

**THE DEVELOPMENT POTENTIAL AND IMPACTS OF
COMMERCIAL EUCALYPTUS WOODLOTS IN SELECTED
AREAS OF KWAZULU, SOUTH AFRICA**

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**Submitted in partial fulfilment of the
requirements for the degree of**

Doctor of Philosophy

in the Department of Geography

University of Natal

Pietermaritzburg

1994

ABSTRACT

This thesis is an analysis of the social, economic and ecological impacts of commercial Eucalyptus woodlots being promoted by a private timber company in certain parts of northern KwaZulu, South Africa.

The impacts are considered from the perspective of the rural farmers themselves via a qualitative methodology consisting of semi-structured, in-depth individual interviews and focus group discussions.

The results of the study show that these woodlots will offer only supplementary income to the majority of the growers. There is little opportunity cost in terms of land or labour, and ecological impacts can be minimised through a programme of education and responsibility on the part of the company.

However, the growers involved feel alienated from the whole tree-growing process occurring on their land. The potential for rural development and empowerment does exist, but will require a fundamental paradigm shift and long-term commitment on the part of the company promoting the woodlots.

Commercial woodlots have an important role to play in the 'new' South Africa by showing that the aspirations of the rural poor need not be incompatible with the profit-orientated motives of private companies.

A model is proposed which consists of training, strengthening existing institutional structures, and initiating ongoing, on-farm research. Following such a model would allow commercial woodlots to form part of an appropriate social forestry land-use system for the region.

Keywords: commercial Eucalyptus woodlots; impacts; rural development; social forestry; qualitative method.

PREFACE

Forestry in South Africa is sharply divided. On the one hand, four major producers (three private companies and the state) manage large-scale commercial plantations of exotic timber species to produce timber products for profit. On the other hand, non-government organisations (NGOs) promote small-scale social forestry projects with indigenous and multi-purpose tree species for a variety of needs ranging from fuelwood and building material to fodder, food and medicine.

Commercial woodlots are a fairly recent phenomenon (started in the 1980s), and lie somewhere between these two extremes. Small-scale woodlots of commercial plantation species (Eucalyptus) are being promoted in rural areas by private timber companies as an additional source of timber for their mills. Their expansion has been rapid, and between 500 and 700 new woodlots are being planted each season.

This study is an examination of these woodlots and of the programme currently being promoted by one major company. The programme in question is called 'Khulanathi', which is a Zulu word meaning 'grow with us', and the company is Mondi Forests, a division of Mondi Paper Company Limited.

Two fundamental questions need to be answered: first, are these woodlots an appropriate land use in rural KwaZulu? and, second, if so, under what conditions?

This study attempts to answer these questions by considering the social, economic and ecological impacts these woodlots have, and by examining their potential to promote appropriate rural development. The existing model is considered, and a more appropriate model proposed.

The fieldwork was conducted during the winter months (May to August) of 1993 in certain areas of northern KwaZulu, a region which lies along the north-east coast of South Africa.

Because the emphasis of this study is on revealing the issues and concerns of the growers themselves, the methodology adopted was qualitative. The fieldwork consisted of individual, semi-structured, in-depth interviews, and focus group discussions.

Preface

Besides the fieldwork (and the analysis and discussion thereof), this study also contextualises commercial woodlots by examining the theory relating to rural development, and the theory and empirical evidence of social forestry.

For the duration of this study the author worked for Mondi Forests as Development Manager, KwaZulu, a position which offered a unique opportunity to understand Mondi's management philosophy, and the company's approach to woodlots. The fieldwork would not have been possible without this direct involvement; from the start, growers made it clear that they would only cooperate "with people who were involved in the woodlots, and could help things to change", and were not interested in "just another university study".

Unfortunately, violence in various forms is a very real danger in much of South Africa in the early 1990s. The study area is no exception, and as a result certain parts were inaccessible for the purposes of this research.

While very real benefit could be gained from more interviews and discussion in all the areas in question, sufficient results were obtained to draw adequate conclusions.

Recommendations are, however, made for areas of further research.

* * *

Preface

I am indebted to my supervisor, Dr. Graham Slade of the Geography Department, University of Natal, Pietermaritzburg, and co-supervisor Professor Peter J.T. Roberts of the Institute for Commercial Forestry Research (ICFR), who both offered excellent and timeous advice. Professor Jeffrey McCarthy was also extremely helpful during the initial stages of this study.

I am grateful to Mondi Forests for financial assistance, and for allowing this study to occur knowing full well that it would result in criticism of the company. Members of the Khulanathi staff were always willing to offer assistance and advice, and I am particularly grateful to 'Doggy' Kewley, Jock Boake and Johnson Khoza.

Nalini Dickson, librarian at the ICFR, was a great help, always calm and pleasant and able to track down the most obscure references!

Finally, my wife Susan not only offered tremendous encouragement, but did an excellent editing job under severe time constraints. Thank you.

* * *

This study represents original work by the author (except where indicated to the contrary in the text). It has not been submitted in any form, for any degree or diploma, to any other university.

Signed,.....



Guy A. Cellier

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

The South African timber industry experienced exceptional growth during the 1980s. The bulk of this growth was in the pulp and paper sector and was achieved mainly through additional plantation establishment, primarily of Eucalyptus species, in Natal province.¹

Mondi Forests (Mondi) responded to the general optimism of the late 1980s by considering an expansion of its Richards Bay pulp mill in 1989. The proposed expansion was to take the form of an additional pulp line which would require 1 500 000 metric tons of fibre per year. Mondi management considered land in neighbouring KwaZulu to be ideal for the establishment of additional plantations, but because this land was not available to purchase, the company implemented its Khulanathi ('grow with us') programme. The map on page two shows the areas of Natal and KwaZulu in which Khulanathi operates. The differences between Natal and KwaZulu are explained in Chapter 2, which sets the context for this study.

Under this programme individual farmers² in KwaZulu are encouraged to grow Eucalyptus timber for sale to Mondi. All of the material inputs (such as plants and fertilizer) are supplied by Mondi, while the farmers are responsible for planting and tending the trees. The costs of the inputs are considered a loan to the farmer and are deducted at the time of harvest; he or she is then paid the balance of the market price for the timber. (A more complete explanation of the programme is given in Chapter 2.)

¹ Pulpwood production experienced an annual growth rate of 6.6% for the period 1979/80 to 1991/92, and during this time 82 710 additional hectares of Eucalyptus species were planted in Natal province (Forest Owners Association, 1993a).

² The term 'farmers' is used to refer to the people in the areas in which Khulanathi operates, most of whom are engaged in some form of subsistence farming. People who have joined the programme and are growing trees are referred to as 'growers'.

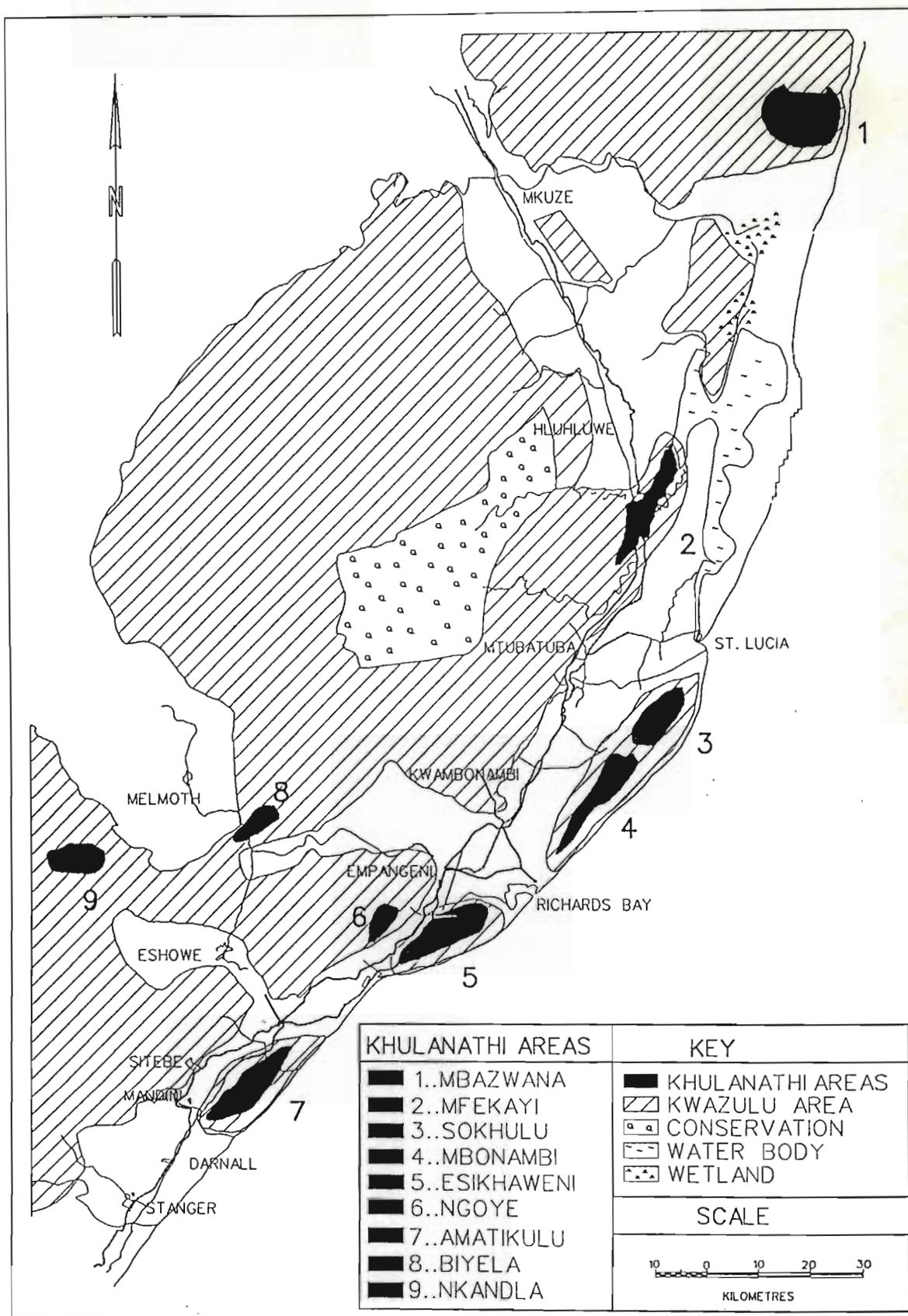


Figure 1.1: Map of the areas in which Khulanathi operates (Fick, 1993).

1.2 PURPOSE OF THIS STUDY

The Khulanathi programme was conceived by Mondi as a commercial venture which would yield additional tons of timber for its Richards Bay pulp mill at a reasonable price to the mill. There was little regard for the needs or desires of the rural farmers themselves, and the attitude of the company appeared to be that if the farmers willingly entered into such an arrangement and received a reasonable price for their timber, then the overall economic gains would be sufficient benefit for them. Mondi managers also made several claims, however, that the economic gains to the communities involved would result in general 'upliftment'³ and rural development.

On the other hand, there has been considerable criticism, primarily from non-government development organisations, for programmes such as this. This criticism can be categorised into three main areas of concern.

First are environmental concerns associated with the introduction of an exotic species into rural areas, as well as the impacts that may be caused by eucalypts in particular (such as the potential impact on water sources).

Second are social concerns associated with a changing land use, such as the possible replacing of food crops with non-edible cash crops; the creation of social divisions between members of participating families and communities; and possible coercion by company officials or local authorities of farmers to plant trees. Also included among social concerns are legal issues associated with rural farmers (for the most part illiterate) entering into legal contracts in a second language (English; the farmers speak Zulu) which ties them and their land up for a number of years.

Third are economic concerns raised because trees grow relatively slowly and appear to yield fairly low returns for the work and time involved in the process; the dangers of indebtedness and economic dependency are also raised because the company loans all the inputs to the farmers, but requires repayment plus interest once the trees are harvested. In addition, there is the question of opportunity cost for the farmers: What is given up in terms of the labour and land involved in order to grow a crop of trees? (These criticisms, and their sources, are described more fully in Chapter 3.)

³ 'Upliftment' was a term used by Kewley (acting as the Mondi manager in overall control of Khulanathi) in a number of presentations in the early stages of the programme.

Given the dichotomy between the claims of the commercial company on the one hand, and the criticisms levelled at the programme on the other, it is the intention of this thesis to clarify the issues involved, and to evaluate both the claims and the allegations that have been made. In particular, this study aims to use the opinions of the growers themselves both to evaluate the existing Khulanathi programme, and to develop a small-scale timber production model that is better suited to the needs and desires of the participants.

The issue is crucial; it was Mondi's stated intention to plant a total of 15 000 ha during the first ten years (1989 to 1999) of its Khulanathi programme, and although this figure has been reduced by half (because the perceived demand has not materialised), the area involved is nonetheless substantial. An evaluation of the whole process is critical in order to build on the positive aspects of the programme and expose and change the harmful components. In particular, the growers need an opportunity to suggest ways of enhancing and developing the current model; between 500 and 1 000 farmers join the programme every year, and changes need to be brought about before the programme becomes too large and unwieldy.

1.3 APPROACH AND METHODOLOGY

In reviewing both the claims and criticisms of the Khulanathi programme, it became apparent to the author that neither the company nor the opponents of the programme had seriously considered the opinions of the growers themselves. Where growers had been consulted (as Friedman did in 1989) the survey was limited to one of the smaller areas in which Khulanathi operates (Biyela), and focused specifically on the organisational potential of small growers (Friedman, 1991). At a later date (during the time that this thesis was underway), Cairns did an overview of the costs and benefits associated with small-scale timber producers in KwaZulu during 1992. However, Cairns' study was an overview of all small-scale timber producers in KwaZulu attached to large companies (3 862 growers at the time of his study), and was severely constrained (he interviewed only 62 growers) by time and resources available to him (Cairns, 1993). For the sake of speed and efficiency, he adopted a purely quantitative approach using a rigid answer schedule, nonetheless deriving some useful results which are discussed in Chapter 5. Neither of these studies drew particularly on related theory; Friedman, for example, uses the term 'basic needs' without ever defining or explaining the concept. This is a trend that is prevalent in much of the literature on rural forestry; economic and related terms are used loosely

without any reference to their originally accepted usage. This thesis will rectify that shortfall.

For the study at hand, the author believed it crucial that growers be given the opportunity to express their own personal opinions and concerns about the issues related to growing trees. The research should also be part of an ongoing learning and communications process between the growers and company officials, building on established relationships and trust that had been fostered over the previous four years. The growers themselves made it quite clear that this was what was needed.⁴

Such an approach is not new or untested. Rapid and Participatory Rural Appraisals (RRAs and PRAs, respectively) as described by Chambers (1992), among others, are specifically aimed at being flexible and interactive, learning from and with the rural people, and are well documented in terms of social forestry. Both RRAs and PRAs are described as qualitative rather than quantitative forms of research, but other qualitative methodologies are available from the sociology and anthropology literature to achieve similar objectives. Taylor and Bogdan (1984) believe that in-depth interviewing allows for understanding informants' own perspectives on their situations as expressed in their own words. Merton *et al.* (1990) describe semi-structured or focused interviews which assume that the participants are involved in a particular situation (in this case tree-growing) and that the situation has provisionally been analysed. The interview is then guided into these areas of importance but focuses particularly on the subjective experiences of the people being interviewed. This methodology was adopted for this study as it meets the essential criterion that the farmers can freely express their feelings about all the issues surrounding tree growing that are important to them. More specifically, both individual, in-depth interviews as well as focus group discussions were held with growers. (These methods are discussed more fully in Chapter 4.)

Despite the fact that the application of qualitative methodologies to social forestry projects is fairly well documented,⁵ the emphasis is normally on designing and implementing social forestry projects with the local people to meet the needs and

⁴ As discussed in Chapter 4, initial talks with growers showed that they were not interested in participating in another round of "meaningless university research". They would participate only with people (company officials) who had the power to change the way Khulanathi functioned.

⁵ The RRA notes series, numbers 1 (1988) to 16 (1992), and the Forests, trees and people newsletters, numbers 14 (October 1991) to 18 (September 1992), describe many such examples.

desires of the people themselves. While this is certainly desirable, it is not appropriate to the case at hand. Mondi Forests designed and implemented its Khulanathi programme without consultation with the farmers, for its own commercial objectives. There is no documented evidence of a qualitative, participatory methodology to assess whether or not such a commercially orientated approach can nevertheless result in appropriate rural development.

This issue is crucial. South Africa is undergoing a process of transformation and profit-motivated private companies are being challenged about the role they will play in the new South Africa. Not least are those industries such as forestry, which are largely land-based. As the Pan Africanist Congress' Peter Mayende states, "The land is the substance and symbol of . . . national self-determination . . . [and] socio-economic development . . . So it is central to change" (Mayende, 1993).

The Khulanathi programme could well provide a basis for bridging the gap between the aspirations of the rural poor and the profit-orientated motives of private timber companies. The results of this research will aid in a more complete understanding for all parties concerned. Mondi management will hear of the issues that concern the growers, and have already committed themselves to responding to the results of this thesis. Through this response, the growers will be able to understand more fully what Mondi's position really is.

Furthermore, a model will be formulated which will use the Khulanathi experience to suggest a more appropriate approach to small-scale commercial production in rural South Africa. It is the author's intention that such a model will apply not only to timber production, but will also have some relevance to related land uses.

1.4 CONSTRAINTS AND KEY ASSUMPTIONS

This thesis, as all research, is subject to certain constraints. One of the major constraints is time. This is particularly important in the context of forestry. Trees take a long time to grow, and even though the trees in question (eucalypts) are particularly fast-growing (six to eight year growing cycle), it is not feasible to assess the implications of the whole cycle. The Khulanathi programme began in 1989 and the first trees planted will only be ready to harvest in 1995/96 at the earliest. This precludes any research into the financial return that growers will receive for their trees. It may become evident that expectations are too high and that growers will consequently be disappointed with their net return.

Harvesting the trees is a critical part of the whole process, and initial analysis (described in Chapter 2) shows that the cost of harvesting can account for as much as one-third of the total cost of producing the timber. Who does the harvesting is therefore crucial; will the growers do it themselves (thereby reducing their costs), or will some third party do the work?

These two constraints, namely the time taken for the trees to grow and the cost of harvesting, are partly overcome by interviewing growers and harvesting contractors in one area where farmers have been growing trees of their own accord for as long as thirty years. In this area it can be assumed that farmers who have gone through several growing cycles are aware of the issues surrounding harvesting, and know what to expect from their woodlot.

Fieldwork conducted over an extensive area is expensive. The interviewees must be paid and accommodated, and provided with a vehicle in which to travel. During the four months that this fieldwork was underway, 112 individual in-depth interviews with growers, 16 with non-growers, 22 with harvesting contractors, 12 with silvicultural contractors and 15 focus group discussions (comprising roughly 10 growers each) were conducted from a total grower population of 1 500 farmers. Presumably greater accuracy could have been achieved by interviewing more farmers, although the repetitiveness of the answers suggests that most issues were covered.

Besides the cost involved, it was also the aim of this study to present results timeously. Khulanathi will enter a new planting season in March of 1994, and has budgeted to establish 1 000 ha of new woodlots during the 1994 season. The results of this thesis should allow for changes to be implemented before the start of the new season.

Rural KwaZulu, no less than other areas in South Africa in 1993, is suffering from the effects of what is generally called 'political violence'. This situation, described more fully in Chapter 2, has had a considerable impact on the Khulanathi programme. Among the more recent incidents: fieldstaff have had their lives threatened and cannot enter certain areas at certain times; a gun-battle has taken place at the Khulanathi weighbridge where timber is purchased, and at other times this weighbridge stands idle through contractors' fears of getting shot on the surrounding roads; two buses have been burned and the drivers killed on the road going past the weighbridge; and a prominent grower has been convicted of smuggling automatic weapons into KwaZulu from Mozambique.

Besides emphasising the dependence on established relationships and trust between the growers and the interviewers, the situation has meant that more fieldwork was conducted in the quieter areas, and less in the more volatile areas. Although this corresponds roughly to the numbers of growers (who are greater in the quieter areas) and although a random sample of growers was drawn from each area for the fieldwork, the general distribution of interviews is skewed. It must be emphasised, however, that the fieldwork and general research of this thesis is qualitative rather than quantitative, and therefore not dependent on a perfect random sample.

The violence in the rural areas has also meant that farmers not associated with the Khulanathi programme do not know the fieldworkers who conducted the interviews, and are generally wary of talking to strangers. This situation is compounded by the sensitivity surrounding land issues, expressing farmers' fears that they might put themselves at risk of having their land confiscated. It will be explained in Chapter 2 that land tenure in KwaZulu is not secure.

Another constraint to the study was language. The growers are Zulu-speaking, and all interviews were conducted in Zulu. The author, however, is English-speaking and the results of the interviews were written in English, as is this thesis.⁶ This constraint was largely overcome by the fact that the two interviewers speak good English as a second language and, having been involved in forestry for some time, understood and could present the technical and other issues involved.

One of the key assumptions of this work is that Mondi is firmly set on a course of commercial timber production. This study was not conducted on the assumption that an aid or development organisation was intent on discovering how best to promote social forestry in rural KwaZulu. Mondi intends to continue encouraging farmers to grow eucalypts that will be processed through its pulp mill. This study intends, with the growers' help, to optimise an existing situation, and not plan a new social forestry programme from scratch.

This study is limited to the Khulanathi woodlot programme. It does not directly examine other woodlot projects, such as the two promoted by Sappi Forests. As

⁶ Because Zulu has only recently become a written language, the spelling of many words is still not standardised. The place names used on the map on page two (and throughout this thesis) are spelled according to the common usage of the Khulanathi project, the focus of this study. It is not uncommon, however, for road signs and even maps to use more than one spelling variation. Esikhaweni, for example, is also spelled Esikhawini, although according to the original meaning of the word, "the place where Chaka passed through," the word should be Esikhaleni.

mentioned previously, Cairns (1993) has done this, and comparisons will be drawn with this study in Chapter 6.

1.5 LAYOUT OF THE CHAPTERS

Chapter 2 sets the context for this study. Because Khulanathi was initiated to assist in meeting foreseen increased demands for pulpwood, the timber demand and supply situation in South Africa is briefly analysed. A description of the Khulanathi programme, covering both the technical and the financial aspects of the process, is also provided.

As stated, land issues are extremely sensitive in South Africa at the present time, and a discussion of the so-called 'homeland' system (of which KwaZulu forms a part) and the implications of this system for small growers is necessary for a complete understanding of the issues involved. This is done in Chapter 2.

Chapter 3 critically analyses the related theory and the available empirical evidence that applies to the current study. One of the major aims of this study is to determine whether or not the Khulanathi programme actually constitutes sustainable and appropriate development, and to do this, it is first necessary to understand these concepts. Included is also an analysis of the social, economic and environmental impacts that can be caused by new afforestation; how they can be defined and measured. The chapter then offers an analysis of the terms found in the social forestry literature in order to place the current programme in its correct context. Terms such as social forestry, agroforestry, community forestry and farm forestry are included.

Chapter 3 considers the empirical evidence available from forestry and related research by first reviewing the commercially-based research undertaken in South Africa. This section will show that this research does not address the social and development issues of woodlot forestry. A brief discussion is then provided of outgrower schemes and contract farming (prevalent in East Africa), which are essentially the origin of the present programme, as well as an overview of the current research into small-scale sugar-cane schemes which operate in rural KwaZulu. Finally, an overview of the controversy regarding the planting of Eucalyptus species is provided.

Chapter 4 describes the research question that will be answered by this thesis, and discusses the methodology adopted in more detail, explaining the rationale for the choices made. This chapter also describes each area in which surveys were conducted, examining the differences between the areas.

Chapter 5 describes and analyses the results of this study. The overriding emphasis is on the opinions of the growers themselves, and not on achieving statistically significant results. This is the basis for qualitative research, and the results of this study will show that this is entirely appropriate for the current situation.

Chapter 6 discusses the results, draws conclusions from this study and makes recommendations for the continuation of the Khulanathi programme. Where appropriate, comparisons are made with related work, both in sugar-cane and in forestry. This chapter also explains what was not covered as part of this study. The model which has been formulated for more appropriate rural forestry is presented, and the areas requiring further study are highlighted.

CHAPTER 2 BACKGROUND

2.1 INTRODUCTION

The commercial woodlots that form the basis of this study fall within the KwaZulu region of South Africa and are comprised entirely of Eucalyptus species being grown for pulpwood.

This chapter consists of three parts. First is an analysis of the forest industry, emphasising Eucalyptus pulpwood production in the Zululand forestry region in order to show exactly why commercial timber companies have become involved in promoting woodlots. The pulpwood market is analysed, and implications for commercial woodlots are presented. Second, in order to contextualise these woodlots, a description and analysis of the South African 'homeland' system is presented, emphasising KwaZulu and the consequences of the system on a newly introduced land use such as commercial woodlots. Finally, this chapter will describe Mondi's Khulanathi woodlot programme, the areas within KwaZulu where it is found, and the way in which it operates.

2.2 TIMBER DEMAND AND SUPPLY IN SOUTH AFRICA

2.2.1 Forestry in South Africa

The South African forest industry experienced exceptional growth during the 1980s; this trend can be seen in Figure 2.1. Figures published by the Forest Owners Association (FOA, 1993) show that for the period 1979/80 to 1991/92, 262 298 hectares (ha) were afforested for the first time. There were also some corresponding conversions out of timber land, but the net increase was a total of 220 198 ha, or an average of 16 938 ha per annum. The bulk of the new planting was in the period from 1986/7 to 1991/2, and the total plantation area in 1991/2 was 1 301 309 ha (1 378 212 ha including the so-called 'independent' homelands of Transkei, Venda and Ciskei) (FOA, 1993).

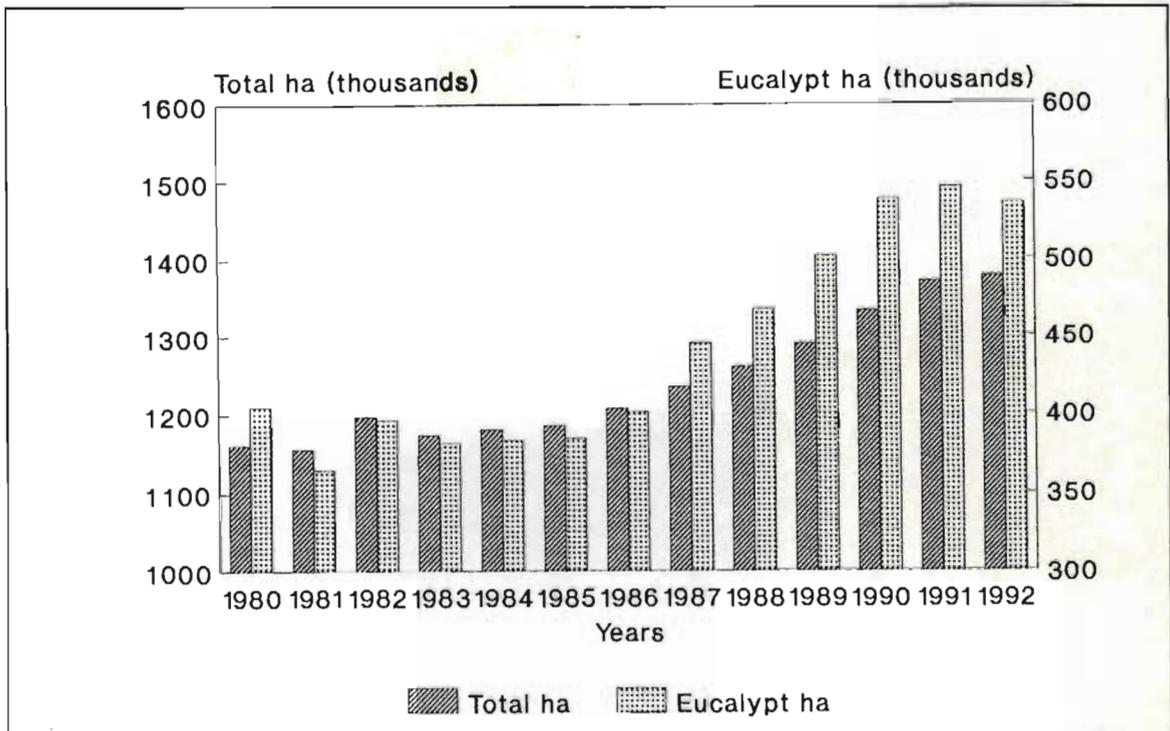


Figure 2.1: Total and eucalypt area (ha) in South Africa (FOA, 1993).

Referring to Figure 2.2 below, it can be seen that new afforestation has occurred in both softwoods (9 719 ha per year) and hardwoods (10 456 ha per year), with eucalypts in particular showing substantial growth (9 315 ha per year) for the period 1979/80 to 1991/92.

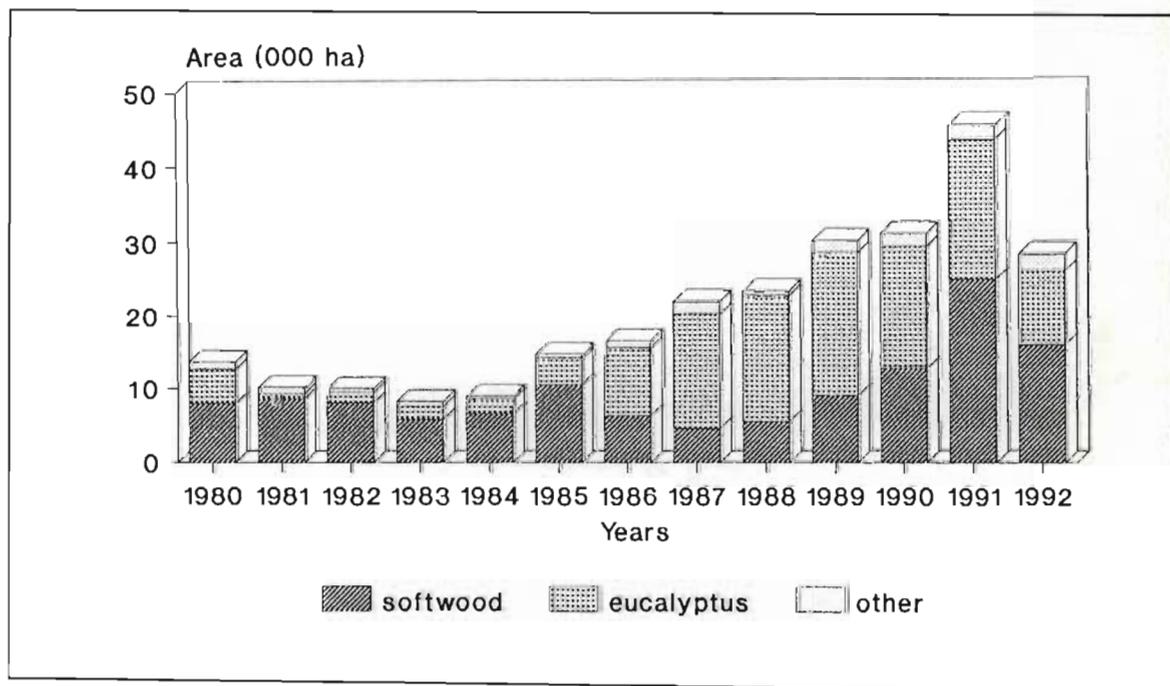


Figure 2.2: New afforestation area (ha) by species (FOA, 1993).

Figure 2.3 shows that of the four provinces in South Africa (no new afforestation in the Orange Free State), Natal has experienced the greatest area of new plantings. This growth has been both in eucalypt plantations (from 161 082 ha in 1979/80 to 243 792 ha in 1991/92 or 3,5% per year) and in softwood (i.e. pine) plantations (from 142 132 ha in 1979/80 to 205 071 ha in 1991/92 or 3,1% per year) (FOA, 1993).

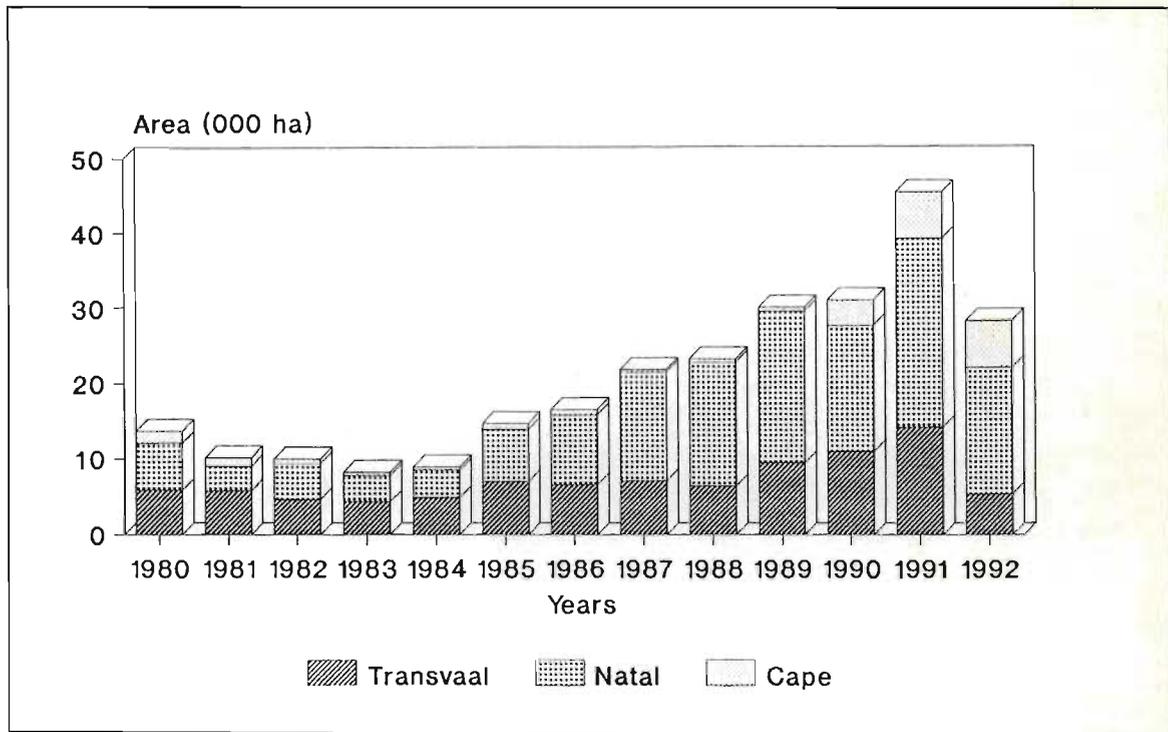


Figure 2.3: New afforestation area (ha) by province (FOA, 1993).

At the same time, there have been adjustments within the industry, by both region and species, with decreases in plantation area most pronounced in the Cape Province (all species), and in wattle species in all provinces (FOA, 1993).

The substantial increases in *Eucalyptus* production are closely allied to the markets for which the species is primarily grown, namely pulp, paper and board (board in this regard refers to cardboard, not to timber or various forms of particle board).

Examining the objectives for which plantations were managed during this twelve-year period shows that areas of pulpwood increased by 3,8% per annum. The only other sector that showed a positive growth rate (1,8% per year) was mining timber, although the fall in gold prices has recently eroded the demand for mining timber (FOA, 1993).

Another important consideration is ownership of these plantations. In the case of Eucalyptus species, private ownership increased from 355 643 ha in 1979/80 to 474 734 ha in 1991/92, an increase of 119 091 ha, or 2,4% per annum. For the corresponding period public ownership (which in South Africa means the state plantations managed by the Department of Environment Affairs)⁶ of Eucalyptus plantation area increased by 9 237 ha from 36 845 ha to 46 082 ha (FOA, 1993).

What this means is that during the 1980s private companies afforested substantial new areas of plantation to Eucalyptus species specifically for the purpose of growing pulpwood. Presumably this was a rational economic decision, and the following evidence appears to support this contention.

Four new pulp, paper and board processing plants came on line during 1984/85 and one mill closed in 1990/91, a net total of 15 mills (FOA, 1993). In response to the increased demand, pulpwood production (shown in Figure 2.4) has virtually doubled from 3 244 222 tons in 1979/80 to 7 005 886 tons in 1991/92, an annual growth of 6,6% (FAO, 1993).

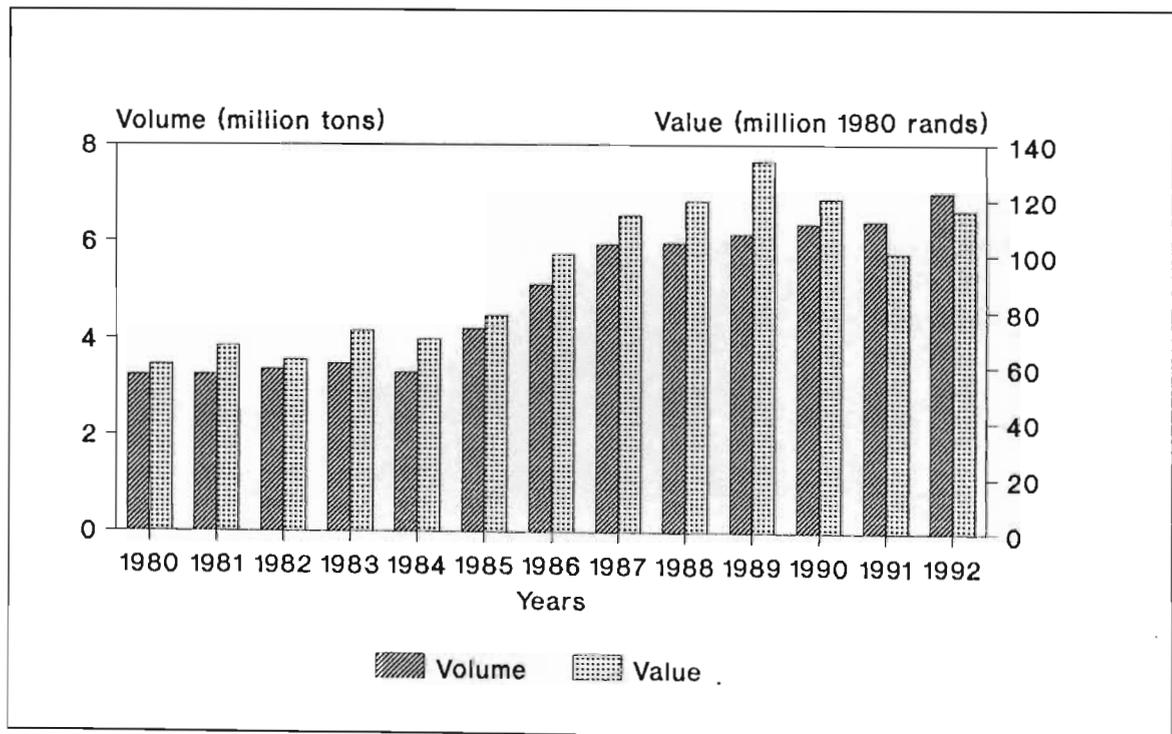


Figure 2.4: Pulpwood production - volume and value (FOA, 1993).

⁶ During 1992 the Department of Water Affairs and Forestry commercialised its forestry branch which is now known as the South African Forestry Company Limited (SAFCOL), but remains wholly owned by the State and therefore public.

The corresponding value of this pulpwood has been an increase from R60 500 000 in 1979/80 to R598 200 000 in 1991/92 in nominal terms, or R116 040 000 in real terms (1980 rands) (FAO, 1993).

The pulp produced by the pulpmills increased from 1 034 649 tons in 1979/80 to 1 866 177 tons in 1991/92. (Refer to Figure 2.5 below.) The corresponding values (1980 rands) of sales from primary processing plants were R356 900 000 in 1979/80 to R693 270 000 in 1991/92 (FAO, 1993).

This expansion and growth during the 1980s led to a mood of general optimism throughout the timber industry; in particular, the Strategic Forestry Development Plan produced by the Department of Environment Affairs in 1989 fueled the spirit of continued expansion by estimating that an area (over one million hectares) almost equal to the present plantation area would have to be planted to meet the expected demand for timber (Van der Zel, 1989).⁷

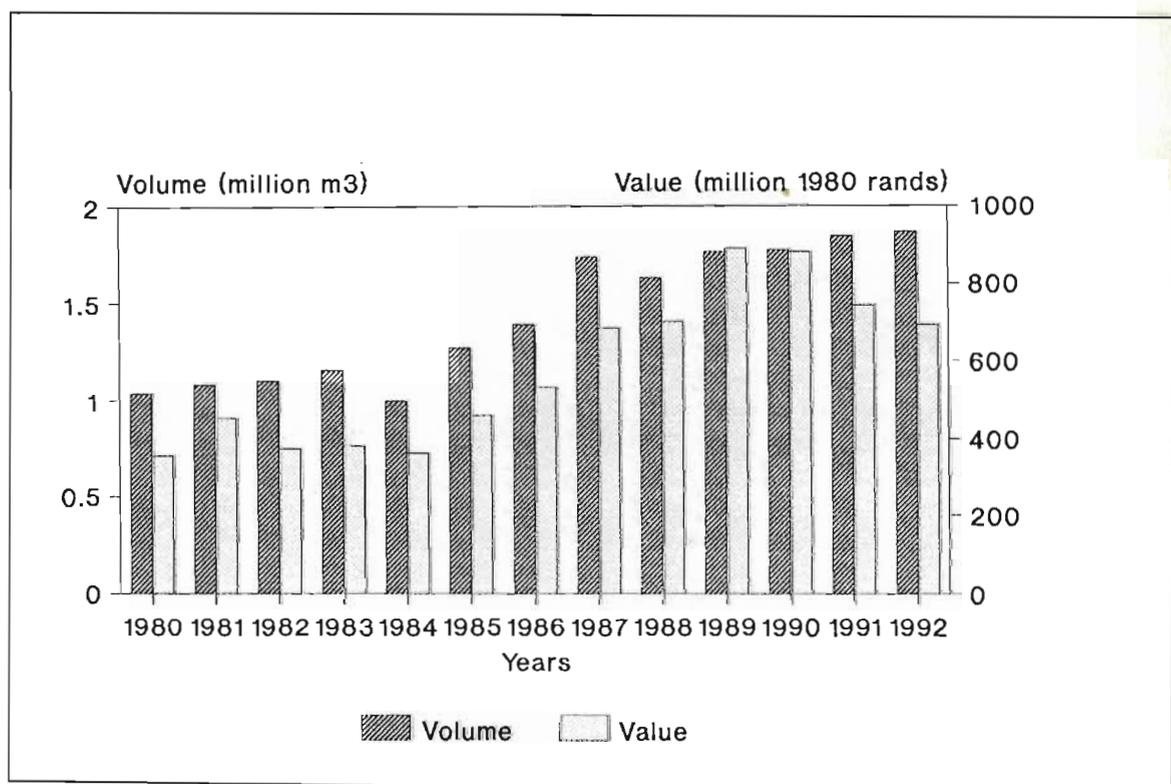


Figure 2.5: Pulp sales from primary processors (FOA, 1993).

⁷ The 'extra million hectares' called for in the plan has alarmed many environmentalists who see the danger of mountain grassland in the Natal Drakensburg area, particularly, being planted under exotic timber species. It is unlikely, however, that this additional afforestation will come about, and far more likely that yield improvements from existing plantations will be relied upon to meet the additional demand.

The plan identified those areas remaining in South Africa that are suitable for extensive new afforestation. Partially in response to this analysis, toward the end of 1989 Mondi Paper Company Ltd., in a joint venture with Anglo American Corporation and De Beers, established North East Cape Forests in the Maclear/Ugie/Elliot district inland of the Transkei by buying up 80 000 ha of former cattle and sheep farms. The move was all the more meaningful in that this area is not particularly close to any major processing plants or existing infrastructure. The nearest large plant is Mondi's Meerbank pulp and paper mill in Durban, some 300 km by road.

Of more direct interest to the KwaZulu woodlots, in that it provides the market for the timber, is Mondi's Richards Bay kraft mill. The mill was built in 1984 and produces 45 000 tons of pulp and linerboard per annum. This volume requires some 4 000 tons of timber per day, or 73 000 ha of plantation dedicated to the mill (assuming 20 tons/ha/year) (Gray, 1993, pers. comm.; Kewley, 1993, pers. comm.). The establishment of the Richards Bay mill was obviously a strategic decision based, among other things, on both raw material supplies and access to world markets via the port of Richards Bay.⁹

2.2.2 The Zululand forestry region

The Zululand¹⁰ coastal region (20 km wide, on average) lies along the east coast of South Africa between the Tugela river in the south, and Lake St. Lucia in the north (although this study also considers the Mbazwana area which lies north of Lake St. Lucia). In terms of forestry production this area is generally considered ideal, particularly for Eucalyptus species, which under 'average' conditions achieve mean annual increments (MAIs) greater than 25 m³/ha/annum when the mean annual precipitation is 1 000 mm or more (Herbert, 1993). The climate is humid-mesothermal, with a mean annual precipitation of 1 200 mm and a mean annual temperature of 22 degrees Celsius. The deep sandy soils are aeolian in origin, whitish to light-grey, generally fine-grained, and consist of almost pure silica (Noble, et al., 1991).

⁹ About 65% of the mill product is exported, and most of the remaining 35% goes to Mondi's paper mill in Durban (Gray, 1993, pers. comm.).

¹⁰ It should be noted that 'Zululand' refers to the region along the east coast of South Africa north of Durban, whereas 'KwaZulu' is the homeland state, much of which lies within the Zululand region.

In 1986 Mondi began a process of buying farms in the general area around Richards Bay on which to plant trees. The move was seen within Mondi as necessary to secure 60% of the required raw material 'in-house' to allow the mill a measure of independence from external suppliers (Kewley, 1993, pers. comm.). At the same time, Mondi Forests was also working on a tree-breeding and clonal programme for both pines and eucalypts. The eucalypt programme has yielded a number of *E. grandis* and hybrid clones that appear to offer exceptional production potential (in excess of 50 m³/ha/annum) for the Zululand region¹¹ (Denison and Kietzka, 1993a,b).

The purchase of land in the Zululand region, which began in earnest in 1986, continued for the next four years during which time Mondi purchased more than 25 000 ha (Kewley, 1993, pers. comm.). Much of this land was previously farmed to sugar-cane, and a certain amount of tension has resulted between the two industries (sugar and timber). In particular, accusations of "monopolistic excesses" leading to "rural unemployment, depopulation and degradation," have been levelled at the timber industry in Natal by the South African Cane Growers' Association (Hudson, 1990a). Hudson's analysis found that in 1989, timber companies paid on average R10 600 per hectare, while land sold for cane farming in the same area over the same period averaged R5 900 per hectare. He contends that timber processors, through having monopoly control over timber land, can pay depressed timber prices at the mill (Hudson, 1990b).¹²

It is not the aim of this thesis to examine the purchase of farming land in Natal, or the social and economic impacts thereof. It is important to this study, however, that within the industry it is generally agreed that the timber companies have now bought virtually all land (currently available for sale) that is suitable for afforestation. Thus, when Mondi began considering an expansion at its Richards Bay Mill in 1989/90, additional sources of raw material were examined. It was calculated that 1 500 000

¹¹ Herbert (1993) cautions against assuming optimistic averages in Zululand; severe problems can be experienced during both wet and dry cycles, and there are questions as to whether or not specific sites can sustain these yields (discussed further in Chapter 6).

