive cost and benefit analysis of tree planting in this study, but inferences were made based on available data. The failure of the majority of the growers to provide figures for the amount of money they made through sales of timber shows that the growers do not have a clear idea of what profit they make, or what it costs them to produce the trees. Trees take a long time to mature, and people seem to be making fundamental long term decisions in ignorance. This can have serious implications to members of the community who will have their land tied down to trees which may not be the best land use option.

A total of 20 growers indicated that they will plant trees again after harvesting the current crop, while only one responded negatively. The majority of the growers are still willing to plant trees under the forestry scheme, contrary to the findings in India where farmers shifted to vegetable production after the first harvest (Chambers 1989). This is an indication that growers believe that they benefit from planting trees. The question that remains unanswered is whether the trees really make more money than alternative land uses? This can only be answered by a cost benefit analysis of the possible land uses. An economic analysis is necessary for people to make rational land use decisions.

The inconsistencies in Tables 4 and 5 for Sokhulu and Mbonambi show that there is lack of information necessary for rational land use decision. Four of the 9 growers in Sokhulu and 2 of the 4 growers interviewed in Mbonambi indicated that they have not benefited from tree planting (Table 4). On the other hand, 8 growers in Sokhulu and 4 in Mbonambi indicated that they will plant trees again after harvest. The question that follows is on what basis do they make decisions to plant trees if they are not sure about the benefits? The study has also shown that community participation in the production of trees is inadequate (see Table 6), and that transport costs are a major concern to those growers far from weighbridges as demonstrated by Sappi growers. The study has also shown that there is confusion over the benefits derived

by growers from trees. For example, only 3 of the 8 growers who had harvested under the Sappi scheme were able to tell the amount of money they obtained from selling their timber. These problems may be due to lack of accountability on the part of the extension staff whose responsibility should include among other things educating the community on all aspects of social forestry. The different interest rates charged on grants by the two schemes and the different prices paid for timber contribute to the disparities in growers' benefits. The above mentioned problems impact negatively on growers' benefits.

To improve the social benefits, community upliftment and the capacity of farmers within the present situation, collective action should be encouraged among the growers rather than only individual response to the programme. Collective action will prevent exploitation of growers, who are the intended beneficiaries, by the middle man, in this case harvesting and transport contractors. Such an institution can be initiated by government organisations such as the Department of Water Affairs and Forestry or the Department of Agriculture. Non-governmental organisations interested in community development can also support such institutions. According to Cornea (1989), collective action in social forestry will enable growers to perform activities (e.g. harvesting timber) and achieve goals that might not be attained by individual growers. In this case, collective action might focus on activities such as ploughing and planting trees, fire protection, harvesting, transportation and marketing of timber. Groups can also bargain more effectively than individuals when selling the harvest.

Collective action means more than grouping all growers together. Cornea (1989) described collective action as :

“...a process of selection or self selection of the members, the willingness to associate, the members perception of both self advantage and co-responsibility, and the establishment of an enduring intra group structure with well defined functions”.

The companies can also play the role of educators, increasing awareness among the growers of the importance of association and how it can benefit them individually and as a community. Cooperatives will provide a suitable institution in such a case. Cooperatives as defined by Bager

(1980) refers to a group of people who together own and control a business for the benefit of the members. This will enable the growers as a group to acquire loans from credit facilities such as banks for the procurement of their own machinery for tilling the soil, harvesting and transportation of timber. According to Cornea (1989), this is only possible if people belong to organised groups are informed and consciously perceive that it is in their best interest to act purposefully in a coordinated manner. The group must also develop leadership structures and internal norms and procedures, and be capable of organising and managing its members and overcoming conflicts and unacceptable behaviour. The leadership structures are necessary to address the issues of benefit distribution, communication, negotiating and repayments of loans.

Financial independence will result in the cooperative's freedom of expression in issues such as the pricing of timber. Palin (1995) provides a good example of successful collective action by the Board of Farmers in Lesotho. Successful examples of cooperatives in social forestry with clearly defined and not too large a membership have been reported by Cornea (1989) in Scandinavia. In both these cases, technical assistance to formulate management plans and the services of field foresters are paid by the government and any other costs covered by the cooperatives themselves. Credit facilities were also made available if needed. While provision of credit by the forestry companies improves access to resources, which in turn removes the economic barrier to tree production, access to services such as market information, extension and research are necessary to increase the tree growers knowledge thereby reducing uncertainty and risk as perceived by the tree growers. Such information will be more easily accessible to cooperatives via their management than to individual growers.

Growers are not adequately involved in the planning of the forestry projects at present (see Table 6). The only activities that seem to involve the majority of the growers in the production of trees in KwaZulu-Natal are land clearing and weeding, found to involve 17 and 20 of the 22 growers interviewed respectively. As for the rest of the activities, i.e. land preparation, planting and harvesting, only a few growers have an input (Table 6). In most cases the forestry companies arrange a contractor to do the work for the growers. The growers may not have the necessary equipment and knowledge to do the work themselves, but their involvement is necessary.

The formation of grower cooperatives will generate employment within the community itself and increase their financial benefits since there will be no need to hire outsiders to do the planting, harvesting or transportation of timber for growers but rather cooperative members (growers) will do the work themselves. With the communities being able to handle the projects themselves, social forestry in South Africa is likely to be a sustainable developmental initiative. The involvement of community members in the decision making process, and employment of local people in its implementation, will result in the empowerment of the community to manage and administer the projects. Empowerment and capacity building will entail transforming communities from passive recipients to active participants in the design and delivery of the programmes.

A similar observation was made by Mitchell-Banks (1996) who indicates that in British Colombia, despite the fact that most of the forest is under public ownership, all the facilities for harvesting and processing the timber are privately held and operated. Mitchell-Banks (1996) further highlights that the situation of public ownership and private use leads to inadequate consideration for community survival, i.e the needs of the community are sacrificed for the purposes of profit. If community participation is one of the objectives of the forestry schemes, then they should provide an environment that will facilitate the procurement of the necessary equipment by the growers.

Meintjies (1995) argues that community woodlots can be successful when community members generate the idea, and set in place an appropriate institutional framework to manage them. Formation of growers cooperatives will provide an appropriate institution to oversee the sustainability of the tree planting activity beyond the existence of the forestry schemes. The present arrangement is short sighted because only a few of the growers will be able to plant trees if the schemes are discontinued. Currently growers are not adequately taught to plant and manage trees on their own. The majority will not have sufficient funds to establish a plantation. Training farmers in forestry and forestry related fields so that they become self-reliant does not appear to be a priority within the schemes. This will result in the discontinuation of tree planting as soon as the companies no longer provide finance for the establishment and management of the trees. This is very much against the principle of sustainable development. Growers should know of alternative sources of credit, and this is only possible if they are well informed, which can be achieved through education and training.

Important as it is, this study has shown that only 18% (see Figure 11) of the growers have undergone any training in forestry. Education and training need to be stepped up to empower members of the community to make rational land use decisions and enable growers to handle most tree production activities on their own to ensure sustainability of tree planting as a community project.

A community project should be designed in such a way that the community can continue to run it even without external financial and technical support. McNeely (1988) observes that this is possible only if such a project results in capacity building to enable the community to manage it, strive for self reliance rather than dependence, and culminate in sustainable sources of income for supporting personnel, equipment and maintenance. Despite the confusion on the cost and benefits of tree planting, the two companies have done a good job of making people aware that they can get financial benefits from tree planting, therefore making them accept the grower schemes. The major barriers in the implementation of any new innovation as were described by Ffoliott *et al.* (1995), i.e. awareness, interest and acceptance had been overcome in this case. The challenge facing the grower schemes now, is to move ahead and encourage growers to establish institutions that will enable them to do all their work on their own without any financial assistance from any company, non- governmental organisation or government agency, as well as improve the economic benefits accruing to the growers. The establishment of production and marketing cooperatives will address the above mentioned issues.

Production and marketing cooperatives will create enterprises able to carry out necessary production and marketing functions more effectively than individual growers (Abbott & Makeham 1979; Abbott 1987). Cooperatives are owned by those who use their services (growers) who will be entitled to share any profits they make, are managed democratically by the owner members, and their day to day affairs are directed by committees selected on a voting system from the owner members. Abbott (1987) views the motivation behind cooperative action as the desire of those who feel exploited by the others to find a solution to a problem under their own control. Helmberger and Jean-Paul (1996) believes that cooperatives are formed as a revolt against the prevailing market environment in which the farmers feel cheated by the private enterprises. This kind of market environment already exists as far as the growers are concerned. They feel that the contractors are overcharging them and there are not happy

with the interest charged by Mondi. These can be used as motivations to organise them into cooperatives. Cooperatives with access to their own harvest and transport equipment will ensure reasonable retention of the profits in the local communities, which will increase their benefits thus enhancing community involvement.

6.3 LAND AVAILABILITY AND TENURE

The major factor that appears to impede the adoption of forestry in the case of non-growers was found to be lack of land. The study has shown that 8 (89%) of the 9 non-growers are willing to plant trees but do not have land to be used for this purpose. The importance of land availability in tree planting is further reflected in Figure 16. This figure shows that willingness to allocate land for trees is influenced by total land holding. The importance of the size of land in tree planting was stressed by FAO (1985), Chambers (1989), Cook and Grut (1989), Palin (1995) and Erskine (1996) who show that the preparedness of farmers to start tree planting increases with increase in land holding.

Regression analysis performed to derive the linear relationship between the total land area and forest area size indicates that farmers are likely to plant trees if they have about 2 hectares of land (see regression equation). Land size and land tenure are complementary factors in influencing growers land use decisions. The importance of secure tenure on land use decision making has been emphasised by several authors (FAO 1985, Vergara 1987, Erskine 1991, van Gelder & O'Keefe 1995 and Palin 1995). Whilst secure tenure has been shown to be very important in long term land use decisions, this study has also indicated that land size is important in determining the size of land allocated to forestry use.

Some growers' believe that tree planting strengthens land tenure. In Sokhulu for example, growers indicated that they started planting trees during the apartheid era as a measure to strengthen their tenure over land since they feared that they might loose the land to the government if it was not used. Johansson (1991) also made a similar observation in Tanzania; trees were used as long term crops to secure land ownership in areas where there were land disputes. Secure tenure was described by the various authors as providing the most economic environment for tree growing. The length of time required for the trees to yield benefits to the grower requires some assurance that the grower is the one who will enjoy the benefits and secure tenure is one of the necessary factors.

