LAND REDISTRIBUTION IN KWAZULU-NATAL: AN ANALYSIS OF FARMLAND TRANSACTIONS RECORDED IN 1997 AND 1998

By

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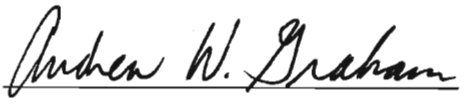
I hereby certify that, unless specifically indicated to the contrary in the text, this thesis is the result of my own original work.



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ABSTRACT

This research has two objectives: Firstly, to examine the rate of land redistribution in the province of KwaZulu-Natal during the years 1997 and 1998 as well as the performance of different modes of land redistribution. Secondly, to study the relationship between mode of redistribution, security of tenure and access to agricultural credit on land redistributed to disadvantaged households in the province during 1997. To measure the rate of land redistribution, results from a census survey of farmland transactions recorded in the province in 1998 were compared with the results from a previous survey conducted in 1997. It was found that 18885 hectares of commercial farmland transferred to disadvantaged owners in KwaZulu-Natal during 1998, which implies an overall rate of redistribution of 0,35 per cent, down from 0,43 per cent in 1997.

There were marked differences in the quality, quantity and agricultural performance of farmland transferred by different modes of redistribution. Private transactions accounted for the majority of the total land wealth and total land area transferred in both years, with mortgage loan transactions making the most significant impact. Also, the mode of land redistribution was an important determinant of the level of tenure security and agricultural performance. Individual households purchasing land through private transactions tend to exhibit much higher tenure security than those households which purchased land collectively under the government land grant programme.

A logit model was employed to determine the probability of household agricultural borrowing. Results of the logit model on data gathered in a sample survey of 129 disadvantaged households that purchased farmland in KwaZulu-Natal during 1997 show that those farmers purchasing land through subsidised mortgage loans were more likely to borrow credit for agricultural purposes. The probability of agricultural credit use increases with more secure tenure, higher levels of wealth and liquidity, and higher education levels. These factors provide greater incentives for lenders to supply credit and for borrowers to use credit for investments and complementary inputs.

The issues of tenure security and access to credit must be considered if land redistribution to the landless poor is to be successful in the long-term. It was recommended that government should reallocate scarce public funds towards programmes which assist emerging farmers to gain access to credit for the purchase and development of agricultural farmland. However, attention must also be directed towards scrapping the Subdivision of Agricultural Land Act, 70 of 1970, which currently impedes land redistribution through regulations preventing large farms from being subdivided and sold as smaller properties to viable emerging farmers. In addition, attention should be focused on converting existing government land grant projects into non land-user group schemes whereby land is set aside and managed in an effort to create a viable joint enterprise for the community to realise a benefit (income) stream.

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

It is widely recognised that land redistribution could promote the political stability needed for economic growth in South Africa. At the same time, it is important to ensure that the efficient use of land and other agricultural resources is not compromised in the long-term (Lyne and Darroch, 1997; van Zyl , 1994). The primary goal of this study is to inform land reform policy in South Africa by providing objective information about the redistribution of commercial farmland to previously disadvantaged people. First, the study analyses transfers in ownership recorded in the province of KwaZulu-Natal during 1997 and 1998. This part of the study examines the relative performance of different modes of land redistribution, including private and government-assisted land transactions. Although the Department of Land Affairs publishes information about government-assisted land transactions, the contribution made by private transactions to land redistribution in South Africa has received scant attention (Lyne and Darroch, 1997; Kirsten *et al*, 1996). This is surprising as international experience has shown that private transactions tend to redistribute much more land than do government programmes (World Bank, 1993:24).

Second, the study provides baseline information that can be used to monitor causal relationships between the mode of acquisition (*eg* land financed privately by individuals versus land purchased by groups with government grants), land tenure security and agricultural performance. This entailed partial analysis of relevant sample data gathered from previously disadvantaged people who acquired commercial farmland in KwaZulu-

Natal during 1997. In particular, the analysis reported in this dissertation extends previous local research by examining the link between tenure security and the use of agricultural credit. Studies by Kille and Lyne (1993) and Moor and Nieuwoudt (1995) showed that secure land tenure encouraged agricultural investment on small farms in KwaZulu-Natal and Zimbabwe respectively, but did not test the primary Place *et al* (1994:16-17) hypothesis that greater tenure security leads to more use of credit to finance improvements and operating inputs.

Although the main focus of the study is to generate objective information about land redistribution in KwaZulu-Natal, the nature of the data and the analysis of credit use offer valuable insight to policy issues in South Africa. These include the impact of high nominal interest rates and the Subdivision of Agricultural Land Act, 70 of 1970, on access to the land market (Nieuwoudt and Vink, 1995; Lyne and Darroch, 1997); the performance of recent financial innovations intended to broaden access to land markets (Simms, 1996); concerns about elitism and gender bias in land reform programmes financed by the private sector; and problems of insecure land tenure, poor access to credit and under-investment in agriculture anticipated in cases where large groups of land users purchase commercial farms with government grants (LIMA, 1998:10-15).

To accomplish the first goal, all land transactions recorded by the Deeds Registry in KwaZulu-Natal during 1997 and 1998 were surveyed to get accurate estimates of the quantity and quality of farmland acquired by previously disadvantaged people, and to

determine the gender composition of transactions involving individual owners. This information was then analysed by mode of land acquisition. To accomplish the second goal, the farms acquired by previously disadvantaged people during 1997 were sampled and a total of 129 households were interviewed. In addition, data were recorded for 276 land parcels used by the sample households. Logit analysis was then applied to a subset of the household-level data to test the relationship between tenure security and use of agricultural credit. To estimate this model, an index measuring respondents' perceptions of the breadth, duration and assurance of their property rights to cropland was constructed using the approach recommended by Place *et al* (1994:20-24).

Chapter 1 begins by reviewing recent land policy in South Africa and traces the economic links between land reform strategies, tenure security and agricultural performance. Chapter 2 outlines private and public modes of land redistribution in South Africa and describes how land transactions recorded by the Deeds Registry in KwaZulu-Natal were consolidated, filtered (to identify farms acquired by disadvantaged entrants) and stratified by mode of land redistribution. Chapter 3 presents the results of the census surveys conducted on land transactions recorded in 1997 and 1998.

Chapter 4 describes the technique used to sample disadvantaged households on government-assisted land reform projects and on farms acquired privately. Respondents' perceptions of property rights are used to construct a composite index of land tenure security. Chapter 5 provides relevant descriptive statistics for the different modes of land

redistribution and describes the empirical credit use and logit models postulated to isolate the incidence of household borrowing as a function of tenure security and household characteristics. The technique used to estimate the logit model is fully explained, including a description of the theory behind the logit model and its advantages to analysis. Finally, chapter 6 provides policy implications based on the results obtained from the sample survey and data analysis.

CHAPTER 1

LAND REDISTRIBUTION, TENURE SECURITY AND AGRICULTURAL PERFORMANCE

After the first democratic elections in 1994, South Africa's new government incorporated land reform into its Reconstruction and Development Programme (RDP). Initially, the aim was to redistribute 30 per cent of white owned commercial farmland within the first five years of democratic rule (Van Zyl *et al*, 1996:v). This ambitious goal reflected the fact that white commercial farmers owned 86 per cent of the available farmland, but constituted only a small minority of the rural population (Van Zyl *et al*, 1996:3).

1.1 Land redistribution policy in South Africa

South Africa's Interim Constitution specified three land reform policies (KFC, 1998:1): Restitution of land lost as a result of racial discrimination in the past, the improvement of tenure security in the former homeland areas, and redistribution of farmland to historically disadvantaged people. The latter policy can have a meaningful impact on the racially skewed pattern of land ownership in South Africa; tenure improvement does not shift land from whites to non-whites, and restitution is a slow legal process involving a finite number of legitimate claims. To date, only 785 claims have been settled, few of which involve farmland (AgriReview, 1998:3-4; Die Boer/The Farmer, 2000:5).

The government has taken an active role in redistributing farmland to previously disadvantaged communities through its settlement/land acquisition grant. In terms of this 'land grant' programme, prospective beneficiaries can apply for a cash grant to finance land purchases (or equity in a farming enterprise), transaction costs, internal infrastructure, home improvements, and fixed and moveable farm assets (LIMA, 1998a:4). To qualify for a land grant (currently set at R 16000 per household) the beneficiary representing the household must:

- be a resident of South Africa,
- be legally competent to contract,
- be married, or living with another person, or have financial dependents,
- earn a gross income of less then R 1500 per month.

In order to reduce sub-division and transaction costs grants are pooled across households, allowing a community to purchase a commercial farm in its entirety. Since the Subdivision of Agricultural Land Act, 70 of 1970 prohibits co-ownership of farmland (other than by husband and wife), ownership of the farm transfers to a legal entity representing the interest of beneficiary households. However, ownership by a legal entity does not exempt the owner from the provisions of Act 70, which restrict the partitioning of farmland between multiple users and the transfer of agricultural land to residential uses. For this reason, the Minister for agriculture and land affairs must exempt each farm purchased from the provisions of Act 70 by designating the land under the Provision of Certain Land for Settlement Act, 126 of 1998. Although land designated under Act 126 may be co-owned in

undivided shares, it was decided that land purchased by groups of beneficiaries should nevertheless be registered to a legal entity (LIMA, 1998a:10). Initially trusts were used as the legal entity to hold land. After 1996, policy emphasised the use of Communal Property Associations.

1.2 Policy outcomes in KwaZulu-Natal

A wide range of tenure and managerial arrangements can emerge when a farm is purchased by a group of co-owners. The members may agree to partition the land with each household exercising exclusive rights over its own parcel; they may share the land with each household exercising inclusive use rights (especially to grazing land); or they may forgo their use rights in favour of benefit rights. In the latter case, the co-owners become 'non-users'. That is, they might elect or hire experts to manage the farm on their behalf and share in the profit generated by their joint asset, or they might lease the land out and share in the rental stream. Of course, a group of co-owners could employ a combination of user and non-user strategies. Each strategy has its own economic implications. In a worst case scenario, the members may be unable to negotiate or enforce any rules governing individual use or benefit rights, converting their farm into an open access resource.

In KwaZulu-Natal, most of the farms purchased by groups of government-assisted beneficiaries have been divided into three parts. A relatively small area is set aside for residential purposes with the balance of the farm separated into grazing and arable land for

crop production. Grazing is communal, but residential and arable land is often partitioned for allocation to individual households. This 'user group' approach appears to be an option for which agreement is easily reached. A business plan is prepared for each project. The planners assess the farm's resources and identify land best suited to residential, grazing and arable uses. However, the planners do not prescribe organisational arrangements, nor do they define or allocate property rights to individual households. Managerial organisation and land tenure are shaped by the institutional rules which the group is willing to accept and able to enforce. Ideally, these rules should encourage the land users to conserve, improve and farm their land profitably. In his case study of community based organisations (CBOs) established to administer wildlife preserves in KwaZulu-Natal, Wynne (1995:649) concluded that more successful CBOs operated as non-user groups because it was virtually impossible for large groups to reach agreement on how best to define and allocate individual use rights. He attributed this observation to transaction costs which rise rapidly with increases in group size.

1.3 Land tenure security defined

In theory, secure land tenure is expected to: (a) increase demand for land improvements and complementary inputs by creating incentives for farmers; and (b) increase the ability of farmers to finance improvements and inputs by creating incentives for lenders. The economic arguments linking tenure security to these desirable outcomes have been well documented by Feder *et al* (1998:49), Pasour (1990:202-204), Kille and Lyne (1993) and

Place *et al* (1994:16-18). The incentive and ability to invest is strongest when there are well-functioning markets for land. First, land rental and sale markets allow owners to realise the benefits of their investments *at any time* by leasing or selling their property. Second, land has no collateral value unless it can be repossessed and sold by the lender. Third, the rental market attaches an opportunity cost to land that could be farmed more profitably, encouraging the transfer of use rights to more effective farmers. Some of these important relationships are captured in an econometric model postulated by Place *et al* (1994:28-30). In essence, the model postulates that credit use (c) is a function of household characteristics (a vector, Vh) and tenure security (Th) – all measured at household level:

(a) c=f(Vh, Th)

At the parcel level, the model can be extended as follows:

(b) m=f(Vh, Vp, T, c)

(c) i=f(Vh, Vp, T, c, m)

(d) y=f(Vh, Vp, m, i)

Where *m* is improvements made to land, *i* represents seasonal inputs, *y* is yield, Vp is a vector of parcel characteristics, and T is tenure measured at the parcel level. Clearly, *c, m, i* and *y* are endogenous variables in a block-recursive model theorising that; (a) credit use is positively influenced by tenure security, (b) improvements made to land are positively

influenced by tenure security and credit availability, (c) seasonal inputs are positively influenced by tenure security, credit availability and improvements made to land, and (d) investments in inputs and improvements in turn have a positive effect on yield.

In this model, the indexes measuring tenure security (Th and T) are constructed from respondents' perceptions of their property rights to land. The mere presence of a title-deed offering legal protection against dispossession does not constitute tenure security in the economic sense. Johnson (1972) argues that the presence of a well-functioning land market is a much better indicator of tenure security. Place *et al* (1994:20) define tenure security in terms of the breadth, duration and assurance of property rights. Duration refers to the length of time a given right or bundle of rights is valid. Assurance relates to the certainty with which rights and duration are perceived. Land tenure is secure when the bundle of property rights is broad, permanent and assured.

To construct an index measuring tenure security, property rights to land must first be ranked. For example, inclusive use rights are less secure than exclusive use rights. Transfer rights presume the existence of exclusive use rights and therefore imply greater tenure security than use rights alone. Within the category of transfer rights, rights of temporary transfer (*eg* lending and leasing) are dominated by rights of permanent transfer (*eg* bequest, mortgage and sale). The unfettered right to sell tops the hierarchy of rights (because land can be sold to any buyer whereas bequests usually involve restricted choices), and presumes the existence of all other transfer rights (*ie* the ability to sell presumes the

ability to mortgage, bequeath, lease and lend, but not *vice versa*). An empirical study by Kille and Lyne (1993) revealed a strong positive relationship between tenure security and investment in fixed improvements to land held by black farmers in KwaZulu-Natal.