¹² It might also be argued that the timber companies have a virtual monopsony (defined in Chapter 3 as a "single purchaser") of the market, as, particularly in the case of pulpwood, one mill does tend to dominate a region. In the case of Richards Bay, however, three other markets have emerged in recent years in the form of chip exports, and the competition appears to be strengthening the prices paid for the raw material.

additional tons of fibre would be required if a second pulp line were built at the mill (Kewley, 1993, pers. comm.).

One obvious solution presented itself. Within the general area surrounding the Richards Bay Mill that was deemed suitable for timber production, much of the land not already committed to either cane or timber fell within what is known as KwaZulu. Existing land-use patterns are examined in the following chapter, but on the whole Mondi believed that if a suitable arrangement could be made with existing land-right holders, there was potentially a considerable area of land within KwaZulu that could be afforested.

Mondi Forests' Khulanathi programme thus began in 1989 based on the assumption that to meet the demand for Eucalyptus pulpwood that a second pulp line at the Richards Bay mill would create, 75 000 ha of new afforestation would be required (Kewley, 1993, pers. comm.).¹³

2.2.3 The pulpwood market

The optimism and subsequent boom in afforestation during the 1980s has not continued during the early part of the 1990s. The economic analysis of the forestry industry prepared by the Economics Advisory Committee (EAC) of the Forestry Council found, in November of 1991, that levels of roundwood consumption in 1991 had not increased from 1987/88. The mining timber industry has been particularly hard hit by the depression in the gold mining industry. The report found that pulpwood consumption has been the exception by growing at a rate of 0,5% per annum, which is still considerably lower than the 7,7% growth per annum during the 1980s (EAC, 1991).

Because the timber grown for Mondi's Khulanathi programme will go to the Richards Bay pulp mill, it is necessary to consider possible factors that could affect the security of this market. In fact, it is one of Khulanathi's selling points that all timber produced will be sold to the mill at prevailing pulpwood prices. Both the prices and volumes of timber into this mill must therefore be considered.

¹³ 75 000 ha based on 20 tons/ha/year, although Mondi is optimistic that its breeding and clonal programme will result in considerable improvements in yield on existing sites, resulting in less additional land being required (Kewley, 1993, pers. comm.). Mondi does not, however, appear to have taken into account the effects of dry cycles (discussed in Chapter 6) which would not allow for these increases in growth.

The EAC analysis examined the international pulp and paper market and found that world prices had declined considerably during 1989 and 1990. This decline occurred in part because while world consumption of pulp decreased, production capacity increased, resulting in spare production capacity and lower pulp prices. Another reason given is that pulp is facing considerable competition from substitute fibre products and greater levels of recycling (EAC, 1991).

South African pulp mills export a considerable percentage of their product and the poor international pulp prices have, according to the report, resulted in reduced earnings for this pulp, and thus severely affected the profitability of the major pulp and paper companies (EAC, 1991). Mondi's Richards Bay mill, which exports about 65 % of its product, has been no less affected (Gray, 1993, pers. comm.).¹⁴

This is important for Khulanathi's small timber growers for two reasons. The Khulanathi project came about during the expansionist mood of the late 1980s which included, among other things, a possible expansion of the Richards Bay mill; poor earnings from the mill, however, will obviously make the likelihood of any such expansion remote. Tough economic conditions also cause companies to consolidate existing operations rather than expand. The second reason is one of risk; promoting a small-grower scheme is a relatively new concept in South Africa, and involves a great deal of uncertainty. During a period of reduced earnings it is not likely that companies will engage in high-risk enterprises unless the potential for 'significant' and 'quick' earnings are great. This, however, is not the case with small growers, which require a relatively high level of management and extension input, as well as a long-term commitment to the farmer. While this could have caused uncertainty as to Mondi's commitment to small growers, Mondi allayed these fears in part by continuing to plant woodlots during 1992, even when the company had cut back on planting on its own land to curtail expenditure.

Furthermore, in the medium-term, various industry analysts and representatives are optimistic about pulp and paper requirements both for the domestic and export markets. Bruce Mackenzie, chairman of the Forestry Council Promotion Committee, addressing a media group in the Eastern Transvaal, said that: "In this country alone, we would need to double our production capacity in the next 10 years to meet local demand" (Doyle, 1992). This appears a little over-optimistic; figures

¹⁴ It should be noted, however, that Mondi's move into the European market through the purchase of the Austrian pulp and paper group, Frantschach, is seen as a means of securing an additional market for its eucalypt pulp from the Richards Bay mill (Mondi world, 1992).

recently released by LHA Management Consultants (LHA, 1993) suggest that a virtual doubling of total roundwood demand (from 17 475 000 m³ to 37 145 000 m³) will only occur by the year 2020, and then only under a gross domestic product (GDP) growth scenario of 2,5 % per annum.

While it is true (and Mackenzie makes reference to the fact) that improved technology on existing land can make up part of this increased production, it will also be necessary to increase area under timber, i.e. new afforestation, if these levels of demand occur.

The economic analysis prepared by the Economics Advisory Committee was also fairly positive regarding the pulp and paper industry, predicting that consumption of pulpwood would grow by 3 % from 1991/92 to 1992/93 (EAC, 1991). In reality, the expected recovery did not occur during 1992, and pulpwood sales fell by -0,4 % (FOA, 1993). However, LHA (1993) is again forecasting a large demand: 3,6 % per annum from 1993 to 2000 under a 2,5 % GDP growth scenario.

Another commonly held view is that paper consumption is a good indicator of a country's development; for instance, consumption of paper and paperboard in 1991 in South Africa was 43 kg/person, compared to 302 kg/person in the United States (LHA, 1993). South Africa is looking forward to renewed economic development, and increases in paper consumption (although not necessarily to the excessive levels of the United States) could therefore result. If this is true then long-term domestic demands for pulp and paper should be firm.

2.2.4 Implications for commercial woodlots

What does this mean for small timber growers in KwaZulu? The current recession and slow-down of the timber industry has not markedly affected the Khulanathi operation, although the drought conditions during this period have resulted in substantially reduced plantings (500 ha instead of the planned 1 000 ha for 1993) (Boake, 1993, pers. comm.).

It would appear that Mondi's support of the small growers through the depressed 1991/92/93 period is a good indication of a long-term commitment. This should give some measure of assurance to the participants that Mondi will hold good to its promises of buying the timber when it is harvestable, and continuing to plant thereafter.

Certainly in terms of a secure market, the Khulanathi growers have the advantage of distance over other suppliers to the mill, some of whom are as far away as the Transvaal (>700 km) and Swaziland (>400 km). Even in the worst of economic times the mill must continue to maximise production, and the closer suppliers (most woodlots lie within a radius of 50 km) will enjoy considerable savings in transportation costs, which normally make about up one-third of the delivered price of timber (see Appendix I).

2.3 RURAL KWAZULU: SOCIO-POLITICAL CONTEXT

The socio-political situation in South Africa in 1993 is undergoing enormous transition. Thus, defining a regional context is fraught with difficulty as it is quite possible, from the start to the completion of this project, for the whole Natal/KwaZulu region to be virtually redefined from a socio-political perspective. This section will merely sketch the background of the so-called 'homeland' system in South Africa and show how this system has influenced the people of the land who may wish to grow commercial woodlots.

2.3.1 The 'homelands' and the land laws

KwaZulu is one of the ten so-called 'homelands'¹⁵ in South Africa, and is one which has chosen to remain 'non-independent' rather than 'independent' (such as Transkei, Ciskei, Bophuthatswana and Venda). All of these homelands, as put succinctly in The Urban Foundation's Urban Debate 2010 series, "are . . . primarily a political artifact of the policies of 'grand apartheid', conceived in the 1950s and implemented with the fullest force during the 1960s and '70s" (Urban Foundation, 1990, p.16).

The South African government has, over the last century, adopted various policies, strategies and laws which have attempted to keep 14,7 million people (44,4% of the total population in 1985 [Urban Foundation, 1990]) physically in these homelands, while offering supposedly economically viable incentives for regional development. The 1913 Black Land Act set the stage by allocating approximately 7% of the land in

¹⁵ Various terms have been applied to these homelands, including 'bantustans' and 'self-governing states'. These terms have been changed somewhat arbitrarily by the South African government, along with the laws governing them. The terms, along with the actual borders, are likely to fall away with the new South African constitution, but for the sake of consistency, and in order to define KwaZulu, the term 'homeland' will be used in this thesis.

South Africa for occupation by 'Africans'. This was an important act of parliament in that it redefined land tenure; prior to this blacks had been able to purchase land on a freehold basis in the Transvaal and the Cape (Urban Foundation, 1990). This original 7% was reserved for African occupation, and fell under the control of the tribal authorities.

The 1936 Development Trust and Land Act extended the area for black occupation from 7% to 13% of the total land area of South Africa; areas which now make up the homelands. This Act purchased land for African occupation, but this was only made available to controlled numbers of tenants (Cooper, 1988).

Both of these laws also effectively prohibited black ownership or occupation of any land outside of these areas, including black squatting on white-owned land. These laws were further strengthened by the Prevention of Illegal Squatting Act of 1961, which made provision for the removal of blacks on public or private land, and gave local authorities the power to establish resettlement camps and villages (Davenport, 1990).

The Development Trust and Land Act of 1936 acted in the same way as influx control (which kept blacks out of urban areas except for the purpose of employment), by allowing blacks to reside in white rural areas only if they work for white farmers (Urban Foundation, 1990).

The Group Areas Act of 1950 further entrenched the restrictions placed on ownership and occupancy of land, but dealt almost exclusively with urban areas, and as such is not of major importance to rural homeland areas (Davenport, 1990).

The Bantu Laws Amendment Act of 1952 was important for local control within the homelands, as it was through this Act that Inkosis and Indunas¹⁶ passed from being locally elected (by clan or community) to being paid government officials, in effect the first tier of local government (Cooper, 1988).

'Betterment planning' was a system introduced by the Bantu Laws Amendment Act of 1952 and was used to force people from scattered communities into villages in which services and education could be more easily provided (Cooper, 1988). Cooper

¹⁶ The Zulu word 'Inkosi' is used even in English to describe the leader of a Tribal Authority. The English word generally used (chief) is considered derogatory, and is to be avoided. Likewise, the Zulu word 'Induna' is used in preference to its English translation, 'headman'.

argues that this process of villagisation is not in itself a destructive strategy, but in South Africa "was violently imposed without consultation with, or obtaining the consent of, the people whose lives it drastically affected. As a result it has not improved the quality of life of bantustan residents" (Cooper, 1988, p. 93).

2.3.2 Consequences of the laws

It is not appropriate within the confines of this thesis for an in-depth analysis of these and other acts of parliament which have affected black people in rural areas. In order to set the context within which farmers in rural KwaZulu attempt to operate commercially, it is sufficient to cite the Urban Foundation's (1990) policy paper on rural development. The paper found that principal motives for these acts included: expanding the supply of wage labour available to industry (particularly the mines) and white farms by restricting the land available to black South Africans; preventing the purchase of land won by military conquest; reducing black competition in the rapidly expanding fresh produce markets (especially peri-urban market-gardens); and reducing the migration of black people to the cities by providing a 'home' for them elsewhere, in part to 'protect' the urban jobs of white voter constituencies from black competition (Urban Foundation, 1990).

The paper goes on to list some of the consequences of these Acts, and finds in particular that the Acts: legalised race discrimination; excluded Africans, 'coloureds' and Asians from the market for rural land; largely destroyed the black farming class in South Africa (causing landlessness through overcrowding in the homelands); formed the base for the policy of forced removals; contributed to the deterioration of conditions in the homelands; contributed to distorted urban settlement in homelands; and helped to shape South Africa's unusual pattern of commercial agriculture (Urban Foundation, 1990).

More specifically, the Urban Foundation analysis lists some of the consequences as:

- (1) overcrowding -- 67 persons per square kilometre in the homelands versus 16 persons in the rest of South Africa (Human Sciences Research Council, 1986);
- (2) reliance on export labour -- 60% - 80% of the gross national income of homelands (Tapson, 1986), while much of the balance of the income comes from civil servant salaries (Urban Foundation, 1990); only 10% of income in homelands comes from agriculture, while only 0,2% of homeland households

actually make a living out of farming (Bembridge, 1987; Urban Foundation, 1990);

- (3) poverty -- by 1990, 84% of households in the rural and dense settlement areas received incomes below the basic subsistence level (Urban Foundation, 1990); and
- (4) resource constraints -- besides land (point 1 above), Bembridge (1987) among others, has identified various other restraints to successful farming in the rural areas of the homelands, including: access to agricultural inputs; financial and organisational support; basic infrastructure; educational and training services; local markets; current land tenure; and support for women.

Considering agricultural production in the homelands specifically, there are also those demands and risks inherent to all farming, such as: "unpredictable weather; the substantial demand for working capital; the need for advanced technical and management skills; the heavy irregular and inconvenient demand for labour; and the uncertainty and infrequency of income flows" (Urban Foundation, 1990, p. 22).

2.3.3 Rural KwaZulu

These points raised by the Urban Foundation's analysis serve to highlight some of the issues of agricultural production in the South African homelands in general. However, this thesis is only concerned with woodlots established in the KwaZulu homeland, and the question must therefore be asked as to whether the above points actually apply in this specific context. While there is little evidence of work done specifically in the areas where Mondi has promoted its woodlots, work done in other parts of KwaZulu appears generally to support the Urban Foundation's findings.

During the 1980s, a number of studies (May and Natrass, 1986; Natrass *et al.*, 1986; Peters, 1987, among others) came out of the Rural Urban Studies Unit of the University of Natal in Durban based on data collected from 600 households (4 600 individuals) from three magisterial districts of KwaZulu. The three areas (Mbongolwane, Mapumulo and Nqutu) are, in turn, "isolated", "intermediate" and part of a "commuter suburb" according to Peters, (1987, p. 11) who believes that "insofar as the three regions are themselves representative of the social and economic diversity in rural KwaZulu, the sample may be considered representative of rural KwaZulu as a whole."

Peters found that most landholders had a plot of less than one hectare, and that land was unequally distributed. In two of the areas (Mapumulo and Mbongolwane) over 80% of households had access to land for crops, but only 33% of Nqutu households had such access. The results also showed that most of those who had access to land made some use of it.

Peters (1987) also found that in Mapumulo (the intermediate area with some workers commuting to both Stanger and Durban), non-stock farming was obviously important. Families investing in agriculture, as well as in crop production for markets, had significantly higher incomes than those which did not. It was also evident that livestock possession did not increase with income. Peters suggests (but cannot confirm statistically) that cash crop production in Mapumulo receives a cash injection from family members engaged in wage labour, while the farm work is actually done by other members of the household.

Peters (1987) concluded that wage labour, local or migrant, is the major source of household income in KwaZulu, followed by pensions. However, Peters also found that household income could not be seen as a simple function of migrancy rates (involvement in wage labour), or size, or educational level. He found that wealthier households did not invest more in agriculture. On the other hand, poorer households (those in the poorest 20%) were not larger in size, nor did they have fewer children in school or less subsistence income. As one might deduce, they did have less stock units and less cash income from farming. In general, subsistence agriculture appeared to act as a "safety net" for those households without alternative means of support. Successful cash-crop farmers had cheap family labour and some income to invest in agriculture (Peters, 1987, p. 61).

Nattrass, *et al.* (1986, pp. 22-23), using data from the same areas as Peters (above), but including data from two additional rural areas, found generally that: living levels were very poor in rural KwaZulu; these levels were almost entirely due to the sale of labour; there was a great deal of income disparity, with the top 10% receiving eight times more than the poorest 40% and 12 times more than the poorest 20%; and "the domestic economic resource base" had been badly eroded, so that only 16% of households were involved in some farming or informal sector production.

2.3.3.1 Land tenure in KwaZulu

The existing land tenure structures in KwaZulu are also fraught with complexities and provide sufficient material for a number of academic studies in their own right.

However, some understanding is necessary in order to contextualise the situation that exists for woodlot production.¹⁷

Bromberger (1988), in his paper covering prospects for land tenure in KwaZulu, describes the current tenure situation, which is primarily so-called 'communal' tenure (2 774 728 ha as opposed to 177 000 ha of individual freehold title and 320 000 ha of Trust farms in 1976), and lists some relevant features of this communal system. He finds that:

"Land is held by the group, and political authority within the group (at various levels) includes the control and allocation of land.

In principle a married kraal-head is entitled to a residential site, arable fields -- one for each wife -- grazing rights on common pastures, rights to the use of various common resources such as water, fuel, building materials and so on.

Rights to the use of land cannot legally be bought and sold--nor leased and hired.

. . . there is substantial security of tenure of arable land in the normal case, at least during the lifetime of a particular kraal-head."

(Bromberger, 1988, p. 208)¹⁸

Lyster (1988) describes similar results from a research project of three KwaZulu magisterial districts, namely that most farm-households had small (0,5 - 1,5 ha) land units, and saw their land-right as belonging to the tribal authority. These households also feared that their land would be reallocated if they did not use it. Lyster also found that the existing tenure system prevented any substantial increases in scale of production, and resulted in a poorly developed land market. Regarding agricultural production of these small land-holdings, Lyster found that very few farms achieved self-sufficiency, and any surplus was mostly sold locally.

¹⁷ Land reform must play a major part of any negotiation process for a new South Africa. The ANC policy guidelines for a democratic South Africa (1992) is clear on this, but it is not the place of this thesis to examine likely scenarios or outcomes. Implications for the timber industry are, however, highlighted in Chapter 6.

¹⁸ Cross (1991) discusses communal tenure in KwaZulu, as does Cousins (1992) in Zimbabwe; however, this study is confined to a project which plants trees almost exclusively on individual land-rights, and the implications of growing trees on communal land are not covered.

As Bromberger (1988, p. 207) says, land tenure reform in that it considers prospects for KwaZulu "must be controversial and political -- in the most profound sense." In a broader context, Marcus (1991, p. 27) states that "Land reform is a complex but fundamental issue. Just as existing landed relations have been the base on which the system of white minority rule has been built, so the success of the struggle for national democracy hinges on their significant transformation."

2.3.4 Implications for commercial woodlots

South Africa is undergoing a radical transformation in terms of rural land that will affect ownership, control, migration, access and use. The complexities and implications of the existing situation are barely understood, and it is likely that a just and equitable solution to land reform will take considerable time to formulate and implement.

A land use system such as commercial woodlots is affected by, and will affect the local land tenure arrangements in specific areas. It will be difficult fully to understand and analyse the situation until general land reform has taken place in South Africa, and commercial woodlots have been practised for some time. However, where appropriate, the dynamics of land reform and a specific land use such as woodlots will be discussed in Chapter 6, which draws conclusions from this research.

2.4 MONDI'S KHULANATHI INITIATIVE

2.4.1 Description of the Khulanathi areas

Khulanathi operates in nine areas of Northern KwaZulu, from Amatikulu (near Gingingdlovu) in the south, to Mbazwana (near Sodwana Bay) in the north (see Figure 1.1). The programme was initiated by Mondi in 1989, although Khulanathi also took over the management of the (historically older) woodlot programme at Biyela through internal rationalization.

By the end of September 1993 there were a total of 1 396 woodlots in the Khulanathi programme, with an area covering 1 875,4 ha. The average woodlot size is therefore 1,3 ha.

Khulanathi's basic management philosophy has always been strictly commercial, and the regional manager, H.C. Kewley,¹⁹ has always insisted on only the best possible sites, as regards tree growth potential, for the establishment of woodlots. Seven of these eight areas fall along the Zululand coast, and a brief description of each area follows. The numbers of woodlots and areas given are as at the end of September 1993.

2.4.1.1 Biyela

The Biyela Integrated Rural Development Programme (located between Eshowe and Melmoth and falling within the Entembeni and Obuka Tribal Authorities) was initiated in 1981 by the University of Natal, Pietermaritzburg's Institute of Natural Resources (INR). The primary objective of the programme is:

"the design and evaluation of appropriate systems of development which enable optimum and sustainable land-use and which encourages [sic] local people to move away from subsistence agriculture and the communal grazing system." (Institute of Natural Resources, 1989, p. 8).

Timber was seen as an appropriate land use alternative on the steep land in the area which is covered by unproductive Ngongoni veld, but which has an adequate mean annual rainfall (between 800 mm and 900 mm) for timber production. Better sites (in this case flatter, with less than a 12 degree slope) were earmarked for agricultural production (Pote, 1993, pers. comm.).

Three demonstration timber plots were established in 1982 on communal land under the local Tribal Authority, but woodlots on individual land-rights began in earnest in 1987 after the INR had coordinated discussions between local organizations, aspirant growers, the KwaZulu Department of Agriculture and Forestry and Natal Tanning Extract Company Ltd (NTE). By the end of 1989, approximately 86 growers had planted 143 ha (INR, 1989). Although the initial involvement of NTE was strictly business oriented and limited to the provision of technical advice and loan finance, this business orientation was constrained by restricting timber production to the steeper and therefore more difficult sites. Steep sites, however,

¹⁹ Prior to his promotion to 'Regional manager, Zululand' during 1993, Kewley was 'KwaZulu Manager', a position now filled by J.B. Boake. Kewley, however, still retains overall responsibility for Khulanathi.

mean that mechanical site preparation is not possible, and harvesting²⁰ will necessitate the establishment of access roads, an expensive undertaking considered prohibitive to Mondi in light of the likely timber production in the area (Boake, 1993, pers. comm.).

The harvesting question is often raised at growers' meetings (which have always received much attention by INR staff and are consequently well established) by growers who feel that their plots might not be harvested at the appropriate time. According to Pote (1993, pers. comm.), there was an undertaking by KwaZulu Department of Agriculture (KDA) to establish these roads in due course, but this issue is still being negotiated and will depend on available funds and other priorities of the KDA.

Since the takeover of the Biyela area by Khulanathi, Mondi personnel have concentrated on better timber sites, which generally means flatter rather than steeper, and have emphasised a preference for certain soil types.

2.4.1.2 Amatikulu

South of Mtunzini but north of the Tugela river (see area 7 in Figure 1.1), Amatikulu is the most southerly area. Planting began in 1991, and by the end of September 1993 there were 79 woodlots covering 73 ha. Many of the farmers in this area have been, or are currently part of the Small Cane Growers' Scheme, which assists farmers to grow sugar-cane for Tongaat Hullett's Amatikulu Mill. According to Wiseman (1993, pers. comm.), small growers have been producing sugar-cane in this area since at least 1925; further discussion of small growers in sugar-cane production is provided in Chapter 3.

2.4.1.3 Esikhaweni and Ngoye

South of Richards Bay, Esikhaweni and Ngoye (areas 5 and 6 in Figure 1.1) were previously considered one area (Esikhaweni only), but have recently been split into two, with Ngoye lying to the west of the N3 national road. Many of the residents work in Empangeni and Richards Bay, and are daily commuters. This has caused some problems in terms of timber production as many of the plots are not well looked after, and weed and grass competition limit tree growth. Generally the reason given is that the grower is away at work and does not have time to work in the

²⁰ Harvesting and transportation of timber to the mill or depot are by far the most expensive operations of producing timber. (Analysis provided in Appendix I.)

woodlot. Nevertheless, there has been a great deal of enthusiasm for the project, and at the end of September 1993 there were 118 and 158 growers with woodlots covering 116 ha and 158 ha in Esikhaweni and Ngoye respectively.²¹

2.4.1.4 Mbonambi

North of Richards Bay lies Mbonambi (area 4 in Figure 1.1). Much of this area (like Sokhulu which lies to the north) is forested on an independent basis, and has been so for at least 20 to 30 years. It is noteworthy that this afforestation came about without the assistance of a forestry company or government or non-government organization (NGO), apart from seedlings made available from KwaZulu's Forestry Department at a nominal charge. During the course of the fieldwork for this study, growers in the area revealed that they originally began to grow trees in order to secure their land tenure amidst fears that the government would expropriate their land.

Mondi's objective here has been to purchase mature timber (Richards Bay mill being the closest large market) and to encourage existing growers to join the Khulanathi programme once they fell their trees. Many of the existing woodlots have been cut and coppiced several times, and far greater yields could be achieved by replanting, particularly if suitable clonal eucalypts were used and better silvicultural methods followed.²² Mondi's KwaZulu manager, Boake, estimates that average yields are currently 10-15 tons/ha/year, and could virtually double to 20-25 tons/ha/year on the same sites (Boake, 1993, pers. comm.).

Political unrest in the area has made extension work extremely difficult and dangerous for Khulanathi personnel, and as a result of violence during 1991 the Khulanathi programme only began in this area in 1992. However, since then the programme has developed rapidly, and by the end of September 1993 there were 155 woodlots covering 311 ha, besides an estimated 1 000 farmers with more than 1 000 ha growing trees without assistance. Mondi is also planning to establish a

²¹ Both of these areas were considered to be inaccessible for interviews as part of this study due to political unrest; this issue is discussed in Chapter 4 in terms of constraints to the fieldwork. Khulanathi staff have only very recently (September/October 1993) facilitated the establishment of a growers' committee in Esikhaweni, and believe that this will result in easier access into these areas in future (Khosa, 1993, pers. comm.).

²² Growers in the area acknowledge that one of their problems is cutting the trees too soon, whereas having joined Khulanathi, they will be obliged to resist until Mondi gives the word that the trees are ready.

weighbridge (similar to the one described below which operates at Sokhulu) in this area in order to purchase the mature timber (Boake, 1993, pers. comm.).

2.4.1.5 Sokhulu

South of the Mfolozi river and north of Mbonambi, Sokhulu (area 3 in Figure 1.1), like Mbonambi, has been largely afforested for many years. In 1991 Mondi established a weighbridge in the area in order to purchase timber coming out of it. The timber had previously been sold to Sappi's Penicuik weighbridge, and then supplied by Sappi to Mondi's Richards Bay mill or to Sappi's own Mandini mill. Mondi has attempted to secure this supply for itself by establishing its weighbridge 5 km closer to the trees than the Penicuik weighbridge.²³ At present (September 1993) Mondi pays R80/ton for timber bought at the weighbridge, of which one rand is paid into a tribal levy.²⁴ Sappi, however, pays cash at the time of purchase whereas Mondi pays out in the form of weekly cheques; this can be an important factor for the suppliers who must pay their workers.

The weighbridge has proved successful; during 1992 Mondi purchased 60 000 tons of timber and paid out more than R4 500 000²⁵ to local suppliers. At the end of September 1993, there were 98 Khulanathi woodlots in Sokhulu covering 214 ha.

2.4.1.6 Mfekayi

North of Mtubatuba and west of Lake St. Lucia, Mfekayi²⁶ (area 2 in Figure 1.1) is considered Khulanathi's most successful woodlot area, with 541 woodlots covering 511 ha at the end of September 1993. The success is attributed by the KwaZulu manager and the extension forester to three main factors (Boake, Mazebuko, pers. comm., 1993).

First, the existing tribal structure under Inkosi Mkhwanazi is particularly stable. The Inkosi has also encouraged woodlot development, although according to Cairns

²³ Apparently the strategy has worked, as harvesting contractors interviewed in the area give "closeness to the weighbridge" as a reason for selling to Mondi.

²⁴ The levy is controlled by the local Tribal Authority and is to be spent on 'community projects'. As yet, however, the money has not been spent.

²⁵ R1 = approximately U.S.\$0,30 (as of September 1993).

²⁶ Mfekayi is just one of the wards of the Mpokonyoni Tribal Authority, but the name is used by Mondi to cover the whole area where Khulanathi operates.

(1993), at times he has pushed woodlots too much. However this development is not restricted to those friends and relatives currently in favour with the Inkosi (the accusation made, for instance at Mbazwana); rather, the distribution of land is largely seen as fair and equitable.

Second, the Mfekayi area has escaped much of the political unrest experienced in other areas where Khulanathi operates. The reasons for this are unclear, but are partly due to the rural location of the area (distance from towns). At the same time it may be that the area is an entrenched Inkatha (the Zulu political party) stronghold, and the African National Congress (ANC) (the numerically superior political party in South Africa), which in other areas is making inroads into Zulu areas amidst extreme violence, has decided to leave it alone for the meantime. At any rate it is peaceful, and this has been conducive to the woodlot programme.

Third, it is evident from the surveys carried out for this study that there are more residents in the area, and far fewer commuters than in other areas such as Mbonambi or Esikhaweni, which are within easy commuting distance of Richards Bay. Many permanent residents means that woodlot owners are more likely to look after the trees personally, and this is clearly evident from a forestry perspective when these areas are compared.

Finally, there are few land-use opportunities in Mfekayi; the most common alternative (revealed through this study) being handcrafts which are sold on the national road passing through the area. Many residents, however, work on neighbouring timber plantations, and it may be that this has resulted in acceptance for the idea of growing trees.

2.4.1.7 Mbazwana

The Mbazwana area lies in Maputaland, which comprises the Ngwavuma and Ubombo magisterial districts of KwaZulu (Mountain, 1990). Mondi's initial interest in Maputaland dates back to 1969 when F.S. Laughton investigated the forestry potential on behalf of Mondi. During the 1980s the decision to build the pulp mill at Richards Bay revived interest, and between 1982 and 1984 negotiations were initiated by R.P.C. Keet between Mondi and the KwaZulu Department of Agriculture and Forestry, but were not finalized. In 1986 H.C. Kewley again raised the issue with an internal afforestation proposal, but it was only with the formation of Khulanathi in 1989 that research and investigation began in earnest, due in part to

the belief that Maputaland could potentially make up 50% of the total area under commercial woodlots (Kewley, 1993, pers. comm.).

Mondi's initiative in Maputaland coincided at this time with work being done by the Institute of Natural Resources (INR). Acting as the development agent for the Siyazisiza Trust the INR began an initial three-year project in 1989 called the Maputaland Integrated Rural Development Project. As part of this project, forestry was seen as a potentially important cash-generator for the region, and the INR approached Mondi to co-operate on a commercial woodlot project.

After a series of joint (INR and Mondi) meetings with interested members of local communities and the various Tribal Authorities of the area in May 1990, Mondi was given the go-ahead to establish 100 ha of trials in Maputaland. These were established at Manguzi (near Kosi Bay), south of that at Manzengwenya, and further south at Mbazwana. The overall success of these plantings, together with the perceived general support from the local people was encouraging, and Mondi decided to proceed with the Khulanathi project in Maputaland, but limiting planting to the Mbazwana area (area 1 in Figure 1.1) given the distance from the mill (150 km from Mbazwana) which was seen as the maximum distance at which timber could be economically grown.

The unique environmental assets of Maputaland, including Sodwana Bay State Forest, Lake Sibaya and Kosi Bay, combine to make the region extremely sensitive to both external and internal pressure. During discussions with the INR and KwaZulu officials, it became apparent to Mondi that in order to proceed at Mbazwana in an environmentally responsible manner, an Environmental Evaluation would need to be done (Kewley, 1993, pers. comm.). Mondi commissioned the INR to proceed with such a study in mid-1990, and it was completed by July 1991. The study investigated both the biophysical and socio-economic issues associated with large and small-scale afforestation in the Mbazwana area, and the findings indicated that commercial woodlots could be an appropriate land-use for the area if implemented in a socially and environmentally sensitive manner (Mander, 1991).

The KwaZulu cabinet resolution that followed the results of the Environmental Evaluation allowed for the planting of 500 ha per year to a maximum of 5 000 ha, with monitoring of the position of these woodlots (away from sensitive areas) by the KwaZulu Bureau of Natural Resources and the KwaZulu Department of Agriculture and Forestry.

Planting proceeded, and by the end of 1991 a total of 273 ha had been planted. During November and December of 1991, however, the local youth systematically destroyed all but 8 ha of woodlots.²⁷ Through public meetings and investigation by local Khulanathi and INR fieldworkers, the main causes were seen to be:

- (1) An unfair allocation of land by the tribal authorities, favouring themselves and their associates;²⁸
- (2) A feeling among the youth that their inheritance was being taken from them by Mondi;
- (3) A lack of communication between Mondi and the local people, in particular communication with the youth; and
- (4) A breakdown in the traditional authority structure, which culminated in the death of the Inkosi in March 1992 (Boake, 1993, pers. comm.; Louw, 1993, pers. comm.).

The unrest was not aimed only at Mondi; the Tribal Game Reserve established on the south-western corner of Lake Sibaya had some of the fencing pulled down at the same time as the woodlots were being destroyed, ostensibly for the same reasons. Local people have also felt pressure (including removals from traditional homesteads) at various times through the actions of the Natal Parks Board and the KwaZulu Bureau of Natural Resources. The KwaZulu Department of Agriculture and Forestry (responsible for 19 000 ha of plantations in Maputaland) has also reported threats made to local staff around Mbazwana.

The social issues are not yet resolved, but the emergence in 1992 of a Mbazwana Development Organization made up of local people for the purpose of controlling development in the area appears to be the right forum for commercial woodlots to be discussed (Louw, 1993, pers. comm.). Mondi has adopted a wait-and-see position, although the current economic recession and slow-down in planting makes it unlikely

²⁷ Some of the woodlots which were cut almost at ground level have coppiced (sent up new shoots) and recovered; at the end of September 1993 there were 30 woodlots comprising 78 ha.

²⁸ Because there were more applicants for woodlots than Khulanathi staff could deal with, a list was drawn up by the growers' committee of the order in which planting should proceed. This list proved to be the cause of much unhappiness among people whose names did not appear.

that Mondi will return to Mbazwana in the near future. At 150 km, the area is not as economically attractive as are areas closer to Richards Bay mill, and it would take an expansion at the mill (with subsequent increased demand) for Mondi to look seriously at Mbazwana again (Kewley, 1993, pers. comm.).

2.4.1.8 Nkandla

Approximately 30 - 40 km inland of Biyela is the Nkandla district (area 9 in Figure 1.1). Khulanathi came into the area when approached by M. Rose of the Siyazisiza Trust in 1990. A large area (155 ha) was planted for Nkosi Mpungose in 1990, followed by other relatively large plots (10 ha - 20 ha). The problems with these areas (extensive fire and cattle damage) have led Khulanathi management to the decision that large areas in general are not a good idea.²⁹ Kewley (1993, pers. comm.) has said that Nkandla is a good example of how not to grow woodlots. It appears to be a question of ownership and responsibility; Mondi does not own or manage the areas under trees, and larger areas require good management and organization if they are going to be successful. Extensive firebreaks are needed, as well as well-coordinated weed-control programmes to reduce competition. Larger areas are also likely to be prohibitively expensive to fence or otherwise protect from cattle damage. It is Khulanathi's experience that woodlots are only successful under individual ownership³⁰ and management (Boake, 1993, pers. comm.).

In September 1993 there were 21 woodlots in the Nkandla area covering 87 ha (i.e. 4,2 ha/woodlot, by far the largest average size in Khulanathi). Mondi will not promote any further woodlots in the area, but will merely maintain these existing woodlots (Boake, 1993, pers. comm.).

2.4.2 Silvicultural considerations

In forestry terms, the timber production potential is greater along the coast than it is inland at Biyela and Nkandla, and Khulanathi is able to make use of the intensive technical research being carried out on the commercial plantations run by Mondi and other forestry companies in the coastal region. Mondi's clonal eucalypt programme is also available to these woodlot farmers, as the planting material used

²⁹ Bowing to pressure from an outside party (M. Rose is in Johannesburg) with some 'connection' to the local Inkosi, also makes a mockery of any attempt at a participatory development process.

³⁰ As explained previously, land cannot be owned by individuals; rather land-use is granted by the Tribal Authority. The trees, however, are owned by the individuals.

in the coastal woodlots is from **Mondi's** clonal nursery at Kwambonambi. The use of sophisticated technology in rural woodlots raises the question of technical dependence, and this issue is addressed in Chapter 6.

2.4.3 Choice of areas for woodlots

A distinction needs to be made as to how exactly the nine areas described above came to be targeted for inclusion in the Khulanathi programme. As described above, in the case of Biyela, Khulanathi essentially inherited the timber portion of the greater Biyela project from NTE, which was already in a working relationship with the INR. The only other inland area (Nkandla) was the result of an approach to Mondi by an outside party. The seven coastal areas were initially identified by Khulanathi management in an overall analysis of timber potential in KwaZulu. This analysis took place at the time when Mondi was purchasing farms for timber production in neighbouring Natal (1986 to 1989), and therefore had a good idea of the production potential of each area. The distance to the Richards Bay mill also played an important role in terms of minimizing transportation costs of a high mass, high bulk raw material, and 100 km was seen as the maximum feasible distance, although an exception was made in terms of Mbazwana (150 km) because of the area's considerable potential (Boake, 1993, pers. comm.).

It should also be noted that not all the areas came into the programme at the same time. Biyela started in 1987, followed by Mfekayi in 1989, Mbazwana, Nkandla and Sokhulu in 1990, Amatikulu, Esikhaweni and Ngoye in 1991, and Mbonambi in 1992.

As discussed above, in the case of Sokhulu and Mbonambi commercial woodlots were an existing land use that had been practiced at least since 1968, and probably longer. In these two areas Khulanathi initially acted more as a timber sales agent than as an extension agent (Boake, 1993, pers. comm.).

Mondi believes that far greater success (in terms of woodlots well-established and having a greater potential to yield an economic harvest) will be achieved with individual growers establishing no more than two hectares per year, than could be achieved with larger areas (Boake, 1993, pers. comm.).

2.4.4 Process of establishing woodlots

Once Mondi has made itself known in a specific area through meetings held with the Tribal Authority as well as more general public meetings, the company essentially

waits for an approach from a farmer (or group of farmers) rather than actively going out to solicit new growers. Usually, however, at either the Tribal Authority meeting or the public meeting, certain individuals will make themselves known to the extension forester as being interested in joining the programme. And because the process of site preparation and planting is relatively slow (two weeks from start of site preparation to completion of planting), and quite visible to neighbours and passers-by, by the time the first few woodlots are established in an area, other farmers have come forward wishing to join the programme. Certainly during the first four years (late 1989 to late 1993), there has been no shortage of willing participants (Boake, 1993, pers. comm.).

The method by which an individual becomes a part of the Khulanathi programme is described below.

- (1) A potential grower approaches a Mondi extension forester and expresses interest in establishing a commercial woodlot.
- (2) The forester goes out with the farmer to see if the site is suitable for growing trees, assessing such factors as soil, rainfall, slope, size of the area, and general geographic location. Initially, Mondi set a lower limit of 1 000 'spots' (i.e. planting spots for individual trees) which means that a site must be at least 0,6 ha given that the espacement is 2,5m x 2,5m,³¹ or 1 600 plants per ha. During the 1992 planting season, however, Mondi reviewed this figure and made the lower limit 500 spots.
- (3) If the area is seen to be suitable, the forester will explain the operations that will need to be done on that particular site (land clearing, ploughing, etc) and the correct timing for each operation. Each farmer must first have the approval of the local induna, as well as that of the Nkosi before any work can take place.³² The local KwaZulu Agricultural Extension officer is also notified of planting

³¹ This espacement (distance between the trees) has been kept by Khulanathi despite a more common 2,5m x 3,0m because payments are made per 1 000 spots, and Boake (1993, pers. comm.) feels that different payment rates could result in confusion among growers.

³² KwaZulu is not subject to the same laws as South Africa where new afforestation is subject to a planting permit issued by the Department of Water Affairs and Forestry. This issue was raised during the Environmental Evaluation of Mbazwana, during which the KwaZulu Bureau of Natural Resources expressed particular concern about trees being planted close to water sources. These (and other environmental issues) are discussed in Chapters 5 and 6.

progress and objectives. A contract is then signed by the grower and by Mondi confirming the legal arrangement that exists between both parties. This contract is discussed in the following section.

- (4) The contract makes provision for an advance to be paid by Mondi to the grower after he or she successfully completes each operation. For example, once the grower has cleared the land, Mondi will pay a tariff amount for that operation. (These operations and the amounts paid for each are shown in the Table 2.1). The grower can keep this money, hire local people to do the work, or have Mondi arrange for a local contractor. Mondi believes it likely that an informal service sector will build up over time to offer these services to growers who do not wish to perform the operations themselves. Mondi also contends that this system either offers immediate employment (and consequently income) to the grower or his/her family, or to a local contractor.³³
- (5) The money paid to the grower for each operation is essentially a loan advanced against the value of the final harvest. Simple interest is charged at 10%, and the amounts advanced, together with the interest, are deducted from the final payment made to the grower at the time of harvest. It is estimated that the total loan repayment will be less than 20% of the final value of the crop. (See the economic analysis in Appendix I.)
- (6) Given the relatively long-term nature of forestry (six to eight year rotations in KwaZulu), it is also possible for the grower to take an additional annual advance against the final value of the crop. In the contract the grower agrees to sell the timber, and Mondi agrees to buy, at the current mill price.

Mondi maintains that an advantage of commercial eucalypt timber production is that once the trees are well established and canopy closure has occurred (generally after the first year), there is little work involved in maintaining growth. All that is required is to ensure that there are adequate fire-breaks around the woodlots (Boake, pers. comm., 1993).

In the following table (2.1) it can be seen that mechanical operations are generally more expensive. Clones are considerably more expensive than seedlings (which are given away free), but Mondi believes that the cost is justified through the growth rates that can be achieved.

³³ The issues of contractors and employment opportunities are discussed further in Chapters 5 and 6.

Besides the mechanical operations, fertilizer can be expensive, although the most expensive (Agrofert at R750/ha) is only rarely applied and then only in small 'troublesome' areas (Boake, 1993, pers. comm.). The normal application costs R88/ha, but in the Mfekayi area the cost is R176/ha.

These rates have been used in the analysis of a 'typical' grower which is presented in Appendix I.

| <u>OPERATION</u> | <u>RATE (Rands/ha)</u> |
|--|------------------------|
| Burning to clear old plantation | 80 |
| Burning to clear grass | 17 |
| Land clearing - bush | 56 |
| Line, pit & mark - inland | 192 |
| Soil prep. - plough and 2 discings | 440 |
| Marking | 24 |
| Pitting | 24 |
| Planting | 56 |
| Blanking ³⁴ | 56 |
| Watering - labour | 35 |
| Watering - tractor cost | 112 |
| Weeding - manual (each time) | 72 |
| Kill stumps - manual | 32 |
| Coppice - first reduction | 48 |
| Coppice - second reduction | 64 |
| Coppice - third reduction | 80 |
| Brashing ³⁵ | 21 |
| Cost of clones | 288 |
| Cost of fertilizer | 88 |
| Fertilizing - labour | 35 |
| Annual advance | 96 |
| Fire protection - first year | 53 |
| Fire protection - annual | 35 |

Table 2.1: Summary of advances paid for work performed.

³⁴ Blanking is the replacement of trees that do not survive with new trees, normally within one to two months after planting.

³⁵ Brashing is knocking dead branches off the stem.

2.4.5 The Khulanathi contract

NTE Ltd. originally drew up a contract for the woodlot programme which began at Biyela in conjunction with the INR.

This contract has since been the subject of intense debate and scrutiny between Mondi and certain outside parties, namely the INR and the Community Law Centre (CLC), both of which are affiliated to the University of Natal. Some of the criticisms raised are that the contract favours Mondi over the growers – an allegation readily admitted to by the company which explains that the contract was originally drawn up by its (urban-based, rather than rural-based/experienced) lawyers to protect the company's best interests. Mondi has since made several revisions to the contract, in response to issues raised by the growers and by the CLC (for example, to deal with the question of death of a grower and inheritance, and to remove the clause stating that Mondi has rights not only to the first crop but also to all subsequent crops).

In particular, the CLC has questioned the process through which the contract was implemented; they believe that the contract should have been negotiated between both parties (Mondi and the growers) before any grower was obliged to sign (Baekey, 1993, pers. comm.). Mondi, on the other hand, believes that this would be impractical given the rate at which new growers join the programme (approximately 30 growers per month from the start of the programme at the end of 1989, to the end of September 1993). Mondi also believes that a fair contract does not need to be negotiated every time it is used (Kewley, 1993, pers. comm.).

The CLC believes that a well negotiated contract drawn up and implemented with the assistance of the growers themselves will go a long way toward avoiding problems in the future (Baekey, 1993, pers. comm.). Mondi argues that the arrangement is both long-term and business-orientated, and only if the growers are satisfied with the relationship established between the two parties will they continue in the programme once the first crop is harvested. Kewley points out that for Khulanathi, timber production is a long-term proposition continuing indefinitely over several crops (1993, pers. comm.).

The whole question of relationships is used by both sides in arguing over the contract. The CLC believes that to establish a working relationship based on trust and mutual satisfaction, the contract needs to be negotiated before being implemented (Baekey, 1993, pers. comm.). Mondi believes that it is involved in an ongoing process of building relationships and trust; to this end Khulanathi is assisting in the establishment of growers' committees in each area where it operates, and

believes that these provide a forum in which issues can be raised and discussed by both parties.

The questions raised over the legal contract are not fully resolved, and will probably be discussed and argued for some time to come. Mondi's latest revision to the contract incorporating CLC criticism, at least to the extent that Mondi believes it appropriate, was in August 1993, and is currently being translated into Zulu. Khulanathi staff are hopeful that Mondi executives will allow the Zulu version to become the legal and binding contract.

In 1991, as a result of what was seen as an urgent need to understand the issues surrounding small timber growers in KwaZulu, the CLC proposed a study that would attempt to "formulate a model for legal rights empowerment of rural communities" (Community Law Centre, 1991, p.3). The study was to be undertaken with growers in the Biyela area, but unfortunately Mondi did not feel it necessary to support the proposal and the concept was subsequently abandoned.

2.5 CONCLUSION

Mondi's Khulanathi project was initiated in 1989 and has grown considerably since then in eight areas of northern KwaZulu. As at the end of September 1993 there were a total of 1 396 woodlots covering 1 875,4 ha.

The programme arose from the perceived demand for pulpwood which, despite suffering set-backs over the last two to three years, remains firm. Khulanathi operates, however, in a complex environment, and as such is likely to be affected by any land reform in the area that arises from South Africa's political transformation.

Khulanathi's basic concept is that Mondi provides the plants, management, financial and technical inputs in return for a guaranteed market, while the farmers provide the land and often the labour.

The programme was initiated by a commercial timber company, Mondi Paper Company, Ltd., and functions along strictly commercial lines, bound by a contract drawn up by the company. It is evident that there was little involvement in the formulation of the programme by the farmers who actually grow the trees. The implications of this strategy and the perceptions and concerns of the growers themselves are the basis for this study and are presented in subsequent chapters.

CHAPTER 3 THEORETICAL FRAMEWORK AND PRIOR RESEARCH

3.1 INTRODUCTION

The purpose of this thesis is to examine the commercial Eucalyptus woodlots being promoted in northern KwaZulu by a commercial timber company (Mondi), and to consider their potential for rural development and the impacts that they have on the people of the region where they are being promoted.

In order to fulfil this purpose, this chapter first considers and defines the concept of rural development. To arrive at a satisfactory definition also requires definition and analysis of related terms, including growth, equity, opportunity cost and sustainability, most of which are often referred to in the development and social forestry literature without ever being defined. To fulfil the second part of the stated purpose, this chapter then considers economic, social and environmental impacts, particularly the available methods of determining and measuring these impacts.