In this study, none of the non-growers cited the tenure system as a hindrance to tree planting. It is therefore logical to assume that tenure system does not play a significant role in preventing farmers from being involved in tree planting in the area. The fact that 7 of the 9 non-growers indicated that trees could be planted without the consent of neighbours provides sufficient evidence that land use rights are well defined and secure in the area.

Despite the fact that the land use rights seem very clear in the area, there are signs of irregularities. For example, 1 grower who was planting a large area of *Eucalyptus* estimated to be 104 ha (see Appendix 2) indicated that it was leased to him by other members of the community at nominal fees. The questions that arise from this practice are as follow :

- since tree crops have a long maturation period, what are the implications with regard to land ownership with reference to land leased out;
- what are the implications to sustainable development;
- what should happen to people under the grower schemes who plant more than 10 ha;
- what are the forestry companies doing about such people;
- according to government policy, what happens to people who rent land from other farmers for a nominal fee to plant trees;
- what structures are in place to prevent foreclosure on for other alternative uses to the owner; and
- what do the companies do to ensure that the rate of tree production is environmentally sustainable.

These questions require more intensive investigation and are therefore recommended as areas for further research.

6.4 INCOME LEVEL

The study has shown that there is a link between monthly income level and adoption of forestry. Figure 8 shows that 7 (78%) of the 9 respondents with household monthly income levels of more than R2000 were growers. Figure 8 also indicates that about 60% of the growers have household monthly incomes of more than R500 while only 33% of the non-growers have household monthly income of more than R500. The above figures show that the community members in high income brackets are more prepared to adopt trees than those with low household incomes. This corresponds with the findings in sub Saharan Africa by Cook and Grut (1989) who conclude that the rate of adoption of forestry is directly linked to the economic status of growers. This leads us to the issue of social security and preparedness to invest in more profit oriented land uses as observed by FAO (1985) and Erskine (1996). Most of the community members in the low income bracket do not have sufficient land to participate in forestry schemes. In most cases, the level of income and the size of landholding are related, with those people in the higher income scales having the largest land area. For example, 5 of the 8 households with a monthly income of more than R2000 have more than 10 hectares of land (see Appendix 2). Under these circumstances, the regression equation suggests that the largest land area of trees will be planted by growers with higher incomes. The implication being that those people who are already secure financially will benefit more from the schemes.

6.5 EDUCATION LEVEL AND TRAINING

The majority of people interviewed who have high school education are non-growers (Figures 7). The most likely reason is that those with secondary education can find themselves employment much more easily or start their own business compared to those who have never been to school. Faced with limited income generating alternatives, less qualified community members opt for tree planting.

It was found that 18% of the growers have undergone training in forestry while 11% of the non-growers have undergone the same training. In total only 5 of the 31 (16%) respondents were found to have undergone any forestry training. As a factor in tree planting, the results are not conclusive because the level of training is too low to make any judgement in this regard. It is reasonable to say the adoption of forestry as a land use has little to do with forestry training, because 72% of the growers have never had any training in forestry. The fact that a

slightly larger proportion of growers (28% growers against 16% non-growers) were found to have undergone training in forestry related fields can be due to bias on the part of the companies towards the growers in targeting the people who go for such training. The other reason for the disparity could be that the sample was too small to give a real picture of the prevailing situation in the area.

Training is a real need in the area . Education and training result in the empowerment of the community to make informed decisions regarding land uses. The importance of training in the sustainability of rural development projects was emphasised by Holomisa (1994) and Erskine *et al.*(1994). The Department of Environmental Affairs and Tourism (DEAT 1993) further supports this by stating that :

“the establishment of an informed community is of cardinal importance in the promotion of the rational use of the environment”. Rational use of the environment will result in sustainable development.

Low intensity participation of growers in raising trees on their own land has negative socio-economic implications both to the grower and the community in general. The most immediate disadvantage is lack of capacity building. This, coupled with lack of training in forestry, means growers are not equipped to do their own planting in future since they will have no hands-on experience, nor will they have the technical knowledge acquired through formal training to plant trees.

6.6 EXTENSION SERVICES

The majority of community members have been planting trees for decades and many are willing to start planting trees. This indicates that farmers realise the value of tree planting. In many cases, the only constraint is land availability. Extension officers should shift focus from making the communities aware of the socio-economic importance of trees, towards assisting them understand what is good about the schemes in terms of how they function, their conditions, as well as create awareness among the growers of the environmental implication of excessive afforestation. Greater awareness and more intensive management of the land base will result in general health of the region's ecosystem (Mitchell-Banks 1996). Growers should also be

assisted to do the work themselves with advice from the field officers. Furthermore, extension workers should teach the growers financial management so that they are in a position to handle and spend money obtained through the sale of timber wisely. It is self defeating to have a scheme that strives for economic upliftment but does not encourage investments of its returns, making the benefits short lived. This being the case, the whole programme will not be sustainable.

6.7 RAINFALL CONDITION

Rainfall condition was found to have very insignificant role in influencing community members in KwaMbonambi area to plant trees. Contrary to Lai and Khan (1992) who found that most of the trees in the Sahelian area were planted during drought periods of the 1960's and 1970's, most growers (59%) in the study area indicated that they started planting trees during a normal year and 14% planted trees during good years. However, 23% and 4% started planting trees during mild and severe droughts respectively (see Figure 12). Generally, a minority of growers (27%) started planting trees during drought periods while the rest planted trees when conditions were favourable for the production of other crops. The idea that farmers move towards tree production when rainfall conditions are too harsh for the production of other crops does therefore not appear to be true in this study.

6.8 MIGRATION

The results presented in section 5.3 show that the majority (87%) of the households that have their household heads working away from home are not involved in tree planting. Tree planting as a land use requires the investment of labour. The absence of the household head due to migration in search for employment elsewhere negatively impacts on the availability of family labour which may act as a hindrance to the planting of trees.

Availability of income from employment is another factor that may lead to households' reluctance to plant trees. Financial requirements, which have proved the major factor influencing farmers to adopt forestry (refer Figure 18) are met through money obtained as wages. People working away from home realise more immediate financial rewards which can be used to cater for the household needs. A long term project may not be attractive for community members in this category, thus their reluctance to invest labour in tree planting.

6.9 TRADITIONAL LEADERSHIP

Growers in the four sample areas indicated that their chiefs are actively involved in tree planting and encourage them to plant trees. Cook and Grut (1989) stress the fact that the participation in and support of a project by the traditional leaders (chiefs) is vital to win the support of people. Traditional leaders are usually very influential in the community and people will normally follow their example. The fact that the forestry companies have to allow the traditional leaders in the study area the authority to decide whether people interested in tree planting can use their land for trees maintains some degree of local power. Once the chiefs have a positive attitude towards the innovation, through their influence they can encourage their people to involve themselves in such a project. It is therefore not surprising that the majority of people in the study area are growers and even those who are not growers are willing to join the schemes.

6.10 LAND USE DECISION MAKING

Most of the people in the study area have very small pockets of land (up to 5 hectares) with only a few possessing more than 5 hectares (see Appendix 2). Land suitability for other crops as a factor influencing growers to plant trees was found to rank 5th in importance (Figure 18). This indicates that trees are not necessarily planted because the farmers feel there are best suited to the area. Rather, growers plant trees because there are easily sold to Sappi or Mondi. Due to the strength of the out-grower schemes, of good technical back up and market guarantee, farmers can be easily led into planting trees, which may not be the most appropriate land use option for the community. As Gregersen *et al.* (1989) suggest, economic incentives influence the way land is used. The financial support provided by the forestry companies for the establishment and management of trees biases land use decisions towards forestry. Forestry therefore does not compete on equal footing with other land uses.

The financial and technical support provided by the schemes does not cover alternative land use options. Forestry schemes can better assist people to meet their needs, which include subsistence and income to provide adequate secure livelihoods, if they move away from a single product and more towards a diversity of products obtained from living trees. This alternative does not imply a total shift from *Eucalyptus* which is important in the companies own business endeavours to another tree species. It makes provision for other crops in combination with

Eucalyptus. These may be in the form of fruit trees, with seedlings provided together with *Eucalyptus* seedlings for the establishment of orchards, encouragement of agroforestry instead of monocultural production of trees or the multiple use of *Eucalyptus*. Douglas and Hart (1984) for example, highlight that most *Eucalyptus* species produce oil which can be used for medical purposes. Such multiple land use systems will ensure that growers continuously get some benefits from the same piece of land used for tree planting before the trees are harvested. Agroforestry will allow the growers to produce trees and food at subsistence level within a single system at the same time.

Even though Douglas & Hart (1984) undertook a limited review on the subject of *Eucalyptus* oil harvesting, it is considered important that further investigations be carried out to see if tapping of the oil cannot be done prior to the harvesting of timber. This might be beneficial in the sense that multiple benefits, which come at different times, will be derived by the growers. The farmers should be encouraged to produce seedlings for themselves so that they don't always have to depend on the forestry companies for seedlings. It is very important that the projects are self sustaining. If growers are able to produce their own seedlings, then more income will accrue to the community. The cost of plantation establishment will be reduced as no money will be spent on seedlings. Seedlings can also be sold to other farmers. Trees that are left for the purposes of seedling production can also be used for tapping oil, or for fire wood and construction material, thereby allowing multiple utilisation of the trees.

The fact that nutrition is an important factor in the health of any nation cannot be over-emphasised and any programme that contributes to the welfare of a society should address as a priority the issue of basic necessities, one of which is food availability. Erskine (1982) mentioned that there is every indication that an average family in KwaZulu produces less than 50% of its food requirements. It is therefore the duty of the forestry companies (Sappi and Mondi), as these are promoting social forestry, to put policy structures in place that commit their extension officers to educate the growers on the importance of agroforestry or not using all land for forestry in terms of efficient land utilisation.