1.4 Tenure security and the mode of land acquisition

The level of tenure security enjoyed by new entrants will depend largely on how they acquire land. For example, emerging farmers who purchase land with credit and technical support provided by commercial banks should enjoy greater tenure security than do users who share a farm financed from their pooled resources. It is highly unlikely that farms occupied by large user groups will command either market or collateral value as prospective buyers and lenders face the daunting task of dispossessing poor households. Similarly, lenders will not accept plots allocated to individual users (or management committee) as collateral if ownership is legally vested with a community trust or communal property association.

In a survey of beneficiary households at two government-assisted land reform projects in KwaZulu-Natal (Labauschagneskraal and Misgunst), the vast majority of respondents stated that they could not transact their residential and arable plots freely (LIMA, 1998:47-48). An earlier case study conducted at Misgunst, revealed that attempts by one household to rent out its arable land had been thwarted by the 'community' (Hornby, 1996:43). In this instance the community comprised of only eight households. While most of the

respondents interviewed by LIMA believed that they could bequeath their property rights to an heir or multiple heirs, virtually all of them stated that their choice of heirs precluded outsiders.

With regard to grazing land, tenure security is constrained by the fact that beneficiary households do not have exclusive use rights. In addition, it has become increasingly evident that limits on the number of livestock recommended by planners are seldom imposed. According to the LIMA survey, one third of the beneficiary households at Labauschneskraal (n=88) were unaware of any limits on herd size. Although the smaller group of beneficiaries at Misgunst (n=8) had been able to establish a maximum limit on the number of livestock grazed by each household, Hornby (1996:42) noted that the limits had been breached and that the management committee had not penalised transgressors. The absence of rules governing individual access to shared resources, or failure to enforce rules, reduces common property to an open access resource. Open access resources do not generate economic rent and they are susceptible to environmental degradation (Gordon, 1954).

Collective action problems also manifest in managerial decisions relating to shared infrastructure (*eg* roads) and community operations such as the need to burn winter firebreaks along the boundaries of the farm. Hornby (1996:47-50) found that the small group of beneficiaries at Misgunst were unable to agree on the contribution that each household should make towards fire protection. The underlying problem is that free riding

is pervasive because voting power and benefits are not proportional to investments made by individual households.

In conclusion, it seems that tenure arrangements on farms acquired by user groups will never be entirely secure in the economic sense – even if the members reach agreement on how the land should be partitioned and allocated to exclusive users. In reality, the process of negotiating agreement on rights involves transaction costs which increase rapidly as groups get bigger and the rules more complex. Unless the process is facilitated and arbitrated by an external agent, it is predictable that members of large user groups will be obliged to accept tenure arrangements that are far from secure (McHugh, 1980). Of course, group ownership does not preclude tenure security. Indeed, much of the commercial farmland that has been pledged as collateral in KwaZulu-Natal is not owned by individuals but rather by private companies. However, these corporate entities function as non-user groups with centralised management and with voting and benefit rights proportional to individual investment (shareholding).

Although government-assisted transactions are expected to generate lower levels of tenure security than are private transactions, the latter are certainly not immune to insecure tenure. It is quite likely that user groups will acquire farms through donation, bequest and cash purchase. Levels of tenure security may therefore also vary within different modes of land acquisition depending upon the legal status of the owner (individual or juristic entity),

choice of juristic entity (company, trust), the number of land users and the level and type of institutional support provided by outsiders.

CHAPTER 2

CENSUS SURVEY OF LAND TRANSACTIONS: METHODOLOGY

Census surveys of all farmland transactions involving transfer of ownership in KwaZulu-Natal during 1997 and 1998 were conducted to determine the overall rate of land redistribution in the province, and to gauge the relative performance of different modes of land redistribution. This chapter introduces some typical modes of land redistribution in South Africa and describes the methodology employed in the census surveys to estimate the quantity and quality of farmland redistributed to disadvantaged owners by different modes of land transfer.

2.1 Modes of land redistribution in South Africa

Since South Africa's political democratization in 1994 three principal modes of land redistribution have emerged transferring farmland to previously disadvantaged entrants; the government land grant programme, private land purchases, and, more recently, equity-sharing arrangements.

2.1.1 Government-assisted land transfers

Since 1994, the main tool employed by the government to redistribute land has been the settlement/land acquisition grant. This programme was designed to provide poor landless

people with a cash grant of R15000, which they can use to purchase and develop farmland. However, the sub-division of commercial farms into affordable individual units has been constrained by high transaction costs and the Subdivision of Agricultural Land Act, 70 of 1970. Hence, beneficiary households usually have to pool their meager grants in order to buy a farm from a willing seller. In most cases, even when groups of disadvantaged beneficiaries finance farms with land grants the land cannot support all of the beneficiaries as full-time farmers. The Department of Land Affairs (DLA) anticipated that emerging farmers would use the grant to leverage loan finance for additional land (Department of Land Affairs, 1994:10). However, it is highly unlikely that creditworthy farmers would qualify for a land grant as the means test applied to potential beneficiaries precludes individuals with a monthly household income greater than R1500 (LIMA, 1998:4).

After two years in operation, the grant programme boasted a total of 5118 beneficiary households on 47202 hectares of redistributed land in KwaZulu-Natal (AFRA, 1998:16). However, these statistics say nothing about the quality of the land, its infrastructure or the services available to beneficiaries. Recent research has revealed major problems associated with the management of farms purchased by groups of beneficiaries who share inclusive rights to grazing land and common infrastructure, even when the group size is relatively small (Hornby, 1996:27,39). These user groups encounter numerous decision-making problems owing to pervasive free riding. Incentives to cooperate are weak because voting rights are equal (*ie* democratic) rather than proportional to the contributions which individual members can make or to the benefits which they can extract. Hence, profound

tensions are likely to arise between users, and the costs of resolving conflicts increase with group size. Indeed it is optimistic to expect that large groups will reach agreement on how best to allocate cropland of varying quality to household heads, further undermining perceptions of tenure security.

2.1.2 Private land purchases

Private land transactions are constrained by severe cash flow problems when loans are used to finance land in times of economic inflation (Nieuwoudt and Vink, 1995). Returns to land consist of two principal parts; rent, which represents the cash dividend or current return to the land, and capital growth. Like an investment in the stock market, the current returns to agricultural land tend to be low relative to capital growth. Empirical evidence from the USA, UK, and South Africa shows that the average annual current return to agricultural land seldom exceeds five per cent of its market value (Nieuwoudt, 1987). Cash flow problems arise due to the high nominal interest rates. During periods of inflation when nominal interest rates are high relative to the current return on agricultural land, mortgage bonds with constant repayment schedules create formidable liquidity problems for borrowers who are unable to make a substantial down payment on the purchase price of a farm. The liquidity problem diminishes over time because inflation raises earnings relative to the fixed loan repayments. Hence, subsidizing the interest charges at a decreasing rate over a finite period of time can effectively alleviate the cash flow problem commonly encountered by these borrowers in the first critical years.

In KwaZulu-Natal, land transactions have been facilitated by Ithala Bank since 1996. In the early stages of this programme, the Illovo Sugar Company offered to sell portions of their sugar estates as medium-scale farms (ranging in size from 55 to 105 hectares) to prospective farmers from previously disadvantaged racial groups. However, none of the more than 100 applicants could afford an equity contribution large enough to reduce the size of a conventional mortgage loan down to a level that could be serviced from farm income (Lyne and Darroch, 1997). In an effort to alleviate this problem, the company agreed to sell the farms at market-related prices and to invest 18 per cent of this purchase price with Ithala Bank. This capital invested, plus interest accrued, funds a finite interest rate subsidy for the borrower (Simms, 1996).

In essence, the Illovo Sugar Company discounted the price of its land by 18 per cent, and Ithala Bank used this private subsidy to reduce the mortgage loan interest rate from 16,5 per cent (the market rate) to 10 per cent in the first year. The subsidy diminishes to zero at the end of the sixth year, in line with expected increases in nominal income associated with an annual inflation rate of roughly ten per cent. Thereafter, the buyer pays the full annual interest rate of 16,5 per cent for the remaining 14 years of the 20 year loan period.

To use a hypothetical example to illustrate the magnitude of these transactions, the average market price of a medium-scale sugar-cane farm is roughly R900000, of which 18 per cent or R162000 is invested with Ithala Bank to fund the finite, diminishing interest rate subsidy

on the borrower's mortgage loan. The buyer is required to make a down payment of at least 10 per cent (R90000) while Ithala Bank provides a mortgage loan for the remainder of the purchase price (R810000). In this case the seller receives a net amount of R738000 (R900000-R162000) for the land. These subsidised land transactions financed by Ithala Bank are still confined to relatively wealthy emerging farmers. Nevertheless, the scheme – now supported by a second company – has financed approximately 109 disadvantaged farmers on medium-scale sugar-cane farms, with total sales reaching roughly R90 million. Prospects for future growth look promising as other large agribusiness companies are eager to liquidate their land holdings in order to invest in more profitable milling and processing activities (Department of Land Affairs, 1998:15-18). In May 1999, the Department of Land Affairs launched a similar financial product through its Land Reform Credit Facility (LRCF) which is intended to alleviate cash flow problems anticipated on farms and farming enterprises (equity sharing schemes) financed by private lenders and investors.

In South Africa the cash flow problem has been compounded by the Subdivision of Agricultural Land Act, Act 70 of 1970. This legislation imposes an "economic" farm size that is beyond the means of most emerging farmers (Lyne and Darroch, 1997) compelling them to borrow heavily in order to purchase a farm. Prior to the first democratic elections in 1994, it was anticipated that Act 70 would be scrapped or amended. However, the new Act amending Act 70 has still not been signed into law by the President. This delay has been attributed to the absence of national zoning legislation prohibiting the conversion of agricultural land into residential or industrial uses without cumbersome Ministerial

approval. Although Act 70 was originally designed to prevent the sub-division of agricultural land, it also prevented the loss of farmland to non-agricultural uses. While it may well be important to establish effective zoning legislation, it is clear that existing restrictions on sub-division prevent emerging farmers from entering the land market. At present, the Minister is considering a proposal that would allow farmland to be subdivided without prior permission as long as it remains in agricultural use (Minister for Agriculture and Land Affairs, 2000:16).

2.1.3 Equity share schemes

Equity sharing schemes present another option for land redistribution. These schemes were first initiated in the Western Cape province in 1994 with the advent of the Whitehall farm project. Typically, farm workers purchase equity in the farming operations where they are employed, giving them part ownership and some influence over managerial decisions (Ngqangweni and Van Rooyen, 1995). Apart from redistributing wealth, these schemes create strong incentives for workers who stand to benefit from profit sharing and growth in the value of their shareholding. Recent research indicates rapid growth in labour productivity (Echert *et al.*, 1996). To date there are only ten equity share schemes in KwaZulu-Natal, with about half still in the initiation phase.

2.2 Data source

Lists of all deeds of transfer recorded in KwaZulu-Natal during 1997 and 1998 were purchased from by the Deeds Registry and converted to a database file by Land Project Consultants (Pty) Ltd. The lists provided information about the buyer, seller, farm size and location, purchase price, and where relevant, the amount of mortgage finance and the name of the lender.

Figure 2.1 illustrates the process by which rural land (*ie* land outside of Transitional Local Councils) transactions were filtered and grouped into four strata representing different modes of land redistribution. The first filtration process involved the exclusion of all Transitional Local Council (urban) transactions from rural transactions. Rural transactions that were listed separately for each parcel (subdivision) of land acquired by one owner (plus spouse in the case of married co-owners) were consolidated. This process more than halved the total number of rural cases in both 1997 and 1998.

Second, transactions involving a small number of farms that had been sold for residential or industrial development were excluded from the group of farmland transactions. Third, transactions which transferred land from one previously disadvantaged owner to another were eliminated unless they transferred land from males to females. This ensured that the farmland transactions considered in this study contained a subset representing net transfers to previously disadvantaged people. By implication, the term 'disadvantaged' refers to all

individuals who were previously excluded from land markets on the basis of racial or gender segregation. Lastly, transactions involving land areas smaller than one hectare or with a purchase price greater than R20000 per hectare were dropped from the remaining set of farmland transactions. The latter criterion is an estimate of the market price commanded by one hectare of the best quality agricultural land in KwaZulu-Natal. Together, the minimum area (one hectare) and maximum price (R20000 per hectare) helped to ensure that the final set of farmland transactions did not contain land acquired for residential or industrial uses.

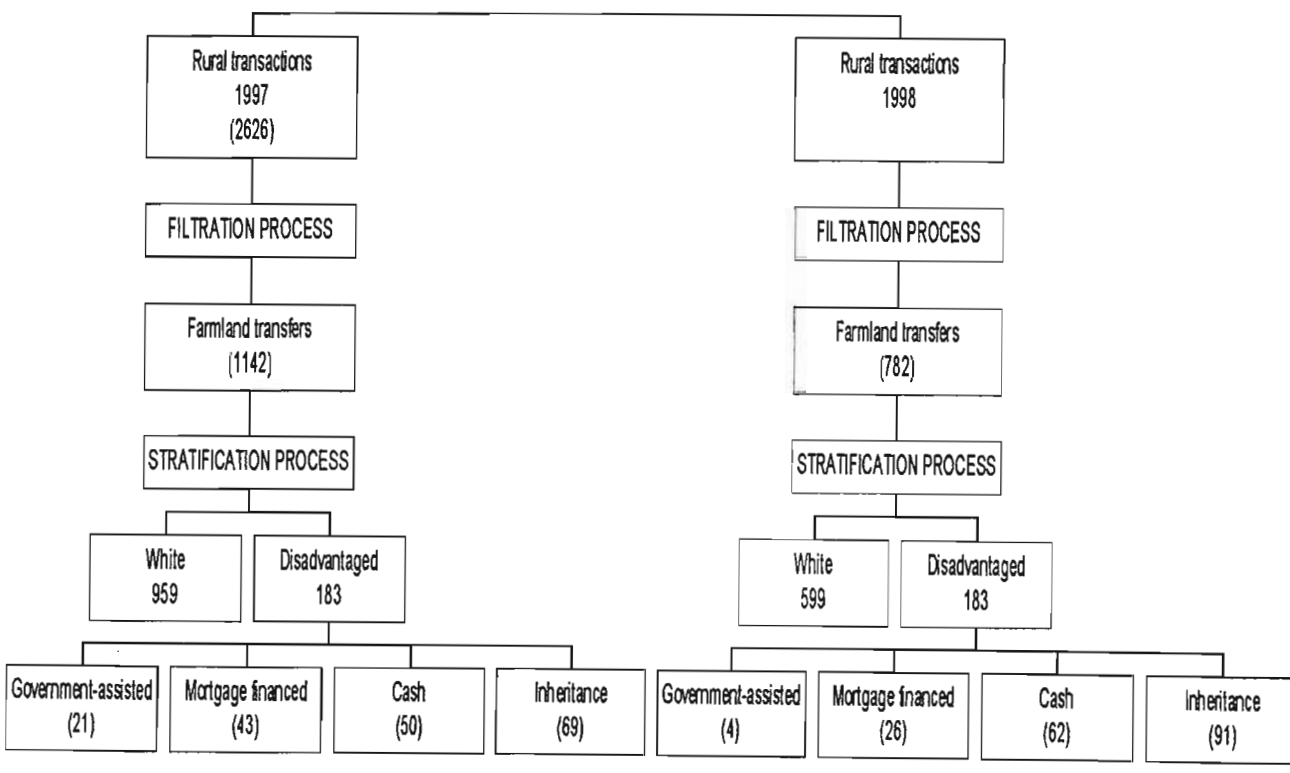

Figure 2.1: Stratification of the transaction data, 1997 and 1998.