Following sections consider the research and available evidence related to the questions about commercial woodlots raised above. Because the emphasis of these woodlots is commercial it is first necessary to consider the commercial forestry research currently being conducted in South Africa. The woodlots, however, are small-scale and are grown by peasant farmers, criteria that are normally associated with social forestry. Analysis and definition of social forestry are therefore required to determine whether or not the Khulanathi woodlots can truly be considered in social forestry terms.

Analysis shows that these woodlots are far closer to what is called 'contract farming' and thus a brief analysis of this system of farming is presented, as well as analysis of one other form of contract farming practised in KwaZulu, namely small-scale sugar-cane production.

Finally, this chapter briefly considers the controversy surrounding the planting of eucalypts, particularly in rural areas.

3.2 RURAL DEVELOPMENT

3.2.1 Definition

A clear and concise definition of development is difficult, if not impossible to find in the literature. As Lele (1991, p. 609) states, "Theorists and practitioners have both been grappling with the word and the concept for at least the past four decades."

There are a number of general definitions of development in common use in the literature. Salmen (1987, p. 72) defines development as "a process that induces people to change their lives for the better." Salmen captures two critical elements, namely that development is a process, and should be brought about by the people themselves. Bartelmus (1986) captures the first but not the second in his definition. He states that "development is generally accepted to be a process that attempts to improve the living conditions of people." Most also agree that the improvement of living conditions relates to non-material wants as well as to physical requirements.³⁶ Other authors, such as Loehr and Powelson (1981, iii) miss both of these elements, but introduce a third, namely equality, in their definition; "sustained material well-being, which can occur only with distributions tending toward equality." While their motives may be good, their definition is not. Far more appropriate would have been equal opportunity, rather than equal distribution.

Lele (1991, p. 609) sums up the debate when he says: "Some equate development with GNP growth, others include any number of socially desirable phenomena in their conceptualization." He goes on to point out, however, that development is a "process of directed change", and a distinction needs to be made between the objectives of this process, and the means of achieving these objectives.

For the purposes of this thesis, the following definition combines elements of Salmen (1987) and Lele (1991) has been derived, namely that rural development is a process of change directed by rural people toward socially, ecologically and economically sustainable objectives they have chosen for themselves, in a manner that is acceptable to them. (The concept of sustainability has been included in this definition, but not yet defined; this is done in a following section.)

³⁶ Bartelmus (1986) lists some of these "wants" or social objectives: affection; recreation and entertainment; education; human freedoms (security); shelter; aesthetic and cultural values; political equity; health; physiological needs and future quality of life. (He does point out, however, that subjective value judgements make such a list somewhat arbitrary.)

3.2.2 Neo-classical economics

Because economic terms and concepts still dominate much of the development literature, a brief review of some of the relevant economic concepts is necessary to show the origin of the terms and to provide some conceptual framework for their use.³⁷

Arndt (1981) provides a semantic and conceptual history of economic development in which he draws a useful distinction between the German theorists (Marx and Schumpeter) and the British colonialists (e.g. Lord Milner). The Germans saw economic development as an historical process that happened without any conscious help, in which society or the system developed, while the British viewed economic development as a result of policy intervention, and believed that natural resources ought to be developed to achieve a particular policy.³⁸

3.2.2.1 Growth

Neo-classical economics was originally concerned with economic growth rather than development per se. Economic growth, in turn, was defined as an increase in gross national product (GNP) (Myrdal, 1973). From this basic concept, 'growth models' developed as a means of explaining and ordering economic growth. The original models (from which a number of contemporary models have been derived) are those of Harrod and Domar, who, during the same period (1939 and 1946 respectively), produced similar models. The basic concept is that growth depends on capital created by investment, and savings (of individuals and firms) make this investment possible (Gillis, et al., 1983).

However, in the 1960s it became obvious that while GNP per capita had risen in many poor countries (in the period after World War II), living conditions had deteriorated for many segments of the population. The perceived failures of the orthodox approach were summarised as follows: unemployment rose despite high growth rates; income distribution became more unequal; and absolute poverty (in terms of the ability of people to meet their basic needs) increased (Seers, 1977a; Weaver and Jameson, 1981.)

³⁷ It is worth noting from the start that the term 'development' appears to have evolved from 'economic development', although many authors confuse the two or use the terms interchangeably.

³⁸ The British colonialists viewed development as quite distinct from welfare (Arndt, 1981).

3.2.2.2 Development

The doubts that began to surface during the 1960s, did not, according to Seers (1977b), cause the demise of this basically neo-classical paradigm (whereby development could be measured by GNP). The reasons he gives are still valid in places today, namely that: it provides aid agencies with an "objective" basis for project evaluation; it is acceptable to governments who want to "slur over internal ethnic or social problems"; and it offers a basis for aid policies to inhibit the spread of communism (today we might refer to unacceptable forms of government in one form or another) (Seers, 1977b, p. 3).

Writing at about the same time (1979), Flammang provides a useful summary of the ideas of this period, and particularly of the confusion surrounding 'growth' and 'development'. He argues that economic growth implies increase, or more of the same, while economic development is a process of structural change, implying something different and not necessarily more. He states that economic growth is quantitative whereas development is qualitative. Flammang provides the bridge from 'economic development' to a more encompassing 'development' by noting that structural change emphasises that development is social and political as well as economic.

Flammang's description encompasses the concepts adopted in the definition derived earlier for the purpose of this thesis, namely that development is a process of change, and can (if so desired by the participants of the process) be far more than merely economic.

3.2.2.3 Distribution and equity

One of the perceived problems associated with economic growth as opposed to economic development was that a policy emphasising growth led to an aggravation of unequal income distribution, which in turn led to increased poverty. Further models were developed to examine this phenomenon, two of which are the Lorenz curve and the Gini coefficient. The Gini coefficient is an index, while the Lorenz curve makes use of income percentiles to show (graphically) the degree of equality; for example in Kenya, that the top 20% of the population receive 68% of the income (Weaver and Jameson, 1981).

Merely explaining income distribution, however, did not resolve fundamental questions of equity, and Weaver and Jameson (1981) were among others who realized that growth of a developing economy did not necessarily mean that poverty would be alleviated. Various alternatives were proposed to attain some sort of

'growth with equity', and Weaver and Jameson describe the following approaches that were seen to be possible: employment generation through small-scale labour-intensive industries, particularly in the informal sector and using appropriate technologies; redirecting investment so that the poor can have access to capital; meeting basic needs; human resource development; agricultural and rural development; and new international economic order. Weaver and Jameson believed the dominant variant at their time of writing (1981) was the basic needs approach; it would appear that 10 or so years later this is still strongly advocated and as such should receive more attention here. These basic needs are seen to include food, potable water, clothing and shelter, medical care, education, participation in decision making, and increased human rights (Streeten *et al.*, 1981; Weaver and Jameson, 1981).³⁹

According to Hicks (1980) there are two main arguments against directly providing for basic needs: Increasing the consumption level of the poor must come at some cost to the net level of investment and saving (therefore reducing the welfare of all); The poor would do better in the long run through higher incomes from greater investment under a traditional growth-oriented strategy (the 'trickle-down' approach). However, Hicks suggests that a basic needs emphasis can actually increase the rate of growth, rather than reduce it (offering evidence that countries with higher life expectancies tend to have higher per capita growth rates).⁴⁰ As Streeten *et al.* (1981, p. 3) suggest; "basic needs is not primarily a welfare concept; improved education and health can make a major contribution to increased productivity."

Glaeser (1984, p. 11) presents another side to the basic needs approach, namely "ecodevelopment" which he defines as "economic development that relies for the most part on indigenous human and natural resources and that strives to satisfy the needs of the population, most of all the basic needs of the poor." It is a poor definition, however, given that it emphasises economic development rather than the more encompassing development, and mentions relying on natural resources without including sustainability of the resource base.

³⁹ Moller (1985, p. 76) in a study of rural blacks in KwaZulu and Lebowa (another homeland area) identified the following categories as "inadequate needs fulfilment": nutrition; water; fuel; health; education; savings and employment.

⁴⁰ du P le Roux (1985, p. 1) argues that within South Africa any strategy aimed at meeting basic needs would have to contend with the difficulty of finding appropriate channels to reach the "really poor". Although written in 1985, the argument still holds today (1993) as it is likely to be some time before representative and acceptable forms of local government are in place.

3.2.2.4 Migration

Two other economic models have bearing on the issues concerning this thesis.⁴¹ Both are generally known as migration models, although the first is more concerned with showing how an agrarian society becomes transformed into an industrial one than with migration *per se*. Fei and Ranis (1964) argue that in a less developed economy, there is a gradual shift of the centre of that economy from the agricultural to the industrial sector as employment and output rises in this sector. At the same time there needs to be an increase in agricultural productivity (resulting in agricultural surplus) that permits a relatively smaller percentage of the population to support the entire economy with food and raw materials. The Harris-Todaro model states that rural-to-urban migration will take place until there is "equality between the actual rural wage and the expected urban wage, which is the actual wage times the probability of being employed" (Corden and Findlay, 1975, p. 59).

These models have two implications for commercial woodlots. First, is agricultural productivity being affected by the woodlots, possibly by diverting resources away from food production? Second, are woodlots providing a sufficiently attractive income to prevent people from migrating toward urban centres?

3.2.2.5 Dependence

Dos Santos (1970) describes the historical basis for three types of dependence that are still prevalent in much of the so-called Third World⁴² today:

- (1) colonial dependence, characterised by trade monopoly in conjunction with an institutionalised monopoly of land, resources and labour;
- (2) financial-industrial dependence, characterised by investment in the production of raw materials and agricultural products in less developed countries for consumption in more developed countries; and
- (3) technological-industrial dependence, based on multi-national corporations which gear their investment so as to take advantage of the internal markets of less developed countries.

⁴¹ As described in Chapter 2, much of rural life in KwaZulu is seriously impacted by the high proportion of migrant workers.

⁴² The term Third World is used in this thesis (rather than Less Developed Country, or the more recently popular 'South') as it still appears to be the most widely used and understood.

Dos Santos notes that in the first two cases, production is determined by demand from the industrialised centers, and is often characterized by rigid specialisation and monoculture.

Commercial woodlots certainly appear to meet some of these criteria; they are controlled financially and technically by a company which is export-market orientated, producing raw material for consumption in more developed areas. Demand is driven from the industrialised centres, and the woodlots are a specialised monoculture. Are the Khulanathi growers technically and financially dependent on Mondi to establish their woodlots, and once harvestable, are they locked into a low-value, export-orientated market?

3.2.2.6 Opportunity cost

A term not always found in the development literature, it does nevertheless apply to the choices made surrounding rural development. As stated by Ellis (1988, p. 37), "the opportunity cost of any resource may be defined as the maximum income that the resource could have obtained in an alternative use." Ellis uses the example of subsistence consumption of farm output, whereby the opportunity cost of on-farm consumption is the income that could have been generated by selling the same amount of output in the market. In the case of commercial woodlots, what do the farmers give up in order to grow trees?

3.2.3 Sustainable development

Most discussion surrounding development, and particularly rural development today, equates development with 'sustainable development' (SD). For obvious reasons this is a vitally important concept for an extensive, land-based industry such as commercial forestry.

The term became popular in the 1980s; in particular, 1980 saw the International Union for the Conservation of Nature and Natural Resources (IUCN) present the World Conservation Strategy (WCS) which had an overall aim of helping to "advance the achievement of sustainable development through the conservation of living resources" (IUCN, 1980, p. IV).

In particular the WCS identified three main objectives of "living resource conservation", namely, "to maintain essential ecological processes and life-support systems"; "to preserve genetic diversity"; and "to ensure the sustainable utilization of species and ecosystems" (particularly fish, wildlife, forests, and grazing land) (IUCN, 1980, p. VI).

One of the most common definitions in use today is that of the Brundtland report, which defines sustainable development as: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 43).⁴³ The report goes on to list the operational objectives of SD. These include reviving growth, meeting basic needs, conserving natural resources and merging environment and economics in decision making. However, as Adams (1990, p. 60) points out, this prescription is based on an economic and not an environmentalist vision, using some of the language of 1970s environmentalism but not the questioning of growth or technology; he says "Our common future hopes to have its cake and eat it."

Lele points out some further problems with the use of the term today. Because a distinction is not made between the the objectives and the means of sustainable development, the term is often interpreted as a process of change that can continue forever, and where development is taken to mean growth in material consumption, this would mean sustaining the growth in material consumption indefinitely. Lele (1991, p. 609) points out that: "At best, it could be argued that growth in the per capita consumption of certain basic goods is necessary in certain regions of the world in the short term."

Lele develops a figure to show the semantics of sustainable development, which is particularly useful for the distinction it shows between social and ecological sustainability. It can be seen that for ecological sustainability there are also social conditions that influence this sustainability, and Lele (1991) uses an example of the marginalization of peasants as a social cause of soil erosion.⁴⁴

Quite distinct from the social aspects of ecological sustainability is social sustainability, which Lele (1991) takes to mean maintaining social values.

⁴³ A term from the forestry industry has similar connotations, namely 'sustained yield', which is generally taken to mean timber production ordered on an annual basis at existing or improved levels. Fri (1991) argues that new technologies will be required for food and fibre production that do not have the environmental consequences of the current ones. In the South African timber industry, the infatuation with improving yields, particularly through technologies such as tree breeding and clonal forestry, does not appear to take sustainability into account, a matter of grave concern to some forestry researchers (Herbert, 1993, pers. comm.)

⁴⁴ A useful conceptualization is provided by Blaikie and Brookfield (1987) in their book Land degradation and society, in which they develop the concept of 'regional political ecology'. The 'regional' aspect is important because it highlights the 'environmental variability' of a specific area of land, whereas the term 'political ecology' encompasses both the concerns of ecology and a broadly defined political economy.

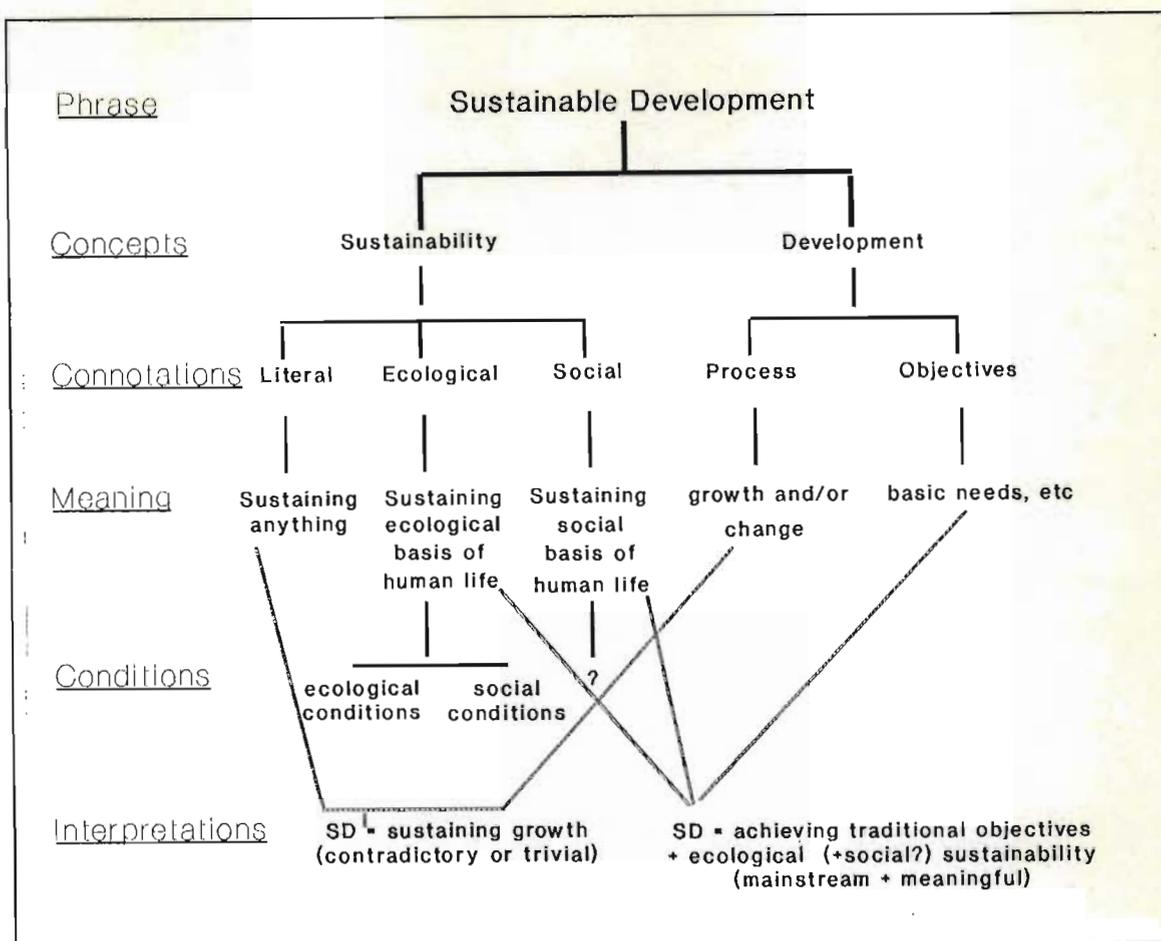


Figure 3.1: The semantics of sustainable development (from Lele, 1991, p. 608).

Bartelmus (1986) points out that many environmental problems in less developed countries are caused by the struggle to overcome extreme conditions of poverty.⁴³ Lele (1991) cautions against assuming, however, that economic growth is absolutely necessary for SD by arguing that the failure of the economic growth approach resulted in the adoption of the basic needs approach in the 1970s.

Lele (1991, p. 618) also expresses the need to make SD "more precise in its conceptual underpinnings", while at the same time allowing more diversity and flexibility in developing SD strategies.

Of particular note to this study of commercial woodlots (in that one of the major recommendations adopted is for greater participation) is Lele's (1991) explanation of how participation as an objective has taken over from the equity and social justice approach. Lele suggests, however, that to assume that any of these three (participation, equity or social justice) will result in ecological sustainability is naive.

⁴³ Bartelmus (1986) goes on to point out, however, that in industrialized countries environmental deterioration is often the result of economic growth.

On the concept of participation, Adams (1990, p. 202) adopts a more political approach, suggesting that sustainable development should be concerned more with who manages the environment rather than the way the environment is managed, i.e. focusing on "the capacity of the poor to exist on their own terms . . . and to direct their own lives." Adams' assessment, however, seems a little naive, appearing as it does to imply that 'the poor' are intrinsically going to be better and more responsible caretakers of the environment than 'the rich'.

3.2.4 Implications for Khulanathi growers

It is clear from the above that any rural development initiative such as the Khulanathi woodlots should mean qualitative change that is chosen and brought about by the rural poor themselves. Such change should not promote dependence or result in harsh opportunity costs for scarce resources, such as land.

If economic growth is a primary objective, then it should not be at the expense of ecological or social sustainability, and it must be recognised that economic growth itself is not sustainable.

3.3 SOCIAL, ECONOMIC AND ENVIRONMENTAL IMPACTS

A private company such as Mondi tends to exhibit the same problematic tendencies as donor or aid agencies do when sponsoring development projects. Blaikie (1985), in arguing for a new paradigm for soil conservation, lists some of these limitations common to foreign aid projects: concentration on producing measurable benefits within three to five years; prediction of quantifiable benefits necessary at proposal stage for purposes of justification; and failure of short-term consultants to perform in-depth analysis of social, political and economic circumstances.

Certainly Mondi's Khulanathi programme has fallen into the same trap of trying to quantify (in as short a time as possible) the benefits to farmers of commercial tree-growing. This study has attempted to avoid that trap, concentrating instead on some of the more difficult (i.e. long-term and less tangible), but no less important impacts of the programme.

However, it is useful to review the literature to consider the ways and means of impact assessment that have been and are still commonly used. It should be noted, however, that this study (and subsequently this review) is concerned with forestry in a so-called 'less-developed' or 'Third World' area, and as such considers only those

methods deemed appropriate. Methodologies used to investigate forestry impacts in the 'First World' (such as regional multipliers used by Reilly (1974) in Australia, or input-output accounts used by Chappelle *et al.* (1986) in the United States) are inappropriate in the present context as they require large amounts of data and sophisticated mathematical modelling.

3.3.1 Economic and financial analyses

In 1979, the Planning and Investment Studies Unit of the United Nation's Food and Agricultural Organization (FAO) Forestry Department produced a publication intended to assist planners to identify, prepare and implement viable and useful forestry development projects (FAO, 1979). The document advocates the need for both a financial and an economic analysis for any potential forestry project. In it, they define a financial analysis as that which considers primarily monetary returns, and an economic analysis as "the return to society as a whole which can be obtained with a given use of its limited resources" (FAO, 1979, p. 11).⁴⁶

The bases for any financial analysis are the physical inputs (purchased and rented) and outputs (traded in the market), their market value at the time of the transaction, and any additional financial transactions (such as taxes and subsidies) needed to arrive at some measure of net value (called Net Present Value/Net Present Worth) (FAO, 1979). The FAO report expands these basic concepts to arrive at the social values required for an economic analysis by including "consumer willingness to pay" (by considering the opportunity costs⁴⁷), and "shadow prices" (for those goods and services where it is felt that the market price does not adequately reflect the economic value) (FAO, 1979, p. 17).

A similar presentation is put forward by the Organisation for Economic Co-operation and Development (OECD), who propose that the Net Present Worth (NPW) and Economic Internal Rate of Return (ERR, but also known as the IRR) should be calculated to measure the economic value of a particular project (OECD,

⁴⁶ The Organisation for Economic Co-operation and Development (OECD, 1986, p. 47) consider the basic question concerning 'economic efficiency' to be this: "Is the value of the benefits greater than the value of the costs of the project, when both are measured as economic values (in monetary terms) and appropriately adjusted to take time into account?" In other words, opportunity cost is the key concept.

⁴⁷ FAO (1979, p. 16) defines opportunity costs as the "best actual opportunity foregone, i.e. the best alternative use of an input that would actually have taken place in the absence of the project."

A local (South African) approach is to use the agricultural concept of 'gross margins' (rands per hectare per year), a method used by Dobson (1990) to compare forestry (pine, wattle and eucalypts) with various forms of agriculture (sugar, dairy, maize, sheep and beef). This method is not appropriate in a study concerned with rural development, however, as it does not take into account any of the broader impacts (such as income distribution, self-sufficiency or skills-development).

3.3.2 Social impacts

The strength of the OECD (1981) approach to evaluating forestry projects lies not so much in its economic technique as in its advocating the examination of both environmental and social effects. The OECD includes in the social effects of forestry projects the following: employment; working conditions; population and community structures; social and cultural conditions; vulnerability; political independence; and individual quality of life. Some of these (like employment opportunity) could well be considered economic effects in a broader categorization; there is more discussion of these and other effects in Chapter 6.

In its discussion of social appraisal, the OECD does begin to acknowledge the more difficult and less easily quantified social effects. The study stresses, for example, the importance of public participation (OECD, 1986), but is still far behind the methods advocated by Cernea (1991), for example, in Putting people first, or Van Gelder and O'Keefe (undated) in The new forester.

In Laarman and Contreras' (1991) analysis of funded forestry projects,⁵¹ they found a severe lack of information concerning social impacts, in part due to insufficient procedures for identifying and measuring such impacts. The scant information they were able to obtain, for effects on employment and income distribution, for example, was not standardized and was too sparse to allow for any estimates of cost per job created. However, in their analysis of the 28 projects, they did find that land scarcity for food crops was not fully appreciated at project appraisal, and that several conflict situations had arisen. Other social problems were the favouring of large landholders over small, and the fact that tree planting used less labour than agricultural production.

Casley and Kumar (1987) consider a critical social impact of rural development projects to be the effects of such projects on women. They suggest that any such analysis should consider the share of inputs and services going to women in relation

⁵¹ The projects were categorised as Africa (13), Asia (10), Europe, Near East and North Africa (4) and Latin America (1).

to the total farming population. They suggest, however, that unless conscious efforts are made during design and implementation, women farmers are unlikely to get their share due to cultural, social and economic barriers.

Lee *et al.* (1984, p. 57), consider three methods for estimating induced social effects, although they qualify this by pointing out that most sociological techniques are theoretically deficient, and not as well developed as economic methods. The first is an "enumerative approach", in which as many social effects as possible are listed with the purpose of examining the linkages to possible development activities. The second is a "social indicator approach" which reduces the large number of effects to simpler indices such as health (life expectancy or infant mortality), literacy, political opportunity or social mobility. The third (and that recommended by Lee *et al.*) is a "structural approach", which focuses on institutional changes in the structure of a local community.⁵²

A local and entirely simplistic approach was that used to examine the impacts of Mondi's purchase of 80 000 ha of land for forestry development in the north-eastern Cape province. Nel and Potgieter (1990, p. 35) considered only direct employment⁵³ and possible "local spin-offs" including transport, accommodation, retail and recreation. That Mondi was permitted to afforest such a vast area without an impact assessment, or was indeed satisfied with this report, is a poor reflection on the emphasis given to the potential impacts, particularly social, that major new afforestation can cause.

3.3.3 Relevance of traditional socio-economic evaluation

There is little evidence in the development forestry literature that traditional economic and social impact methods offer valid proof of the success or failure of projects, particularly when considering the perspective of the intended beneficiaries. Salmen (1987) believes that traditional impact evaluations consisting of before-and-after measurements (such as changes in income or health) do not work because the changes are generally too small to measure and difficult to ascribe to a particular intervention. Moreover, they fail to address issues that arise during the project and do not sufficiently reveal the feelings of the beneficiaries. Salmen (1987, p. 6) goes on to argue for a 'participant-observer' evaluation method, which he describes as "an

⁵² The deficiency of Lee *et al.*'s approach is that they fail to mention any participation by the very people who are supposedly being impacted.

⁵³ The study reports erroneously that employment for 20 forestry workers is created in one hectare of intensive forestry, where it should state one worker per 20 hectares (p. 30).

eclectic blend of techniques designed to interpret the real world of the beneficiaries -- their perceived needs, hopes, and frustrations -- so as to contribute to the decision-making needs of project managers." This and other methods are described and discussed in Chapter 4, and it will be shown that such a methodology is required to answer the questions that form the basis of this study.

Virtually all recent development forestry (including the large development forestry organisations like the World Bank and the Food and Agricultural Organization of the United Nations [FAO]) now makes use of such methodologies, which are characterised by the World Bank's Cernea (1991, p. 8) as being part of a new "people-centered" paradigm. Cernea argues that projects that do not put people first are not compatible with the real social process of development.⁵⁴

The FAO has also published widely in recent years on the need for a stronger social and anthropological approach to development forestry. The FAO (in conjunction with the Swedish International Development Agency--SIDA) publishes the Forests, trees and people series, which strongly supports participatory methods for the assessment and evaluation of forestry projects, with publications, for example, such as "Community forestry: Participatory assessment, monitoring and evaluation" (Davis-Case, 1989).

3.3.4 Environmental impacts

The debate about the appropriateness of planting eucalypts in rural areas is considerable, and is addressed in a following section.

In addition to this, however, it is necessary to consider environmental impacts at a theoretical level in conjunction with social and economic impacts. Beginning with the position of the FAO it is evident that during the 1970s its emphasis was more on the positive impacts of trees than on any possible harmful effects. Tree planting was recommended for erosion control, soil conservation, land reclamation, improving the local climate (reducing wind and water flows), and for wildlife management (FAO, 1978). At about the same time, the World Bank published its influential Forestry: Sector policy paper, which listed similar benefits from forestry and rural tree planting, grouping these benefits into three main categories, namely catchment protection, ecology and wildlife conservation, and soil erosion control (World Bank, 1978). It is apparent, however, that both of these organizations were becoming

⁵⁴ As far back as 1978, the World Bank was showing a shift in support from industrial forestry toward environmental protection and meeting local needs (World Bank, 1978).

increasingly aware of the devastation of natural forest world-wide,⁵⁵ and within this context, it would seem that both organisations believed that any tree-planting must therefore be 'good'.

Moving into the 1980s, however, there appears to have been more concern given to the potentially harmful environmental impacts of forestry projects. For example, in 1986, the OECD suggested a three-phase approach to examining environmental effects as part of the appraisal process of forestry projects. Their three phases progress in terms of intensity of examination from an initial consultation with a local ecologist ("Very rough environmental appraisal of the project idea"), through "More detailed environmental appraisal for screening purposes" to a "Thorough environmental appraisal of the most promising project alternatives" (OECD, 1986, p. 41). Listed as potential indicators of environmental impacts are soil, water, climate, flora and fauna, and quality of the landscape.

Documented evidence of environmental impacts in development forestry projects is scarce. Laarman and Contreras (1991) believe that this is because many projects were planned during the early 1980s when environmental protection was not as much of a priority in rural development as it is today.

By 1991 the World Bank had also changed its recommendations concerning the possible environmental effects of forestry projects, and had questioned the use of plantations to achieve environmental objectives and halt the depletion of natural forests, recommending that the Bank should not be associated with any replacement of natural forests with artificial plantations (World Bank, 1991).

In South Africa, the assessment of environmental impacts was formalised by the publication in 1989 of Integrated environmental management in South Africa by the Council for the Environment (1989). The procedure recommended is to do an initial screening of a project in order to determine which of three classes of assessment are warranted. These classes in turn depend on the likelihood of significant environmental consequences, and the intensity of investigation depends on which class is deemed necessary. A Class 1 Assessment, for example, is the most intense, and would consider (among others) effects on: ecosystems; social, cultural, historic and economic characteristics; long-term risks; groups that will be affected; and mitigation measures (Council for the Environment, 1989).

⁵⁵ The World Bank quoted FAO estimates of the following annual losses in natural forest: 5-10 million ha in Latin America; 2 million ha in Africa; and 5 million ha Asia (World Bank, 1978).

This procedure is not appropriate for rural development, however, as it assumes that the nature and extent of a project is known well beforehand, and is clearly defined. This procedure negates the very emphasis that is generally agreed upon (as discussed previously) by rural development practitioners, namely that of real participation which allows the project to adapt to the needs of the people who are being affected. It also presents difficulties for a woodlot situation where the exact location and extent of the woodlots in an area are not known beforehand. Thus, calls for grand land-use plans (as suggested by Mander, 1991, and Cairns, 1993) are quite impractical. Such calls also go completely counter to the idea of participation, which would allow the farmers to decide where and when trees should be planted.

3.4 COMMERCIAL FORESTRY RESEARCH

Commercial forestry research in Zululand, and indeed in the whole of South Africa, is concerned primarily with maximising the woody, utilisable biomass of the exotic plantations in as economically efficient a manner as possible, and sustaining this production for the indefinite future. Considering that most (73,8%) (Forestry Council, 1993) of the plantations are owned and managed by companies whose primary concern is to show a reasonable return on investment to share-holders and directing boards, this is perfectly rational.

This section will describe the emphasis of commercial forestry research, which will in turn reveal why there is such an urgent need for more work in social forestry in South Africa today.

3.4.1 Forestry research in South Africa

During 1991 a survey in the form of a series of 'task team workshops' was undertaken by the Research Advisory Committee of the Forestry Council⁵⁶ via the Co-ordinating Committee for Silvicultural Research. The task teams covered tree breeding; applied silviculture; climate, soils and ecology; forest protection; environmental pollution; wood and pulp properties; forest biology; mensuration, management and economics; conservation; and hydrology (Forest Owners Association, 1991). The five areas of research found to require the greatest input

⁵⁶ The Forestry Council is the body that represents the forestry industry as a whole, and comprises 20 members: three from government (although the creation of SAFCOL may change this); six from the private growing sector; six from the private wood processing sector; and five appointed by the Minister of Water Affairs and Forestry.

and effort were: wood properties; air pollution; pathology; hydrology (including the management of riparian zones and water catchments); and harvesting and transport (Forest Owners Association, 1992). It is immediately evident that there is no consideration of social or development forestry, or of the impacts of afforestation apart from the hydrological research that is recommended.

The Institute for Commercial Forestry Research (ICFR) is the only fully privately funded⁵⁷ forestry research institute in South Africa. The ICFR's 1993 Annual research report states that: "The research undertaken by the ICFR concentrates on all the applied aspects of commercial timber growing and is conducted in close collaboration with the growers" (ICFR, 1993, p. ii). The ICFR, through its close historical association with forestry in Natal, as well as its geographic situation (on the campus of the University of Natal, Pietermaritzburg), continues to be the main source of research information for the forestry industry in Natal/KwaZulu. Very little completely independent research is undertaken by the forestry companies, and the funding situation of the ICFR implies that the companies can largely dictate the areas of research they consider to be most important. The three major research programmes of the ICFR show what these areas are: tree improvement; site research; and plantation management (ICFR, 1993). The "Director's Report" in the 1993 Annual research report states that there is considerable pressure on ICFR researchers to produce plantation management recommendations as quickly as possible, and in future the emphasis will have to be directed toward "adequate understanding of key system processes and their interactions if the objectives of high level sustainable utilization are to be met" (ICFR, 1993, p. vii).

The other major forestry research institute in South Africa is the recently formulated Division of Forest Science and Technology (Forestek) of the Council for Scientific and Industrial Research (CSIR). Besides its mainstream technical programmes in forestry and wood-science, Forestek also now has a Rural Development Forestry Programme, an Environmental Information Technology Programme, and an Ecosystem Management Services Programme, thus indicating a shift toward social and environmental concerns (Forestek, 1992a). However, a cursory review of the 21 research reports available mid-1992 show that all are concerned with aspects of technical forestry, including soils, silviculture, fire and hydrology (Forestek, 1992b).

⁵⁷ Funded in part by levies on the sale of timber and by direct contributions from timber companies.

The South African forestry journal (SAFJ) is the journal of the Southern African Institute of Forestry, which aims to "promote forest science, wood science and conservation" (SAFJ, 1992, inner cover). Once again, the emphasis of the journal is almost entirely on the traditional scientific forestry disciplines of silviculture, establishment and management of large-scale exotic plantations and, to a lesser extent, conservation and management of indigenous forests. The SAFJ is published quarterly, and a brief review of the four journals covering September 1991 to August 1992 shows that the majority of articles cover fertilizer, site and growth (14 articles); pests and diseases (six articles); fire (four articles); and breeding and propagation (six articles), (SAFJ, 1991a, 1991b, 1992a, 1992b).

This same 'hard-science' emphasis was evident at the 1991 International Union of Forestry Research Organizations' (IUFRO) "Symposium on intensive forestry: The role of Eucalypts", which drew speakers and an audience from 26 countries around the world. The three opening addresses (including the keynote speaker) all spoke extensively about social, environmental and political concerns with regard to commercial forestry; the papers presented over the five-day symposium, however, were almost entirely devoted to the highly technical aspects of commercial forestry. Ninety-eight papers covered biotechnology and propagation, tree breeding, site and species matching, silviculture, nutrition, pests and diseases, economics, mensuration and processing. On the other hand, only thirteen papers covered environmental issues, eucalypts as exotics, and rural development (Schonau, 1991).

3.4.2 Forestry research in the United States

It is useful to compare this strictly scientific / production / economic emphasis within the South African timber industry with timber industries elsewhere in the world. When compared to the United States (US), for example, it is obvious that the US forestry profession has begun to recognise a need for a shift in emphasis.⁵⁸ The Journal of forestry is published by the Society of American Foresters, and aims to "advance the science, technology, education and practise of professional forestry" (Journal of forestry, 1992a).⁵⁹ A review of journals published over the period July 1991 to June 1992 reflects a far broader focus. Articles cover a very wide spectrum,

⁵⁸ Issues in the US are different given the fact that much of the commercial forestry is based on managing natural forests, whereas South African forestry is concerned with managing exotic plantations.

⁵⁹ The Journal of forestry is obviously aimed at a fairly general readership, and there are other journals in the United States which are 'more scientific', and deal with specific issues such as silviculture.

including ethics (September '91, January '92, April '92); religion (September '91); tropical and Asian forestry (September '91, April '92, June '92); gender issues (July '91); art (July, '91, August '91); human/public issues (October '91, April '92); and sustainable development (July '91).

However, even with this newly 'enlightened' focus, Magill (1991, pp. 16-18) suggests that there is some way to go. Writing primarily about forestry professionals in the United States, he finds that they: lack a social orientation, preferring to protect and manage trees, water and wildlife; believe that they "know best" and find the public "unknowledgeable" about resource management; consider politics "dirty and unprofessional", even though they deal in a political world; use technical jargon that discourages public participation; and are not adequately trained to deal with environmental values.

3.4.3 Lessons for rural forestry

Given that the purpose of commercial Eucalyptus woodlots in KwaZulu is to maximize timber production (and income from the sale of this timber) in as short a time as possible, much of the technical and scientific research that supports this same process on the large eucalypt plantations is directly applicable. This includes:

- (1) Mondi's breeding and clonal program which aims to produce the most **suitable** (for climate, soils and disease-resistance) trees for specific areas; the commercial woodlots draw on these same plants out of the same nursery;
- (2) the establishment and silvicultural (spacing, tending, fertilizing, etc) research that is geared toward maximizing the potential of a specific site; the Khulanathi woodlots are located in areas close to the commercial plantations; and
- (3) the disease control research which is also geared specifically to clonal eucalypts in specific areas; the woodlots are not planted to 'new' or 'unknown' species that may prove to be highly susceptible.

There are, of course, questions on the appropriateness of this technology and the technical-dependency relationships which such a close association may promote. However, these will be addressed in Chapter 6 of this thesis.

It is evident that commercial forestry professionals, particularly in South Africa, are not equipped to deal with the many social, environmental and political issues

associated with rural forestry in the Southern African context. There are, however, important lessons (particularly technical) to be learned from the ongoing commercial forestry research in South Africa.

There is also much to be learned from other commercial producers (like sugar-cane) in black rural areas, as well as from the experience of rural and social forestry programmes elsewhere around the world. These will be covered in the following sections.

3.5 SOCIAL FORESTRY

This section will define social forestry and some of the variations of this concept, such as community forestry, farm forestry and agroforestry. This is necessary in order to put the commercial Khulanathi programme in perspective, and to determine whether or not it is actually a valid form of social forestry. There will also be a brief discussion of some social forestry projects, as well as some of the successes and failures of social forestry strategies.

3.5.1 Concepts and terms in social forestry

3.5.1.1 Social forestry

It is useful to note from the start that there is no universally accepted definition for social forestry (or, for that matter, for most of the terms covered in this section), and any attempt to declare one is likely to draw criticism from one quarter or another. Gregersen, Draper and Elz (1989, p. 3) use the term 'social forestry' interchangeably with 'farm forestry', 'community forestry' and 'forestry for local community development', and loosely define social forestry as "a broad range of tree- and forest-related activities that rural landowners and community groups undertake to provide products for their own use and to generate local income." They stress that the focus must be on people and community involvement, and believe that this is where social forestry differs from conventional production forestry.⁶⁰

⁶⁰ There is an obvious link between social forestry and forest sociology, which is taught as a discipline at most of the larger forestry universities, and generally encompasses the 'human' element of forestry.

Magno (1986) also emphasises community involvement, finding that social forestry should focus on people, and aim to provide goods and services for the benefit of rural communities.

In its more general usage, social forestry is taken to include the use of trees for, among other things, fuel, food, fodder, building material, raw material, and saleable products (FAO, 1978).

Cernea (1991) believes that there is now a broad consensus about the content of social forestry programmes, which he believes should do three things, namely, motivate people to plant trees; promote the kind of trees that will provide fuelwood, timber, grasses and income; and increase benefits to the poorer groups.

3.5.1.2 Community forestry

Given the similarity of the words (community and social) it is not surprising that the two terms are used interchangeably by many authors. Semantically, community forestry implies sharing of some sort, either of inputs (land or labour), or outputs (some of the derived benefits as explained above).⁶¹

Foley and Barnard (1984, p. 107) define community forestry as "programmes . . . based upon growing trees on public or community land as opposed to private farms", and point out that community forestry is intended to benefit the community as a whole, a sentiment shared by Blair and Olpadwala (1988).

The FAO provides the dissenting voice, arguing that social forestry implies a predominantly welfare function, and therefore community forestry is more appropriate (Arnold, 1992). For the purposes of this thesis, however, social forestry will be taken to mean any people-orientated forestry that promotes tree-growing for various uses, while community forestry will imply common resources.

3.5.1.3 Farm forestry

Blair and Olpadwala (1988, p. 11), believe that the two main components of social forestry are community and farm forestry. They believe farm forestry "consists of landowners cultivating trees on their own land." This distinction is also made by

⁶¹ The Concise Oxford Dictionary (Sykes, 1982, p. 190) defines "community" as "joint ownership", and "being shared" or "held in common".

Foley and Barnard (1984, p. 75), who define farm forestry as "programmes which promote commercial tree growing by farmers on their own land."

The woodlots that are the focus of this study are commercial in nature, grown by individual farmers on their own land-holdings for profit. Certainly, by the above definitions, they fall into the category of farm forestry.⁶² but only marginally into the concept of social forestry as they provide only one product.

3.5.1.4 Agroforestry

In The greening of Africa, which thoroughly analyses the reasons behind the failure of rural development in Africa, Harrison (1987, p. 204) states, "Agroforestry is arguably the single most important discipline for the future of sustainable development in Africa."

Von Maydall (1979, p. 18) defines the same term as follows:

"Agroforestry implies sustained, combined management of the same land for silvicultural, agricultural and/or animal crops leading to an overall increase of production in comparison to single-crop management."

There are a number of other definitions, by Nair (1984), among others, but Underwood (1991) feels that most do not adequately reflect the importance of involving the local community, an important issue in this thesis which is discussed at length in Chapter 6.

However, it is clear from the available literature that agroforestry is concerned with one or more forms of agriculture in conjunction with trees, and that any such system should be sustainable, and ideally should produce more than would be possible from a monoculture of one of the component species.

⁶² It might be argued in the South African context that farm forestry is nothing other than small-scale plantation forestry. The real distinction is size; plantation forestry in South Africa is dominated by large companies with large land-holdings covered by plantations 100s and 1 000s of ha in extent. Farm forestry in its normal usage means small-scale farms, probably less than 10 ha each in total.

Although agroforestry is extremely popular today⁶³ as an alternative and more holistic form of land use, the concept is not a new one. As Rocheleau *et al.* (1989, p. 15) point out, it is merely a new term "to describe age-old land-use practices familiar to millions of farmers and herders in many parts of the world." There is one form of agroforestry, however, which is relevant to the study at hand, namely taungya.

Taungya is a Burmese word for hill farming, and is said to have developed in Burma in the late nineteenth century as a form of shifting cultivation whereby crops were grown between the trees (teak) during the first few years of tree establishment (Young, 1989). This is relevant to the present study because cowpeas and peanuts are planted between the eucalypts at the time of establishment in Zululand (both on large commercial plantations as well as on the woodlots of this study), and can be considered a form of taungya.

3.5.2 Social forestry policy

In the late 1970s, in response to an increasing awareness of widespread deforestation,⁶⁴ donor and lending agencies began to shift from promoting forestry for industrial purposes to forestry for social and environmental purposes.

The World Bank states that their lending was consistent with the development style of the 1950s and 1960s which emphasized economic growth, and that their emphasis was on developing forestry industries through sawmills, paper mills and logging equipment. Beginning in the 1970s, and particularly during the 1980s, the Bank has tried to "encompass the multidimensional character of the forestry sector by bringing together . . . land tenure, . . . equity, energy and environmental concerns" (World Bank, 1991, p. 8).

As Atampugre (1991, p. 6) put it, the 1980s saw a shift "from forests for the nation towards trees for the people."

⁶³ 1977 saw the establishment of the International Centre for Research in Agroforestry (ICRAF) in Kenya (Agroforestry today, 1992) which concentrates on training, education and research (ICRAF fact sheet, 1991).

⁶⁴ By the World Bank's (1978) estimate, about half the forest area in developing countries was cleared for agriculture in the period 1900 to 1965.

3.5.3 Social forestry examples: Success and failure

Because the woodlot programme that is the basis for this study can (marginally) be described as social forestry, it is relevant to review briefly the literature with a view to examining the successes and failures of these projects.

One of the first major social forestry projects (funded by the World Bank in 1979 to the tune of \$37 million) was the Gujarat Community Forestry Project. The goals of the project were both social (strip plantations, village woodlots and farm forestry for poles, fuelwood and fodder) and environmental (reforestation of degraded forestland), and initial results were impressive. The community component resulted in 3 500 village woodlots (five hectare average size) planted on common land by the end of three years. The farm forestry component resulted in more than 53 000 farmers (average size under two hectares) establishing woodlots in the same time period (Blair, 1988). Large and impressive numbers like these should, of course, ring warning bells, and one of the problems identified with the programme has been the emphasis placed on managers meeting quantitative targets.⁶⁵

The example of tree farming most similar to the Khulanathi programme (in that loans were provided to farmers for a fast-growing species grown for pulpwood) is that of the PICOP project in the Philippines, where, by 1981, 1 159 farmers had received loans (financed by the World Bank) for the establishment of 8 968 ha of Albizia falcatus (Hyman, 1983). Hyman believes that the project was successful in recruiting large numbers of farmers because of: economic expectations; technical services; and guaranteed market. He believes that the main failures resulted from: abandoning a sustained agroforestry approach; harvesting problems; price controls; and choice of a species susceptible to the weather (Hyman, 1983).

Development projects generally do not fare well in Africa. Harrison (1987) states that the failure rate is 18% in West Africa and 24% in East Africa compared to a world average of 12%.⁶⁶ Harrison blames some of this failure on the nature of aid itself, as well as the colonial inheritance over much of Africa.

⁶⁵ The project used primarily Eucalyptus spp., and further criticisms of the project are discussed in a following section: "The eucalypt debate".

⁶⁶ Based on an analysis of World Bank funded projects from 1975 to 1985. These figures are based on audits at the end of the first three or five year funding period, and evidence suggests that after funding was withdrawn most projects fared far worse (Harrison, 1987).

In Southern Africa, the Lesotho Woodlot Project promoted trees for fuelwood and building poles, but most farmers felt that while one or two trees around the homestead was fine, an agroforestry approach with trees integrated with crops was definitely not desirable (Hall and Green, 1989).

Gandar (1991) classifies seven types of woodlots in South Africa: Tribal Authority woodlots (16 000 ha) which are usually established by a governmental forestry department and then handed over to the local Tribal Authority; Forestry Department woodlots (16 000 ha); municipal woodlots (1 000 ha); community woodlots (66 ha); commercial small-grower woodlots (nearly 8 000 ha⁶⁷); private non-commercial woodlots⁶⁸ (5 295 ha); and others (12 513 ha).⁶⁹ Gandar (1991) lists four problems associated with existing woodlots in South Africa: a 'top-down' approach to woodlot establishment; lack of community participation (woodlots under Tribal Authority control with few benefits going to the local community); lack of technical and economic understanding of woodlot establishment and management; and lack of coordination.

Atampugre (1991, p. 7) believes that one of the causes of failure of community forestry projects was that they were often little more than "scaled-down versions of commercial plantations" with little or no involvement by the local people. He also argues that even with the recent emphasis on participation, real decisions are still made by project staff.

A lack of participation is also cited by Hisham (1991) in describing the Finnish International Development Agency (FINNIDA) sponsored project in the Sudan, although the project has achieved considerable success in halting the movement of sand dunes using Gum Arabic (Acacia senegal) and Mesquite (Prosopis chilensis) trees. There are also concerns with the relatively sophisticated technical inputs (particularly through the nurseries) and the economic sustainability once the Finish aid ceases.