6.11 ENVIRONMENTAL ISSUES

The commitment of the South African Government to environmental protection is evident in the Reconstruction and Development Programme Policy Document (RDP 1994) which

advocates the formulation of an environmental strategy that rekindles South Africans' love for their land, increases environmental awareness among the youth, empowers communities to act on environmental issues and promotes an environmental ethic. This study has revealed that, despite the fact that the area is already heavily planted with *Eucalyptus*, 8 (89%) of the 9 non-growers interviewed have a keen interest in planting trees if they can acquire land, mainly because they see forestry as a way of making money. This demonstrates that if land was available, the need to increase income would outweigh growers commitment to environmental protection as there was no obvious awareness among the respondents regarding environmental protection and land care

The fact that the majority of people in the study area, including non-growers were found to be interested in tree planting has serious environmental implications. Water use by commercial forest species, particularly *Eucalyptus*, their visual impact and their impact on bio-diversity have been the focus of considerable debate, culminating in the recently revised Afforestation Permit System. The Forestry Act provides for the control of afforestation to protect water resources, both through limiting afforestation, and through provisions governing the management of the afforestation areas. Initially, this did not apply to the former homelands, but the permit system now applies every where in South Africa. Any land owner intending to plant a stand of trees on new land, or where trees have not been grown for 5 years, is obliged to apply for a permit to plant. The permit determines that no more than about 75% of land may be afforested, and prohibits planting of commercial forest trees in riparian zones, usually defined as the land within 30 m of any perennial stream, and 50 m from the border of wetlands (DWAF 1995).

Since the small grower schemes started in KwaZulu, members of the grower schemes did not require permits from the Department of Water Affairs and Forestry to plant trees. The fact that forestry companies are using the same small grower schemes to grow *Eucalypts* for commercial purposes is in contravention of the country's permit requirements and furthermore, is not a good environmental practice. Since the majority of people in the area are positive towards tree planting as a land use, controlling the extent and location of afforestation under the current circumstances is difficult.

Sustainable afforestation should be the target of the forestry companies. This is only possible if the standards set for commercial estates are applied to the small growers scheme as they are supplying timber for commercial purposes. Such standards should not only be in terms of distance from wetlands and streams, but in terms of the extent to which afforestation should be carried out within each catchment area. The Afforestation Permit System, as a tool regulating the rate of afforestation (DWAF 1995), has not controlled afforestation in the former homelands, where most small grower schemes operate. Currently, forestry permits are linked to the title deeds of property. Communally owned areas are therefore excluded from its application. Furthermore, it does not provide for the regulation of the use of fertilisers and herbicides which are used to enhance the productivity of the trees. These can also lead to environmental degradation if they are used in inappropriate ways.

The study revealed that the average plantation size was 9.93 ha while 4 of the 22 growers had plantations greater than 10 hectares. It is therefore considered that the extent of afforestation occurring under the small grower schemes warrants regulation through the permit system because the cumulative impact of planting many small land areas with *Eucalyptus* is no less important.

6.12 DEFAULTING TO MAXIMISE BENEFITS

Field work revealed that there are growers under the Sappi scheme who prematurely harvest their trees without informing Sappi and sell the timber to Mondi as private growers. No specific figure of such defaulters was quoted. Several factors can drive the growers to harvest without the consent of the company and some of the factors are discussed below.

Approximately 55% of the growers in the study area were found to have monthly incomes of up to R1000 (see Figure 8). The average household size in the area is 7 people, with the average number employed being 1 person per household. The poverty line for a rural household was R740 for the year 1994 (Whitefield, Posel & Kelatwang 1995). For the purposes of the poverty line, Whitefield *et al.* (1995) describes a household as being composed of 2 adults and 3 children. A household income of R1000 is therefore not sufficient for households of the size indicated for the study area. Money is necessary for their subsistence and for payment for social services such as education and health services. Trees are a readily saleable product that can be converted into much needed income. Growers, realising that Sappi will not allow them to

harvest prematurely, harvest the timber without the company's consent and sell as private growers. In so doing, the growers are able to address their financial needs.

Furthermore, the growers might realise that the first crop is not very rewarding financially since some of the money goes into the payment of the grant used in the establishment of the plantation. The net income accruing to the grower is the difference between total income from trees and costs of tree production, which in most cases are covered by grants from the forestry companies. Selling without the consent of the company means that the company will not recover their money and therefore, more income can go directly to the growers. This acts as an incentive for the growers to harvest their timber prematurely without the knowledge of the company.

Another factor is the price offered by the two companies. Mondi is currently paying R120 per tonne while Sappi pays R98 per tonne of timber. Glover and Kuster (1990) highlights that growers are likely to default if the market prices rise above the contract price. In this situation, a market only exists between Sappi and Mondi and the better price offered by Mondi, coupled with the fact that the Sappi growers will avoid paying back the Sappi grant may be enough incentive to drive the growers to default. The fact that there is low intensity competition in the timber market, with the supply and demand involving only Sappi and Mondi, is likely to yield prices that are lower than the real value of timber. This factor, coupled with the price difference between the two companies, might lead to growers defaulting on the agreement signed by the grower when the grant was accepted.

6.13 ASSESSING COSTS AND BENEFITS

This research has shown that there is confusion over the costs and benefits of tree planting (see Tables 4 & 5). The research has also shown that, overall, Mondi growers make more money from selling timber than Sappi growers. The fact that Sappi does not charge interest, while Mondi charges 10% interest does not necessarily imply greater financial benefits to Sappi growers. The price offered by Sappi for a tonne of timber is below that of Mondi by approximately 22%. The Sappi News Letter of 1995 quoted a projected figure of 39% for the net benefit accruing to the grower while Mondi projected the net benefits to 62%. Necessary information should be made available to growers for informed decision making, particularly in

the selection of forestry schemes. Such information should include prices of timber offered by the two companies and all the conditions relating to the grants. The assumption that the growers choose one particular scheme because of the type of package that it offers does not occur because information relating to the alternative company is not usually available.

The growers are therefore likely to default if the financial rewards of doing so are attractive. ZAI (1994) indicates that private companies with forward linkages to the paper industry and under the same ownership, as is the case for Sappi and Mondi, develop commercial forests to secure the supply of timber to the industry. As a result, these larger companies are able to sell timber at break even point which is uneconomical for the small scale growers, and then obtain their returns by charging higher prices in the paper and pulp industry. It further highlights that the profits are made in the paper side rather than in the forestry side which marginalises the small scale timber producers. The timber prices that are set by the companies may not be profitable to the growers, bearing in mind the fact that tree crops need a period of 6 to 8 years to mature, during which the land is tied down to the tree crop only. The two growers who indicated that they obtained net incomes of R700 each represent good examples of unrewarding decisions. Even though the money may be perceived as profit by the individual grower, it may represent a loss of resources and benefits to other members of the community. The real cost of tree production is not known to the growers and therefore it is difficult to quantify the benefits that accrue to the growers and other members of the community. Moreover, the opportunity cost of growing trees are not taken into account in the decision making process.

Two Mondi weighbridges are located in the area, while Sappi does not have weighbridges in close proximity to the area. Growers in the Mondi scheme do not default but those in Sappi do. It is possible that the growers in the Sappi scheme feel that the mills are too far and transportation costs are excessive. There was concern among the growers that contractors who transport their timber are over-charging them resulting in a significant reduction in the amount they are paid out after deductions by the forestry companies. Selling at Mondi weighbridges which are in close proximity is cheaper in terms of transport costs. Realising that they are not allowed to sell to any other buyer other than Sappi as per contract, and probably not knowing that they can sell to Mondi through the Timber Exchange Agreement, growers are likely to do so without informing Sappi. The Timber Exchange Agreement is a new innovation and growers

might not know about its existence, and think they can only cut down on the transport charges by selling their timber at the nearest weighbridge.

6.14 WOODLOT MONITORING

Unlike the Khulanathi scheme, which emphasises high productivity in terms of tree growth, Sappi Project Grow is more concerned with low input tree production. Once the trees are established, the scheme moves on to assist other new growers, only giving advice when necessary or when requested. The question of low intensity staffing is a possible contributory factor to the defaulting of some of the growers. Many extension officers are necessary to monitor all the growers under the forestry scheme efficiently. For the purposes of optimum production, an additional person can only be employed if his/her services will have a positive contribution to the company's total output. Since no interest is paid on the grants that are given to the growers, the efficiency of the company in terms of productivity (valued in Rand per annum) is likely to be reduced which may explain why monitoring of the growers is not carried out effectively. If the growers were paying interest, the money could be re-invested in extension staff to assist the company's productivity, which may be against the welfare of the growers if the current price is maintained. However, the low intensity participation of the Sappi personnel gives the growers the opportunity to manage their own trees which is a necessary condition for the growers to develop hands-on experience in tree production, thereby contributing to capacity building. The missing component of this approach is training of growers so that they can start off tree planting on their own. Furthermore, low inputs also entail lower risk for the farmer.

As for Khulanathi, the extension officers have close contact with the growers to ensure high productivity. The scheme promotes high input tree production, using hybrids and fertilisers to enhance output, the costs of which are added on to the grant that is provided to the growers. The extension officers monitor the activities of the growers on a more regular basis, thereby preventing them from selling timber without the knowledge of the company. The problem that is likely to arise in this case, is that the commercial interests will result in management goals which do not address community interests or farmer development, and which focus instead on profit and risk minimisation for the company.

6.15 TREES AND RURAL DEVELOPMENT

Rural development as described by Abbott and Makeham (1979), Fox and Webber (1981) Dedekind (1992) and Erskine *et al.* (1994), is a series of integrated measures promoting the economic, institutional and social development of the rural population thus improving the productive capacity and the standard of living of the community which leads to improvement in their quality of life. In the case of social forestry, this is only possible if the beneficiaries are involved in the formulation and implementation of the project at group and individual levels and when there is human resources development through appropriate training. Furthermore, the scheme should be directed towards promoting change so as to simultaneously affect the distribution and growth of income, employment, nutrition and health and other dimensions of the quality of life in rural areas.

The success of social forestry schemes in bringing about rural development can be judged in the light of social forestry objectives, such as the extent of community involvement in tree planting activities, employment creation, institution building, development of a skills base and income generation. The two forestry schemes studied (Project Grow and Khulanathi) can be viewed as partially contributing to rural development because they promote a sense of business among the growers through the production of trees for sale. The trees bring income to the household which can be spent on other services such as food, health and education which enhance the quality of life. Tree planting by the farmers also generates employment for the farmers themselves, for the contractors as well as for other community members in the pulp and paper mills thus contributing to national economic growth.