The filtering process described in the previous paragraph yielded a total of 1142 farmland transfers in 1997, and 782 in 1998. These cases were then separated into two groups based on the racial identity of the new owner. The first group, termed the 'disadvantaged' group, contained all those net farmland transfers to disadvantaged entrants. Coincidentally, a total of 183 new owners were identified in the disadvantaged group for both 1997 and 1998. The other group contained all transactions that transferred land to white owners, representing the 'previously advantaged'. White owners accounted for 959 farmland transfers in 1997, and 599 in 1998.

It must be noted that the deeds register does not explicitly record the race or gender of new landowners. In the absence of this information, the race and gender of individual entrants was established primarily on the basis of their names and, where relevant, the source of mortgage loans (for example, Ithala Bank finances only disadvantaged buyers). While every effort was made to identify disadvantaged landowners, the author accepts that some of these new entrants may have been mis-classified, understating the rate of land redistribution. Where land had been acquired by corporate entities (close corporations, companies and trusts) other records obtained from the Registrar of Companies and Master of the Supreme Court were used to determine whether or not the land had transferred to disadvantaged beneficiaries.

Transactions involving disadvantaged entrants were then categorised into unique strata according to their method of financing; grant financed (*ie* government-assisted

transactions), mortgage loan financed, and cash purchases. The remaining private transactions, classified as 'inheritance', were the result of bequests and some donations. Land Project Consultants (Pty) Ltd. were able to cross reference the deeds records with land survey data and to identify the magisterial district and geographical co-ordinates of each transferred farm. Figure 3.1 in section 3.5 presents a map of the province showing the location of disadvantaged transactions during the calendar year 1997.

CHAPTER 3

THE RATE OF LAND REDISTRIBUTION IN KWAZULU-NATAL DURING 1997 AND 1998

This chapter presents estimates of the rate of land redistribution in KwaZulu-Natal computed from census surveys of farmland transactions recorded by the Deeds Registry in 1997 and 1998, and compares the performance of public and private modes of land transfer.

3.1 The rate of land redistribution

Information extracted from the deeds of transfer was used to compute the total area of all farmland registered to new owners in KwaZulu-Natal during the years 1997 and 1998. Lyne and Darroch (1997) estimated that 5,3 million hectares of farmland were available for redistribution in KwaZulu-Natal at the time of political democratisation in 1994. The census survey of farmland transactions showed that 372995 hectares, or seven per cent of the 5,3 million hectares estimated to be available for redistribution, transferred to new owners in 1997. In 1998, there was a substantial increase in the amount of farmland transferred with 603522 hectares transferring to new owners. This represents 11 per cent of the original 5,3 million hectares considered available for redistribution. Both of these census estimates exceed Lyne and Darroch's (1997) sample estimate of 302243 hectares (5,7 per cent) for KwaZulu-Natal in 1995.

Despite a marked increase in the total area of land acquired by new owners, the amount of land acquired by the disadvantaged group decreased by roughly 17 per cent in 1998. In 1997, the disadvantaged group accounted for 22934 hectares, representing 6,2 per cent of the farmland transferred and 0,43 per cent of the total area available for redistribution. In 1998, this estimate decreased to 18885 hectares, representing 3,1 per cent of the farmland transferred and 0,35 per cent of the total area available for redistribution. Although the rates of land redistribution recorded over this period are low, they are nevertheless much higher than Lyne and Darroch's (1997) sample estimate of 0,09 per cent for 1995. In the Northern Province, Kirsten *et al* (1996) estimated that 0,05 per cent of the farmland available for redistribution transferred to previously disadvantaged people in 1995. According to the 1998 estimate, land redistribution in KwaZulu-Natal grew at an annual rate of 57 per cent from 1995 until the end of 1998, transferring approximately 54539 hectares of farmland to disadvantaged owners over this three-year period. However, the analysis of area transferred says nothing about the quality of redistributed land.

3.2 The quality of redistributed land, 1997 and 1998

Table 3.1 presents the mean area of all farms acquired by white and disadvantaged owners, and - for those farms purchased - the mean price of farms and weighted price of land. The t-values in the table test for significant differences between the means of the white and disadvantaged groups in 1997 and 1998. The mean area of farms transacted (and hence mean price paid) is much lower for disadvantaged owners. However, land purchased by

disadvantaged entrants has a slightly higher market price per hectare than that purchased by whites. This would usually signal land of higher quality, but the gap is fairly narrow and may only reflect a tendency for per hectare prices to decline with increases in farm size (due to fixed improvements and fixed transaction costs). In addition, the frequency distribution of per hectare farm prices paid by disadvantaged owners was bimodal, with relatively large proportions of buyers concentrated in the ranges below R2500 per hectare and between R10000 and R13000 per hectare. Such large price gaps suggest clear differences in the quality of land associated with different modes of land redistribution.

Table 3.1: Characteristics of farmland acquired by white and disadvantaged owners in KwaZulu-Natal, 1997 and 1998 (1998=100)

	White		Disadvantaged		t-values	
Characteristic	1997	1998	1997	1998	1997	1998
Mean farm area (Ha)	365 n=959	1007 (n =599)	125 (n =183)	103 (n =183)	3,6***	1,3*
Mean farm price (R)	983061 n=650	692354 (n =452)	438695 (n =114)	291935 (n =92)	1,4*	2,2**
Weighted land price (R/Ha)	2103 n=650	1292 (n=452)	2302 (n =114)	1614 (n =92)		

Notes: *** denotes statistical significance at the 1 per cent level of probability.
** denotes statistical significance at the 5 per cent level of probability.
* denotes statistical significance at the 15 per cent level of probability.

Source: Census survey of farmland transactions

3.3 Relative performance of different modes of land redistribution

All transactions defined as 'disadvantaged' were grouped into the four strata defined in chapter 2 representing different modes of land redistribution. Table 3.2 compares farm characteristics across the different modes of land redistribution in 1997 and 1998. Since this table compares monetary values recorded over time, all prices are expressed in real terms using 1998 as the base year. Prices recorded in 1997 were inflated by 6,9 per cent, the change in the consumer price index over this period (Statistics S.A. 1999).

Table 3.2: Characteristics of farmland by mode of redistribution in KwaZulu-Natal, 1997 and 1998 (1998=100)

Farm characteristic	Government – assisted		Private mortgage		Private cash		Inheritance & donations	
	1997	1998	1997	1998	1997	1998	1997	1998
Number of transactions	21	4	43	26	50	62	69	91
Mean sale price of farms (R000)	684,9	559,2	787,6	643,8	104,2	127,1		
Mean area of farms (Ha)	572	1095	150	221	65	106	18	23
Total market value of land (Rm)	14,38	2,24	33,87	16,74	5,21	7,88		
Total area of land (Ha)	12022	4382	6459	5757	3242	6588	1210	2158
Weighted land price (R/Ha)	1196	510	5243	2907	1608	1196		

Source: Graham and Lyne (1999b)

3.3.1 Government-assisted transactions

Since its inception in 1994, 40 government land reform projects in KwaZulu-Natal have been responsible for redistributing 140916 hectares of land to 4901 beneficiary households (Wilkinson, 1999). The volume of government-assisted transactions appears to have peaked before 1997, diminishing substantially in 1998. In 1997 a total of 21 transactions involved farms purchased by 11 community land trusts representing 984 beneficiaries of government land grants. During 1998, only four transactions took place redistributing land to 1064 beneficiary households (Wilkinson, 1999).

The government-assisted transactions redistributed a total of 12022 hectares of farmland with a market value of R13,5 million in 1997 (Table 3.2). However, in 1998, government-assisted transactions accounted for only 4382 hectares of land with a market value of just R2,2 million. The total amount of land transferred by government-assisted transactions fell by 63 per cent relative to the previous year and the total market value fell by roughly 84 per cent. With a weighted land price of just R1119 per hectare in 1997 and R510 per hectare in 1998, these government-assisted land transactions redistributed land of relatively poor agricultural quality when compared to private transactions.

3.3.2 Private transactions

Mortgage loan transactions, cash transactions, and inheritance transfers represent private transactions as they did not involve government land grants.

3.3.2.1 Mortgage loan transactions

This stratum includes all those transactions financed with mortgage loans provided by either commercial Banks, Ithala Bank, non-governmental organizations (NGO's) or individual lenders. In 1997 this stratum accounted for 43 transactions which redistributed a total of 6459 hectares of farmland with a market value of R33,8 million (Table 3.2). However, in 1998 the number of transactions financed with mortgage loans dropped sharply to 26 cases, redistributing 5757 hectares of land with a market value of R16,7 million, a decrease of 51 per cent in total value. Nevertheless, with a weighted price in excess of R5200 per hectare in 1997 and R2907 per hectare in 1998, the quality of this land still remained far superior to that financed with government grants.

On average, the mortgage loans accounted for 87 per cent of the purchase price paid for farms in this stratum in 1997. However, for farms financed by commercial banks (n=10), the loan proportion was just 48 per cent, whereas loans provided by Ithala Bank (n=28) accounted for 93 per cent of the purchase price. This marked difference between the two

types of mortgage loans shows the extent to which Ithala's privately sponsored interest rate subsidy alleviated anticipated loan repayment problems.

3.3.2.2 Cash transactions

Sixty-two farms were purchased without the benefit of government grants or mortgage loans, up from 50 in the previous year. As expected, the average purchase price of these farms was small relative to those financed with government grants or mortgage loans (Table 3.2). Despite their larger number, cash transactions redistributed less land (3242 hectares vs. 6459 hectares) and much less wealth (R5,2 million vs. 33,8 million) than did transactions financed with mortgage loans during 1997. However, the total market value of cash transactions increased by 50 per cent in 1998 while the value of transactions financed with mortgage loans decreased by 50 per cent, narrowing the difference in total wealth transferred by these two private modes of land redistribution. Although cash purchased farms were relatively small in area, the quality of this land was constantly higher than that financed with government grants. Reduced levels of loan and grant financing during 1998 also helps to explain the smaller size of farms purchased by disadvantaged entrants in 1998.

Overall, private purchases (*ie* those financed without government grants) redistributed much more land and land wealth than did government-assisted transactions over both years. In 1997, private purchases accounted for 73 per cent of the total value of all market transactions in the province. This proportion increased to 91 per cent in 1998. Of course,

this does not shed light on the number of disadvantaged beneficiaries benefiting from each mode of land redistribution.

3.3.2.3 Inheritance transactions

In both 1997 and 1998, inheritance transactions were numerous, but redistributed very little farmland. In 1997, 69 bequests and donations transferred a total of just 1210 hectares to disadvantaged people (18 hectares on average). In 1998, 91 inheritance transactions redistributed 2158 hectares (28 hectares on average). It is conceivable that some of this farmland may have converted to non-agricultural uses. An important feature of these transactions is the gender composition of ownership described in section 3.4.

3.4 Gender characteristics of the different modes of land redistribution

The gender composition of transactions was considered an important factor when analysing the deeds of transfer. Table 3.3 presents the gender breakdown, excluding all transactions involving land acquired by corporate entities representing disadvantaged people. Women are well represented in the inheritance stratum in 1997. They are also well represented in the cash purchase stratum owing to a relatively large number of transactions where land is registered to both husband and wife. However, women appear to be severely under-represented in transactions financed with mortgage loans, raising questions about lenders' perceptions of their legal status and ability to service loans. Farms acquired by women (as

Table 3.3: Distribution of land transactions and farmland characteristics by gender in KwaZulu-Natal, 1997 and 1998 (1998=100)

Mode of redistribution	Unit	Male owners	Female owners	Co-owned by husband and wife	Government and corporate owners
Government- assisted 1997 (n=21)	Transactions (%)	0	0	0	100
Government-assisted 1998 (n=4)	Transactions (%)	0	0	0	100
Mortgage loan financed 1997 (n=43)	Transactions (%)	53	5	26	16
Mortgage loan financed 1998 (n=26)	Transactions (%)	53	27	8	12
Cash purchases 1997 (n=50)	Transactions (%)	26	10	50	14
Cash purchases 1998 (n=62)	Transactions (%)	68	17	4	11
Inheritance transfers 1997 (n=69)	Transactions (%)	19[1]	45	36	0
Inheritance transfers 1998 (n=91)	Transactions (%)	65[1]	35	0	0

Farm and land characteristics	Unit	Male owners	Female owners and married co-owners	Government and corporate owners
Mean area of farms 1997	(Ha)	78 n=50	42 n=99	438 n=34
Mean area of farms 1998	(Ha)	66 n=115	74 n=58	273 n=10
Total area of land 1997	(Ha)	3905 n=50	4129 n=99	14900 n=34
Total area of land 1998	(Ha)	7562 n=115	4313 n=58	2725 n=10
Total market value of land 1997	(Rm)	18,0 n=37	13,4 n=43	22,0 n=34
Total market value of land 1998	(Rm)	12,8 n=58	7,8 n=19	3,9 n=10
Weighted land price 1997	(R/Ha)	4904 n=37	4258 n=43	1478 n=34
Weighted land price 1998	(R/Ha)	2085 n=58	2210 n=19	1461 n=10

Notes: [1] indicates land donated to previously disadvantaged men.

owners or married co-owners) averaged 42 hectares in area, whereas those acquired by men averaged 78 hectares. Although the total area of land acquired by previously disadvantaged men and women (including married co-owners) was similar, men bought land of better quality.