⁶⁷ The author believes there was less than half this area by 1993.

⁶⁸ This classification is misleading; the author's own experience shows that most woodlot owners sell poles, fuelwood and timber out of their woodlots.

⁶⁹ For a more comprehensive review of the nature and extent of woodlots in South Africa, see Gandar (1991), Status report: Woodlots and agroforestry in the SATBVC countries up to 1990.

Guggenheim and Spears (1991) give three good reasons for the lack of success of (some) World Bank funded projects, namely, basic ignorance about why and when farmers decide to grow trees; poor design and organization of forestry projects, particularly in the lack of formulation of social strategies; and lack of communication between those who make policy and those who plant trees.

Besides social and institutional problems, Arnold (1991) also cites a lack of economic (not taking into account the economic decision-making processes at work in rural households) and technical (choice of species) knowledge among project implementers. Foley and Barnard (1984) caution that the use of communal land for tree-growing can be fraught with difficulty unless potential land-use conflicts are not resolved well in advance of tree planting.

3.5.5 Lessons for the Khulanathi programme

Clearly, Khulanathi can only marginally be defined as social forestry. The programme meets one of Cernea's (1991) elements of social forestry (namely motivating people to plant trees), but falls short on at least one count (multiple-use), and possibly two (benefits to poorer groups).

However, there are important lessons to be learned from social forestry projects elsewhere in the world. Problems often cited for failure include the dependence that results from foreign aid, poor or inappropriate technical inputs, poor design and management (including an emphasis on quantitative targets), and above all a lack of community involvement.

3.6 CONTRACT FARMING

The Khulanathi programme that is the focus of this study is a form of contract farming in that the farmers enter into a contract with the company for the production of timber. This type of arrangement is neither unique to Mondi nor a new concept, and has been practised for some time in many countries around the world to produce a wide variety of crops.⁷⁰

This section will define the concepts involved and examine some of the advantages and disadvantages of such systems.

⁷⁰ Glover and Kusterer (1990) provide examples of contract farming as does Levin (1988), who describes cotton, tobacco and pineapple schemes, mostly in Swaziland.

3.6.1 Terms and concepts

Contract farming is a production and marketing arrangement in which the company "replaces or supplements company production of agricultural commodities with purchases from local farmers through contracts" (Glover and Kusterer, 1990, pp. 1-2).

The control that the company exercises can vary considerably. On the one hand, the company merely pays a market price for the crop, and exercises little or no control over the production process. This is often the case for a non-perishable commodity and where the market price does not fluctuate very much. On the other hand, prices may be fixed at planting time, and the company may exercise almost constant supervision over the production process, often providing all the inputs and planting and harvesting equipment (or else doing the work itself) (Glover and Kusterer, 1990).

3.6.2 Advantages for the company

There are several advantages for a company entering into a contract farming arrangement with small farmers. In the case of commercial timber in KwaZulu, the prime factor is good timber land close to the processing plant which does not have to be purchased.⁷¹

Besides land, labour is a major consideration for any contract farming arrangement. The company avoids conflict issues which may arise with a unionised labour force, and has access to labour (family and other) which may not normally be available to it.

Because agricultural (and forestry) production is often seasonal, the company involved avoids the problem of managing a labour force that is not fully utilized. With contract farming these problems are shifted onto the farmer, who is paid for what he or she delivers, essentially a piece-work wage (Clapp, 1988). Mondi only pays for the timber that is delivered to a local depot by the farmer.

⁷¹ In Mondi's case, the company is not permitted to purchase or lease land in KwaZulu. The map (Figure 1.1) shows just how much land makes up KwaZulu, and is therefore inaccessible to Mondi except through some form of contract farming.

Another factor is a steady raw material supply into a processing plant, which can better be done through contracts than by buying on the open market. While Glover (1987) suggests that this is particularly important for food processing companies, it is no less a consideration for a pulp mill with large fixed costs which must keep a constant throughput at predictable prices to run economically. Besides quantity, this type of arrangement also allows the company a degree of quality control over the production process.⁷²

Through contract farming the company is able to transfer most of the production risk to the farmers. Through not owning the land, the company may also avoid the risk of expropriation, while indirectly, the company can benefit from financial aid provided to growers by the government or an external donor agency (Glover and Kusterer, 1990). In Mondi's situation, there is no real aid going to the farmers from an external source, but calls for land reform in South Africa do present a very real danger of expropriation.

From a public relations point of view, the company can look good by promoting a progressive image and involving local producers. The company's own wages and benefits can also be made to appear superior in comparison with those offered by local farmers (Glover and Kusterer, 1990).

3.6.3 Disadvantages for the company

The security of the company's supply is one of the major draw-backs of contract farming. After investing management and capital into the raw material, the company runs the risk of the grower defaulting. Glover and Kusterer (1990) state that this is most common when the market price rises above the contract price.⁷³ They also state that it is difficult for the company to control the quantity and quality of the product, particularly if growers do not follow technical advice (Glover and Kusterer, 1990). While quality is important for timber production, it is relatively low-maintenance compared to fruit, for instance. In the case of Khulanathi, growers

⁷² Mondi, for example, specifies minimum and maximum dimensions for the timber it purchases, and also insists that the timber be relatively dry, although this is hard to control.

⁷³ Mondi may well face this danger. While there is no agreed contract price with the growers and Mondi has agreed to pay a 'market price', other timber purchasers who have not invested in the timber could afford to pay more than Mondi for the timber (assuming that Mondi plans to recover some of its investment).

generally take better care of their trees than Mondi does of its own (Howard, 1993, pers. comm).

Although the whole arrangement is governed by a contract, legal control is difficult to exercise, particularly where the company contracts with many small producers in one area, as Mondi does in KwaZulu. Under these circumstances, the costs of enforcing the contract would probably outweigh the benefits. It is also likely that a local court would feel more sympathy with a "defenseless indigenous farmer" than with a "powerful foreign plaintiff" (Clapp, 1988, p. 18).

3.6.4 Advantages for the farmer

Proponents of contract farming refer to the arrangement between the company and the small-scale farmer as "a dynamic partnership for development" (Williams and Karen, 1984).

The most readily identified advantage for the farmer is the opportunity for increasing net cash income on the farm. This is done through access to technologies, credit and markets which would not normally be available to farmers.⁷⁴ Because the company supplying the inputs has a direct interest in seeing that the product is delivered, it will see that the right inputs are supplied at the right time, including the necessary extension. The company's access to large (often international) markets means that prices can be fixed and the risk from highly volatile perishable markets can be reduced (Glover and Kusterer, 1990).

There is also the potential for the development of small-scale contractors and other secondary employment and development opportunities, either related directly to the production process or indirectly through the injection of cash into the local economy.⁷⁵

⁷⁴ Mondi supplies clonal hybrid eucalypts to its Khulanathi growers which are not commercially available.

⁷⁵ Mondi frequently quotes the R3 million to R4 million injected into the local economy through its Khulanathi weighbridge at Sokhulu (Kewley, 1993, pers. comm.).

3.6.5 Disadvantages for the farmer

One of the most common criticisms of contract farming is that the company maintains a monopsony⁷⁶ on the market and a monopoly on the inputs of production (Clapp, 1988; Levin, 1988; Glover and Kusterer, 1990). This is partly a question of control, and critics observe that the companies tend to control the most profitable sector, the processing and marketing of the commodities, while restricting the farmers to the less profitable production process (Levin, 1988).

It is also argued that various forms of dependency are created in contract farming arrangements (Clapp, 1988). Companies often provide sophisticated technical inputs (as Mondi does with its clonal hybrids); Glover (1987) points out that excluding small farmers from such technologies prevents them from capitalising on their country's or region's comparative advantage. Credit is another form of dependence that can arise, and Clapp cites examples from South America where farmers accumulate debt rather than capital after entering into contracts (1988). Vaughan (1990) believes that in the case of sugar-cane in KwaZulu, dependency is aggravated by the very small size of land-holdings. This may well hold true for timber production, but could only be remedied through creative land reform.

Levin (1988) notes that while the company is free from labour management, the farmers are under pressure to increase the length of the working-day, or use family labour to meet requirements. Another major criticism is that resources are diverted from staple food to cash crop production which does little or nothing in terms of food security (Glover, 1987; Glover and Kusterer, 1990).⁷⁷

Access to equipment (for harvesting, for example) may be limited for small growers, particularly if they rely on company equipment which will first harvest its own crop (Glover, 1987).⁷⁸ The company may also manipulate inspection standards to control deliveries, if, for example, it is over-supplied (Glover and Kusterer, 1990).

⁷⁶ A monopsony is a single purchaser of some type of input. The market power that the monopsonist has means that it can reduce the price paid without losing all of the input. A monopoly, on the other hand, is generally defined as the "sole producer of some product that has no close substitutes" (Browning and Browning, 1983, p. 303).

⁷⁷ In the case of timber production, the labour requirements are small, but available time and food production were issues raised in the fieldwork of this study.

⁷⁸ The whole issue of harvesting has proven to be a major concern for Khulanathi growers (discussed in Chapters 5 and 6).

Growers may receive poor technical assistance. Glover and Kusterer (1990) cite examples of contracts which require growers to follow the company's advice, but absolve the company from poor crop results. This is compounded by the fact that the farmer must assume the risks of weather, insects and disease, since the company only pays for the produce it receives (Clapp, 1988).⁷⁹

Growers may also encounter financial problems with the company, through cheating on the loan accounts (charging for goods and services not delivered), or late payments (up to two years in the Honduran sugar industry) on the crop that is delivered (Glover and Kusterer, 1990).

3.6.6 Risk

As Glover and Kusterer state (1990, p. 130): "Contract farming is fundamentally a way of allocating risk between the company and its growers. The company tends to assume marketing risks while the growers bear most of the production risks." In forestry, there is the very real risk of fire which can destroy a long-term (six to eight years for eucalypts grown for pulp) crop overnight.

Glover and Kusterer (1990) point out that while a contract may specify exactly how the risk is distributed between the company and the grower, the actual implementation of the contract may differ considerably. They believe that the distribution of risk will change over time, and essentially depends on three factors: bargaining power; availability of alternatives; and access to information.

Williams (1984) believes that the company takes the first, large financial risk during the start-up phase of a contract farming scheme, risking capital where public funds would not venture.⁸⁰

⁷⁹ Although trees are not generally as susceptible as more perishable food crops, the severe drought conditions in 1992/1993 in Zululand have seen eucalypts losing substantial growth, and even dying. The trees are also susceptible to a number of pests and diseases.

⁸⁰ In Mondi's case the company bore the cost of staff, equipment and an Environmental Impact Assessment for the Mbazwana area only to see virtually all the trees (184 ha) destroyed by the local youth. In this instance the growers also suffered considerable loss of potential production.

The biggest risk the company takes is that of growers defaulting, either by not tending and harvesting the crop, or by selling to another buyer.⁸¹ Through entering into contracts with many growers, the company is able to spread this risk for itself. It similarly spreads the risk of fire; because the woodlots are generally far apart, and while a grower may lose 100% of his or her crop, the loss of timber to Mondi is small.

3.6.7 Questions for Khulanathi

The Khulanathi programme is clearly a form of contract farming, incorporating distinct advantages and disadvantages for both the farmers and the company.

Contract farming involves risk, which is borne both by the company (primarily through growers defaulting) and by the growers (most of the production risks). This thesis will consider the three factors raised by Glover and Kusterer (1990), i.e. bargaining power, alternatives and information, that determine the distribution of this risk.

This section raises another fundamental question to be answered by this study, namely whether or not Khulanathi's commercial woodlots will lead to empowerment of rural communities, or further disadvantage and subordination.

3.7 THE SMALL GROWER SECTOR OF THE SUGAR INDUSTRY

The small grower sector of the sugar industry is important in terms of Eucalyptus woodlots in KwaZulu as it is the system upon which the woodlots are based.

This section will briefly describe the origins of the small sugar-cane growers in KwaZulu, and highlight some of the more important research that has been conducted into this production system in terms of socio-economic impacts, as well as implications for land reform and policy formulation.

⁸¹ Mondi has an informal agreement with Sappi (a competitive forestry company) not to buy timber from each others' small growers (Kewley, 1993, pers. comm.).

3.7.1 Background

The small-grower sector⁸² makes a substantial contribution to cane production in the Natal/KwaZulu region. About 40 000 growers produce roughly 10% of South Africa's raw sugar-cane (Chapman, 1992).

This involvement by small-scale (black)⁸³ farmers is not a recent phenomenon. In the Amatikulu area of KwaZulu (area 7 in Figure 1.1), sugar-cane has been produced since 1925 (Wiseman, 1993, pers. comm.).

During the 1950s, the South African government (in the form of the Native Affairs Department) supported the development of small (10 to 20 acres) plots for cane production in four of the Natal/KwaZulu reserves (Vaughan, 1992). This support was based on the recommendations of the Tomlinson Commission of 1955 which envisaged one group of people on the reserves being a "full-time agricultural class" (Haines and Cross, 1988, p. 85). The government's assistance was in the form of agricultural inputs with cultivation being done by government officials; today some of these growers (or their children) are still producing cane (Vaughan, 1992).

During the 1960s and early 1970s, sugar-cane production slowly expanded to the point where in 1974 approximately 250 000 tons per annum were produced in KwaZulu (Ardington, 1990). Vaughan (1992, p. 426) states that "white farmers were by no means insignificant in their influence on aspirant neighbouring black producers" and goes on to describe informal arrangements between neighbouring black and white farmers, with seed cane being sold to small producers, and also a transfer of knowledge from farmers to farm labourers.

However, the major push in small grower production came in 1974 when the South African Sugar Association introduced a revolving credit fund known as "The Small Growers Financial Aid Fund", or more commonly as "FAF" (Ardington, 1990). Through the fund, loans are made to individual growers who would not otherwise have access to normal commercial credit to establish sugar-cane. Ardington states that by 1990, 22 000 growers had borrowed over R30 million from the Fund, with

⁸² According to Wiseman (1993, pers. comm.) small growers are classified as producing less than 200 tons of sucrose per year; the average production in KwaZulu is four tons of sucrose per ha.

⁸³ Wiseman (1993, pers. comm.) estimates that 35 000 of the total 40 000 small growers are black.

overall production by small growers rising from the 1974 level (250 000 tons per annum) to over 2 million tons in 1990. Ardington also believes that the Fund has stimulated the milling companies to assist with ploughing, planting and establishment of physical infrastructure.

According to Vaughan (1991), the only major expansion in sugar-cane production in recent years has in fact been by small growers in KwaZulu. She cites as the major reasons rationalization within the industry and expansion of the timber industry into areas traditionally under cane. She thus believes that "the economic importance of KwaZulu cane within the industry is likely to increase in the coming years" (Vaughan, 1991, p. 173).

3.7.2 Research

It is important to review the research that has been aimed at small (black) sugar-cane growers in order to consider implications for small-scale timber producers. Some comparisons with the results of this thesis are presented in Chapter 6.

Vaughan (1991) has examined socio-economic impacts by considering the relationships between people on the land, and between the growers and the millers. In assessing whether or not the small growers now constitute a new class of independent peasant producers, she finds that the present system of land tenure in KwaZulu (whereby land is allocated to households in the traditional manner by the local Inkosi) inhibits any expansion by progressive farmers despite some private arrangements between neighbours to accumulate land.

On the other hand, sugar-cane development in KaNgwane (another homeland situated in the northern Transvaal) is not based on existing land distribution, but is founded on the principle of establishing economically viable farming units, estimated to be seven hectares for irrigated sugar-cane (Vaughan, 1992).

Other authors have examined dependency as it relates to small sugar-cane producers. Gilbert also found, in the Ndwedwe area of KwaZulu (approximately 50 km south of Stanger in Figure 1.1), that small land-holdings effectively prohibited any real financial independence among cane growers (1988). Cobbett (1984, p. 376) is more critical, writing of a "poverty trap" which growers will be unable to escape because of low earnings from sugar-cane, and continued "structural dependence on migrant employment and wage remittances" (p. 376).

Ardington (1990) states that dependency relationships vary from area to area depending on the mill, some being very paternalistic, with others relying far more on the initiative of the growers. He believes that this latter case leads to groups of growers who are largely self-sufficient, and goes on to state that: "A development philosophy which concentrates on removing and/or minimizing the 'hurdles to be jumped' has a greater potential to lead to a new class of independent peasant producers than one which is dependent on the initiatives of an external agency" (Ardington, 1990, p. 605).

A measure of independence among small cane growers is the recently formed Small Grower Development Trust, which aims (according to Chapman, 1992, p. 45) "to boost the development of viable, independent growing communities." The trust will concentrate on three phases, namely, institutional and community development; agricultural and economic extension; and financing sugar-cane development so as to provide alternative sources of finance for growers (Chapman, 1992).

Examining the dependency relationship of growers to agricultural capital, Vaughan believes that the credit system does not allow the growers to take control of their own production process, and has, in some ways "disabled communities" rather than "empowering people" (1991, p. 180). Vaughan found that the growers resented the intervention of the mill which plowed their land, planted the cane, and kept the accounts. At the same time, however, she states that from the millers' point of view, KwaZulu cane is not merely an additional source, but rather is often essential in compensating for losses from traditional sources (Vaughan, 1991).

Again on the subject of relationships, Vaughan (1992) found among growers in the Sezela area that there was significant hostility towards the contractors (responsible for cutting and hauling) who were seen to be taking economic advantage of the growers.

Vaughan (1992) lists other relationships among small growers that are potential sources of conflict, namely between: contract and non-contract farmers; absentee growers and growers on the land; men and women; women who are registered (as holders of Small Grower Entitlement (SGE)) and women who are cultivating on behalf of men who hold SGE; employers of wage labour and those using family labour; and growers attached to different milling companies.

Vaughan (1992, p. 430) suggests that effective farmer organisation is crucial for the empowerment of small growers, and "needs to be built around issues and

difficulties." She further suggests that training in organisational and para-legal skills could result in negotiating a more equitable contract.

Relationships and sources of tension are also examined by Gilbert (1988) who, in a study of cane growers in the Ndwedwe area of KwaZulu, found a number of areas for concern. He found that: sugar-cane bestowed some social status on the growers (a potential source of tension therefore being between the 'haves' and the 'have-nots'); the growers felt that the sugar-cane was not theirs but the company's; the women were unhappy because, while they were generally not consulted, they had to do the work and then received little or no benefit as the contracts were in the men's names.

Cobbett (1984), considering the appropriateness of sugar-cane, found that sugar-cane production: entrenched or even worsened rural social differentiation; did not provide sufficient income to meet the Household Subsistence Level (HSL) for the majority of growers; displaced food crop production as land-holders devoted more land to sugar-cane in order to secure cash earnings, which, in turn, could disadvantage the women and children if cash was paid to the men who did not use it to buy food; and was the only alternative offered to rural farmers in KwaZulu, who would do better in terms of net returns, provided that they received the necessary inputs, by cultivating food crops.

These points raised by Cobbett are largely disputed by Wiseman (1985), the Agricultural Manager at the time for one of the sugar milling companies referred to by Cobbett. One of the main flaws of Cobbett's arguments are that he does not offer any viable or 'more appropriate' alternatives to sugar-cane production. He does not, for example, provide evidence of how many families can meet the HSL without any involvement in sugar-cane. It is naive to suggest that a peasant farmer should reject a means of production because it fails to meet some arbitrary criteria imposed by academic researchers.

Friedman and Vaughan (1990), on the subject of appropriateness, had quite different results. They found, for example, that small black farmers continued to grow subsistence crops for their own consumption, and preferred the guaranteed market for sugar-cane to the limited market for surplus food crops. While Friedman and Vaughan (1990, p. 5) agree with Cobbett on the potential harmful impacts on women and children if migrant men receive the income for the cane, they believe that sugar-cane "has given many economically marginalised rural people, particularly

women, an opportunity to participate in production, and to generate at least some income on land which otherwise might not have been utilised at all."

Vaughan (1991) also states that it would be a mistake to underestimate the significance of the development (at a regional level) that has taken place through sugar-cane production, generating large volumes of income within communities, although only supplementary income for individual households.

3.8 THE EUCALYPT DEBATE

The introduction of an exotic species into a rural area, albeit for purposes of rural development, raises a number of obvious ecological questions. What is the potential for ecological harm that this species can cause? Will the trees dry up water sources? Will they poison or denude the soil? Are they highly invasive? What is their past record? This section will attempt to answer some of these questions by reviewing the literature surrounding the planting of Eucalyptus in rural areas.⁸⁴

The section will also show that what appear to be purely ecological issues cannot be divorced from the social and economic aspects of rural tree planting.

3.8.1 Background

The genus Eucalyptus comprises more than 600 species and is found widely throughout the world, being the largest source of hardwood for pulp, paper and rayon production. Eucalypts are also used for lumber and composite boards. Oil from the leaves is extracted for flavouring (menthol from E. globulis, lemon from E. citriodora) and the gum from E. longirostris is used to treat diarrhoea. The wood burns easily and some species have a high calorific value. The species will coppice (send up new shoots and grow again) if cut down or burnt (FAO, 1986; Joyce, 1988).

The natural range of the eucalypts is Australia, South East Asia and the Pacific, but there are now more than four million hectares planted in over 80 countries around the world (FAO, 1986). Much of this planting has been in vast production plantations, but social forestry programmes also have their share of the species, in

⁸⁴ The topic is highly controversial. Raintree (1991) devotes a chapter of Socioeconomic attributes of trees and tree planting practices to the eucalypt debate, but explains how he had to shorten the chapter considerably because some of the issues raised caused such heated argument that they threatened to undermine the main purpose of the book.

large part due to the perceived benefits listed above. In the early 1980s the World Bank started to encourage the planting of eucalypts in the social forestry programmes that it was funding, and other agencies followed suit, e.g. the British Overseas Development Agency (ODA) (Joyce, 1988).

3.8.2 Eucalypts in social forestry

As discussed in a previous section,⁸⁵ one of the biggest social forestry projects has been in India, where an estimated 2,5 million ha of land has been brought under farm forestry, of which more than two-thirds (over 1,6 million ha) is planted to eucalypts (Chambers *et al.*, 1989). The size of this project has drawn considerable interest, inspection and analysis, as well as severe criticism, and the project has, according to Raintree (1991, p. 23), been the "epicenter . . . of the storm" of the eucalypt debate.

Saxena (1992) found that the farmers themselves had become disillusioned with eucalypts, and cites falling planting rates (from 134 million seedlings in 1984 to 12 million in 1988) as evidence of this. He believes that the farmers' unhappiness was caused by four main factors: production problems, due to poor seedling quality and poor silvicultural practices; supply and demand imbalances, due to a saturation of the pole market, and an inability to compete in the lumber and pulp markets; poorly developed marketing infrastructures, particularly when compared to the highly developed and subsidised agricultural markets; and negative effects on agricultural production, as a result of eucalypts affecting local soil and water conditions.

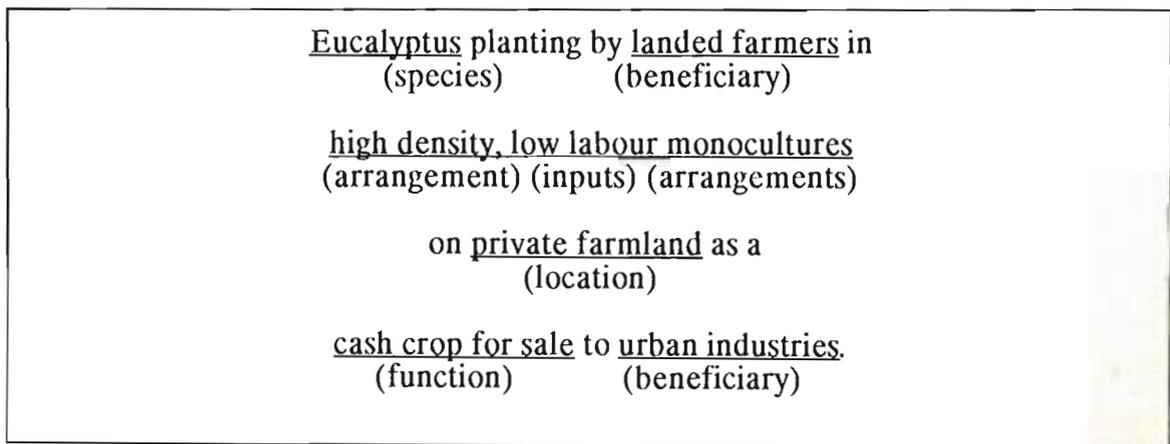
While the issues raised above by Saxena are largely technical, Joyce (1988) believes the problems to be more social in nature, and, describing how farmers in two areas ripped out eucalypt seedlings (replacing them with an indigenous species), blames the project for not meeting the needs of the rural poor for fodder, fuel and small timber. He also cites Vandana Shiva (no reference) who blames eucalypt farm forestry in India for shrinking communal grazing lands, and for benefits going only to the more influential members of the community.

Still on social forestry in India, although writing about the project in Orissa State, Jayaraman (1987) found that social forestry was successful where literacy was high,

⁸⁵ The project described is that in Gujarat, one of the provinces of India. The project originated as the National Social Forestry Project in the late 1970s, and besides Gujarat, was also actively pursued in Uttar Pradesh, Rajasthan, Haryana, Karnataka, Punjab and Orissa (Jayaraman, 1987; Joyce, 1988; Saxena, 1992).

where there was a sympathetic attitude toward the poor, and where class and caste distinctions were less entrenched.

Raintree (1991, p. 23) also examined the available evidence of eucalypt planting in India and found that while much of the debate was "couched in ecological terms, many of the underlying issues are social and economic in nature." In his inciteful analysis (and presentation), Raintree found that much of the criticism concerned the issues presented in the Figure 3.2 below.



While most of the critics felt that the social forestry programme should have concentrated on:

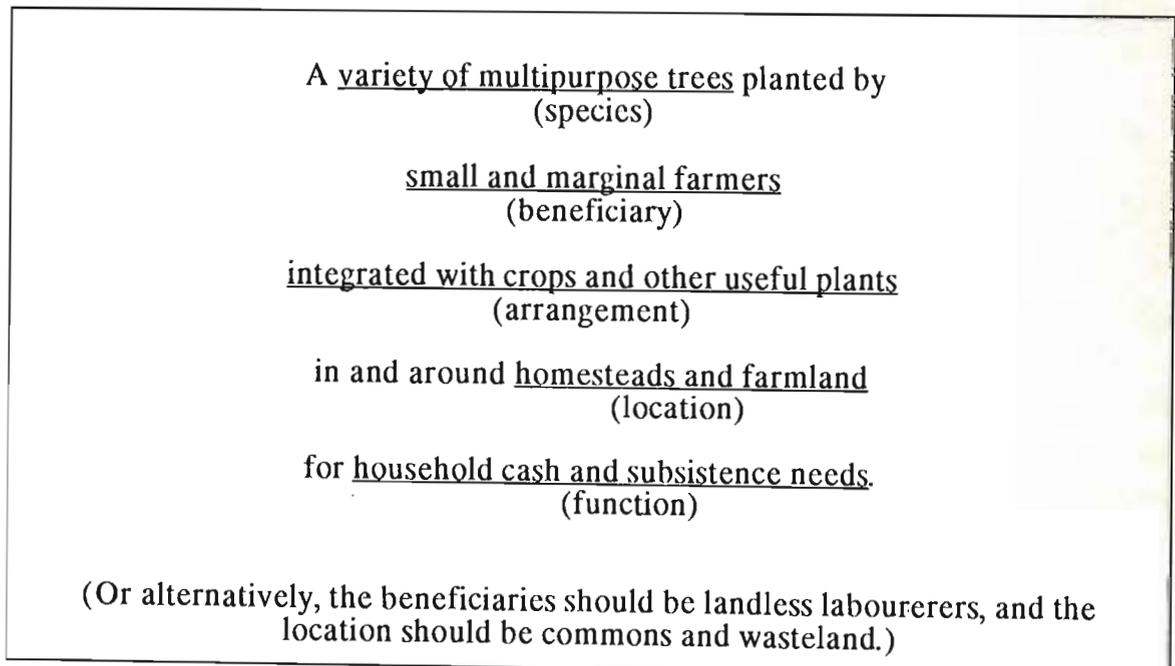


Figure 3.2: The eucalypt controversy (from Raintree, 1991, p. 24)

Raintree uses this representation to show that the controversy involves far more than just a species choice. Farm forestry as a strategy was challenged, as well as economic

development as an objective. He believes that the real concern was that a social forestry programme ostensibly intended to benefit the poorest members of society was actually helping the relatively better off segments of the population (Raintree, 1991).

Besides India, there are other examples of eucalypts used in social forestry programmes. Near Addis Ababa in Ethiopia, a planned 40 000 ha will be planted for fuelwood (MacKenzie, 1988a). In Kenya, the Green Belt Movement of Kenya's National Council of Women promotes nurseries where women grow and sell eucalypts to relieve the fuel-gathering burden on women. Small farmers often plant a small patch of eucalypts on marginal land for building poles and fuel (MacKenzie, 1988).

In Lesotho, the Lesotho Woodlot Project promoted the planting of eucalypts on communal village land. The trees, however, become state owned and are then sold to the local people, which has caused considerable resentment and bitterness. There have been some positive responses to the species, however, with people citing the straightness of the poles for building, and the fact that eucalypts do not give off much smoke when used as fuel (Hall and Green, 1989).

In South Africa, eucalypts have been established by the Government Forestry Department in woodlots for fuelwood and building poles. The woodlots are either completely managed by the Department, or else handed over to local Tribal Authorities (TA) after establishment to manage and sell the timber. Gandar (1991) found, however, that there is little community participation in either case, and with the TA woodlots, the local elite often control the timber.

In Zimbabwe, the establishment of Eucalyptus woodlots has followed the same approach as that adopted in South Africa, namely by the Government for the people in order to redress the rural fuelwood crises. Katerere (1986, p. 125) believes that this approach "invariably ignores the biological, social, cultural and economic environments of the intended beneficiaries."

In Thailand, the emphasis of eucalypt planting is on large-scale plantations, primarily for pulp production, rather than for social forestry. There has been considerable criticism, however, of both the ecological and the socio-economic aspects of planting eucalypts. The plantations have replaced or impinged on natural forests, and people who traditionally relied on the natural forests have been evicted from the areas where eucalypts are planted. The plantations use far less labour than traditional

agriculture, and the 'surplus' people will impact both ecologically and economically on the areas to which they move. There are also fears that the plantations will impact on local agriculture by causing erosion and reducing stream flow below the plantations (Lohmann, 1990).

3.8.3 Ecological concerns

Van Gelder and O'Keefe (undated) believe that the concerns most often associated with the planting of eucalypts are water use, erosion, and competition. The Food and Agricultural Organization (FAO, 1986) summarised the findings of the Swedish International Development Authority concerning the ecological effects of eucalypts using the following broad categories.

3.8.3.1 Water

Catchments under trees have a lower yield than under scrub or grassland. Water tables can be drawn down, particularly where there were no trees before. Young eucalypts will have the most marked affect. Most species (those with strong surface roots) will also compete for water with neighbouring crops and ground vegetation where the water supply is limited (FAO, 1986).

In two studies undertaken in Zululand, South Africa (in two areas that form part of this thesis), Kienzle and Schulze (1993) and Lorentz and Schulze (1993) used a simulation model and found that mean annual streamflow could be reduced by half under E. grandis plantations when compared to natural grassland. They also predicted a lowering of the water table of between two and five metres in and around small (one hectare) eucalypt woodlots. They recommended that woodlots should not be planted closer than 200 metres to boreholes, streams or wetlands.⁸⁶

Van Gelder and O'Keefe (undated), addressing the fear that eucalypts can cause rainfall to decline, state that while rapid growth is associated with high water consumption, there is no evidence that eucalypts affect the local climate.

⁸⁶ Kienzle (1993, pers. comm.) admits, however, that these were very brief 'desk studies' and involved no fieldwork. They therefore used extremely conservative estimates in making these recommendations.

3.8.3.2 Erosion

Because roots suppress ground vegetation (primarily through competition for water), eucalypts are not good for erosion control under dry conditions. The problem is exacerbated by burning the leaf litter, but improved by terracing (FAO, 1986). In Zululand, Mondi Forests is very sensitive to the danger of erosion, due to the erodability of the sands, and for this reason carefully plans the layout of its plantations, even on areas that are virtually flat (Howard, 1993, pers. comm.). Herbert (1993, pers. comm.) recommends staggered-type planting, particularly on slopes, as well as allowing litter to build up.

3.8.3.3 Nutrients

On degraded sites, eucalypts are beneficial to the soil in that there is an accumulation and incorporation of organic matter. In general, however, this is not the case if eucalypts replace indigenous forest (FAO, 1986).

Nutrients can be lost through harvesting; according to Herbert and Robertson (1991), 41% of the nutrients are in the bole of the tree, and the remainder in the bark (20%), branches (17%), leaves (19%) and deadwood (3%). It is evident, then that the harvesting process should remove only the utilizable portion of the bole.

According to Lohmann (1990), in Thailand, *E. camaldulensis* is called "selfish" by local villagers because it monopolizes nutrients. Lohmann also contends that soils will need to be rehabilitated (due to depletion and hardening) after five or six crops of eucalypts.

In Zululand, however, the sandy soils are highly leached, and the nutrients lie in the water table, some metres below ground. Under these circumstances, eucalypts have the ability to draw up these nutrients and return them to the soil surface in the form of leaf litter⁸⁷ (Herbert (1993, pers. comm.).

3.8.3.4 Competition

According to the FAO (1986), ground vegetation is less affected in wet conditions than in dry, since the main competition is for water rather than light, and eucalypts

⁸⁷ A situation similar, therefore, to the 'degraded sites' described previously (FAO, 1986).

cause only a light shading effect. The FAO (1986) study also found that in general, numbers of birds, animals and insects are far less in an exotic plantation than in an indigenous forest. The study also contends that some eucalypt species produce toxins that inhibit the growth of some annual herbs, a so-called allelopathic effect. Christie (1993, pers. comm.) believes that the evidence in South Africa is not conclusive, however, and recommends that further research be conducted into both the allelopathic effects and the nutrient use of eucalypts.

3.8.3.5 Displacement

Eucalypt plantations largely displace the ecosystems that were there before, and are accused of creating ecological deserts (van Gelder and O'Keefe, undated). The FAO (1986) recommends that the relative importance (ecologically as well as socio-economically) of the existing situation should be carefully compared with that of a eucalypt plantation before changing the land use.

There is also the question of biological sustainability, which the FAO report does not cover. Mueller-Dombois (1992) predicts that exotic eucalypt plantations outside of their natural habitat will increasingly suffer 'dieback' (losses in growth and vigour leading to the death of trees) as a result of attacks by fungal pathogens and pest insects, and calls for spatial diversity and following the fallow principle. Howard (1993, pers. comm.), however, believes that while the fungal disease problem is serious in Zululand, Mondi's breeding and clonal programme is specifically geared toward eliminating susceptible and promoting resistant clones.

3.8.4 Implications for woodlots

Van Gelder and O'Keefe (undated) point out that many of the perceived negative effects of eucalypts should not be blamed on the tree itself, but on the management system adopted. As Raintree (1991, p. 30) points out, "There is no use in blaming a tree for human errors."

Certainly, in light of some of the potential negative ecological impacts of eucalypts, great caution should be adopted before replacing an indigenous system with an exotic eucalypt system, particularly if the existing system has achieved a reasonable state of balance.

In the areas of Zululand where Khulanathi operates, however, the situation on the ground is anything but stable; most woodlots are planted on sites that have been

used previously for a variety of crops. Many are considered "finished" by the growers themselves.

Care should be taken, however, in both the location (away from water sources) and the arrangement (to prevent erosion) of the planting. Furthermore, management practices should encourage cover-cropping and mulching. Above all, growers should be well-informed of the potential impacts of planting eucalypts, and how best to mitigate against harm.

3.9 CONCLUSION

This study aims to examine the development potential and the social, economic and environmental impacts of Mondi Forests' commercial woodlot programme, Khulanathi.

Rural development can be defined as a process of change that is directed by rural people toward sustainable objectives that they have chosen for themselves. This study needs to determine whether or not the change that is being brought about is directed by the rural people who join the programme, and whether or not the whole process is sustainable.

Furthermore, the impacts of these woodlots should be examined. Traditional economic and impact methods are not relevant for considering the perspective of the intended beneficiaries. More useful, and common to development forestry work is a new qualitative, "people-centered" paradigm, discussed further in the following chapter.

The woodlots of this study can be considered a form of farm forestry, which in turn is a part of social forestry, but does not (at this stage) subscribe to one of the most common aspects of social forestry, namely multiple-use species.

The woodlots are a form of contract farming and are similar in some ways to the other form of contract farming found in rural KwaZulu, namely sugar-cane production. Care should be taken with the use of an exotic tree species (Eucalyptus) in rural development, but this does not preclude its value to the development process.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter considers the overall purpose of this study, and formulates the specific questions, in the context of the theoretical framework laid out in Chapter 3, needed to address this purpose.

The chapter then considers suitable methodologies that can be used to answer these questions. By considering appropriate social forestry and sociological literature, it is shown that a qualitative rather than a quantitative approach is most suitable for this study. A thorough analysis of the main methods chosen, namely individual, in-depth interviews and focus group discussions is presented.

Finally, a brief description of the study area is presented which highlights the similarities and differences between specific areas. The constraints faced by this study are also presented.

4.2 THE RESEARCH QUESTION

As stated in Chapter 1, the overall purpose of this study is to determine whether or not commercial Eucalyptus woodlots are an appropriate and sustainable land use in north-eastern KwaZulu in the 1990s, and whether or not such a system contributes to local development.

Such a statement obviously begs certain questions, such as: What exactly is appropriate? What is development? What is sustainable? What are the impacts of such a land-use system? Is the existing model suitable as is, or are there obvious flaws? Is the model transferrable?

One of the most important aspects of this thesis is whose perspective is applied when answering these questions. Are value systems being imposed on the primary participants, namely the growers themselves, or are their own values and judgements allowed to emerge through the study process?

This section formulates the specific questions--in the context of the theoretical framework laid out in Chapter 3--and shows how the specific methodology applied can result in meaningful answers to these questions.

4.2.1 Questions to be answered by this research

4.2.1.1 Appropriateness

In light of the above (namely, whose perspective is involved), the question of appropriateness is best addressed by asking who considers the technology appropriate, rather than by trying to define what exactly constitutes an appropriate technology. It is the contention of this thesis that unless a technology (or process or system) is fully accepted (and approved of) by the practitioners of that system (the farmers themselves), such a technology cannot be appropriate. In the case at hand, namely growing trees, the issue then becomes not so much the level of sophistication of the technology involved, but the acceptance and desire to apply such a system. An illustration will help to clarify this point.

The plants provided by Mondi for its Khulanathi program are clonal hybrids produced in Mondi's relatively sophisticated nursery at Kwambonambi. The plants are produced from cuttings, not seed, and require careful handling and the application of growth hormones in the nursery to produce roots. Mondi is convinced that using clones results in superior growth and yield from the trees, and this perception is obviously shared by the small-scale farmers themselves. According to the extension foresters, growers do not want 'second-class' seedlings (plants produced from seed), but insist on 'super-gums' (clonal plants).⁸⁸

Thus, the question asked throughout this study is whether or not the local farmers themselves consider such a land-use system appropriate to their own particular situation.

4.2.1.2 Development

From the theoretical discussion of development in the previous chapter, it is reasonable to use one of the more general definitions, while not losing sight of the derivation of the terms. This thesis is not concerned with economic growth or purely

⁸⁸ This issue is further discussed in Chapter 6, and also in the following section concerning development, as it obviously has dependency implications.

Some of the social impacts described by the Organisation for Economic Co-operation and Development (OECD, 1986) (dependence, for example), are raised as questions in the previous sections, but nevertheless are important and need to be covered. Other social impacts are those on employment potential, and effects on women. Environmental impacts are addressed through considering ecological sustainability.

Once again, however, it is the criteria considered most important by the farmers themselves that will be emphasised in this thesis. Issues (social, environmental and economic) raised during the fieldwork by the growers will be discussed and analysed in Chapters 5 and 6. That is not to say that issues raised by various experts, as well as those issues found in other studies, will not be addressed. The priorities, however, must be set by the people most affected by the woodlot initiative.

4.2.2 Summary of questions

In summary, the primary question to be answered by this research is:

Are commercial eucalypts an appropriate and sustainable land-use in northeastern KwaZulu in the 1990s?

This will be addressed by answering the following sub-questions:

- (1) Appropriateness: Do the growers consider the current model appropriate?
- (2) Development: Do woodlots cause structural change? Is there an increase in rural investment?
- (3) Equity: Are certain community or family groups disadvantaged through woodlots?
- (4) Dependence: Has technical, economic or institutional dependence resulted?
- (5) Opportunity cost: What is the opportunity cost to farmers? Are farmers aware of their choices? Do farmers understand the implications of growing trees?
- (6) Sustainability: Are commercial woodlots ecologically, economically and socially sustainable? What must be sustained, for whom, for how long? Do these woodlots empower people?

- (7) Impacts: What are the economic impacts to the grower? What are the linkages? What value is added to the product? What employment is generated? What are the impacts on local women? on children?
- (8) Have the issues and concerns raised by the growers themselves been adequately addressed?
- (9) Is the current model transferrable, or will it only work in northern KwaZulu?

4.3 METHODS

4.3.1 Background

The need for a 'hands-on' or 'participatory' approach to the researching of rural development is well documented. See, for example: Gow and Vansant (1983); Gregersen, Draper and Elz (1986); Cernea (1991); Chambers (1992); Carter and Gronow (1993); Van Gelder and O'Keefe (undated).

The terminology for this type of methodology has evolved (in the agricultural and forestry literature) from 'Action Research', which is described by Louw (1982, p. 4), as "combining investigative inquiry with participation", and by Cernea (1991, p. 26) as "a methodology for eliciting farmers' own proposals and choices and for mobilizing their initiatives and material resources", to 'On-Farm Research' (Scherr, 1991), 'Farming Systems Research-Extension (FSR-E)' (SAFSR-E, 1992), 'Rapid Rural Appraisals' (Conway, 1988; Molnar, 1989), to 'Participatory- and 'Relaxed Rural Appraisals' (Theis and Grady, 1991; Chambers, undated). While some of these terms appear to be used interchangeably, there are also preferences by discipline. Agriculture and agroforestry seem to prefer On-Farm or Farming Systems Research; 1992 saw a resolution to form a Southern African Association for Farming Systems Research-Extension (SAFSR-E, 1992), while the International Centre for Research in Agroforestry (ICRAF) held an international workshop in 1991 on "Methods for Participatory On-Farm Agroforestry Research" (Scherr, 1991).

In most of the rural and social forestry literature, however, the terms of choice are now Rapid-, Relaxed- and Participatory Rural Appraisals. Chambers (1992) explains how Rapid Rural Appraisals (RRAs) evolved to overcome the limitations of biased information collected in short visits to rural areas (i.e. 'rural tourism') and of the costs, inaccuracies and delays of large-scale questionnaire surveys during the

seventies.⁸⁹ He also believes that professionals began to recognise that rural people were knowledgeable on many subjects that affected their lives. He lists the main strengths of RRA as follows:

- (1) It allows for progressive learning which is flexible, exploratory, interactive and inventive.
- (2) It allows for the necessary reversals. Learning from and with the rural people, eliciting and using their criteria and categories, and finding, understanding and appreciating indigenous technical knowledge.
- (3) It allows for one not finding out more than is needed and not measuring what does not need to be measured.
- (4) It allows for information to be collected with different methods, sources and disciplines and a range of informants in a range of places, and cross-checking to get closer to the truth through successive approximations.
- (5) It allows for direct contact between investigators and local people in the field (Chambers, 1992).

Chambers goes on to describe, however, that while RRAs enable outsiders to learn from local people, the method is extractive. Participatory Rural Appraisals (PRAs), on the other hand, have as an objective for the outsiders to be "learners, conveners, catalysts and facilitators" (Chambers, 1992, p. 5). Chambers believes that the PRA approach draws on several traditions, including the community development approach of the 1950s and 1960s, and participatory action research. A similar assessment is found in the introduction to the RRA notes series, which states that "there are strong conceptual and methodological similarities between Action Research, Participatory Rural Appraisal (PRA), Participatory Learning Methods (PALM), Agroecosystem Analysis (AEA), Farming Systems Research, Rapid Assessment Procedures (RAP), Participatory Action Research, Rapid Rural Analysis (RRSA) and many others" (RRA notes No. 13, 1991, p. 1).

⁸⁹ Molnar (1989) describes some of the advantages of RRA over FSR-E, but points out that FSR-E is evolving rapidly, and the distinctions are not clear-cut.

4.3.2 Qualitative methods

The methodologies described above are a distinct shift away from quantitative data collection and analysis. This is not unique to forestry or rural development *per se*; there is a substantial body of literature, particularly sociological and anthropological, that describes and makes use of qualitative as opposed to quantitative research methods. According to Taylor and Bogdan (1984) the mainstay of qualitative methodology is participant-observation and is well described in the literature concerning qualitative research (Bulmer and Warwick, 1983; Burgess, 1984; Morison, 1986; Salmen, 1987).

Sociological research is dominated by two major theoretical perspectives, described by Taylor and Bogdan (1984, pp. 1-2) as positivism, which "seeks the facts and causes of social phenomena apart from the subjective states of individuals," and phenomenological, which "is committed to understanding social phenomena from the actor's own perspective." Taylor and Bogdan go on to explain that for the second approach, qualitative methods such as participant observation, in-depth interviewing, and others that yield descriptive data are appropriate. In support, Morison (1986, p. 43) describes the basis of participant observation as "anti-positivism".

Such observational techniques are often assumed to be within the realm of anthropology rather than sociology (Whyte and Alberti, 1983), or at least having their "roots firmly in the anthropological tradition of researchers like Malinowski, Margaret Mead and Evans-Pritchard" (Morison, 1986, p. 42). Taylor and Bogdan (1984, p. 5) go so far as to say that at times it is virtually impossible "to distinguish between cultural anthropology and qualitative sociology."

Because the fieldwork that provides the data for this thesis is qualitative, it is useful to have a fuller description of qualitative methodology.⁹⁰ Taylor and Bogdan provide ten points which summarize the technique:

- "1. Qualitative research is inductive . . .
2. In qualitative methodology the researcher looks at settings and people holistically . . .
3. Qualitative researchers are sensitive to their effects on the people they study . . .

⁹⁰ The rationale behind the adoption of this methodological approach is explained in a following section (4.3.5).

4. Qualitative researchers try to understand people from their own frame of reference . . .
5. The qualitative researcher suspends, or sets aside, his or her own beliefs, perspectives, and predispositions . . .
6. For the qualitative researcher, all perspectives are valuable . . .
7. Qualitative methods are humanistic . . .
8. Qualitative researchers emphasize validity in their research . . .
9. For the qualitative researcher, all settings and people are worthy of study . . .
10. Qualitative research is a craft" (Taylor and Bogdan, 1984, pp. 5-8).⁹¹

Van Maanen (1983, p. 256) makes the useful observation that qualitative work has a descriptive emphasis, and aims to "disclose and reveal, not merely to order and predict", a sound principle, in fact, for all scientific methodology.