The results show that more growers under the Sappi scheme participate in tree production activities than those under the Mondi scheme. Since growers do not have the necessary equipment or technical know-how to do the work, forestry companies are obliged to arrange contractors to do the work for them. Mondi has more financial inputs in the production of trees and has to make sure that the growers are able to raise enough money to repay the loan. This is only possible if trees are properly raised. Hiring an experienced and better equipped contractor on the behalf of growers to do most of the technical aspects of tree planting is an alternative way of increasing output. This observation is supported by Armstrong (1992) who states that land preparation and planting are critical to the survival of the seedlings, and should

satisfy the requirements of the species planted. Armstrong (1992) further highlights that costs due to seedling mortality in the field can be minimised through proper training. Reduction in seedling mortality contributes to increase in profits.

Growers are mostly marginalised in harvesting, where none of the interviewees have participated. This reduces financial benefits that accrue to the growers because of the payments that are made to the contractors.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 LAND USE DECISION MAKING

Conclusions

The major motivating factor for community members to start planting trees through the forestry schemes is the perceived financial rewards. In contrast, lack of land is the major limiting factor for those members of the community who are currently not involved in tree planting. Despite being motivated by the prospect of increasing earnings, this study shows that growers do not know how much they make from other land uses, nor do they know how much they should expect from tree production. This study has shown that, overall, the financial benefits accruing to the growers are low. The low financial return is due in part, to the high expenses associated with harvesting, which was generally found to be contracted out. Realising the magnitude of transport costs Sappi and Mondi formulated the Timber Exchange Agreement to address this issue. Even though no cost-benefit analysis of tree planting was undertaken in this study, it becomes apparent from information obtained by means of the questionnaire, that generally the growers' expectations are too high and the financial benefits from planting trees appear small. The high financial expectations emanate from the way the schemes are sold to the growers by the extension officers and the fact that information is not available to enable farmers to evaluate and compare tree planting with other land uses at the time of decision making.

Land suitability for crop production was found to rank low as a reason for planting trees, and it is likely that land more suited to other uses is put to tree production. The idea that social forestry focuses on producing trees on land that is marginally productive, for other land uses, does not seem to be a major driving force.

Community members' decisions to plant trees are not based on any cost-benefit analysis of the various land use options but rather on perceived benefits from trees, which remain unquantified. Rural communities do not appear to attach any monetary value to agricultural products which are produced and used at subsistence level. They believe that they benefit financially from tree planting because the sale of trees to Sappi and Mondi brings money into the household, while

the benefits from other farm products are not given any monetary value. Rational land use decisions are only possible if information relating to productivity for all possible land uses is available in an accessible form that is easily understood by rural communities. The present arrangement is biased towards tree production because it appears as if tree crops alone have the potential to provide the farmers with cash benefits. Funding provided by forestry companies as grants for tree establishment exacerbates the misconception that they provide more financial benefits without any comparative economic analysis with other possible land uses. Farmers may sometimes overlook more profitable alternatives such as sub-tropical fruits.

Furthermore, the concept of growers not paying interest on the grant, in the case of Project Grow, seems very misleading particularly for those growers who opt for the scheme for this reason. The fact that no interest is charged does not necessarily reflect high benefits. There are indications that Mondi growers are making more money than Sappi growers, despite having to pay interest.

In conclusion, although the growers believe that their incomes have improved since they started planting trees, they have no real way of evaluating them at present. A comparative economic analysis is necessary as a basis for determining profitability of the alternative land uses in the study area. Farmers should focus their attention, resources and labour on land uses that maximise benefits and minimise risks. This requires using a diversity of crops in the production system.

Recommendations

- A cost benefit analysis of each scheme should be conducted to evaluate if the growers are really benefitting by planting trees; and if they are, how the two grower schemes compare in terms of benefits. A comparative economic analysis with alternative land uses such as bananas, cassava, oranges and mealies should be undertaken so as to give the growers the opportunity to make the best land use choice in terms of benefits. An independent organisation which is not an interested party in this business venture would be most suited to do the job.

- The resulting information should be made available to members of the community so that growers can make an informed selection of land use, and where tree planting is selected, the choice of a grower scheme can be based on known financial benefits.
- Since the Timber Exchange Agreement appears successful in that it addresses the concerns of the growers regarding financial returns, and since no documentation explaining the agreement exists, it is recommended that the agreement is published in a pamphlet form that clearly outlines the provisions of the agreement and how it works. A copy of the agreement written in Zulu should be made available for those growers who do not understand English.
- Communities should be educated through workshops and seminars on the existence of such an agreement. Such education should ensure that enough people are trained to implement this new plan. It is very important that the forestry companies take note that many of their growers are illiterate or semi-literate with the majority having gone only to primary school, which hampers their understanding of such documents.
- If possible, the agreement should be incorporated into the contract so that it is read alongside other provisions that growers have to accept before joining the schemes.
- The grower schemes should also make provision for other varieties of crops such as oranges, bananas and food crops to be included on the growers' land to allow for the community to derive multiple benefits from their small pockets of land. The fact that growers are already planting some of these crops in their backyard orchards indicates that the soil is suited for the crops and that people see the need to plant them to supplement the benefits derived from trees. Planting a diversity of crops is one way of decreasing the risks crop failure associated with monoculture crop production.
- Participatory land use planning is recommended to enhance capacity building among growers and to assist with optimal land use decision making.

7.2 ENVIRONMENTAL ISSUES

Conclusions

The Afforestation Permit System requires that people who want to plant trees for commercial purposes on virgin land or on land that has not been afforested for more than 5 years apply for a permit (DWAF 1995). Furthermore, the Forestry Act 122 of 1984 empowers the Minister of Water Affairs and Forestry to prohibit the afforestation or reafforestation of any land, or to direct the owner of the land concerned to take any steps which may be deemed necessary for the protection of natural waters (Fuggle & Rabie 1992). The permit system therefore aims to prevent over-exploitation of water resources by preventing further afforestation in sensitive areas, but does not necessarily address the damage that might be caused by afforestation which has already taken place. The permit system has however, not been used to regulate afforestation under the small growers schemes. This has come about because the schemes were started in the former homeland area of KwaZulu-Natal, where the Act did not apply. The small grower schemes were originally promoted as woodlot schemes, even though the timber was used for commercial purposes. Since most of the forestry schemes are implemented on communal land, and afforestation permits are currently linked to the title deed of property, the existing permit system is not suitable for application to social forestry in South Africa. The above factors suggest a revision of the Afforestation Permit System, to include small growers, needs to be undertaken. Even though small areas are planted by individual growers, the cumulative impact of these plantations is of concern as many people participate, and are interested, in tree planting.

These concerns are exacerbated by the fact that the majority of the growers and non-growers do not appear to be concerned about the environmental implications of commercial tree planting. Since only one respondent expressed concern over the environmental implications of excessive tree planting, it can be concluded that the growers' awareness of the environmental implications is low. Increasing the environmental awareness of the growers in the schemes does not appear to be a major concern of the forestry companies.

Recommendations

- The Afforestation Permit System should be modified to apply to small scale commercial afforestation schemes (out-grower schemes) on communal land. If the

area currently under afforestation does not satisfy the standard requirements, afforestation should be discontinued after harvest.

- The forestry companies should put in place structures to improve environmental awareness among growers and communities in general, and educate the communities on the implications of excessive afforestation.
- Provision for area specificity in the application of the permit such that it is responsive to the spatial environmental variations should be considered.
- A study should be conducted within small grower areas to establish desirable levels of afforestation and the areas to be afforested, without jeopardizing the existence of wetlands and environmentally sensitive areas.
- Intensive monitoring of afforestation by the Department of Water Affairs and Forestry is necessary to regulate the number of participants and the size of plantations established under the small growers schemes.

7.3 CAPACITY BUILDING AND COMMUNITY EMPOWERMENT

Conclusions

Training does not seem to be of priority to the forestry schemes in the area. The results of this study suggest that training of growers in particular, and members of the community in general in relation to forestry production is not adequate. Training is necessary to empower members of the community to make the right decisions. There is also insufficient growers' involvement in tree production activities, as the majority indicated that Sappi and Mondi contract a company to do the tree production activities for them. As indicated in section 7.1 above, in addition to limiting the opportunity for empowerment and capacity building, contracting of harvesting and transport significantly decreases the profitability of tree planting for the individual farmers. The major hindrance in this regard is lack of equipment necessary for the growers to do the work themselves.

Recommendations

- Training of community members, particularly the growers, in forestry and financial management is necessary to ensure the sustainability of small growers' forestry projects. This will also empower the growers and the community at large to make responsible management decisions and improve their benefits from trees. It is therefore important that the forestry companies include a well defined training programme as a component of the social forestry scheme.
- The two schemes should encourage the growers to form both production and marketing cooperatives so as to enable them to handle all the activities involved in tree planting on their own. This will result in an increase in community involvement, as well as financial benefits that accrue to the growers. Formation of growers cooperatives, with input from the forestry companies, will facilitate sustainable tree production in rural areas thus contributing positively to community development.
- The government should assist with subsidies to encourage the growers to form such cooperatives.

7.4 AGROFORESTRY

Conclusions

Despite the fact that most of the farmers own small pieces of land, this study has shown that there is not sufficient emphasis on agroforestry in the study area. Growers do not appear to realise that they can spread the risk of crop failure and maximise benefits from their small pockets of land by planting short rotation crops in combination with the trees on the same piece of land. This is reflected by the small proportion of growers who were found to be practising agroforestry in the area. It is also evidenced in the reasons provided by the growers themselves for not practising agroforestry which show that the growers think it will be counter productive to combine tree planting with other forms of agriculture. Farmers therefore, concentrate solely on trees which they perceive to be a more profitable venture, and neglect combining trees with other land use options. The commercial woodlots are not well integrated into the farming system. Therefore, the advantage of agroforestry as a risk minimisation mechanism is lost.

Recommendations

- Forestry extension officers should work in collaboration with extension officers from the Department of Agriculture to educate the community on the value of agroforestry in the overall land productivity, environmental protection and land care.
- Where possible, demonstrations using successful members of the community who are already practising agroforestry should be used to heighten growers' appreciation of the benefits of agroforestry.

7.5 ASSESSMENT OF THE FORESTRY SCHEMES IN THE CONTEXT OF SOCIAL DEVELOPMENT

Conclusions

Social forestry refers to forestry applied to satisfy local economic, social and environmental needs and involves community participation in the design and implementation of projects. This results in capacity building through the involvement of growers in the implementation of the project, and community empowerment through training as well as economic development. Emphasis is placed on the fact that the project should be driven by local community's needs (FAO 1985, Rocheleau 1987 and Gregersen *et al.* 1989). A social forestry scheme will only be appropriate if it satisfies the above conditions. The two forestry schemes encourage the members of the community to plant trees on their farms, which generates income for the farmers, but do not adequately address issues of community participation and education and training.