The area, market value and quality of land and the gender composition of transactions all vary substantially between 1997 and 1998. However, it will not be possible to establish any trends in these variables unless they are monitored for several years.

3.5 Spatial distribution of farmland transactions

Figure 3.1 shows the physical distribution of farmland acquired by disadvantaged people in KwaZulu-Natal. The map is divided into three unique bio-climatic zones, the Coastal Belt, the Midlands, and the Lowveld (Lyne and Ortmann, 1996). Land in the Coastal Belt is generally of higher agricultural quality than land in the Midlands, and of much higher agricultural quality than land in Lowveld. The vast majority of transactions financed with mortgage loans, and all of Ithala's medium-scale sugar farming clients, are located in the Coastal Belt. Most cash purchases, and all of the government-assisted transactions, occurred in the regions of lower quality farmland. In addition, the government-assisted transactions were concentrated in areas characterized by racial conflict over land ownership. This visual evidence supports earlier inferences about the quality of farmland transferred by each mode of redistribution.

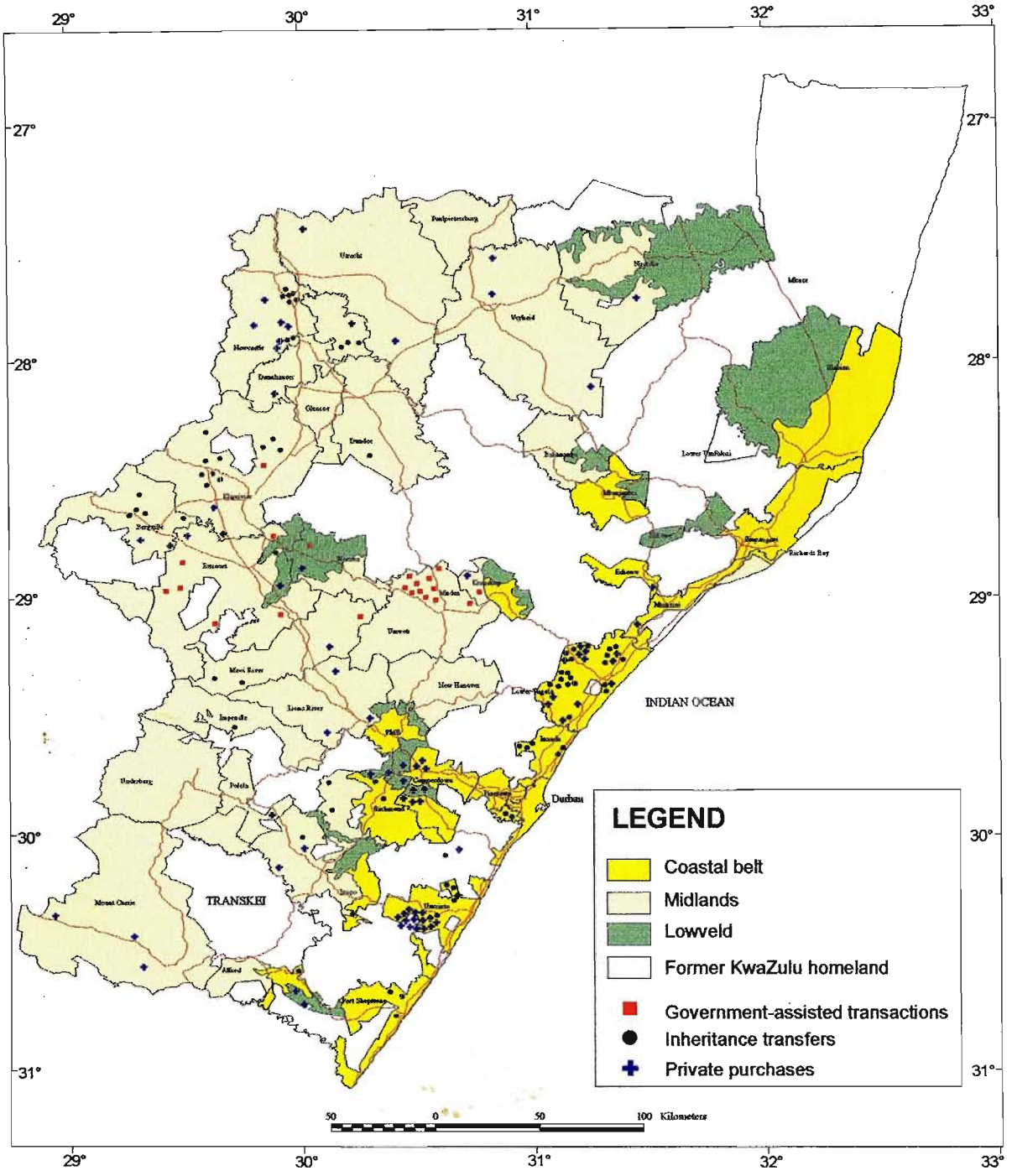

Figure 3.1: Spatial distribution of farmland transactions in KwaZulu-Natal, 1997

Although the Coastal Belt is much smaller than the Midlands region, accounting for only 15 per cent of the area originally available for redistribution, the land is well suited to intensive cash crops like sugarcane, sub-tropical fruits, and pulping timber (Lyne and Graham, 1999:8). In the Midlands, farmland is better suited to extensive grazing, with some sugarcane, pasture and timber production. As a result, the average market price of farmland purchased by disadvantaged buyers in 1997 was much higher in the Coastal Belt (R 6130 per hectare) than in the Midlands region (R 847 per hectare).

CHAPTER 4

SAMPLE SURVEY OF HOUSEHOLDS USING REDISTRIBUTED LAND: METHODOLOGY

A sample survey of households using farmland acquired by disadvantaged owners in 1997 was conducted to gather information about tenure security, use of agricultural credit, investment in farming and agricultural performance on redistributed land. This chapter describes the approach used to collect and assemble relevant data.

4.1 Approach

A stratified, two-stage sample was used to select respondents for the survey. Farms acquired by disadvantaged owners in 1997 were grouped into distinct modes of acquisition, namely government-assisted and private transactions. At the first stage of sampling, farms were selected at random from each of these two strata. Households using the selected farms were then identified and, in cases where many households farmed the land, a random sub-sample of households was drawn. Household data were gathered by interviewing the *de facto* household head and information about land use was elicited directly from each land user within the household. Data were therefore collected at both the household and parcel level.

4.1.1 The government-assisted stratum

Within the government-assisted stratum, a total of 21 transactions involved farms purchased by 11 community trusts representing the beneficiaries of government land grants. Some of these trusts purchased several farms (subdivisions) at different times during the year. Four of these 11 projects were selected at random, creating variation in the size of beneficiary groups sampled. All of these government land reform projects were located in the Midlands bioclimatic zone and were characterised by land best suited to extensive grazing. The four projects sampled were the **Isibonelo Community Land Trust** (Winterton Agri-village), the **Amaswazi Community Land Trust,** the **Ingome Community Land Trust,** and the **Impumelelo Community Land Trust.** Ten per cent, or a minimum of 20 households, were drawn randomly from the beneficiary list. If the project had less than 20 beneficiary households the entire community was selected. In two of the projects sampled, some land had been set aside for joint enterprises managed exclusively by a management committee. These two management committees were treated as land users and were included in the sub-samples, bringing the sample of land users to 109 for the government-assisted stratum.

The Isibonelo Community Land Trust (Winterton Agri-village) comprises 38 beneficiary households on 118 hectares of arable farmland. Although attempts had been made to farm the land, none of the beneficiaries were residing on the property at the time interviews were conducted. Most of the households still lived and worked on a neighbouring commercial

farm owned by the Stockil family. Previously, the redistributed farm had been used for cropping and small livestock production with approximately 65 hectares of dryland crops and 48 hectares of veld grazing (LIMA, 1998b:8). The beneficiaries intend to use 12 hectares for residential purposes, 41 hectares as communal grazing, and 65 hectares for a collective cropping enterprise. At the time of the survey, the existing farmhouse was being leased to a tenant, generating rental income for the trust (LIMA, 1998b:12).

The Amaswazi land reform project is located roughly 30 kilometres from Winterton in the Drakensberg mountain range. The trust, representing 193 beneficiary households, purchased approximately 1000 hectares of natural grazing land in 1997 for residential and agricultural development. At the time the survey was conducted, 100 beneficiary households were residing on the land. Approximately 80 beneficiaries were farming maize on small plots (5000m^2) allocated by the trustees and the remaining 600 hectares was being used for communal grazing.

The Ingome Community Land Trust, representing 500 beneficiary households, purchased 10022 hectares of land 17 kilometres north of Greytown. The land comprises of two subdivisions; a collective game farming enterprise utilises 2280 hectares and generates income through tourism and hunting, while the remaining area is used for residential and grazing purposes. The land is arid and its cropping potential is limited by poor soils. Small areas could be planted to irrigated crops, but this will require substantial investment in infrastructure (Urban Econ, 1998:14).

The Impumelelo community, is located ten kilometres outside the village of Muden. The trust, represented by 28 beneficiary households, purchased 363 hectares of grazing land. The land is characterised by very steep and hilly terrain, and poor quality soils (ZAI, 1998:13-15).

4.1.2 The private stratum

The population of 162 private transactions which redistributed farmland to disadvantaged people in 1997 was separated into reasonably homogenous groups based on magisterial district and the three bio-climatic regions described in section 3.5. Magisterial districts that accounted for few transactions and which were spatially distant from those containing relatively large numbers of transactions were excluded from the study population in order to keep travel and time costs within the levels budgeted for fieldwork.

All of the remaining private transactions were located in either the Coastal Belt or Midlands bio-climatic regions. Together, these two regions account for roughly 85 per cent of the 5.3 million hectares considered available for redistribution in KwaZulu-Natal. Within the Coastal Belt, three magisterial districts were retained accounting for a total of 72 transactions. Within the Midlands, five magisterial districts were retained accounting for 32 transactions. All of the Coastal transactions (n=32) and one-half of those located in the Midlands (n=36) were selected into the sample. It was anticipated that at least 40 of the sample farms would yield successful interviews. However, these expectations proved to be

optimistic as the farms were extremely difficult to locate and some of the owners refused to participate in the survey.

In the final analysis, 17 farms (again roughly ten per cent of the study population) provided a total of 20 respondents. One of the farms, purchased with cash by a private trust, had been occupied by a small group of whom four agreed to be interviewed. Eight of the 20 respondents had purchased their farms with mortgage loans. The remaining 12 were using farmland acquired through cash purchase or inheritance.

4.2 Data collection

In total, 129 interviews (109 government-assisted land users plus the 20 private transaction respondents) were conducted at the household level from February through May 1999. Two survey instruments were used to gather information. The first questionnaire (Appendix A) recorded household data relating to land rights, farm and non-farm enterprises, income, assets, loans, human capital and a host of household characteristics. The second questionnaire (Appendix B) recorded data relating to each parcel of land used by household members. Most beneficiary households, and some of the households in the private stratum, had access to more than one parcel of agricultural land. A total of 276 cases were observed at the parcel level, yielding a wealth of information about investment in fixed improvements and seasonal inputs, parcel-specific characteristics and land rights, crop yields and revenue.

In the government-assisted stratum, interviews were conducted by matriculants recruited from the community of beneficiary households. Training sessions held to acquaint recruits with the questionnaire typically lasted two days at each of the four sites. In the private stratum where respondents were separated by large distances, interviews were conducted by a Zulu consultant who accompanied the author on trips to each sample farm.

The collection of accurate baseline data to monitor future changes in *de facto* tenure status, credit use, investment and agricultural performance on redistributed farmland was one of the key objectives of this study. In this regard, the sample survey described in this chapter produced a unique and readily accessible database for future research. Although the study was not aimed at analysing the sample data, the remaining sections of this dissertation serve to demonstrate the relevance of the data by quantifying Place *et al*'s (1994:28-30) hypothetical relationship between tenure status and the use of agricultural credit. This model is estimated only from data recorded at the household level. The following section describes the approach used to construct an index measuring the level of tenure security (tenure status proxy) on cropland acquired by sample households.

4.3 Estimating an index of tenure security at the household level

The index of tenure security was developed from household perceptions of the breadth and assurance of their rights to cropland. Following the framework suggested by Place *et al* (1994:20-22), a hierarchical index was estimated to measure the breadth component of property rights for all households. The breadth index was constructed from seven levels of

mutually exclusive rights, ranging from one for partially exclusive rights to seven if the household enjoyed unrestricted rights to sell the property. The scoring system was defined as follows:

1 - Exclusive rights to cropland only during the summer growing season.

2 - Restricted rights to exclude others from cropland during the summer and winter months.

3 - Unrestricted rights to exclude others from cropland.

4 - Restricted rights to bequeath cropland to an heir.

5 - Unrestricted rights to bequeath cropland to an heir.

6 - Restricted rights to sell the cropland.

7 - Unrestricted rights to sell the cropland.

The assurance component of tenure security was not hierarchical. Rather it was developed by summing three relevant dummy variables and adding a value of one (see page 46 for rationale) for all households, yielding scores ranging from 1 to 4, as follows:

$D_1 = 1$ if the household occupied the land before it was purchased or inherited, and zero otherwise.

$D_2 = 1$ if parcel boundaries were informally mapped or registered, and zero otherwise.

$D_3 = 1$ if the household holds a formal title deed for the property, and zero otherwise.

Whilst assurance strengthens a household's bundle of property rights, it does not extend the number of rights. Hence, the composite index measuring tenure security on cropland was

computed as the product of the breadth and assurance indexes, yielding household scores ranging from 1 (least secure) to 28 (most secure). For example, a household claiming unrestricted and fully assured rights to sell cropland would score the maximum value of 7x4=28. A value of one was added when developing the assurance component to ensure that the product of the breadth and assurance indices was positive.