The use of qualitative rather than quantitative research methods is a radical shift in terms of forestry research, where 'hard' statistics (biometry) are a corner-stone of any research project or university forestry program.⁹² It is obvious, however, that the research that is the basis for this study is not a measure of one rate of fertilizer application over another, or growth rates of trees over time. What is involved are peoples' perceptions of a forestry project that intimately affects their own lives -- taking land that could potentially be used for some other purpose, and yielding costs and benefits that vary depending on individual circumstances. An issue or insight raised by one farmer may well prove to have long-term importance, and cannot be ignored for falling outside of a 95% confidence interval. As Taylor and Bogdan point out, "In qualitative research, an 'N of One' can be just as illuminating as a large sample (and very often more so)" (1984, p. 81).

⁹¹ It is obviously not possible for the researcher to set aside all personal beliefs and perspectives (point 5, above); it seems likely that Taylor and Bogdan are trying to emphasise that the researcher must be careful not to influence the people he/she is studying.

⁹² This is clearly evident in the 1992 and 1993 Annual research reports of the Institute for Commercial Forestry Research (ICFR, 1992, 1993), as well as in the research reports listed on Forestek's Autumn, 1992 and Winter, 1992 quarterly newsletters (Forestek 1992a, 1992b); these two institutions (ICFR and Forestek) provide the bulk of the forestry research for the South African timber industry.

4.3.3 Other methods

4.3.3.1 Observation

Nachmias and Nachmias (1976) believe that observation is at the heart of social science. Participant-observation, however, is not the only form of observation, and it will be shown that it is not entirely appropriate for the research question at hand. Nachmias and Nachmias describe participant-observation as the least controlled method of observation, whereby the researcher (as indicated in the name) attempts to become attached in some way to the group being studied, while they describe controlled observation as being laboratory experimentation, field experimentation or simulation.

4.3.3.2 Questioning

Nachmias and Nachmias (1976) define three major methods which can be used to secure information from respondents, namely the mail questionnaire, the telephone survey and the face-to-face interview.

Because most woodlot growers in KwaZulu are illiterate and do not have telephones or mailing facilities, the first two are inappropriate to this situation and will not be given any further attention.

The interview, however, is entirely relevant. Face-to-face interviewing can take a variety of forms, and Nachmias and Nachmias (1976) define three main types, namely, extremely structured (where the questions, their wording, and their sequence are fixed for every respondent); focused, nonschedule-structured (where the situation has been analysed beforehand and the respondents are known to have been involved in a particular situation); and non-structured or non-directive (where respondents are encouraged to relate their own experiences, describing whatever they feel is significant).

Burgess (1984) distinguishes between structured and non-structured in terms of the relationship between the interviewer and the respondent, arguing that structured interviews do not imply a long-term relationship, and in fact the interviewer has power over the respondent who is in a subordinate role in the research context.

Unstructured interviews, on the other hand, generally imply that the researcher has some knowledge of a particular social situation, and the research relies on the

relationship that the researcher develops with the research subjects (Burgess, 1984). Parasuraman (1986) believes that the respondents must provide as much information as possible.

Most relevant, however, to the study at hand is neither the structured or the non-structured interview, but rather the semi-structured or focused interview. Merton *et al.* (1990) list certain characteristics that describe the focused interview:

- (1) the people interviewed have been involved in a particular situation;
- (2) the important elements or patterns of this situation have been partially analysed;
- (3) on the basis of this known information, an interview guide is developed which presents the major areas of inquiry; and
- (4) the interview is focused on the subjective experiences of people in order to determine their feelings about the situation they are in or have been exposed to.

4.3.3.3 Focus groups

A variation on the theme of the focused interview is that in which a group is interviewed. Often used in marketing research, the term has become synonymous in that context with qualitative methodology (Parasuraman, 1986).

Kumar (1987a) describes focus group interviews as those in which the participants freely discuss ideas, issues and experiences among themselves, and the moderator merely guides the discussions toward the issues identified in the interview guide. Kumar lists some of the advantages of group interviews:

- (1) speed -- information can be gathered rapidly from 6-10 people in a meeting lasting one to two hours;
- (2) economy -- again, more information can be gathered by fewer people in less time;
- (3) reduced inhibitions -- people may be more inclined to voice fears and frustrations in a group than they would be individually;

- (4) new ideas -- the group may raise ideas and issues that had not been considered by the researcher;
- (5) direct interaction -- between respondents and the researcher (one of the major advantages in Kumar's view);
- (6) accuracy -- respondents may fear being exposed by other group members if they give an inaccurate picture; and
- (7) flexibility -- the interviewer can pursue ideas that come up in the discussion.

At the same time, however, Kumar (1987a) also lists certain limitations:

- (1) quantification -- group interviews cannot generate reliable quantitative data (the purpose of the group is to discuss and raise issues; it is not intended as a means to determine how many within the group feel one thing or another);
- (2) bias -- group interviews can be highly susceptible to interviewer bias whereby the interviewer uses the group merely to confirm his or her own position; and
- (3) sensitivity -- participants do not tend to disclose sensitive information in group situations.

Merton *et al.* (1990) believe that the advantages of focus groups generally outweigh the disadvantages, particularly if one is looking for diverse definitions of a situation. They believe that the group should be socially and intellectually homogenous, and consist of no more than 10 to 12 persons, while the interviewer (or moderator of the group) should (according to Parasuraman, 1986) be sensitive, flexible, encouraging and involved. In the South African context, Jakoet (1988) found in a market research situation that the dress, language and race of the moderator, as well as the venue of the meeting all played an important role in the success of the research; in general, the more relaxed the moderator could make the group feel (through a familiar venue, common language, dress and race), the more the group would open up and reveal true feelings and concerns.

In a following section it will be shown that in-depth interviews and focus groups are the most appropriate methodologies for this study of commercial woodlots.

4.3.4 Triangulation

Triangulation in social and anthropological research generally implies a combination of methodology in order to verify results. Triangulation ostensibly guards against researcher bias, and allows for a deeper and clearer understanding (Taylor and Bogdan, 1984). Taylor and Bogdan (1984) also consider team research to be a valid form of triangulation, whereby two or more fieldworkers study the same or similar settings. Triangulation has been applied in this study of woodlots by using two primary methodologies (in-depth interviews and focus group discussion) supplemented by company records and key informants. A form of 'team research' has also been applied by using two fieldworkers to gather the data.

4.3.5 Rationale for the methodology adopted

The methodology required to collect the data for this analysis of small-scale commercial timber production in KwaZulu must meet the following requirements.

- (1) It must provide opportunity for the growers themselves to express their real feelings and concerns about the issues relating to growing trees.
- (2) These issues must be those considered important by the growers, and not those which are of most concern to the project leaders (in this case company management).
- (3) The information needs to be gathered timeously in order to allow the project managers to react to the results and make the changes recommended by the growers. Because approximately 500-700 farmers join the programme and plant trees each planting season (March to November), any changes that result from this study should happen be implemented before too many seasons come and go.
- (4) The recommendations must be made with due consideration and understanding given to the physical processes and constraints involved, which implies a working knowledge of the rural situation in KwaZulu, the people and cultures involved, and how to grow trees. Salmen (1987, p. 7), in the introduction to his book Listen to the people, suggests that "there is a way to learn about people undergoing development that may provoke direct and immediate benefits to them." This study has the same objective.

Given these criteria, it is clear that a flexible, interactive, holistic and timely approach is required. Certainly this implies some sort of qualitative method. While a Participatory Rural Appraisal (PRA) methodology at first appeared to be the most appropriate qualitative method for this study, it became clear that the actual situation did not allow for this. A PRA approach by definition implies participation at all stages with the rural people who are actually growing the trees. Such an approach would allow for great flexibility and real decision-making on the part of the growers. The Khulanathi programme, on the other hand, was implemented in a traditional 'top-down' manner, with little real participation by the growers. Rather, the growers were offered an opportunity to join a programme already constructed by Mondi management, who were in turn under financial and production pressure to get a certain number of trees in the ground within a certain time period. This is not the sort of approach that allows for participation, a subject discussed in more detail in Chapter 6.

This study was undertaken three years into the programme's life, and is aimed at assessing how the programme is doing, from the growers' perspective rather than the company's, and making recommendations to the company for ways of improvement. While not truly a PRA approach, the methodology adopted makes use of certain PRA and Rapid Rural Appraisal (RRA) techniques, and is certainly qualitative, aiming to describe, as well as "disclose and reveal" (Van Maanen, 1983, p. 256). However, what type of qualitative methodology is appropriate?

Taylor and Bogdan (1984, p. 15) describe participant observation as "research that involves social interaction between the researcher and informants in the milieu of the latter, during which data are systematically and unobtrusively collected."⁹³ However, while the "social interaction" is relevant to this study, the data are not collected "unobtrusively". Rather, what is required is social interaction that leads to a thorough understanding of local perspectives on the issues at hand, namely growing trees as a cash crop. Another definition from Taylor and Bogdan (1984, p. 37) is far closer to what is required, i.e. "repeated face-to-face encounters between the researcher and informants directed toward understanding informants' perspectives on their lives, experiences, or situations as expressed in their own words."

⁹³ The use of the terminology varies from author to author. Salmen (1987), for example, in his description of the 'participant-observer', does not advocate an 'unobtrusive' approach as do Taylor and Bogdan (1984).

This is their definition of in-depth interviewing, and is very close to Merton *et al.*'s (1990) focused interview as described previously. This focused interview is the primary technique employed in this study. The other main technique is the focus group interview. In addition, opinions were elicited from various individuals known to be familiar with the study area and the issues at hand, and company records were used to provide background information. These elements and their application to this study are described below. In the true sense of triangulation, each of these methods contributes unique information and, taken together, serve to present an accurate overall picture.

4.3.6 Methods used in this study

4.3.6.1 Focused interviews

Applying Merton *et al.*'s (1990) four characteristics of the focused interview to the fieldwork done in this study, it can be seen that:

- (1) the people interviewed are all involved in commercial woodlots or are neighbours to these growers;
- (2) the elements of commercial woodlots in KwaZulu have been provisionally analyzed by the author and others;
- (3) an interview guide (consisting of broad questions and areas for discussion) forms the basis of the interview; and
- (4) these interviews focus on the subjective experiences of the tree growers in order to determine their own definitions of the situation.

The 'interview guide' developed and used for this study took the form of a questionnaire comprising mainly open-ended questions, and is presented in Appendix II. These questions were arranged under certain categories known from previous discussions and investigation to be those generally considered important by the growers. These categories were:

- (1) labour/work -- including the time taken for woodlot establishment and maintenance, who does the work, use of contractors and their payment for this work;

- (2) money -- such as expectations of amounts of money that will be made by growing trees and what this money will be used for, understanding of the loan agreement with Mondi, use of cheques, alternative opportunities for making money;
- (3) harvesting -- perceptions of when the trees will be ready and who will do the harvesting, whether the growers would consider doing their own harvesting, and what would be required to do this;
- (4) communication with Khulanathi staff -- whether there is sufficient contact with the foresters (individually and in the form of meetings), whether these meetings are helpful and what could be done to facilitate training and communication;
- (5) Mondi -- relationship with the forester, growers' knowledge of the workings of the programme;
- (6) land -- ownership and tenure, alternative uses for land, effects on the ecology, availability of fuelwood and building material;
- (7) contract with Mondi -- understanding and fairness of the contract, whether or not a contract is necessary, and what should be included; and
- (8) general issues -- including reasons for growing trees, comparisons with alternative (especially food) crops, other organisations in the area facilitating development.

4.3.6.2 Focus groups

As discussed previously, the main reasons for focus groups are the speed and economy with which large amounts of information can be gathered, the flexibility and interaction between the group and the interviewers, and perhaps most importantly for the study at hand, the fact that groups can help to overcome individual inhibitions. Rural KwaZulu tends to be a male-dominated and authoritarian society, where the local Tribal Authorities and their heads (the Inkosis) are all male and often wield considerable power. It is generally agreed that one of the causes of the so-called 'political violence' in KwaZulu is between the older generation who adhere to the traditional tribal system, and the younger generation who want to see a more democratic system in place in the rural areas. Under these conditions there is often a greater willingness to talk and voice opposition within the security of a group. (One example from this study was the

willingness of groups to talk about the relationships between the growers and Mondi staff, whereas individuals seldom discussed these issues.)

Through design, and as recommended in the literature, the groups tended to be fairly homogenous and were kept gender separate. The numbers in each group ranged from six to 12. Members of these groups were not chosen by the fieldworkers; rather they would let it be known that a discussion would be held on a certain day and then work with whomever arrived. This may have resulted in some geographic bias, as those growers living closer to the meeting place were probably more likely to come to the discussion than those further away. It is the author's perception that few people in the study area have their own transport, and taxis are expensive; this reason has been given previously by growers not attending meetings.

4.3.6.3 Key informant interviews

As defined by Kumar (1987b, p. 7), "key informants interviews involve interviewing a select group of individuals who are likely to provide the needed information, ideas, and insights on a particular subject." This would normally mean a diverse group of people in order "to reflect diverse viewpoints and concerns" (Kumar, 1987, p. 7).

However, for the purpose of this study, the term is loosely applied to describe eliciting opinions from various individuals known to have some expertise either with aspects of rural land use in KwaZulu, or with issues about growing eucalypts that directly affects woodlots. Each of these people (a complete list is given in Appendix III) are known to the author to have given considerable thought to the Khulanathi programme, and some had previously expressed reservations about certain concepts and practices involved. Some are quite vociferous in their opposition to commercial woodlots in general, and to eucalypts in particular. The opinions of this group may help to balance some of the optimism of the growers. Rather than presenting their opinions in a separate section, however, they appear where relevant to a particular subject in Chapter 5 (results) and Chapter 6 (discussion).

4.3.6.4 Company records and personnel

Company records were used to provide an overall picture of the situation, such as numbers of growers, comparisons by gender and area, rate of planting and so on. One of the advantages of this study is that all of this information was available to the author (but would not have been available to an outsider), and meant that the total

population (rather than a sample) could be used in some of the description of the study area.

Khulanathi staff were also interviewed as part of this study; their intimate knowledge of various aspects of the different areas was vital to allow for a more complete analysis. These people are also listed in Appendix III.

4.3.7 Quantitative work

The reasons for adopting a qualitative approach have been discussed. However, in each of the areas where the fieldwork was conducted a stratified random sample was drawn. This was done in order to see if there were major (and possibly significant) differences between the areas. It quickly became evident that most of the issues of major concern to growers are common throughout the areas where the fieldwork was conducted. The differences between the areas appear to be due to their unique geographic location (such as the issue of harvesting roads which concerns growers at Biyela but not the growers on the flatter, coastal areas), and as such can be described qualitatively, and do not require quantifiable proof.

A stratified random sample is defined by Scheaffer, Mendenhall and Ott (1986, p. 79) as "one obtained by separating the population elements into nonoverlapping groups, called strata, and then selecting a simple random sample from each stratum." According to Morison, stratified sampling is more representative when the population is mixed in terms of relevant characteristics such as age, sex, area of residence, etc, and where this is so, tends to reduce sampling error.

For the individual interviews that form a substantial part of this study, such a stratified random sampling method was adopted, with each area considered as a distinct stratum, and a random sample drawn at this level. For the Mfekayi area, the area was further subdivided into wards (four) and gender, with the random sample drawn from the lowest level.

This was done in order to see whether or not the responses of women differed markedly from men; if, for example, women felt differently about trees (a cash crop) than did men, given that women (according to Casley and Kumar, 1987) often grow subsistence crops while men grow cash crops. It is also possible that within a particular ward growers received more support from the forester or experienced more community conflict.

4.3.8 Fieldworkers

The fieldworkers used in the collection of the data are critical to the success of the gathering process, particularly in light of Taylor and Bogdan's (1984) concept of 'social interaction'. This study was fortunate to have access to two local people who each had considerable interviewing/fieldwork experience as well as thorough knowledge of local land-use practices, including forestry.

Johnson Khosa is from the Ngwavuma district of KwaZulu. He works as part of the Khulanathi team and is normally responsible for communication and training. He spends much of his time setting up representative growers' committees which function as a channel of communication between the growers and Mondi. Besides a natural ability to communicate with rural people in a very unthreatening manner, he worked previously (for four years) for the Institute of Natural Resources (INR)⁹⁴ involved in rural biology surveys. He also received training in communication and organisational development. He was involved in the Khulanathi programme from its inception, first working for the INR at Biyela before joining Mondi to stay on the same programme.

Peter Zulu is from the Nkandla district of KwaZulu. He has been involved in a number of rural surveys in KwaZulu, working with the Farmer Support Group (an agricultural development NGO attached to the University of Natal, Pietermaritzburg), as well as with the Centre for Social and Development Studies (CSDS) of the University of Natal, Durban. During 1992 he conducted fieldwork with Cairns (1993) on a CSDS study that looked at certain aspects of small-scale timber production in KwaZulu (of which the Khulanathi programme formed a part), and is therefore well acquainted with the areas, some of the people and the issues involved in timber production.

The question of neutrality and objectivity must obviously be raised in terms of Khosa's involvement in the fieldwork. Did his bias in favour of the programme prevent his ability to gather good information? It appears not. He has worked hard to establish his role as a 'neutral party' within Khulanathi, not subject to the production pressures that the foresters face. It became evident during the fieldwork that growers were more than willing to talk to Khosa about Mondi, often criticising the process and their dealings with the foresters.

⁹⁴ A rural development and resource management non-government organisation (NGO) at the University of Natal, Pietermaritzburg.

Far more important is the trust that has grown between Khosa and the farmers. This has come about slowly; Khosa started in 1988 at Biyela, and is now firmly entrenched. Besides the theoretical rationale discussed earlier in this chapter which argues that the relationship between fieldworker and grower is vital to the research, the socio-political situation in KwaZulu presents equally compelling reasons. At a meeting of the Mpukunyoni Tribal Authority in March 1993 the author introduced the fieldworkers and explained the reason for the research. The reason for this introduction was both as a courtesy to the existing authority structures, and to allay any fears that the fieldwork was part of a political agenda.⁹⁵ At the Tribal Authority meeting, the author stated that one of the main reasons for the research was to present Mondi management with options for improving the Khulanathi programme based on the growers' own perspectives, and therefore there were potential benefits to the local farmers. The meeting, however, grew quite hostile and it became clear that they did not want anymore "university people" going around asking questions. There was also a dispute with Mondi over ownership of a piece of land in the area which legally belonged to the company, but on which someone had begun to build a shop. Permission to continue with the fieldwork was refused.

Further meetings with various members of the Tribal Authority were able to clear up that the author was indeed a part of the Khulanathi team, and not an outsider. It was also clarified that the land negotiations were not connected to Khulanathi. As the people had a good relationship with Khulanathi staff and were reasonably happy with the programme, permission for the fieldwork was granted. An outsider would not have been allowed in.

4.3.9 Fieldwork

The fieldwork took place over four months, from March to June of 1993, comprising individual in-depth interviews with 112 Khulanathi growers, 16 non-growers, 22 harvesting contractors, 12 silvicultural contractors, supplemented by 15 focus group discussions.

The work started in the Mfekayi area (area 2 of Figure 1.1), as this area has a relatively low level of unrest and a high number of woodlot growers (541 at the end of September 1993, or 39% of the total number). It is more rural than some of the

⁹⁵ Much of rural KwaZulu is extremely volatile and virtually inaccessible due to various forms of 'political unrest'. This is discussed in a later section of this chapter.

other areas (such as Esikhaweni), with no significant adjacent industry besides plantation forestry.

Each individual interview took approximately one hour, and generally no more than four interviews took place on one day.⁹⁶ Finding individual homesteads also proved to be quite time-consuming.

While the author attended some of the initial interviews, his obvious 'outsider' status (and having to use a translator) prevented open discussion. Translation has posed serious problems to social scientists in South Africa (described by Preston-Whyte, 1982), and within the Khulanathi programme this has also proved to be the case. The issue over the contract (between the growers and Mondi), for example, is a case in point; only recently (November, 1993) has the contract been translated into Zulu (which the growers have requested for some time), but there is still some question as to whether or not Mondi's legal department will accept the Zulu version as the binding document.

Attending some of the in-depth interviews, the author noted that Khosa and Zulu were quite competent in guiding the discussion and focusing on the issues at hand. The questions were thoroughly covered, and they were quite willing to change the sequence and add or drop issues depending on the specific circumstances. For example, discussion around land issues, ownership, tenure, and so on proved to be particularly sensitive, and was often not raised. They also worked well as a team, with Khosa (known to many of the people) doing most of the talking, and Zulu writing the responses and raising points that might have been missed.

4.4 DESCRIPTION OF STUDY AREAS

4.4.1 General

A general description of each of Khulanathi's areas of operation is given in Chapter 2. Looking at the map on page 2, it can be seen that most areas (six of the nine) lie along the northern Natal/KwaZulu coast on the eastern seaboard of South Africa. Topographically, a seventh area (Mfekayi) can also be classified as coastal, as it

⁹⁶ Accepted practise seems to be for 'work' to be done in the morning -- hiring local people for weeding, for example, is for the period 6 am to 11 am or 12 am. Afternoons are kept for household tasks, and the fieldworkers were not welcome at this time, whereas people were quite willing to talk in the mornings.

occurs on the same deep sands and receives a similar rainfall. Mfekayi is also managed as a coastal area as part of the Khulanathi programme.

Only Biyela and Nkandla are truly inland; the area is hilly and steep and the vegetation is quite different from the coastal areas.

Along the coast, there are marked differences between the more rural areas (Mbazwana, Mfekayi and Amatikulu) and the areas (Sokhulu, Mbonambi, Esikhaweni and Ngoye) located close to the main urban and industrial centre of the North coast, namely Empangeni/Richards Bay. Amatikulu is also somewhat different in that many of the woodlots are located in a traditional sugar-cane area, and many farmers belong to the small cane-grower schemes.

Another distinction between the areas is that of 'new growers', that is, areas where small-scale timber production had not previously been occurring (at any substantial level), and 'established' areas where local farmers had been growing trees for some time.

Given the above distinctions, the Khulanathi programme was divided into four distinct categories; one of the aims of the study was to conduct sufficient fieldwork in each one so as to determine its unique features and any particular problems facing the growers there.

4.4.2 'New' coastal areas

The two areas originally considered by Mondi to hold considerable forestry potential were Mfekayi and Mbazwana.⁹⁷ However, as described in Chapter 2, the wholesale destruction of woodlots in the latter area has resulted in Mondi giving up any hopes of returning there, at least for the foreseeable future.

Mfekayi, however, has remained relatively free of political or criminal disturbance, and representing as it does the primary model on which Mondi based its Khulanathi programme, namely converting 'new' land to small eucalypt woodlots, Mfekayi has consequently received the bulk of attention for this study. The author believes that by far the greater part of any future expansion by Khulanathi (or other programmes such as Sappi's 'Project Grow') will be into similar areas, that can be defined as

⁹⁷ More correctly Maputaland, as Mondi planted trials and assisted with woodlots as far north as Manguzi, and not just around the town of Mbazwana.

rural, politically stable, close to processing plants, with good access and good growing conditions.

The Mfekayi area consists of four wards, and at least nine in-depth interviews were conducted in each. In total, 23 men and 36 women were interviewed, and three focus group discussions were held with men and two with women.⁹⁸

4.4.3 'Established' coastal areas

The areas of Sokhulu and Mbonambi make up the areas considered for this study to be coastal established. Timber has been grown commercially in these areas for at least 20 to 30 years.

Fieldwork was undertaken in Mbonambi but not in Sokhulu due to the unrest as described in the following section, "Constraints"; 18 in-depth individual interviews were conducted (of 110 growers), along with three focus group discussions (two with men and one with women).

4.4.4 Coastal 'cane' areas

As described previously, the Amatikulu area south of Mtunzini lies firmly in the Zululand cane belt. Sugar-cane does not do well on the coastal sands, however, and Khulanathi has attempted to capitalise on these areas. There has also been some conversion from cane to timber, either through farmers recognising that timber will do better on their particular site, or unhappiness with the sugar-cane scheme.

Of 69 growers in the area (by mid-1993), 16 in-depth interviews and two focus groups (one men and one women) were conducted.

4.4.5 Inland areas

Because timber production at Biyela forms part of the larger Integrated Rural Development Programme run by the INR, Khosa (1993, pers. comm.) believed that growers were quite familiar with group discussion as these had been conducted by

⁹⁸ Overall, more focus group discussions were held with men (eight) than women (six), but the reason is difficult to determine. This may indicate a bias on the part of the interviewers, who were both men. At times, meetings were arranged but were not conducted if at least a few (three to four) individuals did not arrive. Time constraints prevented arranging repeat focus groups.

INR staff at various times previously. For this reason, five focus groups (two men, two women and one mixed) and 15 individual interviews were conducted at Biyela. Because Nkandla has virtually been excluded from the Khulanathi programme, only minor attention was paid to this area as part of this study; four individual interviews were conducted at Nkandla.

4.4.6 Constraints

As with any survey-type fieldwork undertaken, two of the major considerations are time and cost. The results of this work will be offered to Mondi management with "useful and timely information to help them make decisions that will improve the project's performance" (Salmen, 1987, p. 108). To take this a very necessary step further, the possible changes to the programme suggested in this study will not only have to be approved by Mondi, but also discussed and validated by the beneficiaries (the local people) themselves. Without this crucial step, in as participatory a manner as possible, a mockery would be made of all the arguments put forward as part of this research in favour of Participatory Rural Appraisals.

However, this fieldwork took place during March to June of 1993 and, allowing time for analysis and presentation, will only be available to Mondi by January of 1994. This does not allow much time before the planting season begins in earnest in March of 1994 to work with the growers in order to implement changes. Besides time, financial constraints are always considerable. Two full-time fieldworkers and a vehicle were necessary for the fieldwork, and the four months taken could not have been extended without incurring considerable additional expense. The value of focus groups became apparent as time wore on.

The volatile political situation in South Africa has had a very serious impact on this study. 'Political situation' is commonly used in South Africa to describe unrest that may or may not be politically motivated. Certainly there are many killings throughout KwaZulu between opposing members of the the two main political parties in the region, namely the African National Congress (ANC) and the Inkatha Freedom Party (IFP). However, there are many violent crimes committed in the area that are attributed to common criminals, but aided by the availability of weapons in South Africa brought in as part of the struggle against the Nationalist regime.

In certain areas (notably Esikhaweni, Ngoye, Sokhulu and Mbonambi), the level of violence is generally high, and the intensity and personal danger varies over time

according to prevailing circumstances. At times the Khulanathi foresters cannot enter a particular area because of the violent situation, and several threats have been made to the lives of the foresters and their assistants. On the whole, however, the foresters work hard to maintain politically neutral positions within their areas, and are left alone. Of these four potentially dangerous areas, only Mbonambi was relatively safe for the fieldworkers at the time of this study, and the fieldworkers dismissed any suggestion of conducting interviews in the other three areas. During June of 1993, the University of Zululand (located at Ngoye) was closed for several weeks through protest against the appointment of a new Vice-Rector; vehicles were burnt, property damaged and staff threatened. In the Sokhulu area, the South African army have been providing escorts of armoured vehicles for people going to the local beaches.

The situation shows just how necessary it was for the fieldwork to be conducted by individuals known and trusted by the local people.⁹⁹

4.5 CONCLUSIONS

This study intends to answer questions about the suitability and sustainability of commercial Eucalyptus woodlots in north-eastern KwaZulu in the 1990s. Specific issues raised by these questions also need to be addressed; these include appropriateness, development, equity, dependence, opportunity cost, sustainability and impacts.

It is meaningless, however, to address these critical issues purely from a theoretical or 'outsider' perspective. This study will address these questions and issues from the perspective of the people actually involved in the process, the growers themselves. To do this a qualitative rather than a quantitative methodology has been adopted. This consists of individual, in-depth interviews and focus group discussions, supplemented by company records, and by interviewing a variety of experts involved either directly or indirectly with the situation in rural KwaZulu, or with various aspects of growing eucalypts.

⁹⁹ There was some uncertainty at the time of the fieldwork conducted in the Amatikulu area over the advisability of using a hired vehicle rather than one clearly marked "Khulanathi", as this would raise suspicion among local residents. Fortunately these fears proved groundless.

CHAPTER 5 RESEARCH RESULTS

5.1 INTRODUCTION

This chapter describes and interprets the fieldwork and research findings of this case-study. Because the emphasis is on the subjective experiences of the farmers involved, the bulk of these results are derived from the in-depth interviews held with the farmers. In all, 112 Khulanathi growers, 16 non-growers, 22 harvesting contractors and 12 silvicultural contractors were interviewed, supplemented by 15 focus group discussions. (See the map on page 2 and the description of the areas in Chapter 4.) Results from the individual, in-depth discussions were sorted in order to find trends, and where percentages are given, or graphical presentations made, these are derived from the individual interviews and not from the group discussions.¹⁰⁰

The group discussions often revealed concerns that were not initially voiced; one person would touch on a sensitive area, and in so doing encourage others to agree or disagree. For instance, the relationships between the growers and the Mondi foresters and supervisors were discussed far more freely in groups than individually. Likewise, growers were more likely to express their concerns about the contract when part of a group.

Only 16 non-growers were interviewed as there was considerable reluctance on the part of farmers in the field to talk to strangers. The interviewers felt that the high levels of suspicion were associated with the violence in most of the areas where Khulanathi operates, and were not keen to force interviews on unwilling respondents. While a larger response from non-growers would have been desirable to offset a 'pro-forestry' bias, the emphasis of this study is to determine the concerns of and impacts on the growers themselves, and not on the whole population. It should be recognised, however, that non-growers may be severely impacted by woodlots, and it is recommended that this be investigated further at a later stage.

Because the results are largely subjective, they are presented both in terms of impacts (environmental, social and economic), and in terms of the more general concerns growers had in relation to each of these subject areas. (The overall

¹⁰⁰ The purpose of the focus groups was to generate discussion around a specific topic. It would not be meaningful or practical to separate out individual responses for statistical purposes.

development potential of this programme is discussed as part of the conclusions in Chapter 6.) Comparisons between the areas that fall within this study, as well as with results obtained from other studies, will also be presented as part of the discussion in Chapter 6.

5.2 DESCRIPTION OF THE RESULTS

5.2.1 Environmental impacts and concerns

The growers interviewed seldom verbalised the environmental concerns they might have about growing eucalypts. The specific question, "Are trees good or bad for the land?" usually (74% of respondents) elicited a reply of "good". However, following up on this question showed that trees were seen to be good for their perceived economic rather than environmental benefits, and 13% of the respondents made this particular point.

5.2.1.1 Water

A few growers did state that trees would take too much water, both in the newly planted areas (Mfekayi and Biyela) as well as in the more established area of Mbonambi. Others said that their neighbours were concerned about the trees taking too much water, and one grower said that he had agreed with his neighbour not to plant too close to the stream. Several growers said that while they did have water problems, this was a result of the drought, and not the trees. Virtually all (84%) of the growers interviewed fetch their water by hand from nearby streams or rivers. The remainder get their water from a nearby dam or windmill.

In order to judge the likelihood of water depletion, the interviewers and growers together estimated the distance of trees from the nearest water source. Figure 5.1 shows these distances, and it can be seen that although 40% of the respondents' woodlots lie within the safety distance of 200 metres recommended by Kienzle and Shulze (1993), only 3% lie at about 20 metres which is the limit recommended by Mondi Forests' environmental code of practise (Mondi Forests, undated) and South African law. There is obviously a great discrepancy between these distances, and this issue is discussed further in Chapter 6.

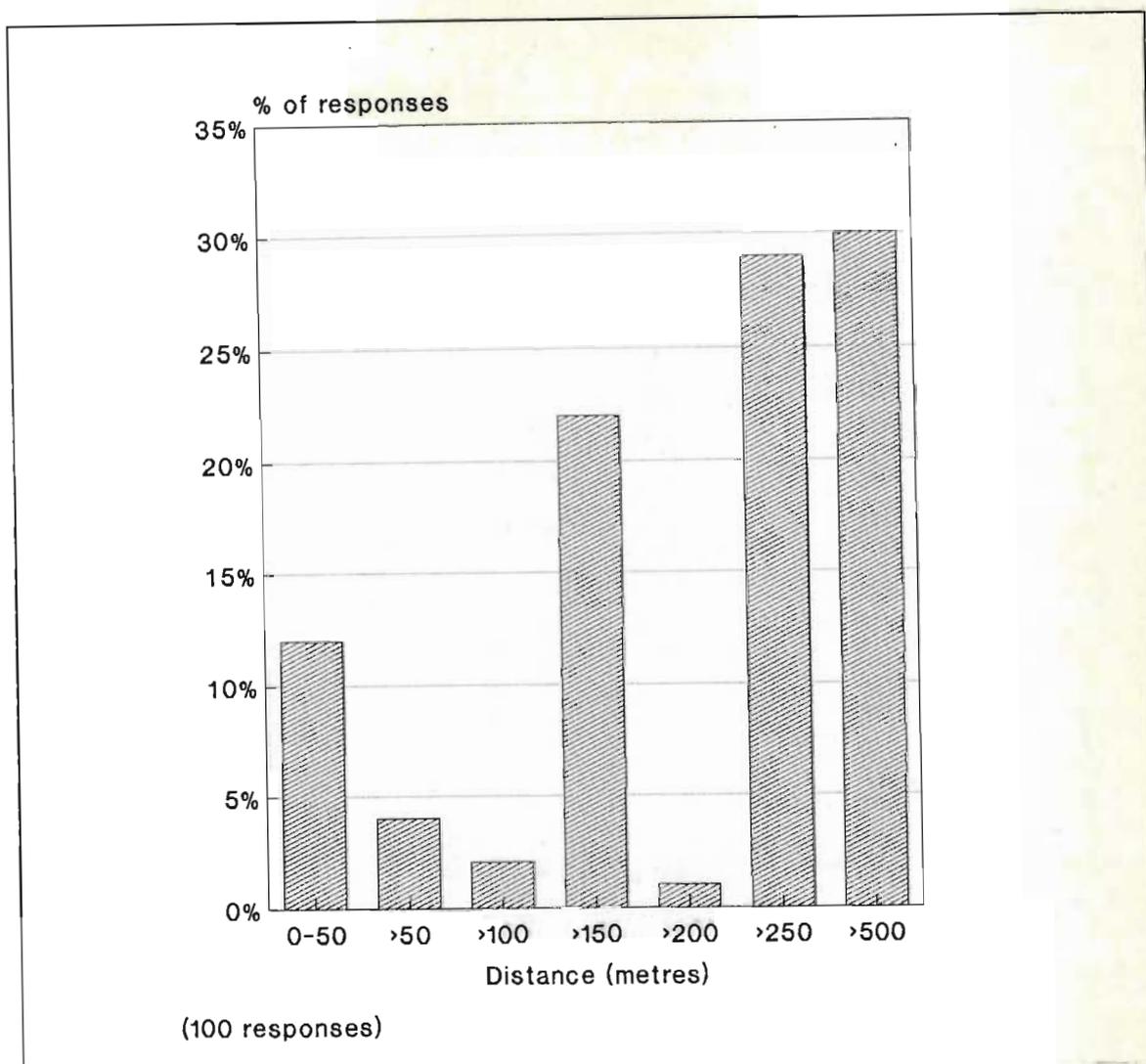


Figure 5.1: Distance of woodlots from the nearest water source (metres) as a percentage of growers responding.

5.2.1.2 Herbicide use

One grower expressed concern about the 'poison' that was sprayed on the plot to kill weeds. It appears that chemical weed control is not favoured by Mondi and has only been used where growers have not kept up with manual weeding, in order to prevent the weeds completely suppressing the trees.

5.2.1.3 Replacement of biodiversity and food crops

Replacement of biodiversity by a monoculture was considered in this study by asking about the previous use of the plot of land. If it could be shown that eucalypts were largely replacing indigenous bush and grasslands composed of a variety of species, then eucalypts would obviously have negative impacts on biodiversity. (This

question also has social and economic implications as the answers show that food crops were replaced.) Sixty-six percent of growers responding had, sometime previously, planted a staple or vegetable crop on the specific piece of land going to trees. It is difficult, however, to determine whether or not trees had recently replaced food crops. Only four men and two women responded that trees were actually taking land away from other things. Discussions showed that some growers (15%) considered their land to be "finished" and no good for anything else, although all of these responses were in one area (Mfekayi). Several others (41%) said they planted food crops on alternate land. Eighteen percent of the respondents said that there had been some grazing on the land that was now planted to trees, and if this were naturally occurring grassland, it would probably indicate a reduction in biodiversity. However, to answer the question of biodiversity satisfactorily, an historic analysis using aerial photographs would probably be required. Such an analysis was not done as part of this study.

5.2.1.4 Fuelwood

Fuelwood is a critical resource in rural KwaZulu. All but one of the farmers interviewed use wood as their primary fuel source, and several complained of the difficulty of finding enough wood. It was difficult to determine whether or not the woodlots planted will help to alleviate this problem. Growers were not willing to admit that they might use timber for fuel or building that they had agreed would go to Mondi, although several complained that they had been promised extra trees by Mondi for their own use, but these had not been supplied. Although distribution of extra trees is approved by Mondi management, the practise does not appear to be widespread.

In the areas where farmers have their own woodlots (not committed to Mondi) all of the respondents said that they did use their own woodlot trees (eucalypts) for building and as fuelwood, indicating that the Khulanathi growers are likely to do the same thing once the contract does not prevent it (after the first crop). At Biyela, growers specifically said that they would like to be able to use their trees for building poles and fuelwood.¹⁰¹

¹⁰¹ During 1992 a demonstration plot was felled at Biyela. At least half of the timber was stolen virtually as it was felled, not in some organised manner but by individuals, it was said, for poles. The timber belonged to the local tribal authority and not to one family, and may have been seen as a common resource.

5.2.2 Social impacts and concerns

5.2.2.1 Family and community conflicts

One of the criticisms of small grower schemes such as this one is that they aggravate family and community relationships by widening the gap between the 'haves' and the 'have-nots' and between men and women. It is argued that women will have to tend trees in addition to, or while neglecting traditional household duties such as food production, child minding, water and fuel collection.

These issues were considered by asking about land ownership, divisions of labour, use of profits, time taken by trees, food production, and by general issues raised in discussion.

It is immediately evident that many woodlots are contractually owned by men, but actually worked by women. The fieldwork conducted in this study aimed to be proportionally representative based on who signed the contract. While 65% of the contracts are signed by men, visiting the woodlots showed that 58% of those visited were actually managed by women. This is consistent with rural KwaZulu, where traditional and legal authority (Zulu customary law) rests with the men (Potgieter, 1992), many of whom are often away as migrant workers.

The author therefore believed that a more representative sample would be obtained by interviewing those individuals actually found to be managing the woodlots, and not necessarily the person who signed the contract. Women respondents therefore constituted 58% of the total survey.

Given this situation in rural KwaZulu, it might have been expected that very few women actually considered the trees to be their own, but only 38% of the women interviewed answered that the trees belonged to their husbands. The others claimed ownership for themselves. One woman explained that while it was necessary for her husband to sign the contract, the trees were most definitely hers. All ownership was within the immediate family; there was no evidence of trees owned by other members of the community or by outsiders.

The obvious follow-up question, given ownership, was who would actually receive the income from the trees. The interviewers experienced difficulty asking this question (and in fact all questions relating to money) directly, and instead discussed how the proceeds from the sale of the trees would be spent. Few women made

reference to having to consult with their husbands, but 19% of these women did not say how they would spend the money, which may indicate having to consult. In the focus groups, one woman did complain of having to do the work while her husband received the income, and another said that she and her husband shared the work but the husband got the income.

The argument that men would spend their money on luxury items, and women on basic needs, was not supported by these results, as only one man and one woman expressed a desire for an obvious luxury item (a car).

It can be seen from Figure 5.2 that the chosen items primarily constitute basic needs: education, housing and household goods comprise 62% of the total responses. Another 21% of the responses can be classified as investments: banking the money, buying a tractor, building or buying a business. (In one of the focus groups, a woman insisted, to the amusement of the group, that the only way to spend the money was to throw a party and enjoy yourself!)

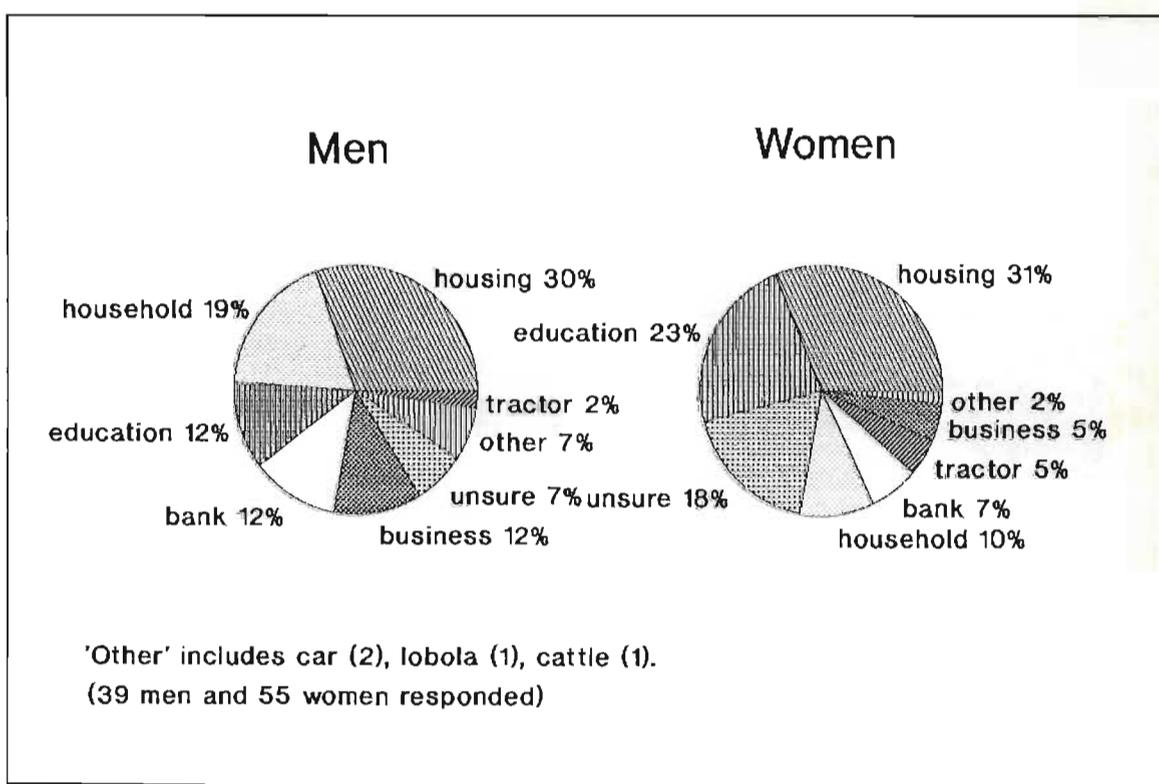


Figure 5.2: Spending preferences of men and women.

The issue regarding whether or not women become further disadvantaged by an increased work-load was discussed through questions of the time taken by forestry work. Only 9% of the women responding felt that forestry did take a lot of their

time, although only 5% felt that forestry caused them not to have enough time for other things. (The equivalent responses for men were 15% who felt forestry took a lot of their time, and 3% who felt forestry prevented them from doing other things.) Complaints about the time taken to manage the trees did not surface during the focus groups.

5.2.2.2 Land use

All of the growers interviewed were asked why they had decided to grow trees. It might have been that women were told to do so by their husbands, but this was not offered as a response. Rather, most women (71%) started growing trees in order to make a profit, although this answer was frequently combined with the response that the land was not being used or was bad for crops. Men responded similarly, with 72% growing trees as a cash crop. A few growers (5%) believe that by planting trees they can secure the boundaries to their land. Only two growers were growing trees for ecological reasons; one as a windbreak and the other to prevent soil erosion.

Trying to establish whether or not trees detracted from food production was done via discussion around crops and alternate tree species grown by the household. Only 36% of households surveyed said that they grew their own food; the others said that they purchased their food. This is inconclusive, however, as 67% of the growers said that they did grow vegetables or staple crops, and it is evident that some households grow fruit trees. In all likelihood, most families both grow and buy food. When asked specifically about having time and water available to grow crops, 41% of respondents felt that these were limiting factors, particularly water. Five percent felt that the land itself was too bad to grow crops (some cited the sandy soil), and another 5% said they did not have enough land to grow crops. Some growers complained that cattle belonging to their neighbours had eaten their vegetables, and so they had stopped growing. A few growers said that they had specifically given up food crops for trees as the trees would make them more money than the food crops ever did.

A subsequent question, about what growers would most like to see their land used for, revealed that the majority prefer cash crops, either eucalypts (28%) or sugarcane (26%). Other preferences were for fruit trees (20%) and food crops (9%).

It should be noted, however, that while talking specifically about trees (rather than land use), most growers (60%) said that they would like to grow fruit trees if they did not do so already (7%). Considering normal land use practices in rural KwaZulu,

where many households grow a few fruit trees for home consumption, this desire for fruit trees is probably in addition to other land uses, and is not likely to indicate a preference for widespread fruit farming, although this was not specifically asked.

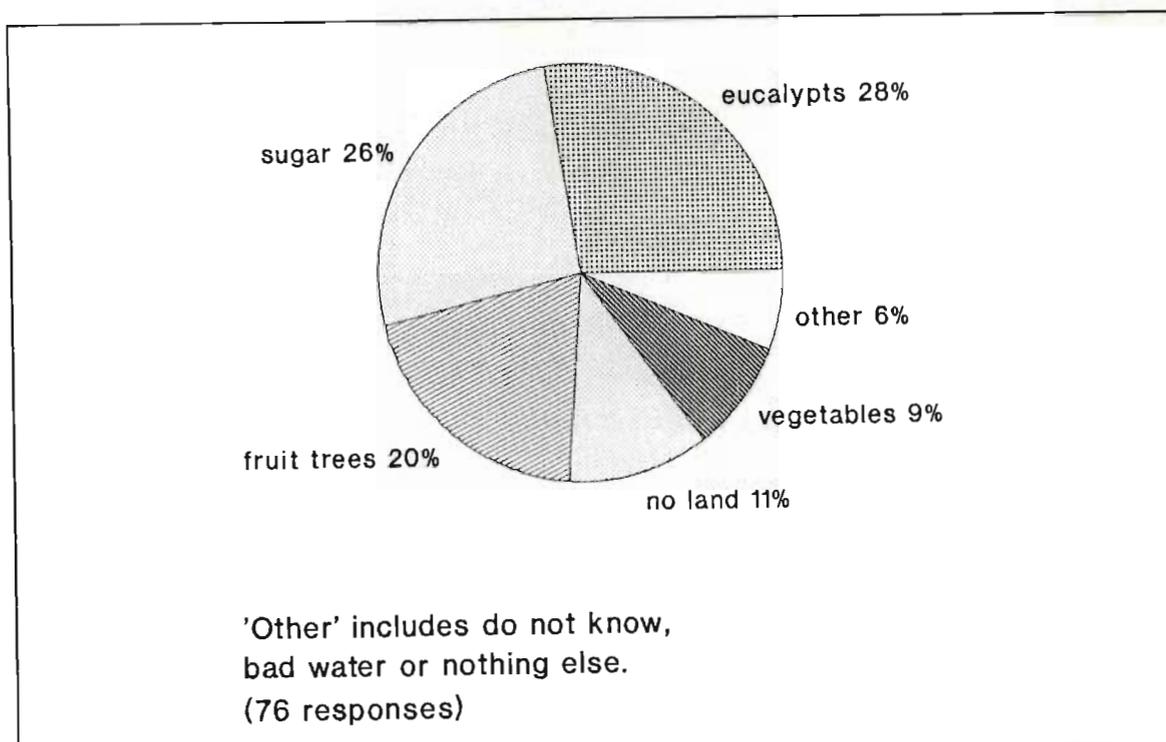


Figure 5.3: Land use preferences of growers.