Both Project Grow and Khulanathi schemes partially satisfy the criteria of social forestry because they encourage the rural communities to plant trees, which are sold to Sappi and Mondi. Therefore, the community derives some financial benefits, thus contributing to the upliftment of the socio-economic status of individuals and enhancing the local economy. The income derived through the sale of timber can be used to acquire other services e.g. education, health services and purchasing of food thereby satisfying other social needs.

The short-falls are that there is no adequate capacity building through participation, or community empowerment through education and training, which constitutes a major

component of any social forestry scheme. As indicated in 7.3 above, training in forestry and forestry related fields is not adequate, thus the element of empowerment is not adequately addressed. The community does not participate in the design of the project since species selection is done by the companies to satisfy their wood requirements, and furthermore the growers are not clear about their benefits. Promoting the participation of farmers in all aspects of the operation should be central to social forestry programmes because participatory land use planning develops a sense of ownership among the farmers, limits conflicts between different land use options and enhances capacity building. Furthermore, the involvement of farmers in the planning process facilitates an understanding of the dynamics of a project, conditions of operation, costs and benefits of the project and problems associated with all land use options. Based on primary information through participation, farmers can make trade-offs between different land use options.

Even though the contribution of forestry to rural development was not thoroughly investigated, the above shortfalls on the part of social forestry schemes represent failure on the part of the forestry companies to contribute sufficiently to rural development. Rural development can be evaluated on the basis of provision of infrastructure, development of skill base, employment, income generation and formation of local institutions that lead to increased community benefits. Employment of members of the community by forestry companies, and self employment among the growers represent a positive contribution to rural development.

Recommendations

- The two schemes need to re-evaluate and enhance their education and training component for the purposes of community empowerment.
- Community involvement should be prioritized so that the community is empowered, through participation, to plant trees with minimal technical advice from the forestry company.
- Provide the community with information on the economics of tree planting for both Project Grow and Khulanathi schemes.

- Encourage participatory land use planning and community involvement in all production activities so that farmers recognise cost and benefits of tree planting and improve growers' accountability for their land use decisions.

7.6 THE WAY FORWARD

This study has shown that while forestry is contributing to social upliftment in the region, there is insufficient community empowerment and involvement of farmers in all tree production activities. Moreover, transport which in most cases is contracted out was found to constitute a major concern to growers who feel exploited by the contractors. The study has also shown that only a small proportion of the growers benefit from tree management activities. Furthermore, environmental awareness among community members was found to be lacking. Efforts should be focused on increasing the benefits accruing to the growers.

Encouraging growers to practice agroforestry will ensure that growers produce some food at subsistence level while at the same time generating income through the sale of trees. Furthermore, it will spread the risks of agricultural production and maximise benefits derived by the grower.

Formation of growers cooperatives, as institutions involved with the establishment, management, harvesting and marketing of the trees for the members, with advice and support from the forestry companies at the inception stage, will be a major step towards achieving sustainable forestry development. Cooperatives will lead to participatory land use planning because they are run by owner-members, who will be involved in the decision making process at all stages of the project. As an organisation, a cooperative will be better placed to train members in various specialised fields to ensure its efficient operation. Some of the major fields of speciality are tree planting and management, environmental management, administration and finance. With skilled personnel in these fields, the cooperative will be able to run the forestry project profitably. Benefits should be distributed to the owner members by a democratically elected committee.

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APPENDIX 1
RESEARCH QUESTIONNAIRE

Topic: An Evaluation of Small Scale Forestry in KwaMbonambi Region of KwaZulu-Natal

1. Date: _____

DEMOGRAPHICS

2. Name of Village _____

3. Interviewee Number _____

4. Sex: Male ☐ Female ☐

5. Age Category (Years):

18-25 ☐

26-35 ☐

36-45 ☐

46-55 ☐

56-65 ☐

66-75 ☐

above 75 ☐

6. Who is head of the household? _____

7. Male or female?

Male ☐ Female ☐

8. Does the household head stay at home or work away from home? _____

9. Occupation of the household head: _____

10. What is the position of the household head in the community?

chief ☐

induna ☐

chief advisor ☐

member of the development committee ☐

no position ☐

other (specify) _____

11. Education level of the household head

no formal education ☐

primary school ☐

secondary /high school ☐

tertiary education (technikon, university etc) ☐

other, eg. certificate, short training course (specify) _____

12. Have you worked on a commercial farm before?
yes ☐ no ☐
13. Have you had any training in forestry
yes * no ☐
14. Household income (Rand per month): (remittances, production /crops, livestock etc)
less than 50 ☐ 401-500 ☐
50-100 ☐ 501-1000 ☐
101-200 ☐ 1001-1500 ☐
201-300 ☐ 1501-2000 ☐
301-400 ☐ over 2000 ☐
15. Sources of income

16. How many people are there in the household? _____
17. How many people in the household are employed?

18. How many people in the household are self employed?

19. Are you part of a stokvel?
yes ☐ no ☐
20. Do you have a savings account?
yes ☐ no ☐
21. Do you have a life insurance policy?
yes ☐ no ☐

LAND ALLOCATION AND UTILISATION

22. Do you have access to any arable/cultivated land?
yes ☐ no ☐
23. What size? (units) _____
24. What do you use arable land for? _____

25. What crops do you grow? _____

26. Do you have cattle?
yes ☐ no ☐
27. (If yes) How many ? _____
28. Do you have goats?
yes ☐ no ☐

29. (If yes) How many? _____
30. Do you have any other livestock (specify)? _____
yes ☐ no ☐
31. (If yes) How many? _____
32. Do you grow fruit trees?
yes ☐ no ☐
33. Do you sell your crop/s?
yes ☐ no ☐
34. (If yes) Which crop(s) do you sell? _____

35. Have you got access to extra land?
yes ☐ no ☐
36. What do you use this extra land for? _____

37. Was it the first time you tried to obtain extra land?
yes ☐ no ☐
38. Was it difficult to obtain this land?
yes ☐ no ☐
39. What was the land previously used for ?
fallow land ☐
grazing land ☐
arable or cultivated land ☐
other ☐ (specify) _____

40. Who was the chief that allocated you this land? _____

41. Who is the chief now? _____
42. How are you related to the inkosi/ *induna*? _____

- (Only for farmers growing gum trees)
43. Are you concerned that land for other uses like grazing is decreasing?
yes ☐ no ☐
44. When acquiring this land, did you have other land uses in mind?
yes ☐ no ☐
- If yes specify _____

FARMING WITH TREES

45. Do you grow gum trees on your land?

yes ☐ no ☐

(Only for farmers growing gum trees)

46. (If yes) When did you plant the gum trees? _____

47. How much of your land area is planted with gum trees? _____

48. Do you have financial assistance from Sappi, Mondi or other companies to plant trees?

yes ☐ no ☐

49. (If yes) Indicate which company is assisting you? _____

50. At the time of planting trees, did you earn less, more or the same income as now?

less ☐ same ☐ more ☐

51. What was the climatic condition at the time of planting trees? -

severe drought ☐ mild drought ☐ normal year ☐ good year ☐

52. Have you harvested gum trees on your land before?

yes ☐ no ☐

53. How many times have you harvested the trees? _____

54. Will you grow gum trees again after this harvest?

yes ☐ no ☐

55. What do you use the gum trees for? (more than one use may be marked)

sell to Mondi or Sappi ☐

sell to neighbours ☐

fire wood ☐

construction material ☐

other (specify) _____

56. Do you grow gum trees and other crops together?

yes ☐ no ☐

57. (If no) what was the reason for separating them? _____

58. How would you prefer the assistance package to be delivered by the forestry companies in future?

UNDERSTANDING OF FORESTRY SCHEME

(only for farmers growing gum trees)

59. How did you and your family expect to benefit from planting trees? _____

60. Have you and your family benefited from planting gum trees?

yes ☐ no ☐

(If yes) How?

61. Who did the following activities in your farm?

land clearing

soil preparation

planting

weeding

coppicing

fire protection

62. Do you know about the financial assistance offered by Sappi and/ or Mondi to farmers who plant gum trees?

yes ☐ no ☐

63. (If yes) What do you know about the financial assistance?

64. How did you come to know about the forestry scheme?

65. Did any one from a forestry company talk to you about the scheme?

yes ☐ no ☐

66. (If no) How did you know about the forestry scheme?

67. Do you know that you can hire people to do work on your gum trees if you do not have enough family labour or skills?
yes ☐ no ☐
68. Do you know that a forestry company would pay money for land preparation, planting and weeding for the trees planted under the forestry schemes?
yes ☐ no ☐
69. What do you think about the scheme now? _____

PERCEPTIONS ABOUT FORESTRY

70. How do other family members feel about planting gum trees?
Support it ☐ opposed to it ☐ indifferent ☐ do not know ☐
71. How do family members feel about replacing other land uses with forestry?
Support it ☐ opposed to it ☐ indifferent ☐ do not know ☐
72. How do your neighbours feel about planting trees?
Support it ☐ opposed to it ☐ indifferent ☐ do not know ☐

(only for farmers not growing trees)

73. Will you consider growing trees in future?
yes ☐ no ☐
74. How would you feel if your neighbour planted trees? _____

75. How do you feel about the gum trees which have already been planted by other members of the community? _____

76. Do you think growers should get approval /consent from neighbours to grow trees?
yes ☐ no ☐
77. Explain why

GENERAL

78. What factors influenced your decision to plant or not to plant trees?(dependent on type of farmer)

Factor	Rank
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>
	<input type="checkbox"/>

RANKING FACTORS

On a scale of 1 - 4 indicate the extent to which the factors indicated above influenced your decision to plant or not to plant trees.