The next chapter compares mean tenure security index scores for the sample households across different modes of land acquisition. It also analyses whether or not tenure status influences the use of agricultural credit by the households sampled in 1999.

CHAPTER 5

TENURE SECURITY AND THE USE OF AGRICULTURAL CREDIT ON REDISTRIBUTED FARMLAND

Place *et al* (1994:16-17) hypothesize that secure land tenure strengthens the demand for, and supply of, agricultural credit. This chapter applies a logit model to identify factors influencing the use of agricultural credit by the households sampled on redistributed farmland in KwaZulu-Natal in 1999.

5.1 Descriptive statistics

Table 5.1 compares the mean tenure security index scores computed for the sample households across different modes of land acquisition. The government-assisted projects are presented individually to highlight differences in tenure security across projects. Households in the private stratum are separated into two modes of acquisition; mortgage financed and non-mortgage financed (*ie* inheritance or cash purchase).

Mean tenure security index scores are higher on farms purchased privately compared to those shared by user groups and financed with government grants. The mortgage-financed group had a higher mean score (20,2) than the inheritance and cash purchase group (15,9). The range of scores computed for households in the latter group was much larger than that computed for households using mortgage finance and spanned the full range of possible

scores (1-28). Two of the respondents who inherited farms in 1997 had been resident on the land several years prior to the transfer and perceived their property rights to be fully exclusive, transferable and assured. Conversely, one of the respondents using land on a farm purchased by a private trust (without mortgage finance) scored the lowest value possible on the tenure security index. This is entirely consistent with the view that private acquisition of land does not guarantee tenure security, especially when legal ownership transfers to a trust representing a group of land users. While all of the households with mortgage loans perceived their tenure to be relatively secure (minimum score = 15), none of them achieved the highest score possible, suggesting that their perceptions were dampened by the possibility of foreclosure and dispossession.

Table 5.1 Tenure security on cropland accessed by sample households using redistributed farmland in KwaZulu-Natal, 1999

	Government-assisted transactions				**Private transactions**	
	Project 1	Project 2	Project 3	Project 4	Inheritance or cash purchase	Mortgage financed
Users sampled	21	20	51	17	12	8
Mean tenure security index score	8,3	10,3	3,9	15,6	15,9	20,2
Range of index scores	1-14	5-15	1-12	3-24	1-28	15-21
Total beneficiary households	38	193	500	17		
Respondents resident prior to purchase (%)	0	80	45	94		
Proportion of male beneficiaries	65	77	77	57		100
Owned by a trust (%)	100				33.3	12.5

Notes: Project 1 = Isibonelo Community (Winterton)
Project 2 = Amaswazi Community (Drakensberg)
Project 3 = Ingome Community (Greytown)
Project 4 = Impumelelo Community (Muden)
Source: Household sample survey

Under the government-assisted projects, the mean tenure security index scores are inversely related to the total number of beneficiary households in the trust. Project 4 clearly has the

highest mean tenure security index score (15,6) and the smallest beneficiary community. Conversely, project 3 with the largest beneficiary community has the lowest mean score (3,9). However, when projects 1 and 2 are compared, tenure security appears to be slightly weaker on project 1 even though project 2 has more beneficiaries. One explanation for this anomaly is that most of the beneficiaries at project 2 lived on the property before it was purchased and were exercising individual land rights specified by the previous owner. Other things being equal, it seems that household tenure security diminishes as the size of the user group increases, as postulated in chapter 1, section 1.5. It is also interesting that project 4, with the highest mean index score, has the largest proportion of female beneficiaries. The gender mix on projects 1-3 raises doubts about how well gender sensitivity proclaimed in government land reform policy is implemented in practice.

Table 5.2 compares the mean values of some relevant variables computed for households in the government-assisted and private strata. The mean tenure security index score is statistically significantly lower for households on government projects. Likewise, mean levels of agricultural credit, crop revenue per hectare, land value per hectare, annual liquidity (combined annual farm and off-farm cash income), and wealth (measured in terms of consumer durables) are all significantly lower on the government projects. These variables appear to be positively related to tenure security. The government-assisted stratum also has fewer households with resident heads (principal decision-makers) and less frequent contact with agricultural extension agents. It would seem that land reform beneficiaries settled mainly for residential, rather than farming purposes. In the government-assisted stratum, annual household liquidity comprises mainly of net wage

remittances, and ranges from 0 to R144050. In the private stratum, the upper limit (about R1,54m) comprises mainly of gross farm income, whereas the lower limit (R400) reflects cash income earned by one of the respondents using land on the farm purchased by a private trust.

Table 5.2 Descriptive statistics for sample households using redistributed farmland in KwaZulu-Natal, 1999

	Government-assisted projects n=109		Private transactions n=20		F-statistic for group means
	Mean	Range	Mean	Range	
Tenure security (hhld index score)	7,8	1-24	17,7	1-28	45,3***
Agricultural credit (Rand)	155	0-12000	398614	0-1260000	60,4***
Crop revenue per hectare (Rand)	19	0-1600	903	0-2092	85,7***
Land value per hectare (Rand)	1400	300-1988	6546	164-12499	128,43***
Liquidity (Rand)	9068	0-144050	352512	400-1538416	45,4***
Wealth (number of refrigerators and TV's)	0,25	0-5	1,75	0-6	49,5***
Agricultural extension (number of visits per month)	0,03	0-3	0,78	0-10	10,1***
Household head resides at home	0,53	0-1	0,85	0-1	7,3***

Note: *** denotes statistical significance at the 1% level of probability.

5.2 Analysis of agricultural credit use

A logit model was used to quantify the effect of tenure security on the incidence of agricultural borrowing amongst sample households. Apart from generating information about the impact of land reform on household tenure security and subsequent use of credit to finance agricultural investment, this analysis draws attention to the database and its application in policy research.

5.2.1 Postulated model

The postulated model aims to assess whether or not higher levels of tenure security lead to increased credit supply (incentives to lenders) and increased demand for agricultural credit (incentives to new owners). At household level, the supply of- and demand for- credit are reflected in the use of credit. Following Place *et al* (1994:28-30), agricultural credit use (AGRICRED) was specified as a function of tenure security and household characteristics hypothesized to influence lenders' decisions:

$$AGRICRED_i = f\,(TENMAX_i,\ WEALTH_i,\ LGLIQUID_i,\ EDTENP_i) \qquad (5.0)$$

where,

$AGRICRED_i$ = 1 if the i^{th} household uses agricultural credit, 0 otherwise,

$TENMAX_i$ = tenure security index score estimated for the ith household using the method described in section 4.3,

$WEALTH_i$ = number of televisions and refrigerators that are owned by the ith household (a wealth proxy),

$LGLIQUID_i$ = log of one plus the liquidity of the i^{th} household (Rands of annual on-farm and off-farm income), and

$EDTENP_i$ = proportion of matriculants in the i^{th} household, a proxy for educational status.

As theory suggests, greater tenure security is expected to enhance the collateral value of cropland and to improve the household's creditworthiness. More secure tenure would also

increase the likelihood that the borrower would make investments in improvements and complementary inputs (*eg* fertilizer and equipment) that increase expected income, since the benefits from these investments can be internalized. This implies a positive relationship between AGRICRED and TENMAX. The postulated model assumes that tenure status is predetermined, *ie* that individual households cannot improve their tenure security at will. Although it is possible that members of a user group could negotiate more secure property rights over time, tenure remains predetermined from the individual's perspective as long as the new rights apply to all members (Lyne and Graham, 1999).

A positive relationship is expected between AGRICRED and WEALTH because more wealthy households would have accumulated more assets, indicating their ability to generate higher expected returns over the longer term. Greater liquidity from both on-farm and off-farm income sources suggests that the household has a greater loan repayment capacity, *ceteris paribus*, and hence improved creditworthiness. This implies that AGRICRED should be positively related to LGLIQUID. The natural log of these income sources is taken because the probability of agricultural credit use is unlikely to increase linearly as liquidity increases. Credit would most probably be granted once expected liquidity reaches a lender's "threshold" or required level.

Finally, AGRICRED is likely to be positively related to EDTENP, an education proxy that reflects the household's potential technical and managerial competence. The household's ability to earn non-farm income and to negotiate loans with formal lenders may also

improve as EDTENP increases. The next section describes the technique used to estimate the empirical model.

5.2.2 Logit analysis

The logit model is employed to determine the extent to which one or more explanatory variables (quantitative or qualitative) influence a single dichotomous dependent variable (Gujarati, 1995:554). The benefit to using the logit analysis, as opposed to ordinary least squares estimation of a linear probability model (LPM), is that it uses the (cumulative) logistic distribution function to model regressions with a dichotomous dependent variable. The LPM is characterized by several problems such as non-normality of the disturbance term (u_i), heteroscedasticity of the error terms, the possibility of predicted dependent variable values lying outside the 0-1 probability range, and lower R^2 values (Gujarati, 1995:552-53).

In this study the appropriate logit model can be written as:

$$L_i = \ln \frac{P_i}{1-P_i} = \beta_0 + \beta_1 TENMAX_i + \beta_2 WEALTH_i + \beta_3 LGLIQUID + \beta_4 EDTENP_i \qquad (5.1)$$

where,

L_i = the logit or the log of the odds ratio in favor of the i^{th} household using agricultural credit.

The parameters β_0 ..... β_4 are estimated using the method of maximum likelihood (Aldrich and Nelson, 1984:26). Equation 5.2 defines the probability of the i^{th} household using agricultural credit as:

$$P(AGRICRED_i=1|X_{ni}) = \frac{1}{1+e^{-Z_i}} \qquad (5.2)$$

where,

$Z_i = \beta_0 + \beta_1 TENMAX_i + \beta_2 WEALTH_i + \beta_3 LGLIQUID_i + \beta_4 EDTENP_i$.

X_{ni} = *the values of TENMAX, WEALTH, LGLIQUID and EDTENP for the* i^{th} *household.*

Hence, the logit model will ensure that the estimated probabilities lie between zero and one. Gujarati (1995:555-556) lists the following properties of a logit model:

(1) As the probability goes from 0 to 1, the logit L_i goes from $-\infty$ to $+\infty$.

(2) The estimated probabilities are not linear.

(3) The intercept β_1 is the value of the log of the odds of the event occurring if $X_{1...i}=0$.

(4) The logit model assumes that the log of the odds ratio is linearly related to X_i.

5.2.3 Empirical results

The statistics presented in this section were estimated using the Statistical Package for Social Sciences (SPSS, 1997) version 7.5.

5.2.3.1 Correlation matrix

Table 5.3 presents a bivariate correlation matrix for the variables used in the logit analysis. It should be noted that the matrix was estimated from 124, rather than 129 cases, as data on some of the hypothesized explanatory variables were missing for five households (three government-assisted, and two private transaction cases).

Table 5.3 Correlation matrix for AGRICRED and the explanatory variables (n=124)

	AGRICRED	TENMAX	LGLIQUID	WEALTH	EDTENP
AGRICRED	1.000				
TENMAX	0.462***	1.000			
LGLIQUID	0.222**	0.346**	1.000		
WEALTH	0.547***	0.297**	0.259***	1.000	
EDTENP	0.210**	0.122	-0.058	0.083	1.000

Note: *** Denotes statistical significance at the 1 per cent level of probability.
** Denotes statistical significance at the 5 per cent level of probability.

AGRICRED is significantly and positively correlated with all of the explanatory variables. This lends empirical support to the logit model postulated in the previous section. Although LGLIQUID, WEALTH and – to a lesser extent – TENMAX are significantly related, none of the correlation coefficients between the explanatory variables exceed 0,35 – suggesting

that these variables are reasonably independent of one another in this sub-sample of 124 cases.

5.2.3.2 Logit estimates

Among the 18 valid cases within the private stratum, ten households did use agricultural credit. On the other hand, none of the remaining 106 households in the government-assisted stratum used agricultural credit. Table 5.4 presents the coefficients (β_n) and associated standard errors (SE's) estimated for the postulated logit model.

Table 5.4 Estimated logit model of household agricultural credit use in KwaZulu-Natal, 1999 (n=124)

Variable	Coefficient	S.E.	Asymptotic t-value
TENMAX	0,1923	0,0817	2,4**
WEALTH	1,1524	0,4550	2,5**
LGLIQUID	0,6048	0,4497	1,3
EDTENP	4,0476	1,8163	2,2**
Constant	-9,3462	2,3388	

Source: Household sample surveys
Note: ** denotes statistical significance at the 5% level of probability.

The estimated tenure security coefficient is positive and significant at the five per cent level of probability. This result supports the view that households with secure land tenure are more likely to demand and receive credit to finance investment in farmland and complementary inputs. As expected, the coefficient estimated for household wealth is also positive and statistically significant. Since wealth was measured in terms of consumer durables, this result is most likely a reflection of the household's ability to service loans

over the longer-term. Household liquidity was less significant from a statistical point of view (15% level of probability), but theory suggests that liquidity is a very plausible indicator of financial viability, and hence an important determinant of credit use. The positive coefficient is certainly consistent with theory, and the variable is retained as the asymptotic t-value is greater than one (Tomek and Robinson, 1990:330). It is possible, however, that the estimated coefficient is understated because liquidity is significantly correlated with the measure of household wealth. The coefficient estimated for EDTENP is positive and significant, suggesting that borrowers had better income prospects (and faced lower transaction costs) than did non-borrowers, due to their superior educational status.

Table 5.5 Classification table for dependent variable (AGRICRED)

Observed	Predicted		Percent correct
	0	1	
0	114	0	100.00%
1	2	8	80.00%
		Overall	98.39%

The classification rates reported in Table 5.5 show that the estimated model predicted 98 per cent of the sample households correctly. All 114 non-borrowers (106 government-assisted and eight private transactions) were predicted correctly, while 80 per cent of the borrowers (eight out of the 10 private transaction households) were predicted correctly. Households with a predicted probability greater than 0,5 were classified as borrowers. To illustrate the procedure, a household with relatively secure tenure ($TENMAX_i$=21), two durable assets ($WEALTH_i$=2), liquidity of R 985999 per annum ($LGLIQUID_i$=5,99), and matriculants accounting for 14 per cent of household members ($EDTENP_i$=0,14), would

have a 77 per cent probability of using agricultural credit when these variables are substituted into the estimated equation:

$$P_i = \frac{1}{1+e^{-Z_i}} \qquad (5.4)$$

Where Z_i = -9,3462 + 0,1923 $TENMAX_i$ + 1,1524 $WEALTH_i$

+ 0,6048 $LGLIQUID_i$ + 4,0476 $EDTENP_i$.