It was evident from the interviews that one of the major constraints to growing fruit trees is help with obtaining them and advice on establishing them. While **some** growers interviewed (13%) believed they could get plants from a nursery, or purchase seed (presumably food crops) from a shop (22% of respondents) or **the** chemist (10%), few (11%) said that they could actually get assistance with **the** process. The only help available is from a local agricultural co-operative (6% of respondents), or the KwaZulu Government's Department of Agriculture **and** Forestry (5%). The group discussions showed that growers would grow more fruit and food crops if they had the type of assistance (inputs and a market) that they **get** from Mondi to grow eucalypts. This is a crucial issue, as it reveals that opportunities are extremely limited in rural KwaZulu.

5.2.2.3 Land tenure

As stated above, some growers do believe that planting a long-term crop like trees will help to secure their rights to that land. At Mbonambi, group discussions revealed that there had been a general fear that the government was going to take

their land if it was not used, and so people had planted trees in response. Critics also believe that individuals may plant trees on land that is communal rather than individually held, and this may give rise to community conflicts. This common land would traditionally be used for grazing cattle.

However, when this question was specifically raised, growers would not willingly talk about the issues surrounding tenure. The question was only asked of 18 growers in the most peaceful area (Mfekayi), and these growers all responded that the land was their own; they had no fear of Mondi, the government or a neighbour taking their land, and had never experienced any conflict with neighbours about planting trees. (However, group discussions in the same area did bring to light a case of an unhappy neighbour.) The interviewers felt strongly, however, that this subject would not be freely discussed, and chose not to raise it in subsequent areas. A related question, asking what family members felt about trees, revealed that in Mfekayi, five families (of 55 asked) had expressed unhappiness at the family planting trees, and group discussions revealed that some families would prefer to plant food crops. Although asked in other areas, there were no further negative responses.

The question, therefore, remains unanswered, and only time will tell whether community conflicts do arise.¹⁰² Obviously the potential for conflict increases with the planting in a specific area; the community may let a few woodlots go on common land, but feel a need to do something if a larger proportion of common land is lost to grazing.

5.2.2.4 Communication with Mondi

The relationship between the growers and Mondi is critical to the whole Khulanathi programme, and trust is probably the most important single element. Mondi must believe that the growers will look after the trees and deliver the timber to them when it is ready. The growers, in turn, must believe that Mondi will assist at each stage of the whole process, charge fair prices, and pay fairly for the timber. This study has

¹⁰² The conflict in the Mbazwana area, where the youth destroyed virtually all woodlots (182 ha), ostensibly because they were not consulted and felt that their inheritance was being squandered and the more powerful members of the community were being favoured by Mondi, has been discussed in Chapter 2.

investigated the relationships involved, and in addition has considered concepts such as dependency and empowerment.¹⁰³

Mondi has been instrumental in establishing and organising growers' meetings, which are supposed to facilitate communication between the company and the growers and serve as a platform for growers to voice their concerns about the whole Khulanathi process. Although these meetings are still in their infancy in many areas, questions were asked about whether there were meetings in the area, who attended, who elected the committee, and if these meetings were helpful.

Most growers (77%) knew that there were meetings in their area, but the frequency of these meetings varied considerably, from monthly to rarely, or once only. Sixty-three percent of the respondents felt that these meetings were helpful, and only 3% responded that the meetings were not helpful. Other growers had not heard about the meetings, or could not attend. In group discussions it was often mentioned that growers did not hear about meetings until after the fact, and were unhappy about this. Thirty-seven percent of those questioned had actually helped to elect the committee, and another 31% said that a committee had not yet been elected in the area. There was some inconsistency, however, as people from a particular area had helped to elect a committee, while others from the same area did not believe there was a committee.

A related question asked how often growers saw the Khulanathi extension forester, and whether this was often enough. The frequency ranged from quite often (weekly) to rarely or once only. Fifty-two percent of those asked felt that they saw the forester often enough, while 46% said they did not. Many growers were concerned that when their trees were planted, the forester had visited them quite often, but now that the trees were a little older, they never saw him. For the forester this is entirely logical, as once the trees are properly established there is little to do, and an annual visit is enough to ensure that firebreaks are maintained and that there are no problems. The growers, however, expressed a need for reassurance that their trees were still doing well, and would be harvested in due course. They seemed to feel that they had been forgotten by the forester.

¹⁰³ Empowerment in this context is taken to mean a process whereby individuals acquire new skills and knowledge that will allow them to take greater control of their own destiny.

Discussions about meetings and communication showed in general that growers want to talk among themselves and with a Mondi representative at regular intervals. Growers feel alienated from the whole process of growing trees; the foresters are very busy and arrange for work to be done by contractors without discussing with the grower what is happening. Several growers complained that they would like to have done more work on their trees themselves, but were prevented from doing so by the forester or by the contractor (who obviously has vested interests in keeping as much work as possible for him- or herself). This is in direct contradiction of Mondi's stated objective of Khulanathi being a 'grass-roots' initiative, which encourages the growers to do the work themselves.

This issue is critical as it goes toward the question of empowerment and dependency. Is Khulanathi promoting local ownership of the whole tree-growing process or not? Although Kewley (1993, pers. comm.) has stated that he would like to see Mondi out of the process after the first rotation, with growers merely selling timber to Mondi, this is not being encouraged. In fact, the control is firmly in the hands of the local foresters, and there is little being done at this stage to change the situation. At the same time, it must be mentioned that some growers were upset at having to do any work themselves, stating that Mondi had arranged for planting, and Mondi should now do something about the weeding. They are thus encouraging a lease-type situation, whereby they give up some land in return for a certain income, but do not want to be part of the process.

It is evident that while the existing growers' meetings are fulfilling a useful function, they have some way to go before they truly serve as a platform for all growers. However, during the final stages of this study, Khoza had organised a successful meeting with growers from all of the Khulanathi areas, and an umbrella committee had been formed which would deal with Mondi from a united position. He had also managed to organise meetings and establish a committee in Esikhaweni, one of the Khulanathi areas not covered by this study due to the potential danger.

Discussions also revealed that while communication between the growers and the forester had been established, there were a number of fairly basic concepts that many growers did not understand. Several did not realise that interest was charged, or that the annual advance was not merely a bonus and would have to be paid back. Several thought that the trees planted on their plots were too small, because some had died. The forester had obviously not explained what was normal practice and that a certain number of trees in the initial planting would die, and have to be replanted (blanked). In fact, this issue frequently came up in discussion; growers

were worried that a hundred or more trees on their plot had died, even though this may only represent a small and acceptable percentage. The stated Khulanathi practise is to leave a box of plants with the grower to fill in these holes themselves, but several growers said that this was not done. It is evident, however, that some growers had used plants left with them for blanking to enlarge their woodlot. Boake (1993, pers. comm.) also states that these plants left with the growers can be used for their own purposes, such as building or firewood. The point remains that the practise of leaving some extra plants with the grower and explaining the correct timing and manner of planting¹⁰⁴ is not universally applied, a problem that could easily be rectified by Mondi.

Another fairly basic concept that is a general area of concern to several growers is the length of the rotation. The growers felt that seven years was too long, and would prefer to cut their trees sooner. Growers whose trees are now three to four years old are also beginning to ask the foresters when they can fell the trees. The growers need to be told that seven years is considered an optimal financial rotation. At the same time, Mondi should consider that a grower's optimum economic requirements may vary because of a particular social factor. (As explained in Chapter 3, economic factors include more than the purely financial.)

One question raised when talking to growers about Mondi was what other things the growers would like to see Mondi doing. Education and training was frequently raised, and this is covered as part of the following section. Other responses (from 101 interviews) were extremely varied, and ranged from loans (39%) to education assistance (5%), housing (2%), community projects (1%) and gardens (1%). Eleven percent had not given the matter any thought, and another 15% felt there was nothing else Mondi ought to be doing.

Group discussion also revealed certain expectations and requests, with growers wanting boreholes, insurance for the trees, braais (barbeques) at the end of the year as Sappi (another timber company promoting woodlots) provided, and firewood from the Mondi plantations. Some of these requests show a certain naivety as to what a commercial company is likely to provide. They also show that there is a real need for basic amenities (like water and education) which are not currently available. Many growers say they would be willing to pay for these things, or else to split the cost with Mondi. Mondi could, if it chose to, facilitate the provision of some

¹⁰⁴ For instance, one grower complained that he had planted his own extra trees but had not realised that they should have been watered.

of these services at little cost to itself, and recommendations in this regard are made in Chapter 6. However, this question again brought up the issue of communication between Mondi and the growers; several growers want Mondi to begin explaining to them about harvesting, so that they are ready when their trees are.

In Mbonambi, where Mondi has held discussions about establishing a weighbridge in the area to purchase trees that are already being harvested (as in Sokhulu), all of the growers interviewed (18 individuals) brought up the weighbridge as something they expected from Mondi. Besides these people, only three individuals brought up forestry issues when discussing this question. Seven women said they would have to consult with their husbands about what was needed. A weighbridge was also mentioned at Biyela, where some growers felt that the distance to the mill would make the transportation cost too high, and they would prefer to sell locally.

It is interesting that minutes of growers' meetings (for example, Empembeni Ward on 23 October 1993) have shown that growers were supposedly promised "many things" when they joined Khulanathi, but had so far not received anything. It is unclear what exactly was promised, but shows the danger of promises made to farmers in order to entice them to join the scheme.

Finally, the discussions about Mondi brought up several problems faced by individual growers, such as a late payment or an amount that seemed incorrect. These further indicate that growers do not have sufficient access to the forester to resolve these issues which may not seem very important to the forester, but can cause considerable concern to the grower.

5.2.2.5 The contract

As discussed in Chapter 2, the contract between Mondi and the growers has been much discussed, notably between Mondi and a non-government organisation, the Community Law Centre.

Interviews with growers aimed to reveal how much they understood, and what they liked or did not like about the contents of the contract. When asked whether or not the contract was explained to them, 84% answered in the affirmative, and the same percentage said they understood the contents. It is unlikely that all of these growers understood all of the points of the contract (10 pages of legal writing in English)

given that the majority are illiterate,¹⁰⁵ but the foresters do appear to explain the basic concepts involved.

However, during the focus group discussions, growers were more willing to admit their ignorance of, and voice their concerns about the contract. Several growers said that they had never signed a contract. Others said they had signed the contract without reading it in order to get their trees planted.¹⁰⁶ Several said that the contract was explained to them by other growers rather than the forester.

Only six growers (of 105 interviewed) said that they had problems with the contract, and five of these were related to paying back the loan and the interest on that loan. Ninety-three percent of the growers said that a contract was needed, and when asked what they would like the contract to say, 80% said to leave it as it is. Two growers said that contract should ensure their ownership of the trees, and another two wanted Mondi to commit to harvesting the trees and ensuring that the second crop was established. Group discussions also brought up the issue of ensuring ownership of both land and trees, as well as the request that the contract spell out what will happen at harvest. Two other growers wanted to see that the loan amounts they will have to pay are specified in the contract. (The contract does specify the loan amounts for each operation, but does not indicate what the final amount owing is likely to be.)

Finally, the growers were asked about the validity of the contract; without a contract, would they still sell to Mondi? Eighty-seven percent said that they would, while 3% said they would not, and 10% said they would sell to the highest bidder. One group endorsed the validity of the contract by arguing that a contract was needed to protect their rights and would prevent Mondi from ever stealing their land.

5.2.3 Economic impacts and concerns

Growers interviewed were asked just how much money the trees were likely to make for them. People were extremely reluctant to talk about the money they might

¹⁰⁵ Interviews showed that most growers said they could not read, but someone (usually a child) in the family could. Exact numbers were not counted as the interviewers were not comfortable asking all growers if they could read, and preferred to ask about whether or not someone in the family could read. It was usually then volunteered that a child could read.

¹⁰⁶ Although most adult growers rely on their children for reading, children are not normally part of the discussions between the company and the grower.

make. This applied not only to growers; the harvesting contractors working around Sokhulu would only say they made a lot of money, but not how much.

Sixty-six percent of the growers interviewed felt they were going to make a lot of money, but their estimates of how much ranged from R1 000 per ha, to R20 000 per ha. (The author's own estimate is R6 000 to R7 000 net profit per ha.) In one area, several growers with different sized woodlots suggested the same figure (R7 000), which may indicate that they had all heard this amount as a per ha estimate, but failed to apply it to their own areas. When asked what the forester had said about this, three growers said R7 000 for their woodlot (although the three areas were all different sizes), but the remainder (except for one person who said that he had been told R50 000) said that the forester had not spoken about actual amounts.

5.2.3.1 Opportunity cost to the growers

One of the aims of this study was to determine what farmers must give up in order to grow trees. Ninety-six percent of the growers did not feel that the time constraints of growing trees prevented them from doing something else. Furthermore, 95 % of the growers responded that trees did not take away land from other things. The opportunity cost, therefore, is low, although no attempt was made to attach a monetary value to the opportunity cost.

Figure 5.4 shows the answers to questions asked about making money in ways other than trees: first, if considering all options available to them, and second, if using their land as a source of income.

It can be seen that ways of making money, particularly off the land, are limited. Considering all options available, only 48 % of the respondents actually have alternate ways of making money (although another 42 % receive some income from remittances and pensions). When looking at options available from the land, 52 % responded that they do make money in other ways: growing sugar-cane, fruit, vegetables and cassava. The rest are not aware of other options, or are not choosing to use their land in ways that could earn income. Furthermore, none of these alternatives are particularly lucrative, and discussions with growers indicate that their families secure income from a number of sources, seldom relying on any one in particular. Growing trees is merely 'another iron in the fire'.

It should be noted that these questions did not ask the growers to rank the importance of their income sources; for example, although 25 % of respondents

make some money from weaving, there is no way (from these questions) of determining the relative importance of weaving as compared to pensions or growing trees.

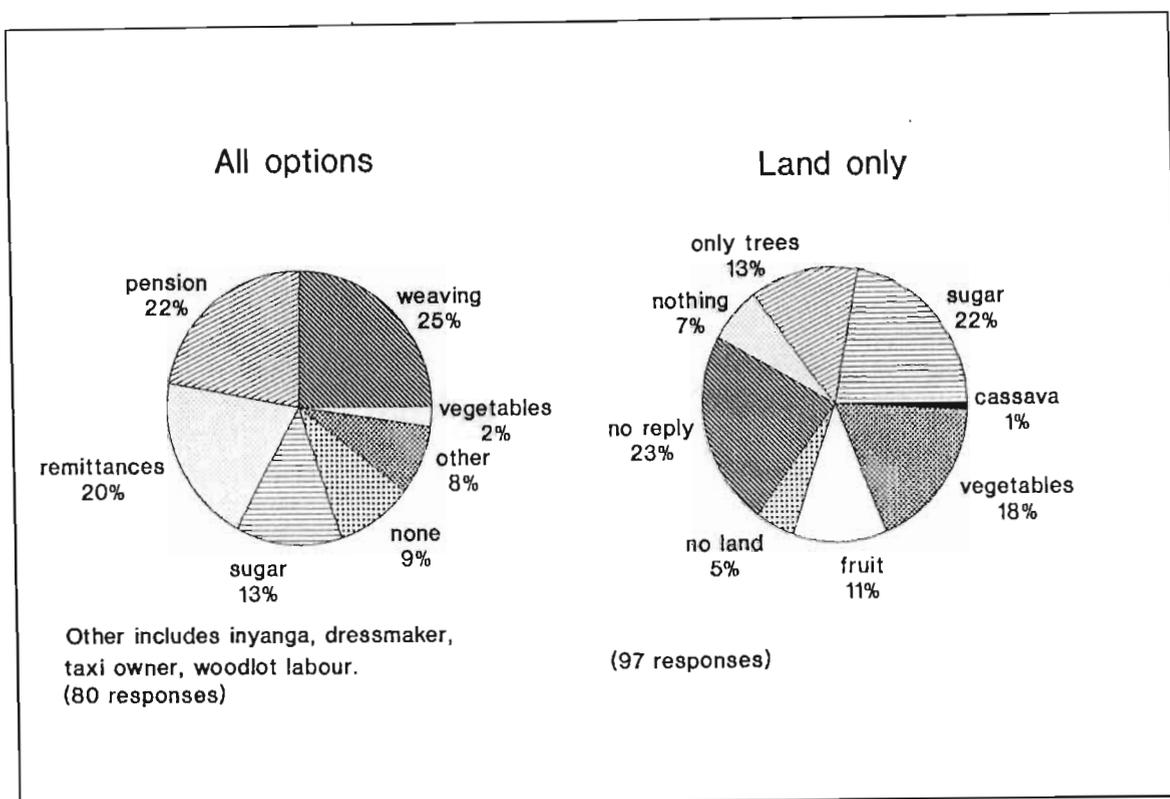


Figure 5.4: Alternate sources of income for growers.

As expected, remittances sent by a family member working away from home and pensions, together, make up a large part of the family's income, although discussions showed that within an average family (9,3 people per family for the growers interviewed), less than one person (0,8) has an outside job.

5.2.3.2 Loans and interest

An area of potential conflict between Mondi and the growers is whether or not growers fully appreciate that the value of the inputs provided by Mondi is actually loaned to them and must be refunded with interest at the time of harvest. Four percent of the growers asked said they did not understand about having to pay back their loans, and 5% said they had never been told. The remaining 91% said they understood about paying back the loan. Asked specifically about interest, 10% said they didn't understand about paying back interest on their loans, and another 15% said they were never told about having to pay back interest. Taken together, one

quarter of the growers do not fully appreciate the fact that they will be paying back their loan with interest, which is one of the basic concepts of the whole scheme.

The contract between Mondi and the grower states that Mondi will provide an annual statement of all loans made by the company to the grower, as well as all interest accruing. Most growers felt that they understood these statements, but several wanted the statement in Zulu. (This has now been implemented by Mondi.) Several do not understand these statements, indicating that more time needs to be spent by Khulanathi staff on explaining the details of the statements, as well as concepts such as interest.

Figure 5.5 below shows what growers thought about the money they received for the work they (or a third party) did on their woodlots, i.e. the loan amounts discussed above.

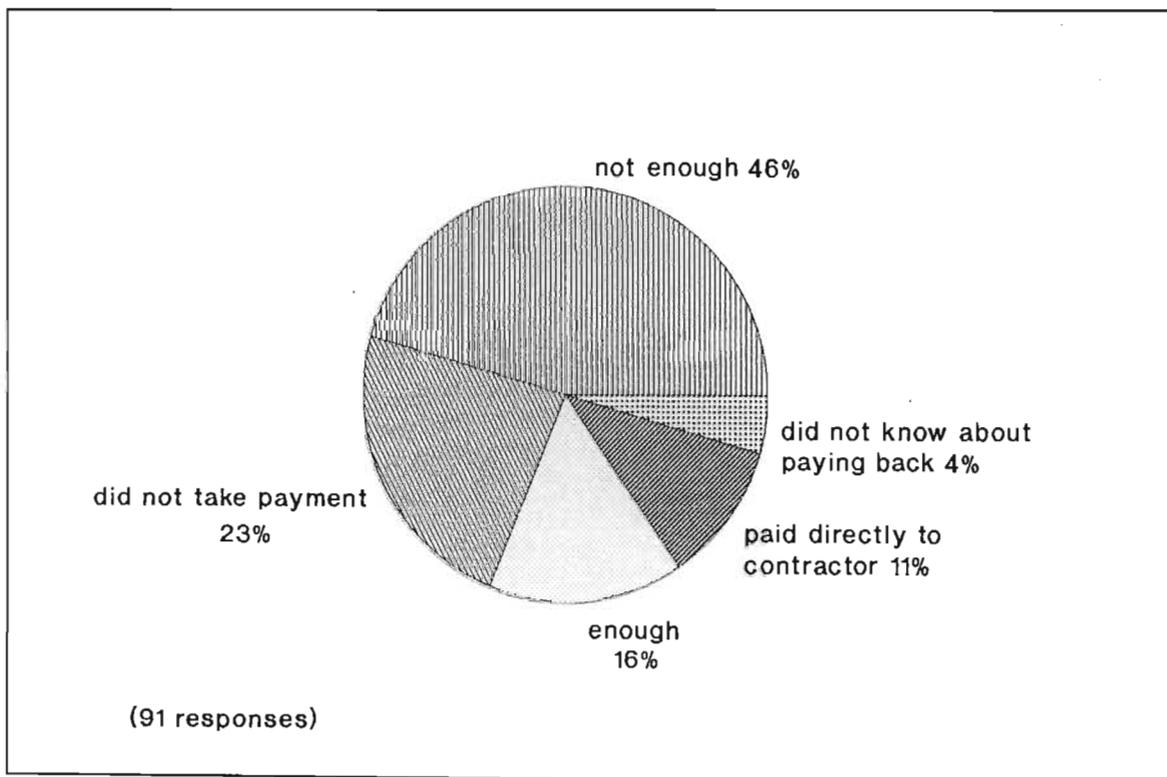


Figure 5.5: Growers' concerns about the money loaned to them for work done on their woodlots.

Figure 5.5 shows that only 16% of growers receiving money are basically happy with the arrangement, and feel that the amount is sufficient. Four percent said they had not realised they would have to pay the money back, and 11% said the money was paid to directly to a contractor and so did not concern them. Twenty-three percent

do not take any payments. The largest response was from growers who said that the amount paid to them by Mondi was not enough for the work done (46%), and if they hired people to work (for example in weeding the plot) then they had to supplement the money from Mondi with their own money. In a related question, 54% responded that they would like more money on loan from Mondi even though it means they will get less at the time of harvest. The whole question of debt, and more or less money from Mondi was debated at length in the group discussions. Many growers will take what they can get to satisfy immediate needs and desires; others feel strongly that any indebtedness to Mondi is definitely not desirable, and would prefer to remain as independent as possible.

There is no apparent problem with growers paying local contractors to do work on their woodlots. Asked about this, 64% responded that they were happy to pay the contractors for work done, and the remaining 36% said that they did not use contractors, so the question did not apply. As mentioned previously, however, some growers said they would rather do the work themselves and did not know that there was a choice.

Mondi pays the growers for work done on the woodlots by means of cheques. The company insists that this is the only safe way to handle the large amounts of money involved. However, the growers are fairly well split, with 38% interviewed approving of payment by cheque, and 32% preferring to receive cash. The problem stated by many growers is that they do not hold bank accounts and must either rely on a local shop to change the cheque or go into town to a bank. Transport is difficult to get, however, and expensive. Furthermore, local shops insist that a person changing a cheque first purchase goods before receiving the remainder as cash. This means that if growers have to pay people who have been working in their woodlots, they are faced with additional costs (transport and/or purchases) which are not covered by the loan amount in order to make these payments.

It was shown in the economic analysis of an 'average' grower in Appendix I that harvesting and transporting costs make up fully one-third of the gross profit derived from a woodlot. This is a substantial amount which could accrue to the grower or a third party. During the interviews, questions were asked about who would do the harvesting, and whether or not the growers would be willing to do their own harvesting. Only 15% of the respondents suggested that they would do their own harvesting; 72% felt that Mondi should do it, or else should arrange for a harvesting contractor. However, when specifically asked whether or not they would consider doing their own harvesting, 50% felt that they could, although many of these growers

suggested that they would first need training, and would like Mondi to organise the equipment. Another 11% had not really thought about it, and 38% of the growers interviewed were quite emphatic that they did not want to get involved in harvesting. (Of these growers who did not want to harvest, 67% were women. It could be that harvesting is seen as heavy work, more suited to men, or else these women do not believe they will have time available; this was not asked.) Several growers who did not want to harvest were concerned because they had been told that Mondi would arrange harvesting, and thought the question indicated that they might have to do it themselves.

5.2.3.3 Development of skills

Mondi has argued that its Khulanathi initiative will lead to the development of entrepreneurs and skills as local people take on silvicultural and harvesting contracting. It is argued that if a local person harvests and transports timber in a particular area, then that person will employ people, and will require certain services such as vehicle and chainsaw maintenance.

It was difficult for this study to test fully that assumption, in part because the whole programme has not been operating for very long, and the trees that have been planted are not yet ready to harvest. However, few growers actually plant their own trees, and normal practise is for the forester to arrange with a local contractor, who has a tractor and employs labour, to plough and plant a woodlot.

Twelve of these local silvicultural contractors were interviewed as part of this study. All but one have started up since Khulanathi began, but none work exclusively on woodlots; rather, they do any related agricultural-type work that is available. They employ on average nine people, and all but one said that the work is full-time. They generally use their own equipment, although Mondi supplies equipment (marking ropes, hoes and fertilizer buckets) to a few of them. Most (eight of 12) complained that their greatest problem was paying their labourers on the rates paid to them by Mondi. All but two of these contractors have their own woodlots. Their training requirements are shown in Figure 5.7.

Obviously, certain growers have recognised that there is money to be made in contracting on the woodlots, as several of them have approached Mondi for assistance in buying a tractor and becoming a local contractor. However, as in the case of harvesting contractors (discussed below), the situation can arise where there are too many for a particular area. Boake (1993, pers. comm.) feels that in each area

there is really only room for one or at the most two planting contractors, and he states that most of these planting teams have been developed and trained by Mondi in order to provide the service. When planting during the hotter months, particularly if rain has not fallen, Mondi provides a water-tanker which is used to apply five litres of water for each tree at the time of planting. Because the contractors do not usually have tankers, Mondi provides this service but charges the growers for the cost of the machine and the operator.

As for maintaining the trees (specifically, weeding between the trees) this is either done by the growers themselves or by workers hired by the growers, or by these local contractors who employ their own people. There is little skill involved and little opportunity to develop skills in these operations, although during the interviews it was shown that some growers earn money by working as labourers for a contractor.

Harvesting, perhaps more than silviculture, appears to offer real potential for local contractors to develop skills and employ local people, particularly if the harvesting operation is largely manual. This study investigated harvesting by questioning 22 contractors who supply timber to the Khulanathi weighbridge at Sokhulu. All are local people from the Sokhulu and Mbonambi areas. These contractors employ on average 11 people, with the largest employing 35 people, and the smallest four. Of these 22 contractors, 12 say that they work full-time as contractors, and 10 say that it is part-time work for them. Eighteen also grow their own trees. The average time that they have been working as contractors is 11 years. Only five are involved in other work besides harvesting, although most said that they would like to become involved in silvicultural contracting for Khulanathi.

The problems faced by these contractors vary considerably. Figure 5.6 below shows that problems associated with transporting the timber (arranging transport as well as mechanical breakdown) are the greatest, followed by mechanical problems of chainsaws. (A number of contractors complained about owning two or three chainsaws, but having only one that worked, and having to take the chainsaw some 30 km or more to get repairs done.)

Other problems faced by the harvesting contractors include having their timber rejected at the mill for being too small (the minimum allowable diameter of a log is 8 cm at the thin end), or too wet. (The mill requires that timber be six weeks air-dried, but this requirement is difficult to enforce and so is seldom applied.) Many contractors complained of having insufficient supplies of timber to harvest, which probably indicates that there are too many contractors working in too small an area.

It is interesting that the contractors usually buy a plot of timber standing from the owner, and then make their profit once the timber is sold across the weighbridge. Competition among contractors may result in timber that is too young and too small being harvested if contractors fear losing the plot to a competitor if they wait too long.

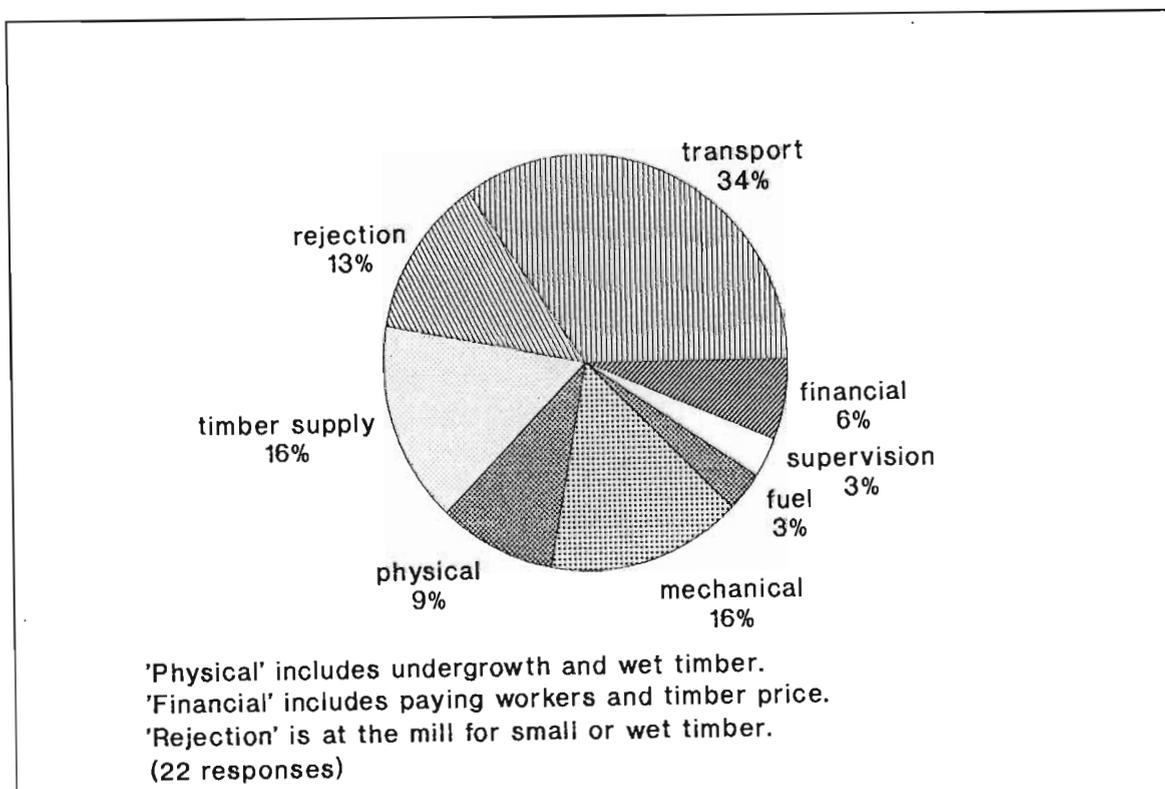


Figure 5.6: Problems faced by harvesting contractors.

When asked, all contractors indicated that they would like training; Figure 5.7 below indicates their preferences. As noted on the figure, most contractors said that they would like training in more than one area, and a number said all three areas (management, harvesting and mechanical) were equally important.¹⁰⁶

Growers were also asked about forestry information and training. All (except one of 91 asked) said that they would like to see posters or books about the technical aspects of growing trees (preferably in Zulu and not English), and most would like to receive some form of training (although one group discussion indicated that the growers did not want to have to pay for this training). This further indicates the

¹⁰⁶ This was one of the only questions asked during the fieldwork in which the interviewers offered a choice of answers. This was not by design, but came about through a misunderstanding whereby these three choices were provided as an example. There may, therefore, be other areas of training which are desired.

desire of many growers to 'own' the process of growing trees. However, discussions also revealed that there are several growers who wanted as little as possible to do with the process, wanting only a final payment. Figure 5.8 shows the training preferences of the growers interviewed.

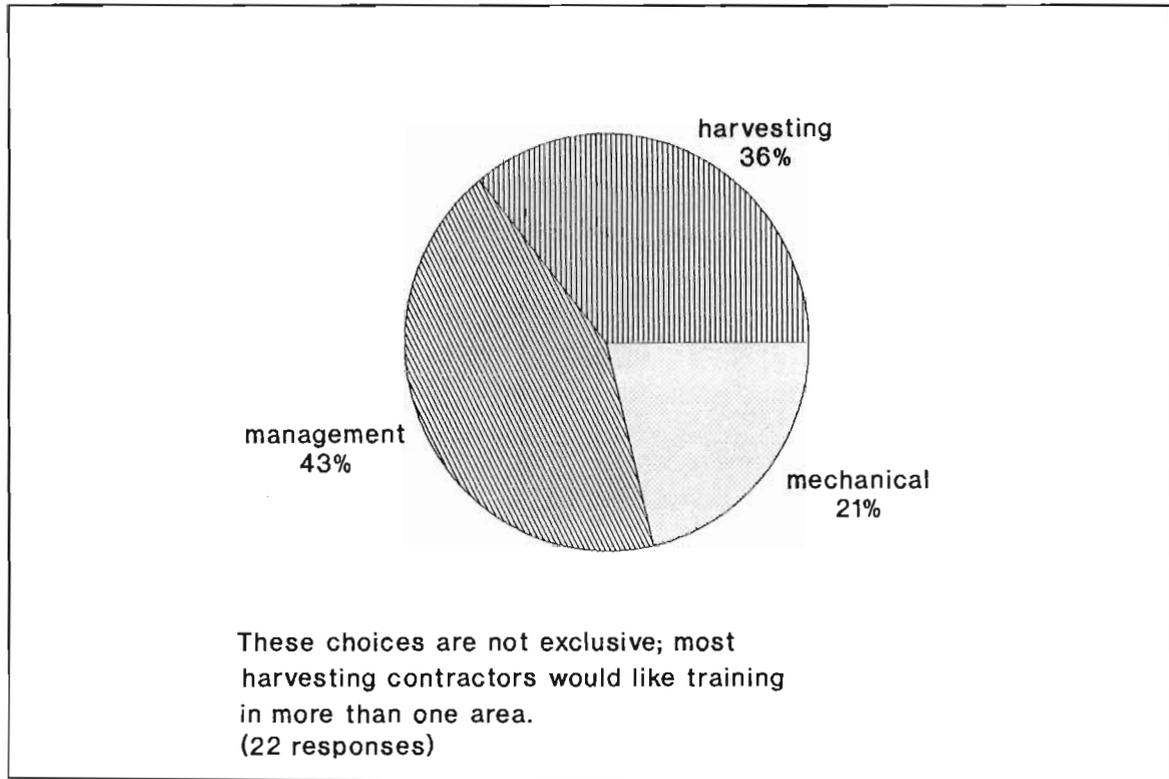


Figure 5.7: Training requirements of contractors.

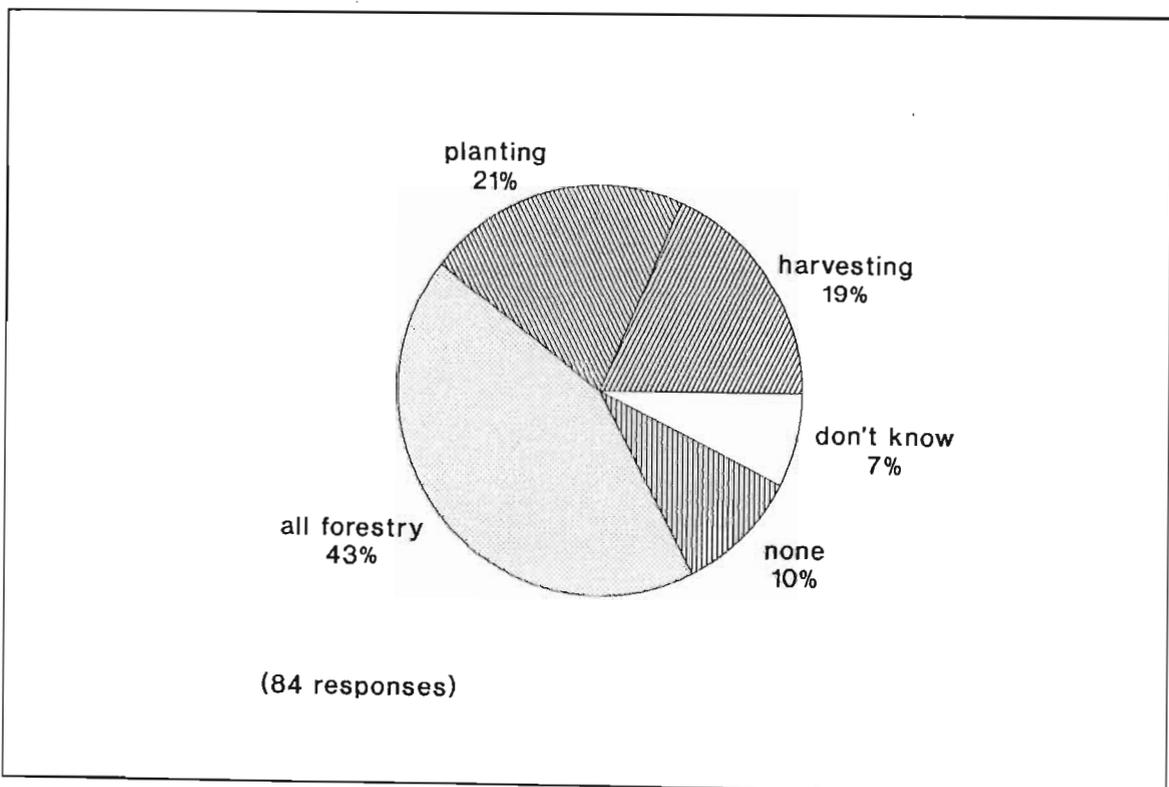


Figure 5.8: Training requirements of growers.

It is apparent, therefore, that both harvesting and silvicultural contractors offer a useful service in the areas in which they work and provide a certain amount of local employment. It is equally apparent that their skills and efficiency, as well as that of the growers themselves, could be substantially developed with various forms of training; this will be discussed further in Chapter 6.

5.2.4 Non-growers

As stated in the introduction to this chapter, only 16 non-growers were interviewed, with the result that this study cannot be used in any way as conclusive evidence of what non-growers in Khulanathi areas think of the programme. However, what little evidence is available is presented here.

All but one of the 16 non-growers interviewed appeared to be familiar with the concept of small-grower forestry. Twelve said that they had considered growing their own trees, but lack of land was the limiting factor. Two people would rather have grown sugar-cane if they did have land. When asked what they would most like to see on their land, the answers were as shown in Figure 5.9. It can be seen that vegetables and staple crops are the first choice, followed by sugar-cane.

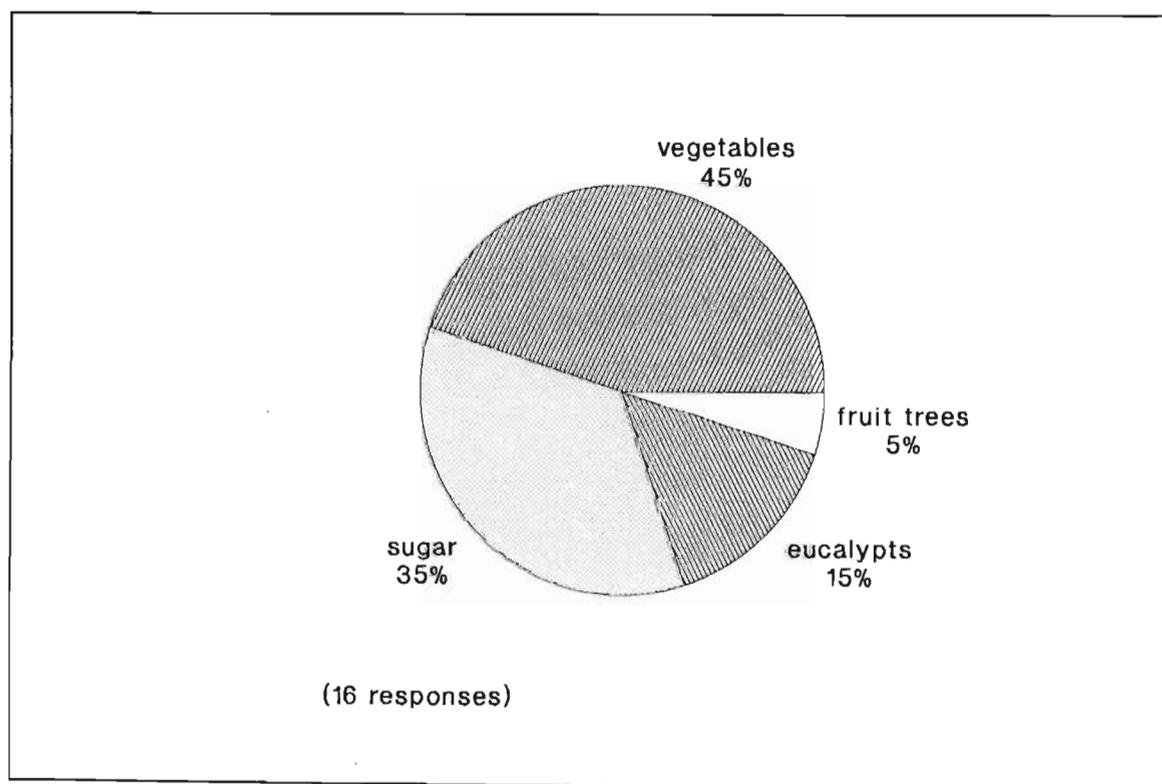


Figure 5.9: Land use preferences of non-growers.

It should be noted that alternatives were not suggested to non-growers, so other tree-species (wattle, for example) which may be welcomed if available, are not represented here. These alternatives are, however, discussed in Chapter 6.

Finally, when these non-growers were asked if they felt there was too much forestry in the area, the response was mixed, with eight saying yes, and eight no.

Underwood (1993, pers. comm.) of the Centre for Low Input Agricultural Research and Development (CLIARD), when part of a group touring the Esikhaweni area (see the map on page 2), found that people in the area (presumably non-growers) felt that waiting for seven or eight years for the trees to mature was something that only the rich could afford to do. Other concerns were the potential water loss resulting from tree planting, and the replacement of food crops by trees.

5.3 CONCLUSION

These results have presented the concerns and issues expressed by approximately 300 people about the Khulanathi woodlot programme.

These concerns range from environmental, through social and contractual, to economic. Two main themes quickly become evident. First, farmers accept commercial woodlots as a reasonable option that does not detract from other things, and are generally pleased for the opportunity to make money where so few options are available. Second, however, most growers do not really understand the whole process, and feel alienated rather than involved in the whole programme. This second issue is one that can, and certainly should, be addressed.

Chapter 6 discusses these results more fully, draws conclusions and presents alternatives.

CHAPTER 6

DISCUSSION, RECOMMENDATIONS AND CONCLUSIONS

6.1 INTRODUCTION

This chapter first discusses the results presented in the previous chapter, referring to the related work and theory of Chapter 3 where appropriate. In each area discussed, specific recommendations are made for ongoing policy concerning small-scale commercial timber production in KwaZulu, emphasising Mondi's Khulanathi programme and the role that Mondi management and staff should play.¹⁰⁸

A discussion of the developmental potential of commercial Eucalyptus woodlots follows, again drawing on the theory presented in Chapter 3. The model suggested as an appropriate alternative to the existing Khulanathi model is then presented, followed by a consideration of some of the lessons commercial woodlots have for the timber industry in light of the social and political change occurring in South Africa. Finally, this chapter makes recommendations on the future research needed in this field.

6.2 DISCUSSION OF RESULTS

This study is concerned with the impacts on and concerns of the people directly affected by Mondi Forests' Khulanathi woodlot programme. The discussion that follows must be seen from that perspective; the 'bigger picture' is only discussed in the section that covers the policy implications of woodlots.

¹⁰⁸ This process will focus specific criticism on Mondi. It should be noted, however, that by encouraging this study Mondi has shown its openness and willingness to change (a comment also made by Cairns, 1993) and should be commended on that; other companies actively involved in woodlot programmes may be less forthcoming, but are no less implicated by the criticisms made and should take note where they apply.

6.2.1 Environmental impacts and concerns

6.2.1.1 Water and soil

Growers seldom verbalised the environmental concerns they may have about growing eucalypts, apart from some concern about the potential water use of the trees. Although 40% of the woodlots surveyed lie within the 200 metre safety distance recommended by Kienzle and Schulze (1993), only 3% lie at about 20 metres, which is the limit recommended in Mondi Forests' environmental conservation code of practise (Mondi Forests, undated). Mondi's limit (20 metres) is also the distance required by the South African Forest Act. This whole issue is currently the subject of considerable debate; Kienzle (1993, pers. comm.) admits that their study was preliminary, did not involve fieldwork, and makes a very conservative recommendation. He further points out that each situation will vary considerably depending on various factors such as soil and slope.

The reality in rural KwaZulu is that individuals will use the land available to them; it is not uncommon to see bananas and other crops planted right to the edge of a stream. Kewley (1993, pers. comm.) describes one woodlot where Mondi staff ensured that the trees were not planted closer than 20 metres to a stream, but where the grower subsequently obtained his own plants from another source and planted virtually to the water.

Mondi, by creating a local market for the timber, must recognise that they encourage planting, whether of their own plants or those coming from other sources. The company should therefore make a commitment to keep growers informed of the issues, discouraging them from planting close to water and explaining that eucalypts can use a lot of water. Because the subject has not yet been resolved, Mondi should review its 20 m policy in light of any new information gained from ongoing research, and should pass this information onto the growers. Mondi, not the growers, is in contact with these hydrological researchers, and thus needs to take responsibility for keeping the growers informed.

Herbert and Musto (1993) recommend that care should be taken in selecting sites for planting trees, and correct species (or clones) matched to each site. Cognisance should also be taken of the particular cycle¹⁰⁹ (wet or dry) that prevails at the time

¹⁰⁹ Preston-Whyte and Tyson (1988) present clear evidence that Southern Africa has been subject to regular cycles of roughly nine years duration of alternating wet

of establishment. If not, reduction in timber yields, as well as the impact on ground water, can be dramatic. (This could obviously be critical to an individual grower whose land may lie on a more marginal site, and who may plant his or her trees in a dry cycle.) They further recommend that mulching or cover cropping be standard practise, and that burning on the Zululand sands (which encompass most of the areas of this study) be avoided to maintain the long-term productivity of the site. As much as possible of the tree (branches, bark and leaves) should remain after harvesting, to slow down the loss of nutrients. Herbert (1993, pers. comm.) also recommends that woodlots be planted in bands (50 m wide by 200 m long for 1 ha) across the slope to prevent erosion. Diamond pattern planting should also be implemented rather than rows up and down the slope. Herbert agrees with Kienzle (1993, pers. comm.), that *Eucalyptus* woodlots will have far less impact on the site than would large-scale plantations.

Mondi Forests is following many of these recommendations by conducting specific site classifications and species/clone matching before any new planting is undertaken on its own plantations. According to Howard (1993, pers. comm.), even flat areas are carefully planned with regard to road layout, conservation and drainage areas to prevent erosion and water runoff and cause the minimum impact to the site. It is not feasible, unfortunately, to go to the same lengths for each woodlot. The Khulanathi foresters, however, should be regularly exposed to these new developments, and taught to match the characteristics of a particular woodlot with those of a similar Mondi plantation. The foresters seem unaware of some of the subtleties of growing trees in Zululand, and tend to follow a fairly standardised approach throughout their areas.