Description of the ranks

- | | | |
|---|---|-----------------------|
| 1 | = | no influence at all |
| 2 | = | moderately influenced |
| 3 | = | influenced |
| 4 | = | strongly influenced |

Factors	Rank
Acceptability to other members of the community <input type="checkbox"/>	<input type="checkbox"/>
Availability of land <input type="checkbox"/>	<input type="checkbox"/>
Not owning the land <input type="checkbox"/>	<input type="checkbox"/>
Size of landholding <input type="checkbox"/>	<input type="checkbox"/>
Conflict with other land uses(eg grazing of animals, planting of food crops etc) <input type="checkbox"/>	<input type="checkbox"/>
Climatic condition (drought) <input type="checkbox"/>	<input type="checkbox"/>
Time trees take to mature <input type="checkbox"/>	<input type="checkbox"/>
Tree species used in forestry <input type="checkbox"/>	<input type="checkbox"/>
Perceived income from trees <input type="checkbox"/>	<input type="checkbox"/>
The way the income is derived (advanced payments) <input type="checkbox"/>	<input type="checkbox"/>
The way the money is paid back (interest) <input type="checkbox"/>	<input type="checkbox"/>
Opportunity ti get extra income <input type="checkbox"/>	<input type="checkbox"/>
Environmental concerns(eg. Water uptake, loss of Biodiversity etc) <input type="checkbox"/>	<input type="checkbox"/>
Knowledge of how the trees are planted and looked after <input type="checkbox"/>	<input type="checkbox"/>
Available family labour <input type="checkbox"/>	<input type="checkbox"/>

Other ☐

☐

79. Indicate by ticking in the appropriate box whether the following factors influenced your decision to plant trees.

a. Trees were planted because no other crop could grow apart from trees

Strongly agree ☐ Agree ☐ Indifferent ☐ Disagree ☐ Strongly disagree ☐

b. Trees were planted because the land was not used for any other purpose

Strongly agree ☐ Agree ☐ Indifferent ☐ Disagree ☐ Strongly disagree ☐

c. Trees were planted because they make more money than other crops(high returns)

Strongly agree ☐ Agree ☐ Indifferent ☐ Disagree ☐ Strongly disagree ☐

d. Trees were planted because it is easier to sell tree products than other crops (to Sappi and Mondi).

Strongly agree ☐ Agree ☐ Indifferent ☐ Disagree ☐ Strongly disagree ☐

e. Trees were planted because forestry company representative said they are good

Strongly agree ☐ Agree ☐ Indifferent ☐ Disagree ☐ Strongly disagree ☐

f. Trees were planted because there was money available for the project from Sappi or Mondi

Strongly agree ☐ Agree ☐ Indifferent ☐ Disagree ☐ Strongly disagree ☐

g. Trees were planted because your neighbours were doing it

Strongly agree ☐ Agree ☐ Indifferent ☐ Disagree ☐ Strongly disagree ☐

h. Trees were planted because they are more reliable than crops

Strongly agree ☐ Agree ☐ Indifferent ☐ Disagree ☐ Strongly disagree ☐

i. Trees were planted because they are easier to manage

Strongly agree ☐ Agree ☐ Disagree ☐ Strongly disagree ☐

APPENDIX 2
SUMMARY OF THE FINDINGS

Profile of interviewees

Interviewee No	Village name	Interviewee gender	Interviewee age group	Household head Gender	Household size	No. employed	Household income	Income level at time of planting	Interviewee Educ. level	Forestry Status	Year scheme joined	Climate condition at first planting	Supporting company	Forest area	Access to arable land	Cropland size	Total land area	Commercial farm work exp	Training in forestry	Advanced planning indicators	Cattle owned	Goats owned	Other stock
1	Sokhulu	male	26-35	male	8	2	1001-1500	same	secondary	grower	1995	good	Mondi	2.8	yes	2	0	yes	no	no	0	0	43 (chicken)
2	Sokhulu	female	56-65	male	15	2	401-500	less	primary	grower	1995 (30)	normal	Mondi	6.3	no	0	0	yes	no	yes	0	0	3 (chicken)
3	Sokhulu	female	65-75	female	4	1	<50	less	no formal educ	grower	1995 (30)	normal	Mondi	4	yes	1	0	yes	no	no	0	0	0
4	Sokhulu	male	36-45	male	10	1	1001-1500	same	secondary	grower	1998 (30)	normal	Mondi	2.3	no	0	0	no	no	yes	0	0	1 (chicken)
5	Sokhulu	male	48-55	male	8	3	>2000	more	no formal educ	grower	1998 (30)	normal	Mondi	17	yes	1	0	yes	yes	yes	0	0	0
6	Sokhulu	male	48-55	male	11	2	>2000	n/a	secondary	non-grower	n/a	n/a	n/a	0	yes	1.4	0	no	no	yes	0	0	0
7	Sokhulu	female	48-55	female	8	2	<50	less	primary	grower	1990	normal	Mondi	2.1	yes	0.75	0	no	no	yes	0	0	20 (chicken)
8	Sokhulu	male	48-55	male	12	1	401-500	less	primary	grower	1992	good	Mondi	1.8	yes	1	0	yes	no	no	0	0	10 (chicken)
9	Sokhulu	male	26-35	male	7	3	1001-1500	n/a	secondary	non-grower	n/a	n/a	n/a	0	no	0	0	yes	yes	yes	0	0	0
10	Sokhulu	male	18-25	male	11	4	301-400	n/a	secondary	non-grower	n/a	n/a	n/a	0	yes	2	0	yes	no	no	0	10	20 (chicken)
11	Sokhulu	male	65-75	male	8	6	1501-2000	less	primary	grower	1990	normal	Mondi	34	yes	0.5	0	no	no	yes	7	0	5 (goats)
12	Sokhulu	male	75+	male	8	1	301-400	less	primary	grower	1990	normal	Mondi	1.2	yes	2	0	yes	no	yes	0	0	8 (chicken)
13	eMbonambi	male	36-45	male	10	3	>2000	less	secondary	grower	1992	normal	Mondi	45	yes	25	0	no	no	yes	8	0	15 (chicken)
14	eMbonambi	male	56-65	male	8	2	101-200	same	primary	grower	1998	normal	Mondi	4.8	no	0	0	yes	no	yes	20	7	20 (chicken)
15	eMbonambi	male	46-55	male	95	2	>2000	less	secondary	grower	1991	mild drought	Mondi	5	yes	1.5	0	yes	no	yes	500	8	10 (chicken)
16	eMbonambi	male	46-55	male	12	1	>2000	less	primary	grower	1994	normal	Mondi	1.7	yes	5.5	0	yes	no	yes	21	0	50 (chicken)
17	eMbonambi	male	56-65	male	8	0	101-200	n/a	no formal educ	non-grower	n/a	n/a	n/a	0	yes	0.049	0	yes	no	yes	0	0	2 (chicken)
18	eMbonambi	female	46-55	female	13	1	101-200	less	no formal educ	grower	1996	normal	Sappi	2	yes	2	0	no	yes	yes	0	0	0
19	eMbonambi	female	86-75	female	5	1	301-400	less	no formal educ	grower		mild drought	Sappi	2.5	yes	2	0	no	no	yes	0	0	0
20	eMbonambi	female	56-65	female	3	0	401-500	n/a	no formal educ	non-grower	n/a	n/a	n/a	0	yes	8.5	0	yes	no	no	0	0	4 (chicken)
21	eMbonambi	female	36-45	female	5	1	501-1000	less	no formal educ	grower	1998	mild drought	Sappi	7	no	0	0	no	no	yes	0	1	5 (chicken)
22	eMbonambi	female	48-55	female	1	0	50-100	n/a	primary	non-grower	n/a	n/a	n/a	0	no	0	0	no	no	yes	0	0	4 (chicken)
23	eMbonambi	female	26-35	male	5	1	1501-2000	n/a	primary	non-grower	n/a	n/a	n/a	0	yes	1	0	yes	no	no	0	0	5 (chicken)
24	eMbonambi	female	56-65	female	3	0	501-1000	more	primary	grower	1993	severe drought	Sappi	8	yes	1	0	no	no	yes	0	0	0
25	eMbonambi	male	66-75	male	20	4	>2000	less	no formal educ	grower	1999	good	Sappi	3	yes	12	0	yes	no	yes	0	0	10 (chicken)
26	Mfakane	female	18-25	female	10	2	401-500	less	no formal educ	grower	1998 & 1999	mild drought	Sappi	7	yes	2	0	no	no	yes	0	0	0
27	Mfakane	male	35-45	male	27	3	>2000	less	secondary	grower	1985	normal	Sappi	104	no	0	0	no	no	yes	1	0	20 geese, 10 ducks, 9 peacocks, 7 chickens
28	Mfakane	female	26-35	male	5	2	401-500	n/a	secondary	non-grower	n/a	n/a	n/a	0	yes	0.1	0	no	no	yes	0	0	5 (chicken)
29	Mfakane	male	66-75	male	10	2	>2000	same	primary	grower	1987	mild drought	Sappi	13	yes	10	0	yes	yes	yes	0	0	lots
30	Mfakane	male	28-35	male	18	2	501-1000	less	primary	grower	1998	normal	Sappi	5	yes	2	0	yes	yes	yes	1	1	40 (chicken)
31	Mfakane	female	66-75	male	4	2	50-100	n/a	primary	non-grower		n/a	n/a	0	yes	1	0	no	no	yes	0	0	0

APPENDIX 3
SAPPI CONTRACT

AGREEMENT

between

SAPPI FORESTS (PROPRIETARY) LIMITED

(hereinafter referred to as "Sappi")

and

(hereinafter referred to as "the Grower")

1. BACKGROUND

- 1.1 Sappi has established a fund to assist small Timber Growers in KwaZulu-Natal.
- 1.2 The Grower has applied for financial and other assistance from Sappi to afforest certain portions of the property referred to in 1.3.2.
- 1.3 The Grower's Application for Assistance is annexed hereto marked "A". The application consists of -
 - 1.3.1 personal details for the Grower, marked "A1";
 - 1.3.2 the full description and details of the property to be afforested, marked "A2" (hereinafter referred to as "the property");
 - 1.3.3 details of the assistance required by the Grower and the number of planting spots to be planted marked "A3"; and
 - 1.3.4 the applicable Tribal Authority's consent marked "A4".
- 1.4 Sappi has inspected the property and has undertaken to assist the Grower financially and technically to afforest certain portions of the property.
- 1.5 The Grower has agreed to sell to Sappi and Sappi has agreed to buy from the Grower all the timber emanating from the afforested areas of the property when such timber reaches maturity.
- 1.6 The parties wish to record the terms of their agreement in writing.

2. DURATION

Notwithstanding the date of signature hereof, this agreement shall be deemed to have commenced on _____ and shall continue in operation until all the timber has been removed from the afforested area of the property and the Grower has repaid the full amount of his indebtedness in terms hereof to Sappi.