Clearly, this household would be classified as a borrower as the predicted probability exceeds 0,5.

The next chapter considers some policy implications that can be drawn from the analysis of land transfers in chapter 3, and the logit model of agricultural credit use described above.

CHAPTER 6

POLICY IMPLICATIONS

This chapter discusses the policy implications of results presented in chapters 3 and 5. In brief, the results show: (a) that private transactions have redistributed much more land wealth, (b) that households benefiting from government grants do not have secure tenure, even on cropland where property rights are exclusive, and (c) that insecure tenure helps to explain why none of the 106 government programme beneficiary households sampled in this study used credit to finance investments in agriculture. Although the empirical analysis reported in this study did not quantify relationships between credit use, investment and yields, Graham and Lyne (1999) extended the analysis to show that insecure tenure is also an important determinant of poor agricultural performance observed on the government-assisted projects.

Poor agricultural performance may have contributed to the moratorium imposed on new land redistribution projects by the South African government in July 1999. The latest statement on land reform policy (February, 2000) emphasizes a shift away from group ownership and poverty alleviation. Emerging black farmers who are trained and experienced will qualify for larger grants to finance their own, individual farms (Minister for Agriculture and Land Affairs, 2000). However, government intends to place a very restrictive cap on the level of loan finance that a beneficiary may use to supplement his or her grant and equity capital. Of course, a severe cap on borrowing could make the

proposed grants unattractive to all but the least creditworthy candidates. If the government responds to this problem of adverse selection by raising the ceiling on debt finance, beneficiaries are likely to encounter cash flow problems if the loan repayments are not graduated.

At the other extreme, previously disadvantaged individuals who purchased their own farms enjoyed high levels of tenure security and many were able to secure loans. Graham and Lyne (1999) showed that tenure security and loan finance contributed to high levels of agricultural performance on these farms. However, it is also clear that these emerging farmers are relatively wealthy and invariably male. From a policy perspective, government appears to face a tradeoff between outreach and efficiency objectives. Outreach shaped the grant programme which initially targeted poor and landless rural communities. In 1996, grants were made available to farm workers for the purpose of financing equity in commercial farming enterprises, and in 1999 the Land Reform Credit Facility (LRCF) was launched to give equity-sharing companies and emerging farmers better access to private loans with graduated repayment schedules. The latest policy proposals reinforce this trend by directing bigger grants to better farmers, but curtail rather than facilitate private financing. The shift away from poverty alleviation has already been criticised as elitist (Natal Witness, 2000:5).

An important point highlighted by this study is that private transactions could redistribute land faster and more equitably if the outmoded Subdivision Act were replaced with zoning regulations. This would allow part-time farmers to purchase smaller, more affordable

farms. In addition, the study shows that a finite, diminishing interest rate subsidy on mortgage loans helps to broaden access to the land market when nominal interest rates are high. This subsidy alleviates temporary cash flow problems encountered by borrowers, improving their risk profile and allowing the lender in this case (Ithala Bank) to service clients who otherwise would not be creditworthy. It is interesting that the market for farmland is relatively inactive in Zimbabwe where only 1,5 per cent of the land originally available for redistribution transferred to new owners of all races in 1996. Lyne *et al* (1999:11) suggest that high nominal interest rates (reaching 32 per cent in 1996) made loan finance unattractive to potential buyers, while the Zimbabwean government's decision to cap interest rates charged on mortgage loans made lending unattractive to banks. Clearly, a better policy approach is to keep inflation in check and to encourage private financial products that address temporary cash flow problems. The LRCF (1999) has already reported considerable interest in its financial product and will clearly be over-subscribed (with applications from private financiers exceeding R 15 million) in the first year of its operation.

Indeed, the apparent tradeoff between outreach and efficiency is reminiscent of the debate which raged in India before higher yielding wheat varieties were allowed into the country. Experts advised the government not to import the new technology because it would benefit farmers with irrigated land and harm those with dryland (Hopper, 1978). Fortunately, the politicians were pragmatic and ignored the experts. In the end, the new technology lowered food prices and raised rural wages conferring widespread benefits. Hopper (1978)

concluded that it is best to address inequalities if and when they arise rather than to sacrifice efficiency.

The other policy issue highlighted by the study relates to the problem of under-investment in agriculture where farms have been purchased by large groups of land users. While outreach is desirable, it is debatable whether members of user groups stand to derive meaningful benefits from their agricultural land. They cannot realise the value of their land or improvements nor can they benefit from any capital gains because the property is not saleable. In addition, economic rent is constrained by insecure tenure, and there is a real danger that cropland will revert to grazing. The latter problem is anticipated on government-assisted projects where management committees and beneficiaries are unable to reach agreement on how best to delineate and allocate plots of arable land. If these circumstances persist, the perception that rights to cropland are exclusive will diminish, effectively converting cropland into a communal grazing resource.

The next objective to consider is how to make these existing government-assisted projects more productive. This policy question can be addressed by examining the government-assisted projects sampled in this study. The Isibonelo and Ingome communities have set aside land to be managed as a joint enterprise for the benefit of the entire community. These two cases represent farming ventures where corporate entities manage the land in the interests of non-users of land. This non-user approach can also be seen with equity-sharing schemes in the Western Cape. These schemes operate as farming enterprises in which financial equity is shared between the previous farmer and his farm workers. The farm

workers become shareholders in the company, which owns all the farm assets. This arrangement, therefore, is a creditworthy enterprise, which represents the interests of all the shareholders. Because land reform beneficiaries value residential needs as the most important reason for land ownership, it is conceivable that these groups of beneficiaries may be willing to sacrifice their non-residential rights for a share of the benefit (income) stream from a joint enterprise directed by a management committee. A scenario similar to this emerged in Mpumalanga province in 1996. An expert was hired by the community's management committee to farm the land, with the remainder being leased out to neighbouring farmers. This scheme evolved into a very successful farming enterprise, however, there were no formal arrangements with the members of the community trust on how to distribute the profits (LIMA, 1998a:14, 51-53). To counter this problem, these joint enterprises should be organised in such a way that voting and benefit rights are proportional to individual shareholdings.

Finally, logit model results show that tenure security appears to be a *necessary*, but *not sufficient*, condition for access to agricultural credit. Household repayment capacity, and the ability to adopt and manage farm technologies and managed debt finance, should also be considered when allocating public funds to emerging farmers.

CONCLUSIONS

This study found that in 1997 and 1998, government-assisted land reform projects in KwaZulu-Natal redistributed far less land wealth to previously disadvantaged people than did private transactions. Also, tenure insecurity on this government-redistributed land has an adverse effect on agricultural performance because beneficiaries do not have proper access to credit financing, which means that investment in both improvements and seasonal inputs is scarce. The principal problem with redistributing land through the government land grant programme is that it invariably leads the beneficiaries to purchase the land collectively and occupy commercial farms as a user group. This scenario often creates disparity in the community as voting rights are equal rather than proportional to the contributions made by individuals. This can easily result in the land reverting to an open access resource. Furthermore, formal lending institutions find it difficult to lend to individuals in these communities because of the difficulties involved in foreclosure of loans on group owned land.

This study also shows that 18885 hectares of commercial farmland transferred to disadvantaged owners in KwaZulu-Natal during 1998. This implies that the overall rate of redistribution was 0,35 per cent, down from the 1997 estimate of 0,43 per cent. Although low, these estimates suggest dramatic growth in the rate of land redistribution since 1995 (when the rate was 0,09 per cent). Since the inception of the government land grant scheme, the government has been responsible for redistributing 140916 hectares of land to 4901 beneficiary households in the province of KwaZulu-Natal (Wilkinson, 1999).

According to deeds records, the amount of land redistributed via government schemes in the province appears to have peaked in 1997, redistributing a total of 12022 hectares of farmland to 11 different community land trusts. Performance, however, declined substantially in 1998, when a mere 4382 hectares of land was redistributed to four community land trusts - this represents a 63 per cent decrease in the amount of land redistributed through government-assistance. Furthermore, with a weighted land price of R1119 per hectare in 1997 and R510 per hectare in 1998, these government-assisted land transactions redistributed land of relatively poor agricultural quality when compared to private transactions.

The land transfer data in 1997 and 1998 show marked differences in both the quantity and quality of farmland transferred by different modes of redistribution. For instance, private transactions accounted for 46 per cent of the total area redistributed, and for 73 per cent of the total market value of farms purchased by disadvantaged entrants in 1997, while these proportions increased to 74 and 91 per cent respectively in 1998. This clearly shows that private land transactions have redistributed far more land wealth in KwaZulu-Natal than government-assisted transactions. Among the private transactions, mortgage loan financed land purchases were responsible for 86 per cent of the total market value of farmland and 70 per cent of the total area redistributed.

In contrast to 1997, disadvantaged women were poorly represented in land transactions resulting from bequests and cash purchases, and remained poorly represented in transactions financed with mortgage loans in 1998. In aggregate, they gained less than half

of the area gained by disadvantaged men, and – after excluding inheritance transactions - gained less than half of the land value (wealth) gained by their male peers.

Another impediment to land redistribution is the Subdivision of Agricultural Land Act, 70 of 1970 which provides for an 'economic' farm size that is beyond the means of most emerging farmers. Under this law, commercial farmland cannot be subdivided and sold to smaller farmers. This effectively prevents emerging farmers from purchasing smaller and more affordable farms.

The logit model results show that households on redistributed farmland have a higher probability of agricultural credit use with more secure tenure, higher levels of wealth and liquidity, and higher education levels. Security of tenure appears to be a *necessary*, but *not sufficient* condition for access to agricultural credit. Through demand and supply side effects, tenure security provides incentives for lenders to supply credit and for borrowers to use credit. This, in turn, can lead to improved agricultural performance if households have sufficient financial resources and the capacity to adopt and manage farm technologies. However, lenders must also carefully assess whether borrowers have the capacity to withstand income shocks from unexpected weather conditions and low product prices.

These results suggest that government could consider reallocating scarce public resources from the land grant programme towards programmes that encourage individual ownership of farmland by emerging farmers. The Land Reform Credit Facility (LRCF) is one viable option to effectively redistribute arable farmland by means of mortgage loan facilitation.

However, this programme may be criticised as elitist, since it transfers farmland to a relatively small number of creditworthy beneficiaries. Therefore, an area for further research is to examine the feasibility of converting land user groups to non-user groups by setting aside farmland that could be managed for the group's benefit. However, this would require that the group agree on how to share in profits. In addition, the issue of whether equity-share schemes - whereby farm assets are owned by companies in which beneficiary households own financial equity along with the previous owner - can meet beneficiary outreach goals *and* sustain agricultural performance needs further analysis.

SUMMARY

Progressive land redistribution in South Africa is necessary to promote political stability and, hence, economic growth in the long-term. Economic theory suggests that secure property rights can lead to increased credit use by agricultural households by providing incentives for investment and enhanced collateral value of land; more land transactions due to contract certainty and lower transaction costs; less land disputes and increased agricultural output. Secure land tenure is expected to create incentives for emerging farmers in South Africa to invest more in improvements (like fencing and equipment) and short-term complementary inputs (like fertiliser and chemicals). An efficient land market allows emerging farmers with secure tenure to internalise the benefits of these improvements and to use the land as collateral for borrowing. Only through the establishment of permanent and enforceable land rights can tenure security be realised by these emerging farmers.

The aim of this study was twofold: Firstly, to examine the value of land redistribution by different modes (government-assisted versus private transactions) in the province of KwaZulu-Natal during 1997 and 1998. Secondly, to investigate the relationship between mode of land redistribution, security of tenure, and access to agricultural credit by households on farmland transferred in KwaZulu-Natal during 1997. The level of tenure security on a purchased farm will depend largely on the mode of land acquisition. It is hypothesised that tenure security is likely to be greater for a household that obtains farmland in a private transaction (subsidised mortgage loan, inheritance, or cash purchase)

than for a household that purchases farmland collectively under the government land grant programme.

Since 1994, the government has taken a direct role in the land reform process in South Africa through the settlement/land acquisition grant programme. Under this scheme, the landless poor can apply for a R 15000 land grant to purchase and develop farmland. However, individually these R 15000 land grants are not sufficient on their own to purchase a sufficient amount of decent quality arable land. This has led individuals to pool these resources, thereby creating a land user group on generally poor quality agricultural land. Furthermore, lack of access to credit under this collective ownership of land has proven to be an impediment to agricultural development. Therefore, much of this farmland remains idle because there is no opportunity cost (foregone income) to penalize non-use. Previous research has shown that government land reform projects produce large user groups and, subsequently, high transaction costs in decision-making. This, in turn, can undermine tenure security and investment in agriculture.

Farmland transactions data in KwaZulu-Natal during 1997-1998 were analysed to measure the rate at which commercial farmland is transferring to previously disadvantaged people and to further establish the causal relationships between the mode of land acquisition and subsequent land use and access to agricultural credit. Private land transactions redistributed far more land wealth in KwaZulu-Natal than did government projects during 1997-1998. Gender analysis revealed that in 1997 women were well represented in land transactions involving inheritance, but generally acquired farms of smaller size and land of lower quality

than men. In 1998, despite the larger mean farm sizes, the total area of land and total market value of land accounted for by women decreased substantially compared to those for their male peers. Also, the number of women involved in land transactions in 1998 halved, raising questions about whether gender sensitivity in proclaimed land reform policy is actually implemented in practice.