6.2.1.2 Biodiversity and fuelwood

There is little indication that the eucalypts being planted are replacing indigenous grass or bush species. The majority of woodlots are established on sites that have been used sometime previously, though not necessarily recently, for crop production. As appears to be the current practise, the extension foresters should be made aware of sensitive areas, such as pockets of indigenous bush, and should discourage clearing of these areas for woodlots; however, as in the case of water sources, growers will use the land that is available to them. Unless these areas are seen to offer greater value under an alternative strategy, it is perfectly rational for farmers to clear unused bush

(predominantly above average) and dry (below average) periods. This has major implications for fast-growing trees such as eucalypts. During 1992/93 Mondi sustained severe losses due to drought damage.

and plant eucalypts. Fortunately, people in rural KwaZulu are slowly becoming more aware of the benefits of conservation areas through the activities of local conservation organisations, and Mondi can play a role in keeping growers informed of alternatives. Unfortunately, little can be done to an area that has already been cleared and planted to eucalypts.

All but one grower uses wood for fuel, and this fuel is mostly collected locally, comprising both indigenous and exotic species. Growers say that they will not use their planted trees for building or fuel, but it seems that this response was more an unwillingness to admit that all trees might not go to Mondi.

In the area (Mbonambi) where growers have their own woodlots (not committed to Mondi), growers interviewed said that they do use these trees for building and fuel. This indicates that other growers will do the same with their second crop of trees, which are not committed to Mondi. For the first crop, however, Mondi should follow up on its stated intention of providing extra plants for the growers' own use. With or without Mondi's permission it is quite likely that growers will use a few poles for building. By agreeing to this practise with a small percentage of trees (5% of one ha would be 75 trees), Mondi could show that it is sensitive to the growers' needs, and avoid a potential conflict situation if a grower is 'caught' using his or her own trees. Mondi should recognise that this will only happen if the perceived value of building poles to the grower is greater than the return from selling those extra poles to Mondi. It is quite likely that many of these 'extra' trees will still be sold to Mondi as pulpwood.

With regard to fuelwood, it can be estimated that on one hectare, 19 oven-dry tons (or 42 m³) of branches and tops (too small to sell as pulpwood) will remain, and it is this timber that will be used for fuelwood.¹¹⁰ This would virtually satisfy the fuelwood requirements of a household of six using Fenn's (1991) 'average' of one m³ or Aron *et al.*'s, (1989) estimate for KwaZulu of 700 kg (not oven-dry) per person per year, i.e. if six people require one cubic metre each per year over a seven-year

¹¹⁰ Herbert (1993, pers. comm.) supplied the formula: Oven Dry branch mass = 16,35 - 0,942 (height) + 0,1502 (pole mass). Some broad generalisations were made to arrive at the figure of 19 m³, namely: an average tree height of 22 m, and an average tree volume of 0,2504 m³. The conversion from m³ to oven dry mass is m³ x 0,456 t/m³.

growing cycle, then they require a total of 42 m³.¹¹¹ As Hall and Green (1989) reported from Lesotho, eucalypts are quite acceptable as fuelwood. Growers need to be made aware, however, that nutrients are lost if branches, and especially bark, are burned.

6.2.2 Social impacts and concerns

6.2.2.1 Family conflict

There is no real indication from this study that rural women in KwaZulu will be further disadvantaged by the growing of commercial eucalypts.

Although only 35% of the contracts are signed by women, this very signing is in contravention of customary Zulu law, which views women as legal minors, and would seem to indicate that rural women are willing to take whatever opportunities are open to them. In all, 62% of women interviewed consider the woodlots to belong to themselves, despite the fact that their husbands may have signed the contract. These women intend to spend the income from the trees on fairly basic family needs such as education, housing and household requirements, and give no indication that they will turn the money over to their husbands, or even that they have to consult their husbands. There was however, one case of a woman doing the work while her husband received the money, and another instance of the work being shared while the husband got the money. Cairns (1993) reports another case where this has happened, but explains that this woman is taking the matter before the Tribal Authority.

Despite these isolated cases (which should certainly not be dismissed) women interviewed were generally enthusiastic about commercial woodlots, quite possibly because so few options are traditionally available to them in rural areas, and are eager to take advantage of a situation whereby they can secure income for their own purposes rather than having to rely on their husbands. Friedman and Vaughan (1990, p. 5) present similar results, arguing that cash-cropping of sugar-cane has presented an opportunity for "economically marginalised rural people, particularly women" to generate income on unutilised land.

¹¹¹ While the trees are growing, however, only some dead branches (eucalypts are self-pruning and bigger branches will die and fall off) are available. The bulk of this wood is only available when the trees are harvested.

There was also no indication that male growers were more likely to spend money on luxury items to the detriment of family welfare, with men also indicating basic household needs, and in addition, banking the money or putting it into a local business, as fairly strong preferences.

6.2.2.2 Land tenure and community conflict

Land tenure and the potential conflict with neighbours over boundaries and communal land were seldom discussed because the subject is so sensitive. Cairns (1993) found that conflict over trees was more likely where trees were planted in large blocks (on communal land), or where there had previously been land disputes (state plantations on tribal land, or forced removals, for example). It is possible that conflict will be provoked in areas where rapid planting is promoted and some growers are seen to be gaining an unfair advantage, or where individuals are seen to be planting on communal land.

Using the conflict at Mbazwana as an example, where 182 ha of woodlots were destroyed by the local youth, it is fairly easy (with hindsight) to draw conclusions and make recommendations for avoiding similar conflict. Because of the limits placed on initial planting (pending the outcome of an Environmental Impact Assessment), and high demand, a list had been drawn up of the order of planting that would be done. The list was seen to be biased, favouring more influential members of the community over others. The youth felt that they had not been consulted and were losing their inheritance. Furthermore, the people in the Mbazwana area had recently been through considerable conflict with local conservation authorities over land rights, access to resources, and removals of people from conservation areas. Forestry was seen as yet another encroachment on the land.

Ideally, Mondi should have recognised that the youth were an affected party in Mbazwana and informed them (not necessarily asking their permission). It is ironic, however, that Mbazwana received far more attention from the company in terms of public meetings and discussions with community leaders than have any other areas in the Khulanathi programme. Mondi should also have ensured that the planting allowed during the first year was carried out equitably, although this is easier said than done, as local custom would dictate that the 'more important' members of the community be serviced first, and Khulanathi staff were not in a position to challenge the existing authority structure. Perhaps the most important lesson from this incident would be the need to move slowly, spending more time in consultation than in planting, although this is extremely difficult for private companies to grasp, given

the need to justify current expenditure on salaries, vehicles and the like, by showing a certain number of hectares under trees.

6.2.2.3 Food security

Critics argue that non-edible cash crops such as timber divert valuable resources (labour and land) away from food production (Lele, 1975), and that rural farmers would do better to concentrate on 'food security' (Underwood, 1993, pers. comm.). Food security is a concept that has been defined as "economic and physical access to food, of all people, at all times," and encompasses both sustainability and equity (Food and Agricultural Organisation, 1989, p.1). However, as Falconer and Arnold (1991) explain, it is increasingly common in poor rural areas for farmers to rely on off-farm cash earnings as their physical resources (i.e. land size and productivity) decline, making continued food crop production impracticable. Barbier (1987) states that aggregate evidence from developing countries suggests that expansion of cash cropping is not necessarily at the expense of staple food production, and in sub-Saharan Africa, declining per-capita food production is associated with constant or declining shares of land allocated to cash crops, i.e. greater areas of land are not being allocated to cash crops while food production declines.

Results from this study support the concept that resources are declining in that many growers said their land was not good for crops. Besides the land, water was often cited as one of the main limiting factors.¹¹² Food is both bought and grown, although most growers (63%) buy most of their food. It is possible that more farmers in the study areas would grow more food if they had access to the necessary inputs such as seed and advice. When asked, most growers felt that there was little or no assistance. Five percent mentioned access to an agricultural co-operative, and another 5% said that they received help from a KwaZulu government agricultural extension officer.

Few growers (7%) believe that their trees are taking land away from other things. Similarly, time does not appear to be a limiting factor; only 5% of women and 3% of men were concerned that growing trees prevented them from doing other things.

¹¹² The majority of food crops in KwaZulu can only be grown under irrigation; however, the location of most homesteads make hand-watering impractical, and piped water is extremely rare. The current practise with eucalypts, on the other hand, is to apply only two litres of water at planting, which is done via a company tanker.

This study could not evaluate the overall nutritional impact of trees grown for cash on the well-being of a family. Falconer and Arnold (1991), after considering results from studies world-wide, suggest that the results are unclear.

Cash crops (trees and sugar-cane) appear to be the most popular land-use options for the growers interviewed, although by definition these growers are already involved in cash-cropping.¹¹³ Most growers would also like to grow some fruit trees on their land, but were constrained by access to plants and assistance with growing these trees.

It must be said, however, that the types of fruit that can be grown in the study area are limited. Sub-tropical fruits such as avocados, mangoes, litchies, paw-paws and bananas appear to offer the best option, particularly in terms of a few trees per household. Based on his experience with rural farmers in KaNgwane, Atherton (1993, pers. comm.) believes that this system (individual trees per household) is the only real option, as traditional commercial production requires too great an input in terms of capital. He estimates that one hectare of avocados, for example, will require R1 000 000 before the trees begin to bear. Citrus fruits are also favoured by rural farmers in KwaZulu and do occasionally appear, although they would normally require more water than is available. Underwood (1993, pers. comm.) also reports some farmers growing peach trees.

It is evident, then, that within the areas where Khulanathi operates most growers are already reliant on cash for the purchase of food, rather than on growing it themselves, although most people do grow some of their own food. Lyne (1991) argues that in KwaZulu, households have little incentive to produce crops as they are able to secure food and income at lower cost by allocating better educated members to off-farm employment. Families appear to have a multi-faceted approach to securing this cash; remittances, pensions, local wage earnings, sale of handcrafts and food all make up the total basket of household income. A strategy that encourages additional food production is a good thing, but where the land is badly degraded, or where people have committed the bulk of their time to other activities, a timber cash crop may well be the best use of available resources. Friedman and Vaughan (1990) found in studies on small sugar-cane growers in KwaZulu that while farmers

¹¹³ As discussed in a following section, which suggests a more appropriate woodlot model, wattle (*Acacia* spp.) will almost certainly return more cash in the cooler inland areas. The bulk of the Khulanathi growers, however, are on the coastal areas which are too hot for wattle.

continued to grow subsistence crops for their own consumption, they preferred the guaranteed market for sugar-cane to the limited market for surplus food crops.

This study shows that most people would like to grow fruit trees in addition to other activities. Eucalypts as a cash crop are not exclusive of fruit trees, and may actually serve to enhance a positive attitude toward the value of trees. There is little to prevent Mondi from acting as a facilitating agent in the provision of fruit trees. Atherton (1993, pers. comm.) reports that individual trees are easily sold at their cost price of R10 (roughly US\$3 in 1993) per tree in KaNgwane. Other commercial timber companies elsewhere in South Africa are using their sophisticated nurseries to propagate indigenous medicinal tree species, and enjoying positive exposure as a result. Mondi could certainly act as an agent for the sale of fruit trees (if not actually propagating trees in its own nursery during off-peak times), supplying them during the foresters' normal travel in the area, and offering an extension service.

The inter-cropping with cowpeas and groundnuts that does occur within some of the woodlots, and which can provide substantial food as well as benefit to the site in terms of nitrogen fixation and mulching effect, should not just be tolerated, as seems to be the current situation, but vigorously encouraged. Growers should be made aware of the economic benefits to be gained from not having to weed their woodlot, as well as the fact that one ton of cowpeas or peanuts can be produced between the trees on one hectare in the first year before the trees dominate the site (Melis, 1993, pers. comm.).

6.2.2.4 The relationship between growers and Mondi

From the interviews and discussions held with growers, it is clear that, to many of them, their relationship with Mondi is the single most important aspect of the eucalypt-growing exercise. Communication is seen as a critical issue, and growers often feel excluded from the process occurring on their own land, and unable to discuss their concerns with the foresters.

Many growers simply do not understand the whole tree-growing process, and are not even aware of why Mondi wants trees. They may have attended a meeting where they heard about the general concept, and then had a forester look at their piece of land and sign them up to grow trees. Thereafter a contractor may have arrived to actually plant the trees, and the forester, in checking on progress, may have spoken only briefly again with the grower. This is alienation and not empowerment.

The situation will only be improved if Mondi management clearly acknowledges the importance of communication in the whole process, and commits resources to this end. One forester does have the task of facilitating growers' committees and meetings, but his effectiveness is limited because he only has an off-road motor-bike at his disposal which is not suitable for the distances (up to 100 kilometres) between the areas, and so must rely on other foresters for lifts. There is also some question as to how long his 'non-productive job' can be justified. Mondi needs to recognise that with an ever-increasing number of growers (a further 500 to 700 growers are planned for 1994, with no additional staff), the communication problems will become greater, and not diminish over time.

Results from research into small sugar-cane growers in KwaZulu apparently concur. Vaughan (1991a) believes that effective farmers' organisations are crucial to the process of empowering small cane growers in KwaZulu, but states that the strength of these organisations varies considerably. She suggests that these organisations are strengthened when they work on specific concerns of the growers to the extent that policies are actually changed.

The communication/relationships problem is not surprising considering the process adopted by Mondi for appointing fieldstaff at both a forester and field-supervisor level. For the most part, these are technical people with a forestry background placed in a situation where a large part of their job is dealing with people. They have been very successful at planting trees, but less successful in dealing with growers.

Khosa (1993, pers. comm.) contends that the conflict at Mbazwana could have been avoided with more carefully planned public meetings; he believes that serious conflict was developing at Mbonambi, with consequences far greater than the area lost at Mbazwana, but was diffused through timeous growers' meetings.

Growers generally have high expectations of what Mondi can provide, ranging from housing and education, to basic forestry training. In some areas, promises have been made to growers in an apparent attempt to entice them to join the programme. Once again, this comes back to basic communication; Mondi needs to make it very clear at the outset what will and will not be done, and to reinforce what is said through pamphlets or posters distributed to growers. Virtually all growers would like more technical information; again, this goes toward the concept of allowing farmers to take control of the tree-growing process that is underway on their own land.

6.2.2.5 The contract

It is clear that the contract signed between Mondi and the growers is not fully understood by the growers, many of whom say they signed after a brief explanation from the forester, but never had time to read and consider the contents.

As stated, the relationship between growers and Mondi is obviously important to the growers, who believe that this relationship will be defined, and their rights protected, by a contract. At the same time, trust and loyalty is a major factor, as most growers said that they would sell their timber to Mondi even without a contract, because the company had helped them with the whole process.

It is unfortunate that the contract has never been negotiated by Mondi and the growers, although changes to the contract (including its translation from English into Zulu, and the release of the growers from any obligations after the first crop is harvested) have been implemented by Mondi on suggestions emerging from growers' meetings and from discussions with the Community Law Centre (CLC). Mondi argues that it was really not practical to begin a process of negotiation with the few growers who first started planting trees. However, a process aimed at explaining the terms and conditions of the contract, particularly if facilitated by a neutral third party, could go a long way toward convincing growers that Mondi's intentions are fair. Potential conflict situations arising through misunderstandings, or from growers suddenly finding themselves committed to something they weren't aware of, could also be avoided. Para-legal skills should be built into an overall training programme for the growers. Training, of course, is expensive, and this aspect is discussed in a following section.

6.2.3 Economic impacts and concerns

6.2.3.1 Opportunity cost

Virtually all of the growers are growing trees for the final profit, and, as discussed, this income makes up one more part of the average family's total income. This situation is similar to that found among small sugar-cane growers in KwaZulu; Vaughan (1991b) states that while cane production has had a "huge" impact (in certain areas) on the overall volume of income generated in communities, for individual households the income is only supplementary. The same is true of small timber producers; the small size of average land-holdings simply precludes timber as a viable full-time farming option.

In terms of the opportunity cost, the results of this study indicate that growers do not believe they are giving up land or time from other activities to grow trees. Grazing land may be sacrificed for trees (as suggested by Cairns, 1993), but this was not evident from the discussions held with growers. Most farmers keep some cattle, and these animals use whatever land is available. It is likely, therefore, that grazing pressure will increase with the spread of woodlots, and may result in conflict situations or a natural transition whereby trees replace cattle as a sign of wealth. Lyne and Nieuwoudt (1990) suggest that herd sizes decrease where sugar-cane and timber have been introduced in response to an increase in the opportunity cost of grazing land. Without a detailed analysis, however, it cannot be determined just how, and to what extent, the introduction of woodlots in an area might lead to increased pressure through over-grazing on surrounding land.

6.2.3.2 Expected income

Although growers were generally unwilling to talk about the specific amounts of money they are likely to make from their trees, expectations are high, and for the most part unreasonably so. This may be a function of having to wait seven years for the trees to grow, with expectations building up as the trees increase in size. Timber, however, is a high volume, but low value crop. A mature tree at seven years is worth less than R10 when delivered to a depot for pulp, despite being an impressive 20-plus metres tall.¹¹⁴

Cairns (1993) experienced similar difficulties when asking growers about expected profits from trees. Cairns had the advantage, however, of being able to obtain information from growers from other schemes who had already felled their timber. He found that 20% had received more than they had expected from the harvest, while 43% had received less than expected.

This situation of over-expectations could have serious implications, and should be addressed by Mondi as part of an overall information/training strategy. Khosa (1993, pers. comm.), who is not an alarmist, feels that the disappointment of growers who expected more revenue from the harvest of their trees could be sufficient reason for them to kill a forester or supervisor if they believe that this person had lied to them or led them on.

¹¹⁴ A good site can yield 150 tons/ha at harvest, which can be sold for R80/ton at the Sokhulu weighbridge. Assuming 1 500 trees/ha results in a value of about R8/tree.

It is useful to note that Hyman (1990) considers one of the main problems of the commercial woodlot experience in the Phillipines to be one of expectation; government regulation kept the price of timber below what had been promised.

6.2.3.3 Risk

Growing eucalypts in Zululand is not without risk. As mentioned, droughts during 1992/93 caused forestry companies to sustain considerable losses. Mondi estimates that one full year of growth was lost on virtually all plantations, a loss of approximately 500 000 m³ over Mondi's 25 000 ha of plantations in Zululand (assuming a mean annual growth rate of 20 m³/ha/year) (Kewley, 1993, pers. comm). Extending the rotation by one year can have a major impact on a small grower expecting income at a certain time; either he or she will fell at the expected time (and get a reduced volume of timber), or else have to wait an additional year.

Besides drought, Mondi is experiencing considerable damage through diseases (mainly fungal pathogens) in the eucalypts that can severely retard or even halt growth (Howard, 1993, pers. comm.). Part of the idea of a breeding and clonal programme is to find hybrid clones that are pest and disease-resistant; however, the programme is still developing, and there have been cases where clones that at first appeared resistant suddenly became severely infected. Mondi has adopted a policy of planting no more than 5% of the plantations in a certain area, and no more than 30% of that allowable area in any one year to a particular clone in order to minimise risk; however, a farmer with 1 ha planted to a susceptible clone could lose everything if his or her woodlot becomes infected.

There is also some danger from fire; either wildfires or those that might be set by a disgruntled neighbour, although Howard (1993, pers. comm.) believes that this risk is slight given the minimal amounts of undergrowth beneath the trees, and the scattered arrangement of woodlots. Cattle and goats can also damage young trees, not by eating them, but by trampling or lying on them.

The issue is not that commercial eucalypts are a high-risk enterprise. The point is that growers must be made aware of both the risks and the potential profit to be made before they plant trees. (This aspect is discussed further in a subsequent section which makes recommendations for a more appropriate woodlot model.)

Of course, life for rural farmers in KwaZulu has its own series of risks, whatever income-generating activity the family may be engaged in. Woodlots may well be an

entirely rational way in which rural households can spread the risks that they face, offering one more alternative should another fail. Once again, the point is that farmers need to be made aware of all the issues so that they can make an informed choice.

6.2.3.4 Loans and interest

Growers are generally unsure about the amounts of money that have been loaned to them to establish their trees, and the interest that has accumulated on this money. However, it appears to be mainly the detail that is not clear to many of the growers; the basic principle that Mondi's inputs are loans is understood by most (but not all) growers. The growers are issued with statements at the end of each year showing what money has been paid out to them (or a third party) for their woodlot. Explaining this statement, and how the interest is calculated, needs to be another part of Mondi's training programme.

The actual amounts loaned to the growers are also a source of contention, with many growers (46%) feeling that the amounts are too low to pay people who do the work on the trees. However, many other growers would not like this amount increased as it would mean greater indebtedness to Mondi. An optional supplementary loan amount would be taken by over half of the growers interviewed; this could be one way of allowing growers to decide for themselves on the overall process. It would become clear at the time of harvest that growers who had taken a smaller loan would receive a greater net income, and sentiment may then shift against taking greater loans.

6.2.3.5 Harvesting

Harvesting is an important issue to growers and rightly so given that harvesting and transporting comprise fully one-third of the total value of the timber at the time of harvest (see the analysis in Appendix I). Cairns (1993) looked at 30 woodlots (non-Mondi) that had been felled, and found that 50% of the gross profit from timber went on harvesting and transporting. He also found that some contractors were charging 'excessive' transport costs, and recommends that the timber companies negotiate directly with contractors on behalf of the growers, who should then be informed of reasonable prices in their areas. A more 'democratic' process would be for the growers, through a representative committee, to negotiate directly with the contractors themselves; this concept is discussed further in the following section, "An appropriate woodlot model". It must also be noted that the areas covered by Cairns'

study are mostly steeper, inland areas which are further from the mills than most of the areas covered by this study (apart from Biyela and Nkandla), and are therefore more marginal in terms of financial return.

Cairns (1993) further suggests that local depots would stifle local contractors (presumably because only one large transporter would replace several smaller contractors to move timber from the depot to the mill), but the situation at Sokhulu suggests otherwise. This study examined the experiences of 22 harvesting contractors at Sokhulu, and it is the author's impression that most of them would have inadequate vehicles to transport timber directly to Richards Bay (the vehicles are not, for the most part, road-worthy, and would not be allowed onto the main roads) and must therefore restrict their activities to the area where the trees are grown. The weighbridge therefore allows small contractors with less sophisticated equipment to operate. These 22 contractors employ, on average, 11 people each, and so their overall impact in the area is substantial.

Mondi pays these local contractors who harvest and bring the timber to the weighbridge directly, and then negotiates a transport contract with a large-scale haulier. The contractors, in turn, buy the woodlot standing from the growers; competition among the contractors appears to be quite vigorous, which may encourage growers to sell the trees early (before the optimum financial return). Once again, an educational strategy is necessary to show growers the benefit of waiting for the correct time to harvest. At the same time, however, Mondi should try to be sensitive to those growers who need the income from their trees before the trees are ready for felling. Individual needs may dictate that a reduced return at five years is of greater benefit than the theoretically optimum return at seven years.

Many growers (throughout the areas where Khulanathi operates) are uncertain as to what will be done when the time comes to harvest their trees, and feel that Mondi will make all of the arrangements. Half, however, are willing to do their own harvesting if they receive help with training and equipment.

6.3 DEVELOPMENT POTENTIAL¹¹⁵

The general definition derived in Chapter 3 was that rural development is a process of change that results in some improvement in the living conditions of rural people, and that this improvement should both encompass the objectives of, and be directed by the people actually involved in the process.

Furthermore, a chosen development path should be sustainable, both from a social and an ecological perspective. As Lele (1991) points out, economic growth as such cannot be sustainable, and this should be kept in mind with the woodlot programme in question. Finally, a development process should promote participation, and aim to meet basic needs.

6.3.1 The process of change

Change is a critical element of development. Lele (1991) describes a process of directed change, and Flammang (1979) adds that this change should be structural through a process of transformation. Certainly, at a basic level, these woodlots are the cause of regional change in areas in which they are emerging. Visually, fast-growing trees alter the landscape, and have been accused (in the discussions held) of offering refuge to "bad people" who may be in the area. This visual change, however, is indicative of the more fundamental changes which are brought about through the tree-growing process. It is very soon evident in an area who is growing trees and who is not, which in turn may aggravate inequity rather than promote equity.

At the household level, this change is not likely to be substantial. The average size of land-holdings in KwaZulu¹¹⁶, in conjunction with the current price of pulpwood (R80/ton at the Sokhulu weighbridge), does not allow for an emerging class of farmers who make their living solely by growing trees. Making very broad assumptions that a household of six may have 7,2 ha of which 50% is suitable for (or the family is willing to put under) trees, and using the analysis of Appendix I which shows that a net present value of R7 357 could be achieved after seven years, this

¹¹⁵ The discussion thus far has concerned the Khulanathi programme in particular, and reference has therefore been made to Mondi. The discussion that follows is more general, and could equally apply to any company involved in a similar process. Reference is therefore made (for the most part) to 'the company' and not to Mondi in particular.

¹¹⁶ Estimated at 1,2 ha per capita, of which 12,1% on average is arable (McKenzie, *et al.*, 1989).

would amount to R3 783/year, or R315 per month for the family. This amount is far below even the 1990 Human Sciences Research Council estimate of R1 200 for a family of five to meet the minimum living level in one rural area of KwaZulu (Huggins, 1993, pers. comm.) Such estimates, of course, usually incorporate severe generalisations; the point remains that the resource constraints do not favour a class of economically viable timber growers. Within an average household, the income after seven years will allow for small, not substantial change. A grower indicating children's education as a spending preference, for example, could use the money to allow a child to complete secondary school, but would not have sufficient income from one hectare of trees to pay for a year of university education. On average then, small improvements in the living conditions of rural people are likely, reinforcing the notion of supplementary rather than replacement income.

There are, however, two areas of change at an individual or household level which have the potential to be quite substantial. First are the small-scale contractors, both silvicultural and harvesting, who are emerging as a class of rural entrepreneurs around the woodlots. With adequate support from the timber companies involved in woodlots, the potential for their own individual development, as well as the effect they can have in the community by demonstrating economic independence, could be marked.

Timber companies should actively encourage and support these small contractors. With the changing political situation in South Africa, there is increasing pressure on private companies to demonstrate that they have a commitment to social and economic change. Timber companies face the additional pressure of calls for land reform, given that land is a highly emotive topic in South Africa and the companies control large areas of productive land. Fostering a class of small forestry contractors would begin to show a commitment to social change. A highly relevant question asked by one of the small silvicultural contractors working on the woodlots was, "Couldn't Mondi allow us a chance to do weeding and other work on the big plantations?"

The companies need not have to bear the entire cost of supporting small contractors. There is no reason why companies should not lobby government for tax-relief on subsidies provided to assist small contractors. There are also non-government development agencies which may be willing to support training, for example.

Positive intervention on the part of private timber companies is vital. Merely allowing 'the market' to take its course is not enough, given the historical bias in

South Africa which has worked to the advantage of large white-owned companies. Transformation requires action; in this case the basic concept of affirmative action.

Besides encouraging small contractors to work on company plantations, there are regular sales of equipment and vehicles that are no longer needed by the companies. Creative alternatives that encourage small contractors to lease or purchase this equipment are needed; it is unreasonable to expect a small contractor trying to build a business to have the full cash amount ready on the day of the sale. The long-term cost of allowing small contractors to work off the price of the equipment, for example, would not be great for the company, but could foster enormous good will, and offer real potential for transformation.

The other area of change at the household level that can be brought about through commercial woodlots is less obvious than that which applies to contractors, but has potentially far greater impact. This is the change that will evolve through individual independence. This study showed that women were more often the growers of the trees than men. As Friedman and Vaughan (1990) found with sugar-cane, trees offer an opportunity to women who otherwise have very few choices open to them. Women who normally have to rely on an elderly parent's pension, or on the remittances of a family member working elsewhere now have an opportunity, however limited, to use the resources available to them to make money.

There is, however, a fine line between dependence and independence. Under the current situation, the means of production are tightly controlled by the company; the plants come from the company nursery, the technical know-how is supplied by the company extension foresters, and the timber must be sold back to the company. It will take conscious effort on the company's part to change this situation so as to allow for real independence on the part of the growers.

6.3.2 Sustainability

A complete analysis from a regional political ecology perspective would be necessary to arrive at a definitive answer to the question of whether Eucalyptus woodlots in northern KwaZulu are indeed sustainable. Even then, it is unlikely whether consensus could ever be reached; opinions have been formed, and the most persuasive evidence would probably not cause many of these opinions to change. This is not to say that the issue should be trivialised or set aside. Ongoing research is needed to gain a clearer understanding of the sustainability of eucalypts grown in

South Africa; fortunately, the ecological aspects of eucalypts are receiving considerable attention.

At the risk of over-simplification, some general recommendations can be made to promote ecological sustainability. A patchwork pattern of woodlots which are kept at the correct distances from water sources will allow for recharge and should not impact negatively on the long-term sustainability of water supplies.

Individual plots should be protected against erosion through correct planting patterns and the use of cover-crops for mulching purposes. At harvesting, as much biomass as possible in the form of bark, leaves and branches should remain on the site. The temptation to harvest whole tree-lengths and debark at a central depot or the mill should be strongly resisted. Site rotation (planting trees on another site to allow recovery of the first) should be considered after the second or third coppice crop in light of any new evidence. Elsewhere, this thesis calls for greater education and training for the growers by the woodlot promoters. Ecological aspects should become part of this training programme.

As Lele (1991) argues, not only can local social conditions greatly influence ecological sustainability, but social sustainability is important in itself. In the case of woodlots in KwaZulu, it is likely that there will be social change, and the companies involved should consider how they can promote positive social change, while not impacting negatively on existing social values.

Adams (1990) believes that sustainable development is the beginning, not the end, of a process and should allow the poor to maintain or enhance their power to survive and direct their own lives. The commercial woodlots in question are starting a process of change; it is possible that they will enhance empowerment to some greater or lesser extent. Whether they do or not is largely in the hands of those who currently wield the power, namely the company and local authorities.

6.3.3 Participation, equity and basic needs

Holmberg et al. (1991) argue that development does not happen without participation in the design and execution of the process by the people meant to benefit. This concept is now widespread in the development literature, and Lele (1991) suggests that participation has taken over from equity as a primary objective. There is sufficient evidence from the present study to suggest that the woodlots have

not been promoted in a manner that enhances participation, and thus fundamental changes to the overall approach by the company is needed to achieve this objective.

Essentially, the company needs to realise that rural farmers have limited options available to them; many of these farmers accept that commercial woodlots are their best alternative at present. However, precisely because so little else is happening on their land, the woodlots are important to the farmers and they want to be involved in the whole process. One hectare to a company that controls over 500 000 ha of plantations is somewhat insignificant; this is not so to a farmer who has given over one-third or one-half of his or her entire land-holding to trees.

Substantially greater participation is entirely possible even with existing growers, and certainly with new growers who join the programme. The growers' meetings and committees need to be strengthened, made more representative and allowed to influence the existing modus operandi. The existing training and education programme must continue and become more responsive to the needs of the growers. All that is really required is a commitment by the company.

Equity can be encouraged through commercial woodlots. Mondi has sufficient evidence that some large woodlots owned by prominent individuals are being neglected, while small woodlots owned by poor farmers are being carefully tended. The extension foresters need to avoid the temptation of pandering to the more powerful elite within the community. There is little, however, that woodlots can do for the landless poor apart from a limited amount of work associated with contracting. It is also possible that by increasing the value of previously underutilised land, unequal allocations will be made by the local Inkosi to individuals in his favour.

The concept of food security has been discussed. Rural farmers are already reliant on off-farm cash earnings to purchase food. To buy food, as well as other essential items, cash can well be considered a basic need. Woodlots can, however, make a limited contribution to other commonly defined basic needs such as food, potable water, shelter, medical care and education, in three ways.

First, by encouraging a culture of tree-growing on sites that are often seen as "finished", it is possible that farmers will consider other tree species that have a wider use than just timber. The company can encourage this by providing fruit and other tree species.

Second, facilities that can only be provided at a community level (schooling, for example) can be promoted through voluntary levies on the sale of timber. At Sokhulu, the local tribal authority imposes a R1/ton levy for community purposes on all timber sold across the Mondi weighbridge; during 1992 over R50 000 was collected in this manner (although it has not yet been spent). As part of this process of community development, organisational development can be encouraged through the growers' committees that are beginning to function in each area.

Finally, fuelwood and building poles, both basic requirements in rural KwaZulu, are provided as a by-product of trees grown for pulp.

6.4 AN APPROPRIATE WOODLOT MODEL

Based on the evidence presented in this study, an appropriate woodlot model should have certain characteristics. The four that are considered absolutely crucial are: participation; flexibility; empowerment; and commitment, and are shown schematically in Figure 6.1. Following a discussion of these characteristics, details of a more appropriate woodlot model are presented by comparison to the existing Khulanathi model.

First, participation is vital. There is sufficient evidence in the literature, as well as compelling evidence from this study, to indicate that growers really want to be involved in the whole process, from conceptualisation through all the stages of implementation, and that this involvement is vital to the long-term success of the programme.

A participatory process will of necessity proceed slowly. For the company involved, this will require an understanding that initially, at least, fewer trees will be planted as mutual trust and understanding are established. The company will have to ensure that from the start, potential growers are informed, and know what they are getting into, both in terms of financial returns as well as possible risks. Although this process will take time, the resulting structure will be more solid, and less susceptible to the type of conflict that beset the Mbazwana area. The growers, too, will have to accept that a slower planting rate will mean that fewer plots are planted initially, and an equitable arrangement will have to be found within the community for deciding whose plots are planted first.

1. PARTICIPATION

Commercial woodlots should be a process that is owned by both the company and the farmers.

Strong, representative growers' committees are vital.

2. FLEXIBILITY

The process must be flexible, adapting to the particular circumstances of the growers in specific areas.

Alternative systems involving different species should be encouraged; they will bring long-term sustainability.

3. EMPOWERMENT

Empowerment must be encouraged through a process of ongoing, on-farm research and training that is participatory and seeks appropriate alternatives.

4. COMMITMENT

The farmers are making a major, long-term commitment.

The company must do the same. This commitment has to be to the whole process of rural development, and not just to commercial timber.

Figure 6.1: Basic characteristics of an appropriate commercial woodlot model.

Participation will be encouraged by promoting strong and representative growers' committees. This will mean support from the company involved for organisational development, and a willingness to address the issues raised by these committees. This will also mean that the people appointed by the company to work as extension foresters are actually suitable for the job at hand. Their social skills will have to be as good as their technical skills, and they will have to be convinced, right from the start, of the need for participation.

Eberhard (1992), however, offers a word of caution against increasing the burden of the rural poor through too much participation. People with limited resources and numerous responsibilities may not be able to participate at every stage of the process. Sensitivity on the part of the company, as well as the removal of obstacles or commitment of additional resources, will go a long way toward relieving this situation. For example, ensuring that meetings are centrally located and using the

forester's vehicle to transport growers from further afield would cut down on the time spent on meetings. The optimum level of participation is that which is desired by the people of a specific area.

Second, an appropriate woodlot model will be less prescriptive, allowing for greater flexibility depending on the circumstances of individuals or communities. This is obviously linked closely to the concept of participation, but there are differences. Discussions with growers showed that some want to participate fully in the process, while others have other commitments, and want as little to do with the trees as possible. The company should accommodate these differences, encouraging those farmers who want to do it all themselves, and arranging contractors for those who prefer a 'hands-off' approach. Flexibility is the key.

Similarly, some growers want greater loans, while others prefer as little debt as possible. Allowing growers to pay off their debt ahead of time (as Mondi now does) is good, but the company should also consider more credit based on the value of the trees at the time.

The company involved in supporting commercial woodlots should allow for alternative forestry systems which build linkages between the commercial orientation of the eucalypts, and other priorities that the farmers may have. This may appear to be paradoxical, but by being part of a more appropriate (and probably sustainable) system, the company would be building a more solid foundation for ongoing cooperation.

Support by the company for fruit trees, as an example, has been discussed. Farmers in a particular area may want to set up an agricultural co-operative for better access to inputs or for marketing purposes. The company can help to facilitate this process, offering collateral for a co-operative tractor, for example, when it can be seen that there is sufficient forestry work in an area to justify the expense of a machine that may well spend much of its time on non-forestry crops. Alternatively, rather than the company's own direct involvement, it may merely facilitate access of growers to existing organisations, such as NGOs, local community-based organisations (CBOs), or co-operatives.

The company must beware, however, of adopting a popular concept that appears to be progressive, and forcing such a system onto the farmers. For example, the potential for a complete agroforestry-type system incorporating eucalypts might appear, in principle, to offer a solution for both food and timber production.

However, eucalypts have aggressive root systems and tend to dominate a site. On-farm research may show that it is better to limit the impact on a small farm by concentrating the trees in a block rather than spreading them around the farm, at best using the trees as a windbreak for other species. In addition, nitrogen-fixing leguminous tree-species and fruit trees can be planted on the farm, making up part of an overall strategy to provide both food and cash from the resources available.

This study has emphasised the coastal areas of northern KwaZulu, which are the areas where Khulanathi is concentrating (see the map on page two). In the cooler, inland areas (Biyela and Nkandla), however, Acacia species may well offer the best alternative, as these trees are nitrogen-fixing, and offer two crops, namely bark (for sale for the tannin that is extracted¹¹⁷) and timber which can be sold as pulp but which is also popular for building and firewood in the inland areas.

The key is to encourage the farmers involved to arrive at the most suitable system for their own physical and socio-economic situation. This may well include commercial eucalypts. However, if the farmers decide after a time that eucalypts are not the best alternative for them, the company would do well not to try to force them to remain in the programme. Unwilling growers would not look after the trees and resources that could be better used elsewhere would be wasted.

Third, empowerment must be encouraged through a process of appropriate training and ongoing research. Commercial woodlots will not result in appropriate rural development unless the growers 'own' the whole process, and growers have indicated that they want and need technical training before they will feel adequate to the tasks at hand. With forestry training, many growers will plant and manage their own trees, and with harvesting training, some growers would harvest the trees themselves. Training is also a priority for the harvesting contractors, most of whom face technical problems and would like management, harvesting or mechanical training.

The training and research that is implemented should be 'on-farm' and again should have a participatory emphasis. Growers must be able to set the goals and develop the whole training and research effort in conjunction with the company. Strong

¹¹⁷ Wattle bark sells for R315/ton, and between 8 and 15 tons is realistic off 1 ha at eight years. Timber can be sold at Richards Bay for R106/ton, although the yields are lower than from eucalypts. There are currently 1 900 small black growers who belong to the South African Wattle Growers' Union, and who supply approximately 5% of the industry's bark (Dobson, 1993, pers. comm.).

growers' committees could play an important part in co-ordinating and deciding on priorities for an overall training and research strategy, as well as negotiating prices with the company or contractors and securing funding. The political and development climate in South Africa at present would make external funding quite feasible; local, community-based organisations have far greater access to funding through development channels than a private, profit-making company does.

Fourth, an appropriate woodlot model would have the long-term commitment of the company involved to the development of the farmers. Some of the necessary elements have been discussed: participation; appropriate on-farm research and training; greater flexibility. However, this commitment would also manifest itself in specific issues raised by the farmers. For example, will the company guarantee a minimum price that will be paid for timber? Similarly, fire insurance is an issue of concern to the growers that should be addressed. Even though there is no insurance company willing to underwrite woodlot insurance at the present time, the timber company could again show good faith by matching an amount raised through timber levies, for example, to cover a portion of the loss to a woodlot through fire or some other disaster. This would show a commitment to the long-term well-being of individual farmers, and an understanding of the risk assumed by the farmers themselves.

The company also needs to show long-term commitment by ensuring that the staff appointed to the programme are appropriate to the task at hand, and not merely appointed because they happen to be available at the time. When good people are in place they need to have the assurance that their jobs are secure, and that the company supports what they are doing.

Rural development utilising trees is a slow and difficult process. Before a company embarks on a woodlot programme, it needs to take the time to ensure that it has the support of the local farmers, and in turn is willing to commit itself to the process for the long-term.

The most appropriate method of describing a woodlot model (apart from, but incorporating the characteristics described above), is by adapting the classic investigative procedure known as the "5-Ws & H" (Emery *et al.*, 1974), that is: "who,

what, when, where, why, and how?" to the five stages involved in this context, namely: "what (includes why), who, where, how, and when?"¹¹⁸

Under the current Khulanathi model, the company dominates each of the five stages, as shown in Figure 6.2.

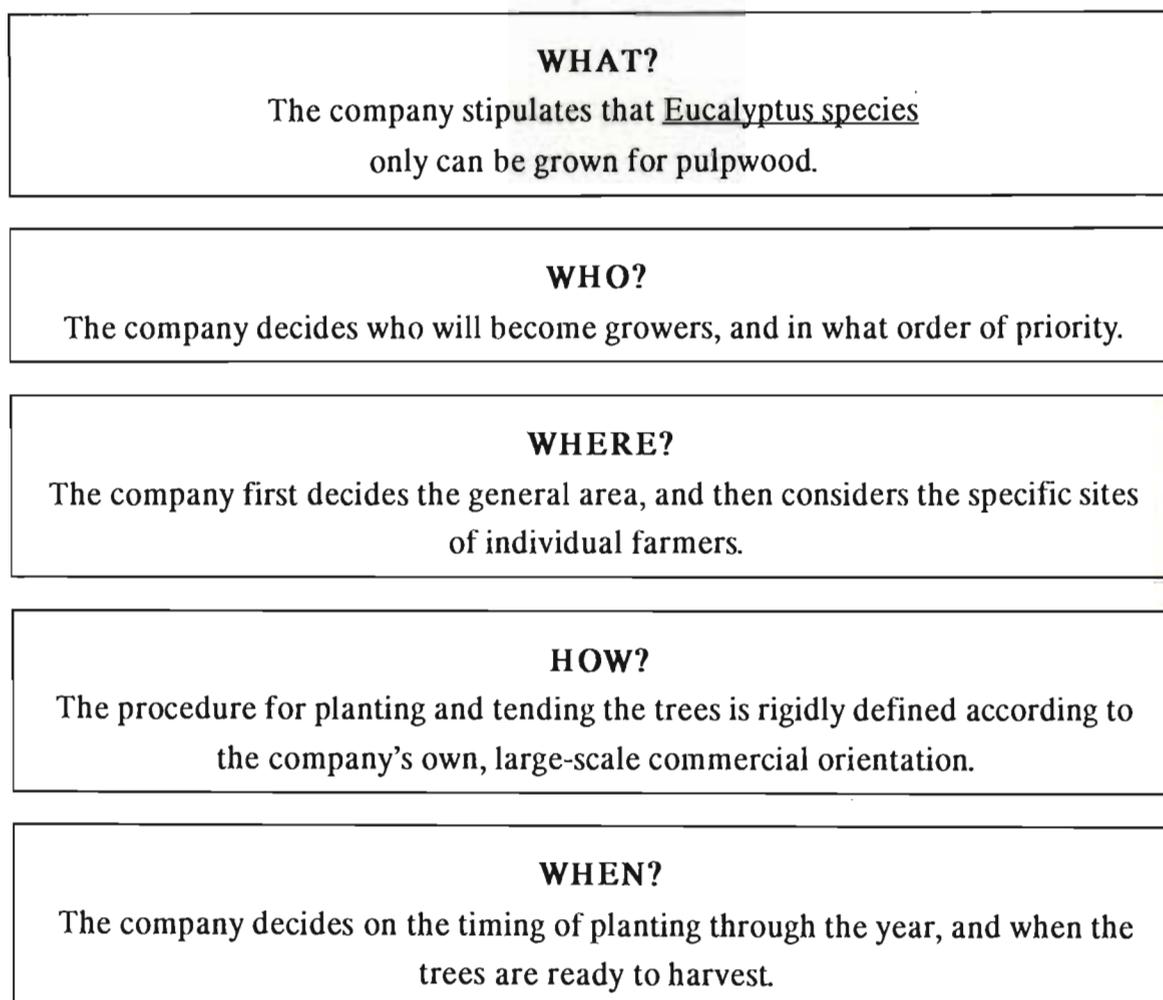


Figure 6.2: Schematic representation of the current Khulanathi model.

The findings of this study suggest that an appropriate model will be an adaptive process that is formulated by the growers together with the company. A step-by-step guide is therefore entirely inappropriate and would make a mockery of the findings of this study. However, by working the four basic principles described previously (namely, participation, flexibility, empowerment and commitment) into the above model, the following procedure can be formulated but should be used as a guide only.

¹¹⁸ The procedure is not unique, and has been used in the social forestry context (although in different formats) by Young (1989), who used "what, why and how?" and Underwood (1991), who used "what, where and how?"

WHAT?

The company and the farmers together decide on the species based on the needs of the company (for pulpwood¹¹⁹) and of the farmers.

WHO?

The whole process is owned by the farmers themselves with the support of the company. This is critical. The farmers will negotiate with the company as to who is responsible for what aspects of the process.

WHERE?

Consultation with farmers before embarking on the programme will reveal which areas will foster most support and enthusiasm for the process.

HOW?

Participation and negotiation must start before any trees are planted, together with the establishment of representative growers' committees. On-farm research is needed to show exactly how commercial species will fit into the overall land-use situation.

WHEN?

Tree growing must fit both the company's and the growers' schedules in order to spread the workload and become a more appropriate land-use option. Time of harvesting should also be flexible.

Figure 6.3: Schematic representation of the proposed model.

Commercial woodlots that are both appropriate and sustainable in the long-term are entirely feasible in rural KwaZulu at the current time. Companies must realise, however, that the process is slow and will require creativity and a long-term commitment on their part. There is no 'quick-fix' or predetermined procedure, and although support is quickly fostered among rural people with few options, this support and trust can easily be lost if the growers feel that they are being neglected by the company.

¹¹⁹ An obvious point is that the company is only involved in promoting woodlots for its own purposes. Therefore, commercial species have to make up an integral part of the whole process.

6.5 LESSONS FOR THE TIMBER INDUSTRY

There are three important lessons for the South African timber industry that can be learned from commercial woodlots.

First, commercial woodlots show that absolute control (including ownership) is not essential to secure timber. Eucalypts grown on woodlots often receive more care and attention than those grown on company plantations. Growers also indicate that they are loyal to the company that offered the initial assistance and will sell the timber back to the company even if a better price is offered at the last minute. Thus the risk to the company is small, and initial fears that the trees would not be cared for, or cut too early, or that the wood would be used for fuel, appear groundless.

The counter-argument, however, that rural farmers will respond to the market for timber without any assistance, is equally invalid. This has only occurred to a limited extent in the Sokhulu and Mbonambi areas. For the most part it is evident that, particularly in the short term, inputs are necessary to create the initial momentum. There is not the technical knowledge or the necessary capital for small farmers to begin to grow trees of their own volition. However, because so few alternatives are currently available, rural farmers will quickly respond to a viable initiative.

The second lesson the timber industry can learn from woodlots is how to deal with rural people whose objectives may not be the same as those of private companies, but may not be entirely dissimilar either. Conflict situations such as the farm at Mooibank¹²⁰ which Mondi purchased and wants to plant with trees, but which local farmers claim has traditionally been theirs, are likely to increase. It is well known that timber companies and the state own forest land from which people were forcibly removed before trees were planted.¹²¹ Not surprisingly, calls for land reform and redistribution are increasing as South Africa undergoes political transformation.