3. ASSISTANCE

- 3.1 Due to the difficulty in measuring the area of the property to be afforested, the area and corresponding advance payments to be made by Sappi to the Grower shall be measured and calculated per 1 000 planting spots.
- 3.2 Sappi undertakes to assist the Grower to establish an initial area of _____ planting spots on the property as specified in annexure "A3" attached hereto.

- 3.3 Sappi will supply free of charge, sufficient seedlings for the initial number of planting spots agreed upon in terms of 3.2 hereof.
- 3.4 Sappi undertakes to supply fertilizer and other assistance for the initial establishment of plantation on the afforested area as more fully set out in annexure "A3" attached hereto.
- 3.5 The full amount of the Growers indebtedness to Sappi based on the Grower's Application for Assistance is set out in annexure "B" attached hereto.
- 3.6 At all reasonable time during the currency of this agreement, Sappi will, if required by the Grower and subject to Sappi's agreement and consent thereto, supply additional tree seedlings, fertilizer, technical advise and any other assistance agreed upon by Sappi. The amount of such additional assistance will be added to the Grower's initial indebtedness in terms hereof.
- 3.7 Any subsequent financial assistance in terms of clause 3.6 will only be given once Sappi has checked and confirmed that the initial establishment of afforested areas has been satisfactorily carried out by the Grower.
- 3.8 Sappi will submit to the Grower a statement of his annual loan account once per year.

4. THE GROWER'S OBLIGATION

4.1 The Grower -

- 4.1.1 shall undertake all planting, silvicultural practises and felling strictly according to Sappi's prescription and in accordance with Sappi's forestry practice;
- 4.1.2 shall allow the members of the KwaZulu-Natal Department of Forestry and/or the Department of Water Affairs and Forestry (where the property is situated within the KwaZulu homeland) and/or the South African Department of Environment Affairs and authorised employees and technologists of Sappi to inspect the afforested areas of the property at any time during the duration of this agreement.
- 4.1.3 shall discharge the amount of the Grower's indebtedness to Sappi in terms of this agreement by setting off the amount thereof against the purchase price of the timber which will become payable by Sappi to the Grower in terms of clause 5 hereof for timber which is harvested from time to time.
- 4.1.4 shall, notwithstanding anything to the contrary contained in this agreement, repay the total amount of his indebtedness to Sappi within a period of 12 (twelve) years from the commencement date of this agreement.
- 4.1.5 shall sign the statement of his indebtedness to Sappi on an annual basis.

5. PURCHASE AND SALE OF TIMBER

- 5.1 The Grower shall sell all timber planted on the property pursuant to this agreement to Sappi and to no other person whatsoever, when such timber in Sappi's opinion, reaches maturity and Sappi agrees to purchase the timber.
- 5.2 The price payable by Sappi for the timber purchased in terms of clause 5.1 shall be the ruling local market price paid for types and quality of the timber in question at the time the timber is felled, having regard to the purpose for which Sappi wishes to use such timber. Should the parties hereto fail to agree on any of the foregoing and as a consequence have not agreed in writing, within 60 (sixty) days of the date on which Sappi gives the notice to the Grower that it wishes to purchase the timber described in clause 5.1 upon the price payable by Sappi for such timber shall be the delivered pulpwood prices then payable by the Tugela mill or the Sappi depot nearest to the Grower.

6. BREACH

Should the Grower breach or fail to comply with any term and/or condition of this agreement, then the Grower's entire indebtedness in terms of this agreement shall, notwithstanding anything to the contrary herein contained, immediately become due, owing and payable in one lump sum by the Grower to Sappi upon demand thereof by Sappi.

7. CESSION

7.1 As security for the due fulfilment by the Grower of all his obligations in terms of this agreement, the Grower hereby cedes, assigns, transfers and makes unto and in favour of Sappi all his right, title and interest in and to all amounts which will become owing to the Grower in respect of timber emanating from the afforested areas of the property in the event that the Grower breaches his obligation in terms of clause 5.1 hereof and sells such timber to a third party.

7.2 This agreement shall constitute written authority to any third party to which timber has been sold in terms of this clause 7.1 to give effect to the terms of this clause and the Grower consents to the payment of proceeds of such timber being made directly to Sappi.

8. TRANSFER OF RIGHTS

8.1 The Grower shall not be entitled to cede, delegate, assign or subcontract any of his rights and/or terms of this agreement to any person or entity other than one which succeeds the Grower as the Registered owner of the property without the written consent thereto of Sappi being first had and obtained which consent shall not be unreasonably withheld.

8.2 The Grower -

8.2.1 shall procure that the provisions of this agreement are binding upon all successive registered owners of the property including the Grower's heirs, curators and/or executors, until expiry of Sappi's rights in terms of this agreement; and

8.2.2 shall not be entitled to sell or alienate the property or any portion thereof to any person or entity unless and until the Grower shall first have delivered to Sappi the written acknowledgement and undertaking in such form as Sappi may reasonably require, of any such successors-in-title that he or it is bound by the provisions of this agreement.

9. NOTICE

All notices to be given to the Grower by Sappi in terms of this agreement shall be delivered to the Grower personally or by placing it in his home.

10. JURISDICTION

The Grower hereby consents and agrees in terms of Section 45 of the Lower Courts Act, 1944 (as amended) that Sappi shall be entitled, but not obliged, to institute any legal proceedings against the Grower which may arise out of or in connection with this agreement in any Magistrates' Court having jurisdiction over the person of the Grower's claim might otherwise exceed the jurisdiction of such court.

11. ENTIRE CONTRACT

This agreement constitutes the entire contract between the parties hereto regarding the subject matter of this agreement, and the Grower has not been induced to either, or influence in entering into this agreement by any undertaking, representation or statement not recorded herein.

THUS agreed to and signed at
19 in the presence of the undersigned witnesses.

this day of

As Witnesses :

1 _____

Name: _____

2 _____

Name: _____

For and on behalf of Sappi

Name: _____

Capacity: _____

THUS agreed to and signed at
19 in the presence of the undersigned witnesses.

this day of

As Witnesses :

1 _____

Name: _____

2 _____

Name: _____

For and on behalf of the Grower

Name: _____

Capacity: _____

APPLICATION FOR ASSISTANCE

1. Full names of Applicant : _____
2. National Identity Number : _____
3. Date of birth / age in years : _____
4. Marital Status : _____
Full name/s of spouse : _____
The marriage is in/out of Community of Property : _____
5. Full permanent residential address :

6. Full postal address and postal code :

7. Name of Chief : _____
8. District : _____

DETAILS OF THE PROPERTY

1. a) Name and description of the property/land:
- _____
- _____
- b) 1 : 50 000 Hap reference : _____
- c) Basis of occupation of land eg. Freehold Title, Lease, Certificate of Occupation of Traditional allocation by Chief?
- _____
- d) Does Applicant reside on the Property? _____
- e) Details of any servitude or other restrictions on the property
- _____
2. When do you intend to plant the trees for which this application applies?
- _____
3. Details of any cession or other authority to pay timber proceeds or part thereof to any person / firm / bank or other institution, and reasons:
- _____
- _____
- _____

NATURE OF ASSISTANCE REQUIRED FROM SAPPI

OPERATION	R/1 000 PLANTING SPOTS 19__	NO. OF PLANTING SPOTS	VALUE
Seedlings (initial)			
Fertilizer (approximately)			
Pitting			
Planting			
Fertilizing :			
Weeding - First Year			
Weeding - Second Year			
Fire Protection (per annum)			
Ploughing			
1st Coppicing			
2nd Coppicing			
Voorskot (per annum)			
Land Preparation			
Chemical Weeding			
Discing			

LOAN FOR INITIAL ESTABLISHMENT

PURPOSE	R	C
A)		
B)		
C)		
D)		
E)		
F)		
G)		
H)		
I)		
H)		
TOTAL		

APPENDIX 4
MONDI CONTRACT

ISIVUMELWANO SOKUTSHALWA KWAMAHATHI OHWEBO

UMLIMI OMUSHA

kanye no-

MONDI LIMITED (INOMBOLO 67/13038/06)

abazinze ku - 26 Bredelia Street, KWAMBONAMBI 3915

kulesisivumelwano abamelwe ngu - H.C Kewley ogunyazwe ngokusemthethweni (ngokufanayo nawondlalifa, abaphathi bamafa nalabo abaqokwe ukwengamela amafa) kanye no-

INOMBOLO KAMAZISI/NOMBOLO YESITIFIKETI SOBUZWE BAKWAZULU

.....
wakwa

(ikheli lendawo ohlala kuyona)

(kubandakanya abaphathi-mafa bakhe asebezobizwa ngokuthi "UMLIMI").

ISINGENISO

NJENGOKUBA ABAKWAMONDI befisa ukukhutshala ukutshalwa kwezihlahla zohlobo luka-Gomu kwelakwaZulu;

NANJENGOBA "UMLIMI" engumnini womhlalathi esigodini sase

.....
kusifundaMantshi

futhi nangokwalesisivumelwano uhlose ukutshala "amahekthari angu"

.....
asezobizwa ngokuthi (IZIQINTSHANA ZAMAHATHI) njengokwemininingwane ekhonjiwe kumfanekiso-mdwebo ohambisana nalesisivumelwano (ingxenye "A");

Manje ngokuba abakwaMONDI kanye noMLIMI (nhlangothi zombili) bezimisele ukwenza isivumelwano futhi sebevumelene ngokuqopha phansi amaphuzu nemibandela yesivumelwano njengokuba kuhlelwe ngezansi.

AMAPHUZU NEMIBANDELA

UKUQALA UKUSEBENZA KWESIVUMELWANO, INHLOSO NOBUNGAKO BESIKHATHI SESIVUMELWANO

Lesisivumelwano siyoqala ukusebenza kumbe siyokwamukelwa njengesesiqalile ukusebenza kusukela osukwini lokusayinwa kwaso abakwaMONDI bese siqhubeka ukusebenza isikhathi esinganqunyiwe silawulwa ngamalungelo anhlangothi zombili njengokuba eqoshwe lapha phansi.

1. UKUSUNGULWA KWEZIQINTSHANA ZAMAHATHI

1.1 "UMLIMI" uyoqala ukutshala isiqinti sehlathi futhi aqinisekise ukuthi akhula ngendlela efanele asuse ukhula awagcine ehlanzekile enze nokunye okungadingwa abakwaMONDI ukuhlangabezana nezinga lokukhuliswa kwamahlathi.