A logit model was used to estimate the probability of agricultural credit borrowing by 129 households using farmland redistributed in KwaZulu-Natal during 1997. The objective was to assess whether or not higher levels of tenure security lead to increased credit supply (incentives to lenders), and hence increased use of agricultural credit (incentives to new farmland owners). A tenure security index was constructed to capture respondents' perceptions of the breadth, duration and assurance of their property rights to cropland. Household characteristics examined were the amount of household durable goods (wealth proxy), the proportion of matriculants within the household (education proxy), and the liquidity of the household. Results from the logit analysis reveal that, as postulated, the incidence of agricultural credit borrowing was highest on farms purchased through private transactions due to more secure tenure (land could be used as collateral to secure additional agricultural loans to finance on-farm investments and improvements). These farms also tended to be operated by wealthier, more liquid, better-educated households.

It is recommended that government should consider reallocating scarce public resources from the land grant programme towards programmes that encourage individual ownership of farmland by emerging farmers, such as the Land Reform Credit Facility which helps

these farmers gain access to private mortgage loans or subsidised mortgage loans. Attention must also be given to scrapping of the Subdivision of Agricultural Land Act, 70 of 1970, which currently impedes land redistribution through regulations preventing larger farms from being subdivided and sold as smaller properties to viable emerging farmers. In addition, existing farms under the government land grant schemes could be made more productive if these communities exchange their non-residential rights for a share in the benefit stream from commercial production run by an appointed manager or able management committee.

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APPENDIX A:

ROUND 1: HOUSEHOLD QUESTIONNAIRE

APPENDIX A: HOUSEHOLD QUESTIONNAIRE

ROUND I

1999 HOUSEHOLD SURVEY

These questions relate to households that reside on, or use redistributed land - excluding hired labourers. This information is strictly confidential and will be analysed by Researchers at the School of Agricultural Sciences and Agribusiness, University of Natal. The findings will inform both government and private sector programmes aimed at assisting prospective farmers who were previously disadvantaged. Refer to the Instruction Book for notes on how to administer the survey.

DATE: _____ **ENUMERATOR:** _____

RESPONDENT: _____ **HHID:** _____

RELATION TO OWNER: _____

FOR OFFICE USE - Deeds Register information about the redistributed land

Stratum (government assisted transaction, private transaction, *etc*) _____

Bio-climatic region (**coastal, midlands or lowveld**) _____

District _____

Is the farm owned by an **individual**, **husband and wife**, or **legal entity** _____

Size of farm Ha _____

Purchase price of farm Rand _____

Size of mortgage loan (if applicable) Rand _____

LOCATION INFORMATION

Nearest town _____

Name and/or number of nearest district road _____

Name of the farm _____

Residential address used by the household _____

_____

___

_____ Postal Code

_____

Telephone number (if available) Code _____ No._____

Name and surname of nearest neighbour _____ _____

GROUP PURCHASE AND JOINT ENTERPRISES

*Answer the following questions only if the redistributed farm is owned by a **community land trust or common property association (CPA), or if it was purchased by the government for a community or group of beneficiaries**:*

Questions about group settlement of redistributed farms	Codes	Response
How many households are officially recorded as members of the trust, CPA or beneficiary community?	Number	
How many households have actually settled on the redistributed land?	Number	
Which members of the household are officially recorded as members of the trust, CPA or community?	1. HH head only 2. HH head plus spouse 3. All adults in HH 4. All members of the HH 5. Don't know	
Who is eligible to vote for representatives on the trust, CPA or community Management Committee?	1. Registered HH members only 2. All adults 3. All HH members 4. Don't know	
How often are elections held to vote for new representatives?	Specify	
How often does the Management Committee meet?	1. Every week 2. Every month 3. Seldom 4. When there is a need 5. Don't know	
Can members of the household attend these meetings even if they are not members of the	1. Yes 2. No	

Management Committee?	3. Don't know	
Are household members allowed to vote on farming decisions of common interest (eg when to burn firebreaks) even if they are not members of the Management Committee?	1. Yes 2. No 3. Don't know	
Did the household reside on this farm before it was purchased for redistribution?	1. Yes 2. No	
Does each household have roughly the same amount of cropland?	1. Yes 2. No 3. Don't know 4. Cropland has not been allocated to households	
How was the location of your household's cropland chosen?	1. By government officials 2. By the Management Committee 3. By the previous landowner 4. Chosen by myself	
Are any of the enterprises on this farm managed exclusively by a committee, team or person on behalf of the members of the trust, CPA or community?	1. Yes 2. No 3. Don't know	
If yes, what are these joint enterprises and who is responsible for their management?	List joint enterprises 1 2 3	Key manager

Questions about joint enterprises	**Enterprise 1**	**Enterprise 2**	**Enterprise 3**
Did your household contribute money to finance any of these joint enterprises (**yes** or **no**)			
If yes, did other households contribute the same amount of money (**yes** or **no**)			
Will income earned by these joint enterprises be invested in **community services**, retained by **management**, paid to stakeholders as a **cash dividend**, **all**, or **don't know**			
If cash dividends are paid, how will they be distributed (shared **equally** regardless of, or in **proportion** to, the amount contributed by each stakeholder)			
Can a household sell its right to benefit from a joint enterprise (**yes** or **no**)			
If yes, who must authorise the transaction (**no one, government, Management Committee, neighbours, family members**, etc.)			

HOUSEHOLD DEMOGRAPHICS

Household member's name & relationship to head[1]	Gender (M or F)	Age	Primary occupation[2]	School standard passed
1 (*De jure* HH head)				
2 ( )				
3 ( )				
4 ( )				
5 ( )				
6 ( )				
7 ( )				
8 ( )				
9 ( )				
10 ( )				
11 ( )				

[1] Relationships: **(W)** wife, **(H)** husband, **(S)** son, **(D)** daughter, **(M)** mother, **(F)** father, **(SI)** sister, **(BR)** brother, **(N)** niece/nephew, **[C]** cousin, **(ML)** mother-in-law, **(GD)** granddaughter, **(GS)** grandson, **(FR)** friend.

[2] Occupation should be categorised as Wage Employed **(WE)**, Farmer **(F)**, Self-Employed **(SE** - *eg* contractor, taxi owner, *etc*), Housekeeper **(H)**, Senior School Scholar or Student **(SS)**, Junior School Scholar **(JS)**, Disabled **(D)** if paid a disability grant, Pensioner **(P)** if paid a pension, Unemployed **(U)** if seeking work, **(I)**infant if too young to attend school, or vagrant **(V)**.

If the household head is a migrant or weekly commuter, who is the *de facto* household head **(name)** _____

Is the *de facto* head, **single**, **married**, **widowed** or **separated** _____

DECISION-MAKING

Who makes decisions about household expenditure on the following consumption items (list major decision maker(s)):

Consumption item	Household member(s)[1]
Food purchases	
Expenditure on child education	
Expenditure on household durables (*eg* fridge, stove)	
Expenditure on materials for building or improving homes	

[1] Codes:1 = *de jure* household head, etc.

NON-FARM INCOME

Did any adult household members engage in wage work, earn a pension, get welfare payments, or receive a transfer from household members anytime during 1998? Include income when household member is <u>not</u> self-employed:

Household member[1]	Activity (describe, eg pension, wage work, etc.)	Average monthly income in 1998 (in Rand)	Average monthly remittance to household (in Rand)	Who gets the remittance[1]
Total household monthly remittances in 1998 (R/month)				

[1] Codes:1 = *De jure* household head, etc.

ENTERPRISE ACTIVITIES

List all enterprise activities for adult household members in 1998. An enterprise activity is one where the household member is self-employed:

Household member[1]	Activity[2] (describe)	Total income (in Rand)	Total input and labour costs (in Rand)	Total remitted to household (in Rand)	Who gets the remittance[1]

1 Codes: 1 = *De jure* household head, etc.

2 Taxi service; renting out rooms; hiring out contractor services; milling grain; baking, brewing or selling meals; building or repairing houses; block making, stone or metal work; making or repairing furniture; repairing vehicles and machinery; sewing or cobbling; shop keeping; hawking; and handicrafts such as making and selling mats, baskets, pottery or curios, tanning and dyeing.

GIFTS

Has the household received goods or money from people outside the household in 1998?

Household member[1] receiving gift	Who sent gift? (specify)	Amount of gift (in Rand)	Purpose of gift (specify)

1 Codes: 1 = *De jure* household head, etc.

TIME ALLOCATION OF DE FACTO HEAD

Indicate the number of hours the de facto head spends on a typical weekday in summer and in winter across all the activities listed. The total number of hours should add up to 24.

De facto head ID _____

Activities	Hours spent during a typical Summer week day (September – February)	Hours spent during a typical Winter week day (March – August)
Wage work (Including farm labour work where paid by someone else)		
Enterprise work (Selling, buying inputs, making product)		
Own Agricultural activities (Planting, weeding, soil preparation, buying inputs, harvesting on own land)		
Own Livestock activities (Tending, selling animals, selling animal products or own livestock)		
Transit/travel (Travel between home and work)		
Domestic activities (Cooking, cleaning, getting water, child care, spouse care, buying groceries)		
Personal needs (Eating, personal hygiene, health care)		
Sleeping		
Free time (Chatting, listening to radio, watching television, receiving guests, religious activities, celebrations)		
Maintaining common infrastructure (Burning fire breaks, fixing fences)		
Community service (Committee obligations)		
Property maintenance on own property (Fixing fences, house maintenance)		
Total Number of hours	24	24

RESIDENTIAL PROPERTY RIGHTS

Does the household live on the farm (**yes** or **no**) _____

If yes, how many months has the household lived here _____?

Did you buy or build your **own** house on this farm, or do you **rent** it _____

If you own the house, what written proof of ownership do you have?
(**1.** Formal rental contract, **2.** Title deed, **3.** Receipt of purchase, **4.** None) _____

Transferability of residential property	Yes or No	If yes, must the transaction be authorised (yes or no)	If yes, who authorises the transaction[1]
Can the household sell its house			
Can the household lease out its house			
Can the household head bequeath the house to a single heir			
Can the household mortgage the house			

[1] Need permission from government, chief, community authority, neighbours, family members and relatives.

HOUSEHOLD ASSETS

HOUSING ATTRIBUTES	RESPONSE
Number of rooms to sleep in	
Source of electrical power (**no electricity**, a **generator**, **Eskom power**)	
Main source of drinking water (**Stream, protected spring, borehole, rain tank, municipality**)	
Is the water piped to your house (**yes** or **no**)	
Approximate replacement value of home in 1998 (Rand)	
Did you borrow cash or use credit to buy or build the house (**yes, no**, or **rent in**)	
If yes, what were the sources of loans or credit (**Bank**, materials **supplier**, **NGO**, **friend or relative**, **local** money lender)	

Do you or any household member own any of the following serviceable assets:

Key serviceable assets	**Owned by who?**[1]	**Number owned**	**Approximate replacement value (for each) in 1998 (Rand)**	**Borrowed cash to pay or paid over time (y or n)**	**Sources of credit used**[2]
Bakkies					
Tractors					
Trucks					
Irrigation pumps					
Television sets					
Fridges or freezers					
Approximate equipment asset value					

1 Codes: 1 = *De jure* household head, *etc.*

2 **Local** money lender, **friend** or relative, **stokvel** or savings **club**, the **seller**, a **bank**, or another source (specify).

INVENTORY OF HOUSEHOLD FARMLAND

List all land that the household accesses for agricultural purposes either exclusively, communally, or through a management entity. This includes land that is owned, allocated, rented in, rented out, and currently unused. Include residential parcel(s), crop parcel(s), communal land, and land managed by a team.

1. Access to agricultural land on the redistributed farm

Land used exclusively by household (including owned, allocated, unused, rented in, or rented out land)

Parcel number	Land Holder[1]	Access status[2]	List ALL Land Users[1] (including Land Holder, if applicable)
1			
2			
3			
4			
5			
6			

1 Primary landholder and user codes: 1 = *De jure* household head, *etc.*

2 Access codes: Owned with **title-deed**, allocated by **government** or community authority, borrowed or **rented** in, **lent** or **rented out** and **unused.**

Land used communally

Land type	Area of communal land (in hectares)	All Land Users from HH[1]	Total number of communal users
Veld and grazing			
Forest			

1 Primary landholder and user codes: 1 = *De jure* household head, *etc.*

Land managed by a team or person on behalf of stakeholders

Land type[1]	Area of team-managed land (in hectares)	Total number of stakeholders

2 Access to agricultural land off the redistributed farm

Land used exclusively by household (including owned, allocated, unused, rented in, or rented out land)

Parcel number	Land Holder[1]	Access status[2]	List ALL Land Users[1] (including Land Holder, if applicable)
1			
2			
3			
4			
5			
6			

1 Primary landholder and user codes: 1 = *De jure* household head, *etc.*

2 Access codes: Owned with **title-deed**, allocated by **government** or community authority, allocated by **farm** owner, **borrowed** or **rented** in, **lent** or **rented out**, or **unused.**

Land used communally

Land type	Area of communal land (in hectares)	All Land Users from HH[1]	Total number of communal users
Veld and grazing			
Forest			

1 Primary landholder and user codes: 1 = *De jure* household head, *etc.*

Land managed by a team or person on behalf of stakeholders

Land type[1]	Area of team-managed land (in hectares)	Total number of stakeholders

1 Land types are **dry** cropland, **irrigated** cropland, **pasture**/grazing, **forest**.

LAND RENTED OUT

Record the following details for agricultural plots lent, rented, or sharecropped out by the household's primary landholders.

Primary Land Holder code[1]	ID assigned to parcel	Area of plot rented or lent out (Ha)	**Rented**, **lent**, or **sharecropped** out	How long is the current rental agreement? (years)	Value and frequency of payments (*eg* R/month)
Approximate value of annual rental income (Rand)					

[1] Primary landholder and user codes: 1 = *De jure* household head, *etc.*

LAND DISPUTES ON REDISTRIBUTED FARM

Have any members of the household been involved in land disputes on the redistributed farm (**yes** or **no**) _____

If yes, record the following information about the main land disputes:

Question	**Answer codes**	**Primary landholder[1] involved in dispute**		
Year dispute began	Year			
Nature of dispute	Land **ownership**, **boundary** dispute, breach of **rental** contract, other (explain)			
With whom is/was the dispute	**Government**, **community authority**, **tribal authority**, other members of the **household**, **neighbours**, others (explain)			
Year dispute resolved	Enter **NR** if the dispute has not been resolved			

CREDIT AND CASH LOANS

What were the three largest loan or credit transaction (that is, "goods/services received before full payment made") undertaken by any of the household members in 1998:

		Loan 1	Loan 2	Loan 3
Borrower ID[1]				
Amount borrowed (Rand)				
Primary purpose of loan[2]				
Source of loan or credit	**Bank, seller, local** money lender, **friends** or relatives, **employer, stockvel** or savings club, **govt agency**			
Security provided	*eg* **land, assets purchased, guarantor, output** produced			

1 Borrower codes: 1 = *De jure* household head, *etc.*

2 **Consumption** (includes borrowing for food, social obligations and medical needs), **education**, purchase of **durable** goods, **home** construction or improvements, **fixed** improvements to farmland, purchase **farm inputs** or equipment, purchase **non-farm inputs** or equipment, purchase **land**.