Forestry managers have little understanding of these issues or of how to accommodate expectations other than those of their head-office executives. Woodlots are one way for timber companies to learn to co-operate with rural farmers who may have a different perspective. At Mooibank, for instance, instead of losing the whole farm through a lengthy and costly court case, a compromise

¹²⁰ Randall, 1993.

¹²¹ Christie, pers. comm., 1993.

involving some woodlots, some training and development of small-scale forestry contractors and some propagation of fruit trees in a company nursery might be the answer.

The third lesson is related to the first and second. Calls for land reform and redistribution are accompanied by calls for job creation and skills development. Once the timber companies understand that they do not have to own every tree in order to secure the timber, they can begin to look creatively at their own plantations. The land-reform lobby is currently supported by the environmental lobby (when it comes to timber plantations) who see monoculture plantations as the antithesis of the biodiversity they are fighting for.

The implications for timber companies are that any proposed large-scale afforestation in the future will be met with vociferous opposition. If the companies can begin to consider options that actively encourage 'people development' while accommodating local customs and desires, then any future expansion, by being more appropriate, will probably be more acceptable to all concerned. There are examples of small-scale contractors doing piece-work for Mondi, and a local forester who used goats to clear undergrowth, but these odd cases are tolerated rather than actively encouraged. Encouraging fuelwood collection, grazing and cultivation on firebreaks, and establishment of hiking trails would all begin to show an industry which welcomed public participation; a scary thought for most forestry managers.

A fairly fundamental paradigm shift will be required for timber companies to become more relevant in the new South Africa. Successful woodlots may help to convince timber executives that such a shift may not be as painful as they fear.

6.6 RECOMMENDATIONS FOR FUTURE RESEARCH

Three main areas of research are revealed through this study. First, the land reform that will take place in South Africa will affect the timber industry. Investigation is urgently required to determine the extent of the impact this will have on the industry, and to consider the appropriateness of commercial woodlots as one way of compromise between the aspirations of disadvantaged rural communities and the objectives of commercial companies.

It is likely that a new model will have to be developed to accommodate this compromise; for instance, what are the implications of converting existing timber plantations into viable 'family-size' tree farms of, say, 20 ha each?

The second area of research that is required is economic. This study did not analyse in any depth the economic implications for either the timber company or the farmers involved. This was not possible given that the trees have not yet reached maturity and so have not yet earned any income for the growers. However, a detailed analysis of a cross-section of growers is needed to complete the picture, and to consider viable options for increasing the profitability of commercial woodlots.

The third and probably the most important area of research that should be initiated is participatory, on-farm research that will allow the growers themselves to arrive at the best possible woodlot model for their own circumstances. It must be understood that the areas where woodlots are now grown vary considerably. In some areas the people have been working with cash crops (timber and sugar-cane) for some time, and are looking for refinements to current practices; in other areas growing trees is relatively new, and farmers are more concerned with the basics. Participatory research has the advantage of being able to be appropriate in a certain place at a certain time, and to adapt as circumstances change. Furthermore, deeper levels of trust and understanding will develop, allowing investigation of sensitive issues (such as potential family conflict) that were incompletely covered by the present study.

The success of commercial woodlots will depend largely on their adaptability; if the timber companies assume that they now have a woodlot model that works and can be kept as is and applied in other areas, they will be making a mistake. The key is flexibility, and ongoing participatory research will assist in this process.

6.7 GENERAL CONCLUSIONS

This study has shown that commercial Eucalyptus woodlots occupy a particular niche in certain areas of rural KwaZulu, and can be entirely appropriate under existing land-use patterns.

The trees are grown for profit, an objective which fits into the overall survival strategy for most families who are largely reliant on cash income from a variety of sources. The opportunity cost in terms of land, time or food crops is small, and there is no evidence that women are further disadvantaged through commercial woodlots.

Environmental impacts can be minimised through careful implementation, but more attention will have to be paid to the situation of individual woodlots if long-term ecological sustainability is to be achieved.

The potential for rural development and empowerment may be considerable, but will require a fundamental paradigm shift on the part of the company involved. In particular, the company must concentrate on aspects such as communication and training which allow growers to own the whole process of growing trees on their own land.

There is also a real need for greater flexibility on the part of the company and a process of participatory on-farm research which allows farmers to devise more appropriate land-use models that are specific to individuals in particular areas. A model devised by the farmers themselves in which commercial timber crops are part of an overall land-use strategy is far more likely to be sustainable (both ecologically and socially) in the long run, and should not be seen as a threat to the company promoting eucalypts. All that is required of the company is a long-term commitment which acknowledges that the farmers can determine what is best for themselves.

There are also some important lessons for the timber industry to learn through involvement in commercial woodlots. The changing political dispensation in **South Africa** means that private companies will have to learn to consider and accommodate some of the objectives of traditionally disadvantaged communities whose perspectives may differ from their own.

The timber industry will find itself even more affected through its dependence on land, a valuable and highly emotive resource in South Africa. Commercial woodlots offer a partial solution and a way for companies to learn the vital lesson of creative participation.

REFERENCES

- Adams, W.M., 1990. Green development: Environment and sustainability in the Third World. London & New York: Routledge.
- African National Congress, 1992. Ready to govern: ANC policy guidelines for a democratic South Africa. Johannesburg: Policy Unit of the African National Congress.
- Agroforestry today, 1992. Vol. 4 (1): 2.
- Ardington, A.J., 1990. "Private sector and other possible initiatives in promoting rural development." In: Development Southern Africa, Special issue: Restructuring the rural economy: A strategy for land access, Vol. 7: 603-614.
- Arndt, H.W., 1981. "Economic development: A semantic history." Economic development and cultural change, Vol. 29 (3): 457-466.
- Arnold, J.E.M., 1992. Community forestry: Ten years in review. Rome: Food and Agriculture Organisation of the United Nations.
- Aron, J., Eberhard, A. and M. Gandar, 1989. "Demand and supply of firewood in the homelands of South Africa." Cape Town: Second Carnegie inquiry into poverty and development in Southern Africa, Post conference series, No. 21.
- Atampugre, N., 1991. "The search for new perspectives." In: Hisham, M.A., Sharma, J., Ngaiza, A. and N. Atampugre (eds.), Whose trees? A people's view of forestry aid. London: Norris Books.
- Atherton, V., 1993. Personal communication. Nursery manager; H.L. Hall & Sons (Nurseries) (Pty) Ltd., P.O. Mataffin, 1205, South Africa.
- Baekey, C., 1993. Personal communication. Director, Community Law Centre, 7th Floor Berea Centre, 249 Berea Road, Durban, 4001, South Africa.
- Barbier, E.B., 1987. Cash crops, food crops and agricultural sustainability. London: International Institute for Environment and Development, Gatekeeper series no. SA2. Sustainable Agricultural Programme.
- Bartelmus, P., 1986. Environment and development. Boston: Allen & Unwin.
- Bembridge, T.J., 1987. Private sector council on urbanization: Report for working group on rural development. Johannesburg: Urban Foundation.
- Blaikie, P., 1985. The political economy of soil erosion in developing countries. New York: Longman Scientific and Technical with John Wiley and Sons.
- Blaikie, P. and H. Brookfield, 1987. Land degradation and society. London: Methuen.
- Blair, H.W. and P.D. Olpadwala, 1988. Forestry in development planning: Lessons from the rural experience. Boulder, CO: Westview Press.
- Boake, J.B.B., 1993. Personal communication. KwaZulu manager, Mondi Forests, P.O. Box 35, Kwambonambi, 3915, South Africa.

- Bromberger, N., 1988. "Cash-cropping, subsistence, and grazing: Prospects for land tenure in KwaZulu." In: Cross, C.R. and R.J. Haines, Towards freehold: Options for land development in South Africa's black rural areas. Cape Town: Juta & Co. Ltd, pp. 207-213.
- Browning, E.K. and J.M. Browning, 1983. Microeconomic theory and applications. Boston: Little, Brown and Company.
- Bulmer, M., 1983. "General Introduction." In: Bulmer, M, and D.P. Warwick (eds.), Social research in developing countries: Surveys and censuses in the Third World. Chichester: John Wiley and Sons, pp. 6-24.
- Burgess, R.G., 1984. In the field: An introduction to field research. London: Allen & Unwin.
- Cairns, R.I., 1993. Small grower commercial timber schemes in KwaZulu. Durban: Centre for Social and Development Studies. Research paper.
- Carter, J., and J. Gronow, 1993. "Participatory vs. promotional approaches to tree cultivation on private land: Experiences in the middle hills of Nepal." Forests, trees and people newsletter, No. 19: 4-9.
- Casley, D.J. & K. Kumar, 1987. Project monitoring and evaluation in agriculture. Baltimore: Johns Hopkins University Press, for the World Bank.
- Cernea, M.M. (ed.), 1991. Putting people first: Sociological variables in rural development, 2nd ed. New York: Oxford University Press, for the World Bank.
- Chambers, R. (undated). Participatory rural appraisal. Brighton: University of Sussex, Institute of Development Studies.
- Chambers, R., 1991. "Shortcut and participatory methods for gaining social information for projects." In: Cernea, M.M. (ed.), Putting people first: Sociological variables in rural development, 2nd ed. New York: Oxford University Press, for the World Bank, Ch.14: 515-537.
- Chambers, R., 1992. "Participatory rural appraisals: Past, present and future." Forests, trees and people newsletter, Nos. 15&16: 4-9.
- Chambers, R., Saxena, N.C., and T. Shah, 1989. To the hands of the poor: Water and trees. London: Intermediate Technology Publications.
- Chapman, C., 1992. "Small cane growers seek empowerment." Enterprise, June: 45-46.
- Chappelle, D.E., Heinen, S.E., James, L.M., Kittleson, K.M. and D.D. Olson, 1986. Economic impacts of Michigan forest industries: A partially survey-based input-output study. East Lansing, MI: Michigan State University Agricultural Experiment Station, research report 472.
- Christie, S., 1993. Personal communication. Project leader, Forestek Forestry Research Centre, Private Bag X11227, Nelspruit, 1200, South Africa.
- Clapp, R.A.J., 1988. "Representing reciprocity, reproducing domination: Ideology and the labour process in Latin American contract farming." Journal of peasant studies, Vol. 16 (1): 5-39.

- Cobbett, M., 1984. "Sugarcane farming in KwaZulu: Two communities investigated." Development Southern Africa, Vol. 1 (3&4): 369-385.
- Community Law Centre and Institute of Natural Resources, 1991. "Concept proposal: Promoting the empowerment of rural communities through a process of legal education which will be based on an investigation of issues and negotiation of contracts with timber companies." Durban and Pietermaritzburg.
- Conway, G., 1988. "What's in a name?" RRA notes, No. 1. London: International Institute for Environment and Development, Sustainable Agricultural Program, p. 3.
- Cooper, D. 1988. Working the land: A review of agriculture in South Africa. Johannesburg: Environmental and Development Agency.
- Corden, W.M. and R. Findlay, 1975. "Urban unemployment, intersectoral capital mobility and development policy." Economica, Vol. 42 (165): 59-63.
- Council for the Environment, 1989. Integrated environmental management in South Africa. Pretoria: Joan Lotter publications.
- Cousins, B., 1992. "Contesting the land: Communal tenure in Zimbabwe." New ground, No. 6: 19-21.
- Cross, C.R., 1987. "The land question in KwaZulu: Is land reform necessary?" Development Southern Africa, Vol. 4 (3): 428-451.
- Cross, C., 1991. "Informal tenures against the state: Landholding systems in African rural areas." In: de Klerk, M. (ed.), A harvest of discontent: The land question in South Africa. Cape Town: Institute for a Democratic Alternative for South Africa, pp. 63-98.
- Davenport, T.R.H., 1990. "Land legislation determining the present racial allocation of land." Development Southern Africa, Special issue: Restructuring the rural economy: A strategy for land access, Vol. 7: 431-440.
- Davis-Case, D., 1989. Community forestry: Participatory assessment, monitoring and evaluation. Rome: Food and Agriculture Organisation of the United Nations, community forestry note, no. 2.
- Davis-Case, D., 1990. The community's toolbox: The idea, methods and tools for participatory assessment, monitoring and evaluation in community forestry. Rome: Food and Agriculture Organization of the United Nations.
- Denison, N.P. and J.E. Kietzka, 1993a. "The development and utilisation of vegetative propagation in Mondi for commercial afforestation programmes." South African forestry journal, No. 166: 53-60.
- Denison, N.P. and J.E. Kietzka, 1993b. "The use and importance of hybrid intensive forestry in South Africa." South African forestry journal, No. 165: 55-60.
- Dobson, D., 1990. "Large scale afforestation in Natal/KwaZulu: The challenge facing the small private growers." In: Erskine, J.M., (ed.) The physical, social and economic impacts of large-scale afforestation in Natal/KwaZulu: Proceedings of the Forestry Impacts Workshop, Pietermaritzburg, 8 May 1990. Pietermaritzburg: Institute of Natural Resources, pp. 92-96.

- Dobson, D.A.G., 1993. Personal communication. Assistant director, South African Wattle Growers' Union, P.O. Box 633, Pietermaritzburg, 3200, South Africa.
- Dos Santos, T., 1970. "The structure of dependence." American economic review, Vol. LX (2): 231-236.
- Doyle, J., 1992. "Environmental management in the forestry industry." Environmental planning and management, Vol. 3 (3): 27-33.
- Du P le Roux, P.J., 1985. "Introduction: The relevance of the basic needs approach to the South African situation." In: Basic needs in rural areas: A report on a seminar held in Cape Town on 19 February 1985. South African national scientific programmes, report no. 116: 1-10.
- Eberhard, A., 1992. "Community empowerment or exhaustion?" New Ground, No. 9: 29.
- Economics Advisory Committee, 1991. An economic analysis of the S.A. forestry industry 1990 to 1992. Report to the Forestry Council, November 1991.
- Ellis, F., 1988. Peasant economics: Farm households and agrarian development. Cambridge: Cambridge University Press.
- Emery, E., Ault, P.H. and W.K. Agee, 1974. Introduction to mass communications, 4th ed. New York: Dodd, Mead and Co.
- Falconer, J., and J.E.M. Arnold, 1991. Household food security and forestry: An analysis of socio-economic issues. Rome: Food and Agriculture Organisation of the United Nations.
- Fei, J.C.H. and G. Ranis, 1964. Development of the labor surplus economy: Theory and policy. Homewood, Illinois: Richard D. Irwin for The Economic Growth Centre, Yale University.
- Fenn, T., 1991. "Policies and approaches towards afforestation and the provision of fuelwood in developing countries: Lessons for South Africa." Biomass Initiative - Appendix 1. National Energy Council, Energy for Development Division.
- Fick, T., 1993. Cartographer, Mondi Forests, P.O. Box 35, Kwambonambi, 3915, South Africa.
- Flammang, R.A., 1979. "Economic growth and economic development: Counterparts or competitors." Economic development and cultural change, Vol. 28: 47-61.
- Foley, G. and G. Barnard, 1984. Farm and community forestry. Earthscan Energy Information Programme. London: International Institute for Environment and Development.
- Food and Agricultural Organization of the United Nations, 1978. Forestry for local community development. Rome: FAO forestry paper no. 7.
- Food and Agriculture Organisation of the United Nations, 1979. Economic analysis of forestry projects. Rome: FAO forestry paper, no. 17.
- Food and Agriculture Organisation of the United Nations, 1989. Forestry and food security. Rome: FAO forestry paper no. 90.

- Food and Agricultural Organization Forestry Department, 1986. "Are eucalypts ecologically harmful?" Unasylva, Vol. 38 (152): 19-22.
- Forest Owners Association, 1991. 21st annual report. Sandton: Forest Owners Association.
- Forest Owners Association, 1992. 22st annual report. Sandton: Forest Owners Association.
- Forest Owners Association, 1993a. Forestry and forest products industry facts 1979/80 to 1991/92. Sandton: Forest Owners Association.
- Forest Owners Association, 1993b. 23rd annual report. Sandton: Forest Owners Association.
- Forestek, 1992a. Autumn. Division of Forest Science and Technology, CSIR.
- Forestek, 1992b. Winter. Division of Forest Science and Technology, CSIR.
- Forestry Council, 1993. South African forestry facts. Sandton: Forestry Council Promotions Committee.
- Forests, trees and people newsletter, 1992. Nos. 15 and 16.
- Forests, trees and people newsletter, 1993. No. 20.
- Fri, R.W., 1991. "Sustainable development: Can we put these principles into practice?" Journal of forestry, Vol. 89 (7): 24-26.
- Friedman, M. and A. Vaughan, 1990. "The implications and problems of small grower production." In: Symposium - Sugar and Timber: Their future in Zululand. Felixton, South Africa.
- Friedman, M., 1991. Commercial timber production and basic needs: Organisational potential of small growers in KwaZulu - Lessons from an integrated rural development (IRD) project. Pietermaritzburg: Institute of Natural Resources, occasional paper no. 42.
- Gandar, M., 1991. "Status report: Woodlots and agroforestry in the SATBVC countries up to 1990." Biomass Initiative - Appendix 2. National Energy Council, Energy for Development Division.
- Gilbert, A.J., 1988. "A rural community's response to the development of sugarcane." In: Cross, C.R. and R.J. Haines, Towards freehold: Options for land development in South Africa's black rural areas. Cape Town: Juta & Co, Ltd, pp. 233-240.
- Gillis, M., Perkins, D.H. and D.R. Snodgrass, 1983. Economics of development. New York: W.W. Norton and company.
- Glaeser, B., 1984. "Ecodevelopment in Tanzania: An empirical contribution on needs, self-sufficiency and environmentally sound agriculture on peasant farms." Mouton, Berlin. Cited in: Adams, W.M., 1990. Green development. London & New York: Routledge, Ch. 3: 42-243.
- Glover, D.J., 1987. "Increasing the benefits to smallholders from contract farming: Problems for farmers' organizations and policy makers." World development, Vol. 15 (4): 441-448.

- Glover, D. and K. Kusterer, 1990. Small farmers, big business: Contract farming and rural development. London: MacMillan.
- Gow, D.D., and J. Vansant, 1983. "Beyond the rhetoric of rural development participation: How can it be done?" World development, Vol. 11, (5): 427-446.
- Gray, M., 1993. Personal communication. Public relations officer, Mondi Richards Bay, P.O. Box 1551, Richards Bay, 3900, South Africa.
- Gregersen, H., Draper, S. and D. Elz, 1989. People and trees - Role of social forestry in sustainable development. EDI seminar series. Washington, D.C.: World Bank.
- Guggenheim, S., and J. Spears, 1991. "Sociological and environmental dimensions of social forestry projects." In: Cernea, M.M. (ed.), Putting people first: Sociological variables in rural development, 2nd ed. New York: Oxford University Press.
- Haines, R.J., and C.R. Cross, 1988. "An historical overview of land policy and tenure in South Africa's black areas." In: Cross, C.R. and R.J. Haines, Towards freehold: Options for land development in South Africa's black rural areas. Cape Town: Juta & Co, Ltd, pp. 73-92.
- Hall, D. and T. Green, 1989. Community forestry in Lesotho: The people's perspective. Overseas Development Administration of the United Kingdom.
- Harrison, P., 1987. The greening of Africa: Breaking through in the battle for land and food. An International Institute for Environment and Development - Earthscan Study. London: Paladin Grafton Books.
- Herbert, M.A., 1993. "An initial assessment of the sandy soils on the Zululand coastal plain." Institute for Commercial Forestry Research (ICFR) newsletter, May 1993.
- Herbert, M.A., 1993. Personal communication. Principle research officer, Institute for Commercial Forestry Research, P.O. Box 375, Pietermaritzburg, 3200, South Africa.
- Herbert, M.A. and J.W. Musto, 1993. "The sandy forestry soils of the Zululand coastal plain: An initial assessment and notes on management." Pietermaritzburg: Institute for Commercial Forestry Research bulletin series, 12/93.
- Herbert, M.A. and M.A. Robertson, 1991. "Above-ground biomass composition and nutrient content for Eucalyptus species in the southeastern Transvaal." In: Schonau, A.P.G. (ed.), International Union of Forestry Research Organizations. Symposium on intensive forestry: The role of eucalypts, Durban, South Africa. Pretoria: Southern African Institute of Forestry, pp. 662-674.
- Hicks, N.L., 1980. "Is there a tradeoff between growth and basic needs?" Finance and development, Vol. 17 (2): 17-20.
- Hirschman, A.O., 1958. The strategy of economic development. New Haven: Yale University Press.

- Hisham, M.A., 1991. "Disappearing trees and mobile dunes." In: Hisham, M.A., Sharma, J., Ngaiza A. and N. Atampugre (eds.), Whose trees? A people's view of forestry aid. London: Norris Books.
- Holmberg, J., Bass, S. and L. Timberlake, 1991. Defending the future: A guide to sustainable development. London: Earthscan.
- Howard, M.D., 1993. Personal communication. Technical manager, Mondi Forests, P.O. Box 35, Kwambonambi, 3915, South Africa.
- Hudson, J.R., 1990a. "The cane grower's view on timber production." In: Erskine, J.M. (ed.), The physical, social and economic impacts of large-scale afforestation in Natal/KwaZulu: Proceedings of the Forestry Impacts Workshop, Pietermaritzburg, 8 May 1990. Pietermaritzburg: Institute of Natural Resources, pp. 97-103.
- Hudson, J.R., 1990b. "The cane industry's view." In: Paper summaries: Forestry Impacts Workshop, Pietermaritzburg, 8 May 1990. Pietermaritzburg: Institute of Natural Resources.
- Huggins, G., 1993. Personal communication. Researcher, Group: Social dynamics, Human Sciences Research Council, Private bag X41, Pretoria, 0001, South Africa.
- Human Sciences Research Council, 1986. Population redistribution: A summarised review and evaluation of theoretical contributions, strategies and policy instruments with specific reference to the South African situation. Pretoria: Human Sciences Research Council, SN250. Cited in: Urban Foundation, 1990. "Rural development: Towards a new framework." Policies for a new urban future, Urban debate 2010, Vol. 4. Johannesburg: Urban Foundation.
- Hyman, E.L., 1983. "Pulpwood treefarming in the Philippines from the viewpoint of the smallholder: An ex post evaluation of the PICOP project." Agricultural administration, Vol. 14: 23-49.
- Institute for Commercial Forestry Research, 1992. Annual research report 1991. Pietermaritzburg: Institute for Commercial Forestry Research.
- Institute for Commercial Forestry Research, 1993. Annual research report 1992. Pietermaritzburg, Institute for Commercial Forestry Research.
- Institute of Natural Resources, 1989. Annual report. University of Natal, Pietermaritzburg.
- International Centre for Research in Agroforestry (ICRAF), 1991. Fact sheet for dissemination programmes, Kenya, October 1991.
- International Union for Conservation of Nature and Natural Resources (IUCN), 1980. World conservation strategy: Living resource conservation for sustainable development. Gland, Switzerland: (IUCN), United Nations Environment Program and the World Wildlife Fund.
- Jakoet, S., 1988. "'Horses for courses'--An evaluation of the effect of the focus group moderator on the responses elicited from participants." In: Convention papers--10th SAMRA convention, South African Marketing Research Association, pp. 27-49.

Jayaraman, K.S., 1987. "Trees for the poor." In: Towards sustainable development. Nordic Conference on Environment and Development at Saltsjobaden, Stockholm, May 1987: The Panos Institute.

Journal of forestry, 1991a. Vol. 89 (7).

Journal of forestry, 1991b. Vol. 89 (8).

Journal of forestry, 1991c. Vol. 89 (9).

Journal of forestry, 1991d. Vol. 89 (10).

Journal of forestry, 1991e. Vol. 89 (11).

Journal of forestry, 1991f. Vol. 89 (12).

Journal of forestry, 1992a. Vol. 90 (1).

Journal of forestry, 1992b. Vol. 90 (2).

Journal of forestry, 1992c. Vol. 90 (3).

Journal of forestry, 1992d. Vol. 90 (4).

Journal of forestry, 1992e. Vol. 90 (5).

Journal of forestry, 1992f. Vol. 90 (6).

Joyce, C., 1988. "The tree that caused a riot." New scientist, 18: 54-59.

Katerere, Y., 1986. "Tree planting activities in Zimbabwe's rural areas." Zimbabwe agricultural journal, Vol. 83 (4): 125-128.

Kewley, H.C., 1993. Personal communication. Regional manager, Zululand, Mondi Forests, P.O. Box 35, Kwambonambi, 3915, South Africa.

Khosa, J., 1993. Personal communication. Khulanathi facilitator, Mondi Forests, P.O. Box 35, Kwambonambi, 3915, South Africa.

Kienzle, S.W., 1993. Personal communication. Senior research hydrologist, Department of Agricultural Engineering, University of Natal, P.O. Box 375, Pietermaritzburg, 3200, South Africa.

Kienzle, S.W. and R.E. Schulze, 1993. "Simulation of the effect of afforestation on ground water resources at Nyalazi." In: Cairns, R.I., 1993. Small grower commercial timber schemes in KwaZulu. Durban: Centre for Social and Development Studies. Research paper: Appendix B.

Kumar, K., 1987a. Conducting group interviews in developing countries. Washington, D.C.: Agency for International Development (A.I.D.) Program design and evaluation methodology report, no. 8.

Kumar, K., 1987b. Rapid, low-cost data collection methods for A.I.D. Washington, D.C.: Agency for International Development (A.I.D.) Program design and evaluation methodology report, no. 10.

- Laarman, J.G. and H.A. Contreras, 1991. "Benefit from development assistance projects in forestry: Does the available evidence paint a true picture?" Unasylva, Vol. 42 (164): 45-54.
- Lee, R.G., Briggs, D.G., Schreuder, G.F. and J. Kronick, 1984. The local impacts of forest industries: Approach and methodology. Seattle: University of Washington College of Forest Resources, for the Food and Agriculture Organization of the United Nations.
- Lele, S.M., 1991. "Sustainable development: A critical review." World development, Vol. 19 (6): 607-621.
- Lele, U., 1975. The design of rural development: Lessons from Africa. Baltimore: Johns Hopkins University Press, for the World Bank.
- Levin, R. 1988. "Contract farming in Swaziland: Peasant differentiation and the constraints of land tenure." African studies, Vol. 47 (2): 101-120.
- Loehr, W., and J.P. Powelson, 1981. The economics of development and distribution. New York: Harcourt Brace Jovanovich.
- Lohmann, L., 1990. "Commercial tree plantations in Thailand: Deforestation by any other name." The Ecologist, Vol. 20 (1): 9-17.
- Lorentz, S.A. and R.E. Schulze, 1993. "Evaluation of runoff reduction due to afforestation in a small catchment in the Matikulu area of KwaZulu." In: Cairns, R.I., 1993. Small grower commercial timber schemes in KwaZulu. Durban: Centre for Social and Development Studies. Research paper: Appendix B.
- Louw, C., 1982. "Action Research." KwaDlangezwa: University of Zululand, Centre for Research and Documentation, occasional paper no. 4.
- Louw, C., 1993. Personal communication. Field manager, Mbonambi, Institute of Natural Resources, University of Natal, P.O. Box 375, Pietermaritzburg, 3200, South Africa.
- Lyne, M.C. and W.L. Nieuwoudt, 1990. "The real tragedy of the commons: Livestock production in KwaZulu." The South African journal of economics, Vol. 58 (1): 88-96.
- Lyne, M.C. and W.L. Nieuwoudt, 1991. "Inefficient land use in KwaZulu: Causes and remedies." Development Southern Africa, Vol. 8 (2): 193-201.
- Lyster, M., 1988. "Agricultural marketing in KwaZulu: Increasing private sector involvement. In: Cross, C.R. and R.J. Haines, Towards freehold: Options for land development in South Africa's black rural areas. Cape Town: Juta & Co. Ltd, pp. 248-254.
- MacKenzie, D. 1988b. "Kenya's president causes panic among foresters." In: Joyce, C., 1988. "The tree that caused a riot." New scientist, 18: 54-59.
- MacKenzie, D., 1988a. "The Emperor's new trees, or how to reclothe Ethiopia." In: Joyce, C., 1988. "The tree that caused a riot." New scientist, 18: 54-59.
- Magill, A.W., 1991. "Barriers to effective public interaction." Journal of forestry, Vol. 89 (10): 16-18.

- Magno, V.C., 1986. Community forestry handbook. Rome: Food and Agricultural Organization of the United Nations. Cited in: Sato, E., 1991. Social forestry: An evaluation of social forestry projects. Seattle: Unpublished M.S. thesis, University of Washington.
- Mander, J.J., 1991. Environmental evaluation of the proposed commercial afforestation in the Mbazwana area: A report prepared for Mondi Forests, Kwambonambi. Pietermaritzburg: Institute of Natural Resources, investigational report 53.
- Marcus, T., 1991. "National, class and gender issues in land reform." In: de Klerk, M. (ed.), A harvest of discontent: The land question in South Africa. Cape Town: Institute for a Democratic Alternative for South Africa, pp. 25-42.
- May, J. and J. Nattrass, 1986. Migration and dependency sources and levels of income in KwaZulu. Rural urban studies unit, University of Natal, Durban. Working paper no. 3.
- Mayende, P., 1993. "Agrarian reform in South Africa." In: Hallows, D. (ed.), Hidden faces. Environment, development, justice: South Africa and the global context. Scottsville, South Africa: Earthlife Africa.
- Mazibuko, E., 1993. Personal communication. Khulanathi extension forester, Mfekayi, Mondi Forests, P.O. Box 35, Kwambonambi, 3915, South Africa.
- McKenzie, C.C., Weiner, D. and N. Vink, 1989. "Land use, agricultural productivity and farming systems in Southern Africa," Development Bank of Southern Africa, internal working paper. Cited in: Brand, S., Christodoulou, N., Van Rooyen, J. and N. Vink, 1992. "Agriculture and redistribution: Growth with equity." In: Schrire, R. (ed.), Wealth or poverty? Critical choices for South Africa. Cape Town: Oxford University Press.
- Melis, R.J.M., 1993. Personal communication. Managing director, Proseed (c.c.), 45 Maud Ave., Pietermaritzburg, 3200, South Africa.
- Merton, R.K., Fiske, M. and P.L. Kendall, 1990. The focused interview: A manual of problems and procedures, 2nd ed. New York: The Free Press.
- Minutes of the Empembeni subward woodlot growers' meeting of 23 October 1993.
- Moller, V., 1985. "Rural blacks' perceptions of basic need fulfilment." In: Basic needs in rural areas: A report on a seminar held in Cape Town on 19 February 1985. South African National Scientific Programmes Report No. 116: 67-94.
- Molnar, A., 1989. Community forestry: Rapid appraisal. Rome: Food and Agriculture Organisation of the United Nations, community forestry note 3.
- Mondi Forests, (undated). Environmental conservation code of practice.
- Mondi world, June 1992. "Looking to the future with Frantschach." Johannesburg.
- Morison, M., 1986. Methods in sociology. London: Longman.
- Mountain, A., 1990. Paradise under pressure: St Lucia, Kosi Bay, Sodwana, Lake Sibaya, Maputaland. Johannesburg: Southern Book Publishers.

- Mueller-Dombois, D., 1992. "Sustainable forestry: The role of eucalypts and lessons from natural and artificial monoculture systems." South African forestry journal, No. 162: 57-59.
- Myrdal, G., 1973. Against the stream: Critical essays on economics. New York: Pantheon Books.
- Nachmias, D. and C. Nachmias, 1987. Research methods in the social sciences. London: Edward Arnold.
- Nair, P.K.P., Fernandes, E.C.M. and P.N. Wambugu, 1984. "Multipurpose leguminous trees and shrubs for agroforestry." Agroforestry systems, Vol. 2: 145-163.
- Nattrass J., with May, J., Perkins, D. and A. Peters, 1986. The anatomy of rural black poverty : The challenge to a new economic order. Rural urban studies unit, University of Natal, Durban. Working paper no. 4.
- Nel, H. and J.F. Potgieter, 1990. Impact study of the Mondi forestry development in the North-east Cape. Port Elizabeth: University of Port Elizabeth, Department of Economics.
- Noble, A.D., Ramsden, R. and C. McInnes, 1991. "The influence of two organic fertiliser sources on the rehabilitation of an under-performing stand of E. grandis." In: Schonau, A.P.G. (ed.), International Union of Forestry Research Organizations, Symposium on intensive forestry: The role of eucalypts, Durban, South Africa. Pretoria: Southern African Institute of Forestry, pp. 705-713.
- Organisation for Economic Co-operation and Development (OECD), 1986. The public management of forestry projects. Paris: OECD.
- Parasuraman, A., 1986. Marketing research. Reading, Massachusetts: Addison-Wesley.
- Peters, A., 1987. The household in rural Kwazulu: Foundations for a statistical model. Rural urban studies unit, University of Natal, Durban. Working paper no. 5.
- Pote, G., 1993. Personal communication. Field manager, Biyela, Institute of Natural Resources, University of Natal, P.O. Box 375, Pietermaritzburg, 3200, South Africa.
- Potgieter, J.C., 1992. "Opinion re woodlot agreement." Pietermaritzburg: Mondi Forests South.
- Preston-Whyte, E., 1982. "Why questionnaires are not the answer: Comments and suggestions based on a pilot study of the rural informal sector in KwaZulu." In: Questionnaires are no short cut. Southern Africa Labour and Development Research Unit (SALDRU), School of Economics, University of Cape Town. SALDRU working paper no. 48: 42-53.
- Preston-Whyte, R.A. and P.D. Tyson, 1988. The atmosphere and weather of Southern Africa. Cape Town: Oxford University Press.
- Raintree, J.B., 1991. Socioeconomic attributes of trees and tree planting practices. Rome: Food and Agriculture Organization of the United Nations. Forests, trees and people, community forestry note 9.

- Randall, E., 1993. "Lessons about land from the farm near the forest." The Weekly Mail & Guardian, Vol. 9 (43): 16.
- Reilly, J.J., 1974. "Impact of softwood plantations on rural economic development in Australia." Australian forestry, Vol. 37 (2): 143-152.
- Rocheleau, D., Wachra, K., Malaret, L., and B.M. Wanjori, 1989. "Local knowledge for agroforestry and native plants." In: Chambers, R., Pacey, A., and L.A. Thrupp (eds.), Farmer first: Farmer innovation and agricultural research. London: Intermediate Technology Publications.
- RRA notes, No. 2, 1988. London: International Institute for Sustainable Environment and Development, Sustainable Agricultural Programme.
- RRA notes, No. 13, 1991. London: International Institute for Environment and Development, Sustainable Agriculture Programme.
- RRA notes, No. 16, 1992. London: International Institute for Sustainable Environment and Development, Sustainable Agricultural Programme.
- Salmen, L., 1987. Listen to the people. New York: Oxford University Press.
- Saxena, N.C., 1992. "Eucalyptus on farmlands in India: What went wrong?" Unasylva, Vol. 43 (170): 53-58.
- Scherr, S.J., 1991. Methods for participatory on-farm agroforestry research: Summary proceedings of an international workshop. Kenya: International Centre for Research in Agroforestry.
- Schonau, A.P.G. (ed.), 1991. International Union of Forestry Research Organizations, Symposium on intensive forestry: The role of eucalypts, Durban, South Africa. Pretoria: Southern African Institute of Forestry.
- Seers, D., 1977a. "The meaning of development." International development review, Vol. 19 (2): 2-7.
- Seers, D., 1977b. "The new meaning of development." International development review, Vol. 19 (3): 2-7.
- South African forestry journal, 1991a. No. 158.
- South African forestry journal, 1991b. No. 159.
- South African forestry journal, 1992a. No. 160.
- South African forestry journal, 1992b. No. 161.
- Southern Africa farming systems research - extension (SAFSR-E) newsletter, No. 4.
- Stilwell, T., 1992. "The 12th Annual AFSA-E Symposium: Hosted by the Michigan State University." Southern Africa farming systems research - extension newsletter, No. 4: 2-4.
- Streeten, P., with Burki, S.J., Haq, M.U., Hicks, N., and F. Stewart, 1981. First things first: Meeting basic human needs in developing countries. New York: Oxford University Press.

- Sykes, J.B. (ed.), 1982. The concise Oxford dictionary of current English, 7th ed. Oxford: Oxford University Press.
- Tapson, D.A., 1986. The homelands: Vehicle for or obstacle to rural development (draft report). Johannesburg: Urban Foundation.
- Taylor, S. and R. Bogdan, 1984. Introduction to qualitative research methods: The search for meanings, 2nd ed. New York: John Wiley and Sons.
- Theis, J. and H.M. Grady, 1991. Participatory rapid appraisal for community development: A training manual based on experiences in the Middle East and North Africa. London: International Institute for Environment and Development.
- Underwood, M., 1991. "Agroforestry': concepts characteristics and research needs for its planning and implementation in Southern Africa." In: Koen, J.H. (ed.), African agroforestry: Emphasis on Southern Africa. Pretoria: Foundation for Research Development.
- Underwood, M., 1993. Personal communication. Agroforester, Centre for Low Input Agricultural Research and Development, Private Bag X1001, KwaDlangezwa, 3668, South Africa.
- Urban Foundation, 1990. "Rural development: Towards a new framework." Policies for a new urban future. Urban debate 2010, Vol. 4. Johannesburg: Urban Foundation.
- Van Daalen, 1991. "Introduction." In: Koen, J.H. (ed.), African agroforestry: Emphasis on Southern Africa. Pretoria: Foundation for Research Development.
- Van der Zel, D.W., 1989. Strategic forestry development plan for South Africa. Directorate of National Forestry Planning and Extension, Forestry and Environmental Conservation Branch, Department of Environment Affairs, Republic of South Africa.
- Van Gelder, B. and P. O'Keefe (undated). The new forester. Social Forestry Network, ODI. London: Regent's College.
- Van Maanen, J., 1979. Qualitative methodology. Newbury Park, California: Sage Publications.
- Vaughan, A. 1990. "Ways of working the land: Small cane growers and employment creation." In: Beukes, E.P. et al. (eds.) Development, employment and the new South Africa. Innesdale, South Africa: Development Society of South Africa, Ch. 18: 317-343.
- Vaughan, A. 1991. "Cane, class and credit: Small growers in the Glendale Mill area." Antipode, Vol. 23 (1): 172-184.
- Vaughan, A. 1992. "Options for rural restructuring." In: Schrire, R. (ed.), Wealth or poverty? Critical choices for South Africa. Cape Town: Oxford University Press.
- Von Maydall, H.J., 1979. "Agroforestry - A combination of agricultural, sylvicultural and pastoral land-use." Plant research and development, Vol. 9: 17-23.

- Weaver, J. and K. Jameson, 1981. Economic development: Competing paradigms. New York: University Press of America.
- Whyte, W.F. and G. Alberti, 1983. "On the integration of research methods." In: Bulmer, M, and D.P. Warwick (eds.), Social research in developing countries: Surveys and censuses in the Third World. Chichester: John Wiley and Sons, pp. 299-312.
- Williams, S., 1984. "Agribusiness and the small-scale farmer: A dynamic partnership for development." In: Williams, S. and R. Karen. (eds.), Agribusiness and the small-scale farmer: A dynamic partnership for development. Boulder, CO: Westview Press, Ch.1: 1-11.
- Wiseman, G.D.R., 1985. "Sugarcane farming in KwaZulu: Two communities investigated—Rejoinder." Development Southern Africa, Vol. 2 (3): 447-451.
- Wiseman, G.D.R., 1993. Personal communication. Manager, Extension services, Tongaat Hulett Sugar Mill, Private Bag, Amatikulu, 3801, South Africa.
- World Bank, 1978. Forestry: Sector policy paper. Washington, D.C: World Bank.
- World Bank, 1991. Forestry: The World Bank's experience. Washington, D.C: World Bank, Operations Evaluation Department.
- World Commission on Environment and Development (WCED), 1987. Our common future. Oxford & New York: Oxford University Press.
- Young, A., 1989. Agroforestry for soil conservation. Oxon: C.A.B. International.

APPENDIX I

ANALYSIS OF A 'TYPICAL' KHULANATHI GROWER

ASSUMPTIONS

1. One hectare plot in one of the coastal areas.
2. Site preparation R440
(Consists of ploughing and two discings.)
3. Planting R768
(Consists of: clones (R288); marking (R24); pitting (R24); fertilizing (R35); fertilizer (R138); planting (R56); blanking (replacing dead trees) (R56); watering (R147). An average fertilizer rate (R138) of the two most common rates (R88 and R176) has been used.)
4. Hoeing R135
(Consists of three manual operations in the first year to remove weeds.)
5. Grower takes all loan amounts and advances.
7. Trees planted at 1 600 trees per ha.
8. Mondi charges 10% simple interest on all loans and advances, but an inflation and discount rate of 13% has been applied.
9. Cost of harvesting and transporting to a local depot is R25/ton and price paid at the depot is R80/ton.
10. Rotation is seven years, and yield is 25 tons/ha/year.

NOTE

It must be noted that the price of land has not been included. This is an obvious omission, but one justified by the results of this study which found that most growers do not feel that they are "giving up" some alternative crop to grow trees; i.e. the opportunity cost is very low in the perceptions of the growers.

ANALYSIS (IN RANDS)

| <u>YEAR</u> | <u>OPERATION</u> | <u>COST</u> | <u>LOAN</u> | <u>INTEREST</u> | <u>INCOME</u> |
|--|------------------|-------------|-------------|-----------------|----------------|
| 1992 | site preparation | 440 | | | |
| | planting | 768 | | | |
| | hoeing | 216 | | | |
| | fire protection | 53 | | | |
| | advance | 96 | 1 573 | 157 | |
| 1993 | fire protection | 40 | | | |
| | advance | 108 | 1 721 | 329 | |
| 1994 | fire protection | 45 | | | |
| | advance | 123 | 1 889 | 518 | |
| 1995 | fire protection | 51 | | | |
| | advance | 139 | 2 078 | 726 | |
| 1996 | fire protection | 57 | | | |
| | advance | 157 | 2 292 | 955 | |
| 1997 | fire protection | 65 | | | |
| | advance | 177 | 2 534 | 1 209 | |
| 1998 | fire protection | 73 | | | |
| | advance | 200 | 2 807 | 1 489 | |
| 1999 | fire protection | 83 | 2 890 | 1 778 | |
| | harvest | 10 293 | | | 32 936 |
| Gross income from the harvest: | | | | | R22 643 |
| <u>Less:</u> Outstanding loan amount: | | | R2 890 | | |
| Outstanding interest: | | | R1 778 | | |
| Net income to the grower: | | | | | <u>R17 976</u> |
| Net present value in today's (1993) money: | | | | | <u>R7 357</u> |

APPENDIX II

FIELDWORK QUESTION GUIDE

NOTE: Questions are not numbered and not in any particular order. The order often varied, and certain questions were sometimes omitted.

Labour/Work

Whose trees are these?

Who does the work?

Does forestry take a lot of your time?

Do you have enough time to do other things?

Do you do your own work on your trees?

Do you use contractors? Why?

Do you know these contractors?

Do the contractors do good work, are they fair, etc?

Are you happy to pay them for their work?

Money

Are your trees going to make lots of money?

How much?

What does the forester say?

When will you get this money (how old will the trees be)?

What if you need money before Mondi says the trees are ready (6-8 years)?

Who will do the harvesting?

What about money for work you do on the trees now?

Who gets it, and who does the work?

Is it enough, on time, etc?

How does Mondi pay you for the work on your trees?

Are cheques good/bad/what?

What about paying this money back to Mondi?

Interest on this money?

When you get your money from the harvest, what will you use it for?

Communication

Are there growers' meetings in your area?

How often?

Do you go to these forestry meetings?

Will you be on the committee?

Would you like to see posters, books about forestry?

Mondi

Do you get good advice?

How often do you see the forester?

Is it often enough?

Do you know enough about forestry?

Land

Ownership and tenure:

- whose land are the trees on?
- do you worry that Mondi will steal the land?
- any conflict with neighbours?
- do you worry that the land might go to someone else?

Competition:

- do you have enough land for forestry?
- does forestry take land away from other things?
- previous use? what do you do now?

Ecology:

- what effect does the forestry have on the land?
- taking water?
- poisoning the land?
- distance of trees to water?

General

Why did you start to grow trees?

What does the rest of your family feel about the trees?

What about growing other trees?

Other crops?

Are there people who can help with these other crops?

Can you get seed for other crops?

Is there enough water/time for other crops?

What would you most like to see your land used for?

Contract

Was it explained to you?

Do you understand it?

Do you have a copy?

What are the things that worry you in the contract?

Do you think we need a contract?

If there was no contract, would you still sell to Mondi?

What if someone will pay more than Mondi for your trees?

APPENDIX III

LIST OF KEY INFORMANTS

EXPERTISE IN DEVELOPMENT

- Louw, C., 1993. Field manager, Mbonambi, Institute of Natural Resources, University of Natal, P.O. Box 375, Pietermaritzburg, 3200, South Africa.
- Pote, G., 1993. Field manager, Biyela, Institute of Natural Resources, University of Natal, P.O. Box 375, Pietermaritzburg, 3200, South Africa.
- Underwood, M., 1993. Agroforester, Centre for Low Input Agricultural Research and Development, Private Bag X1001, KwaDlangezwa, 3668, South Africa.

EXPERTISE IN SMALL-SCALE PRODUCTION

- Atherton, V., 1993. Nursery manager, H.L. Hall & Sons (Nurseries) (Pty) Ltd., P.O. Mataffin, 1205, South Africa.
- Dobson, D.A.G., 1993. Assistant director, South African Wattle Growers' Union, P.O. Box 633, Pietermaritzburg, 3200, South Africa.
- Wiseman, G.D.R., 1993. Manager, Extension services, Tongaat Hulett Sugar Mill, Private Bag, Amatikulu, 3801, South Africa.

EXPERTISE IN RESEARCH

- Christie, S., 1993. Project leader, Forestek Forestry Research Centre, Private Bag X11227, Nelspruit, 1200, South Africa.
- Herbert, M.A., 1993. Principle research officer, Institute for Commercial Forestry Research, P.O. Box 375, Pietermaritzburg, 3200, South Africa.
- Huggins, G., 1993. Researcher, Group: Social dynamics, Human Sciences Research Council, Private bag X41, Pretoria, 0001, South Africa.
- Kienzle, S.W., 1993. Senior research hydrologist, Department of Agricultural Engineering, University of Natal, P.O. Box 375, Pietermaritzburg, 3200, South Africa.
- Melis, R.J.M., 1993. Managing director, Proseed (c.c.), 45 Maud Ave., Pietermaritzburg, 3200, South Africa.

EXPERTISE IN THE KHULANATHI PROJECT

- Boake, J.B.B., 1993. KwaZulu manager, Mondi Forests, P.O. Box 35, Kwambonambi, 3915, South Africa.
- Kewley, H.C., 1993. Regional manager, Zululand, Mondi Forests, P.O. Box 35, Kwambonambi, 3915, South Africa.
- Khosa, J., 1993. Khulanathi facilitator, Mondi Forests, P.O. Box 35, Kwambonambi, 3915, South Africa.
- Mazibuko, E., 1993. Khulanathi extension forester, Mfekayi, Mondi Forests, P.O. Box 35, Kwambonambi, 3915, South Africa.