1.2 AbakwaMONDI bayonikeza UMLIMA izithombo ezanele zo-Gomu, umanyolo kanye nezinye izidingo ezingabakhona ekufezeni inhloso yokuqalisa nokunakekela ukusungulwa kwesiqinti sehlathi.

1.3 Izindleko zalokhu okubalwe esigabeni 1.1 ngasenhla ziqoshwe phansi kungxenye u"B" yalesisivumelwano.

1.4 Izindleki zalokhu okubalwe esigabeni 1.1 ngasenhla UMLIMI uyozebolekwa abakwaMONDI. AbakwaMONDI bayoziqopha phansi zonke izindleko abazikweletwa UMLIMI.

2. AMALUNGelo KANYE NEZIBOPHO ZOMLIMI

2.1 Ngaphandle kokukhohlwa amaphuzu aqoshwe ngenhla, UMLIMI kuyofanele:-

2.1.1 enze isitubhe sokuvikela umlilo, njengokulawulwa abakwaMONDI futhi ngasosonke isikhathi sokusebenza kwalesisivumelwano athathe zonke izinyathelo ezifanele ukuvimbela umonakalo, ukucekeleka phansi kumbe ukwebiwa kwezingodo.

2.1.2 engavumeli isimo sokuba izingodo ezitshalwe ngohlelo noma imibandela yalesisivumelwano zisetshenziselwe noma yini ngaphandle kokudayisela abakwa MONDI njengokulawula kombanela 2.1.3 oqoshwe ngezansi.

2.1.3 ukuvuna izingodo ngokubonisana nangokuhambisana nezimiso zesigayo somshini wakwa MONDI inqobo uma ubudala bezihlahla bungengaphansi kweminyaka eyisithupha (6) futhi bungeqile eninyakeni eyishumi ngaphandle kokuba kunemvume yabakwaMONDI ukuba lowo mbandela ungalandelwa. UMLIMI uzibophezela ekudayiseleni abakwaMONDI izingodo azivunile kuphela, futhi abakwaMONDI bayazibophezela ukuthenga izingodo ngamanani asemthethweni okuthenga izingodo zokwenza iphepha.

2.2 UMLIMI uyavuma ukukhokhele abakwa MONDI inzalo engokweshumi ekhulwini (10 %) ngonyaka esikweletini esiyobe simsalele izikhathi ngezikhathi size sikhokhwe ngokuphelele isikweletu.

2.3 UMLIMI uyavuma ukuthi zonke izimali azikweleta abakwaMONDI, uyozikhokha uma esedayise izingodo noma esikhathini esiyiminyaka elishumi (10) kusukela osukwini okusayinwe ngalo lesisivumelwano noma yikuphi okuyokwenzeka kuqala kulokhu okubili futhi ugunyaza abakwaMONDI ukuba bathathe lezozimali eziyisikweletu sabo kulezozimali abayobe bezikweleta UMLIMI ngezingodo azidayisele abakwaMONDI.

2.4 UMLIMI uyovumela abasebenzi bakwaMONDI kumbe labo ababaqokile ukuba babe nemvume yokuhlola isiqinti sehlathi ngazozonke izikhathi ezingeke ziphazamise UMLIMI ngenkathi kusasebenza lesisivumelwano.

2.5 UMLIMI uyavuma ukuthi uma ehluleka ukuhlangabezana nanoma imaphi amaphuzu nemibandela yalesisivumelwano, zonke izimali azikweleta abakwaMONDI kuyomele azikhokhe khona manjalo

3. AMALUNGelo NEZIBOPHO ZABAKWA-MONDI

3.1 UMLIMI uyokhokhelwa ngemuva kokuhlola komsebenzi isikhulu esiqokwe abakwaMONDI, futhi lokho kuyoncika ekutheni umsebenzi osuphothuliwe uyasenelisa yini lesosikhulu/omele abakwaMONDI njengoba kuchazwe emibandeleni 2.1 no 2.2 ngasenhla.

3.2 AbakwaMONDI banokuyikhokha ngaphambi kwesikhathi esinqunyiwe ingxenye yemali mboleko unyaka nonyaka inqobo nje abamele abakwaMONDI una beneliswa ukuthi wonke umsebenzi wenziwe ngokohlelo nangezimiso zesivumelwano njengoba kuchazwe emibandeleni 2.1 no 2.2 ngasenhla.

3.3 Lezizimali mboleko nenkokhelo eqhutshwa phambili kanye nezindleko zempahla enikezwa UMLIMI ziyokwenyuka minyaka yonke kuncike ekunyukeni kwentengo ngokwezinqumo zabakwaMONDI.

3.4 AbakwaMONDI bayoqopha phansi usuku kanye nesamba sezimali mboleko; okungukuthi inali mboleko, inkokhelo eqhutshwa phambili kany nenzalo. AbakwaMONDI bazibophezela ukuqopha isitatimende esiyonikezwa UMLIMI minyaka yonke esimayelana nezimali mboleko, kuhlangele nenzalo ekupheleni kwalowo nalowo nyaka.

4. UKUFA KOMLIMI

Uma kwenzeka UMLIMI ashone sisasebenza lesisivumelwano lowo owengamele ifa loMLIMI uyophoqeleka ukwedlulisela amalungelo oMLIMI ngokwalesisivumelwano ESIQINTINI SEHLATHI, kulabo ababalwe ohlweni olulandelayo:-

4.1 kunomangubani oyothenga ISIQINTI SEHLATHI; noma

4.2 kundlalifa/izindlalifa, inqobo nje lowo oyindlalifa abakwaMONDI beneliswa ukuthi ungumunto osesimweni sokulandela imibandela ebekelwe UMLIMI njengokuba kuchazwe kulesisivumelwano; futhi evuma ukwemukela amalungelo nezibopho zoMLIMI oseshonile kumbandakanya izikweletu zikamufi azikweleta abakwaMONDI eziyobe zikhona kuze kufike osukwini lokudluliselwa kwamalungelo ngokugcwele kuleyondlalifa.

5. IMIBANDELA YOKUVIKELEKA KWAMALUNGELO ANHLANGOTHI ZOMBILI ALAWULA ISIQINTI SEHLATHI NEMIBANDELA YOKUDLULISA AMALUNGELO KULOWO ONGESIYENA UMLIMI NOMA ABAKWAMONDI

5.1 Akukho hlangothi oluyilunga lwalesisivumelwano olunelungelo lokudlulisela amalungelo kumbe izibopho zalesisivumelwano kulowo ongesilona ilunga lanhlangothi zombili kungatholakalanga kuqala invume ebhalwe phansi yolunye uhlangothi. Leyomvume akufanelekile ukuba igodlwe singekho isizathu esinqala.

5.2 UMLIMI uzibophezela ukuvikela amalungelo endawo okutshalwe kuyona ISIQINTI SEHLATHI futhi ngeke avume kwenziwe noma yini engabeka ebucayini, nganoma iyiphi indlela, amalungelo anawo endaweni okutshalwe kuyona ISIQINTI SEHLATHI.

6. IZAZISO

Iloko naloko hlangothi luziqokela ikheli elichazwe esingenisweni sesivumelwano njengendawo oluyokwemukela kuyona izaziso ezilethwe mathupha noma ezithunyelwe nge- rejista esikhokhelwe. Lokhu kuyothathiwa njengendlela okuyiyonayona yokuthumela izaziso kulolohlangothi oluthintekayo.

7. IMIBANGO

7.1 Uma kungenzeka kuqubuke umbango phakathi kwezinhlangothi zombili mayelana nokuhhunyushwa kwalenkontileka, noma ukusetshenziswa kwamalungelo aloko nalolohlangothi ngokwalenkontileka umbango unokwedluliselwa kumlamuli ozimele/ongathintekile kulesisivumelwano uma kunohlangothi olufisa ukwenza lokho. Lowo mlamuli ozimele/ongathintekile kulesisivumelwano uyoqokwa futhi asebenze njengokuqoshwe kusomqulu (iSouth African Arbitration Act 1965) kulandelwa nanoma yiziphi izichibiyelo ezikhona kulowosomqulu.

7.2 Izinhlangothi zombili ziyavumelana kivelokuthi iNkantolo eyokuba namandla okuhlaziya imibango engase iqubuke mayelana nalesisivumelwano, kuyokuba

iNkantolo yesifunda Mantshi okutshalwe kusona ISIQINTI SEHLATHI nanomangabe izimali ezithintekayo kulowombango zingaphezulu kwegunya enalo leyoNkantolo.

8. UMTHETHO OYOSEBENZA

Isivumelwano, amalungelo, nezibopho zezinhlangothi zombili kuyolawulwa ngezimiso zoMthetho wamaHlathi akwaZulu (KwaZulu Forestry Act number 15 of 1980) zihlaziye ngendlela engenakuphikisana nemithetho yaseRiphabliki yaseNingizimu neAfrika.

9. ISIQINISEKO SOMLIMI

Ngokusayina lapha, noma ukwenza umdwebo noma ukugingqa isithupha UMLIMI unikeza isiqiniseko sokuthi uchazelwe ngakhokonke okuqukethwe yilesisivumelwano, ngolimi alukhulumayo, phambi kofakazi abasayine ngezansi njengokuthi uyawaqonda amalungelo nezibopho zakhe phansi kwalesisivumelwano.

Uqinisekisa futhi ngokuthi uyavuma, ngokwazi analo, nangokuzithandela kwakhe, nangaphandle kwengcindezelo, ukuzibopha ngemibandela nezimiso zalesisivumelwano.

NGAKHO-KE MANJE: IZINHLANGOTHI ZOMBILI SEZIYAZIBOPHEZELA NGEMININGWANEEQUKETHWE ISINGENISO, IMIBANDELA KANYENEZIMISO KUBANDAKANYA NAWOWONKE AMAPHEPHA AYINGXENYE EBALIWE KULESISIVUMELWANO.

IHLELWEYASAYINWAE.....MHLAKA.....

KU 199...

OMELE INKAMPANI

H.C. KEWLEY
I G A M A

REGIONAL MANAGER
ISIKHUNDLA

OFAKAZI

1. _____ 2. _____

INHLELWEYASAYINWAE.....MHLAKA.....

KU 199

U M L I M I

OFAKAZI

1. _____ 2. _____

ANNEXURE A.

SKETCHMAP OF PLANTATION LAND

PLANTATION LA

NOT TO SCALE

POSITION: LAT
LONG
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