If no credit was used, does the household have enough cash to finance farm expenses (**yes** or **no**) _____

If no, what is the likelihood of the *de facto* household head getting loans or credit from the following sources:

Source	**Likelihood**[1]	**If unlikely or impossible**	
		First reason[2]	**Second reason**[2]
Commercial Bank			
KFC			
Input seller			
Local money lender			
Friends or relatives			
Savings club or stokvel			

1 **Very likely, possible, unlikely, impossible**, don't know - **DK**.

2 Borrowing is too **risky**, Do not know how to **apply**, request would be **rejected**, repayments are too **expensive**, no **collateral** to secure the loan, procedures too **complex**, have not repaid **previous** debt, **interest rate**.

FINANCIAL ASSETS AND FORMAL SAVINGS

For each household member operating a bank account, or investing in financial assets (eg life insurance, unit trusts, stocks and bonds), please provide the following information:

Household member[1]	**Current value of financial assets (Rand)**	**Current level of deposits in Bank (Rand)**[2]	**Name of Bank**	**Distance to Bank (km)**

1 Codes: 1 = *De jure* household head, *etc.*

2 Score as: <R500, R501-R1000, R1001-R5000, R5001-R10000, R10001-R50000 or **don't know**.

If the *de facto* household head had more savings to invest, where would this money be invested (*if the respondent gives more than one reason, please rank them in the order of importance, where 1=highest*):

Savings action	**Yes or No**	Rank
Deposit the cash in a Bank		
Buy financial assets		
Deposit the cash in a stockvel or savings club		
Buy livestock or some other physical store of wealth		
Keep the cash at home		

PERCEPTIONS OF ECONOMIC SECURITY FOR DE FACTO HEAD

The following are questions about future uncertain events. In each case, ask the de facto head to try and think about the whole range of possible outcomes and think about how likely they are to occur before answering. If the respondent is not the de facto head, try to find the de facto head and ask him/her. If the respondent cannot give a percentage, use the probability line to get the de facto's response to the probability questions.

What is the likelihood (% chance) ...	**Percentage Chance**
1. That you could get land to rent-in for five consecutive growing seasons?	
2. That if you were offered a high-paying wage job in the city next year, you would take it?	
3. That if you inherited money next year, you could spend it ALL on what you wanted?	
4. That you (*if respondent a woman*) or your spouse (*if respondent a man*) will be pregnant next year?	
5. That you will be robbed next year?	
6. That you will NOT have enough to eat at some point next year?	

Question	**Response**
7. What percent (%) increase in income do you expect 7.1. Next year	
7.2. In three years	
8. If you needed money for health, education, or clothing, 8.1. Who would you go to?	
8.2. What is the probability (%) that you would get all the money you needed?	
9. If you needed labour for agricultural production, 9.1. To whom would you go to get it?	
9.2. What is the probability (%) that you would get all the labour you needed?	

LIVESTOCK REVENUE IN 1998

TYPE OF LIVESTOCK OWNED[2]	NUMBER OWNED	NUMBER SOLD IN 1998	WHO CAN SELL ANIMAL? (owner, other, or both)	GROSS INCOME FROM ANIMAL SALES	DISTANCE TO MAIN POINT OF SALE (in kilometers)

[1] Codes:	[2] Codes:
1. De jure HH head, etc.	1. Dairy cattle 2. Beef cattle 3. Sheep 4. Goats 5. Pigs 6. Zulu chicken 7. Duck 8. Other

LIVESTOCK EXPENSES IN 1998

A. Variable Inputs and Hired Labour

LIVESTOCK TYPE	TYPE OF INPUT	TOTAL COST OF INPUT	DAILY WAGE	PURCHASED ON CREDIT
	Vet medicine and services			
	Livestock feed			
	Summer Hired Labour			
	Winter Hired Labour			
	Vet medicine and services			
	Livestock feed			
	Summer Hired Labour			
	Winter Hired Labour			
	Vet medicine and services			
	Livestock feed			
	Summer Hired Labour			
	Winter Hired Labour			
	Vet medicine and services			
	Livestock feed			
	Summer Hired Labour			
	Winter Hired Labour			
1. *Dairy cattle* 2. Beef cattle 3. Sheep 4. Goats 5. Pigs 6. Broiler chicken 7. Layer chicken 8. Zulu chicken 9. Duck 10. Other		Rand	Rand	1. Yes 2. No 3. Don't know

B. Family Labour

LIVESTOCK TYPE	SUMMER LABOUR (Sept – March)	
	ID CODE OF HOUSEHOLD MEMBER SUPPLYING LABOUR	AVG # OF HOURS SUPPLIED PER DAY

PROPERTY RIGHTS ON COMMUNAL LAND

Ask the following questions about using communal grazing land and security of livestock holdings.

QUESTION	RESPONSE
1. How many animals is the household entitled to graze[1]?	
2. Is the limit the same for each household?	
3. Is there a penalty for exceeding the upper limit?	
4. Has anyone in the community ignored the upper limit on herd size?	
5. If yes, was the penalty applied?	
6. If you have less than the entitled number, can you entitle someone to graze more[2]?	
7. Can you lease grazing rights to another[2]?	
8. Can you sell grazing rights to another[2]?	
9. Is this communal grazing land over grazed[3]?	
11. What is the probability (%) that all of your livestock will survive to next year?	
12. What percent (%) of your livestock will be stolen next year?	

AGRICULTURAL EXTENSION INFORMATION

What is the agricultural extension officer's name

For whom does he or she work (eg **DoA**, **DLA**, an **NGO**, *etc*)

How many times did the extension officer make contact with you or another member of your household during the past month

Were any of the following training courses offered to farmers in this area last year:

Subject	Course offered (**yes** or **no**)	List all household members[1] that attended
Livestock or poultry production		
Crop, tree or pasture production		
Soil conservation		
Farm budgeting or financial management		

[1] List household member codes (*eg* 1 = *De jure* household head, *etc)* for attendees.

[2] **DoA**, **DLA**, **NGO**, **Bank**, other (please specify), or **DK**.

Can you get farming information when you need it (**yes** or **no**)

If yes, who do you prefer to get it from;(**DoA**, **DLA**, **NGO**, **Bank**, *etc)*

Do any household members participate in a farmers cooperative, farmers association or garden club:

Institution	**List all household members[1] that participate**
Farmer co-operative	
Farmer association	
Garden club	

APPENDIX B:

ROUND 2: PARCEL LEVEL QUESTIONNAIRE

APPENDIX A.2: LANDHOLDER QUESTIONNAIRE

ROUND II

1999 LAND HOLDER AND LAND USER SURVEY

This survey is to be completed for each parcel used (owned, allocated, borrowed, or rented in) or unused by the household or by a management team. These parcels were inventoried on pages 10 and 11 of the Household Survey. Complete a survey for each parcel. Questions should be addressed to the Land Holder of the parcel and to the Land Users of the parcel. In the case of land managed by a team, questions should be addressed to the management committee. For land managed by a hired manager, ask the hired manager to answer from the owner's perspective. Refer to the Instruction Book for notes on how to administer the survey.

DATE: _____ **ENUMERATOR:** _____

HOUSEHOLD ID: _____ **PARCEL NUMBER:** _____

LAND HOLDER'S NAME: _____ **ID:** _____

RESPONDENT: _____ **RELATION:** _____

PARCEL HISTORY

Ask the Land Holder the following questions.

QUESTION	CODES	RESPONSE
1. Year and month of acquisition	Month and year	
2. Principle mode of acquisition	1. Inherited 2. Occupation (squatting) 3. Purchased 4. Rented-in 5. Allocated 6. Other _____	

QUESTION	CODES	RESPONSE
If parcel is rented-in, skip to question #14. *If not, complete questions #3 - #7.*		
3. From whom was the land obtained?	1. Private land holder 2. Government 3. Chief 4. Family or kin 5. Neighbours and friends 6. Through marriage 7. Management committee 8. Community authority 9. Other _____	
4. Purchase price of parcel or (if group purchase) share of total purchase price	In Rand	
5. Motive for purchase	1. Place of residence 2. Land for children 3. Investment 4. Farming and/or grazing 5. Establish enterprise 6. Other _____	Primary Motive Secondary Motive
6. Paid fully in cash or amortized in future?	1. Fully in cash 2. Future payments	
7. Source of funds used?	1. Personal Savings 2. Government Subsidy 3. Cash loan 4. Mortgage loan 5. Credit 6. Other _____	Primary source Secondary source
If funds came from a cash loan, mortgage loan, or credit, complete questions #8 - #13. If not, skip to question #20.		
8. If cash loan or credit, from whom?	1. Money lender 2. Bank 3. Previous landholder 4. Family or kin 5. Non-family or friends 6. Other _____	
9. Amount of down-payment paid	In Rand	
10. Type of collateral required	Describe	
11. Size of repayments	In Rand	

QUESTION	CODES	RESPONSE
12. Frequency of payments	1. Weekly 2. Monthly 3. Annually 4. Other _____	
13. Number of periods of loan repayment	Number	
If parcel is rented-in, complete questions #14 - #17. If not, skip to question #20.		
14. Rented from whom	Name	
15. Cash payments 15.1. Rental price	If fixed cash payments, specify in Rand per period Or If % of gross income, specify amount per period	
15.2. Payment period	1. Weekly 2. Monthly 3. Annually Other _____	
16. In-kind payments 16.1. Rental payment	If fixed amount of crop, specify unit and number per period **Or** If % of harvest, specify amount per period	
16.2. Payment period	1. Weekly 2. Monthly 3. Annually 4. Other _____	
17. Length of rental agreement	Years	
18. Do you hold a formal rental contract?	1. Yes 2. No 3. Don't know	
19. Number of consecutive years that household has rented this same parcel	Years	
If parcel was rented-in, skip to next Section. If not rented-in, complete questions #20 - #24.		
20. Was parcel registered in writing before	1. Yes 2. No	

QUESTION	CODES	RESPONSE
acquisition?	3. Don't know	
21. Is parcel currently registered?	1. Yes 2. No 3. Don't know	
22. If registered, do you own the title deed?	1. Yes 2. No 3. Don't know	
23. If not registered, have the boundaries of the parcel been demarcated?	1. Yes 2. No 3. Don't know	
24. If yes, how?	1. Formal survey 2. Sketch map notarized 3. Informal marking 4. Other ____	

ARABLE LAND RIGHTS

For all Land Users of this parcel (identified in the Inventory of Household Farmland in the HH Survey), ask the Land Holder to identify the type and area of land used.

NAME OF LAND USER	LAND USER ID	LAND TYPE	ESTIMATED AREA (ha)
Land Holder:			
	1 = De jure household head, etc.	1. Dry cropland 2. Irrigated cropland 3. Pasture/grazing 4. Forest 5. Residential land	

For the Land Holder and each Land User listed in the table above, complete the following table. For the Land Holder, ask about rights on the entire parcel. For Land User(s), ask about their own rights on individual plot(s).

QUESTION	RESPONSE			
	LAND HOLDER	LAND USER ID	LAND USER ID	LAND USER ID
1. What land rights are you able to exercise[1]? 1.1. Plant trees				
3.2. Build structures				
3.3. Bequeath				
3.4. Lease land out				
3.5. Sell land				
2. Can others graze cattle on this parcel during the winter[1]?				
3. Can you exclude others by fencing off this parcel[1]?				

PERCEPTIONS OF ECONOMIC SECURITY FOR LAND USERS

The following are questions about future uncertain events. In each case, ask the respondent to try and think about the whole range of possible outcomes and think about how likely they are to occur. Ask the Land Holder and the Land User(s). If the respondent cannot give a percentage, use the probability line to get the Land User's response to the probability questions.

What is the likelihood (%) ...	Land Holder	Land User ID	Land User ID	Land User ID
7. That you could get land to rent-in for five consecutive growing seasons?				
8. That if you were offered a high-paying wage job in the city next year, you would take it?				
9. That if you inherited money next year, you could spend it ALL on what you wanted?				
10. That you could get financing from a				

formal bank (eg KFC) for agricultural productive inputs?				
11. That you (*if respondent a woman*) or your spouse (*if respondent a man*) will be pregnant next year?				
12. That you will be robbed next year?				
13. That you will NOT have enough to eat at some point next year?				

QUESTION	**RESPONSE**			
10. What percent (%) increase in income do you expect 10.1. Next year				
10.2. In three years				
11. If you needed money for health, education or clothing, 11.1. Who would you go to?				
11.2. What is the probability (%) that you would get all the money you needed?				
12. If you needed labour for agricultural production, 12.1. To whom would you go to get it?				
12.2. What is the probability (%) that you would get all the labour you needed?				

1998 CROP PRODUCTION SEASON AND REVENUE EARNED IN 1998

For all Land Users, fill in the table below. If the Land Holder is also a land user, then treat the Land Holder as a Land User and complete the table for him or her as well. Ask <u>each</u> Land User about <u>all</u> crops produced on their field(s) and record all relevant information for each crop and each User.

Name of land user and land user ID	Crop code	% of plot planted	Yield per hectare	% eaten	% sold	% traded or bartered	Gross revenue from sales	% given to HH expenditure
( )								
( )								
( )								
( )								
( )								
( )								
( )								
( )								
( )								
1 = De jure household head, etc.		Percent	Amount	Percent	Percent	Total HH Revenue: Percent	Rand	Percent

1997/1998 CROP PRODUCTION EXPENSES

(Expenses during September 1997 – August 1998)

A. Variable Inputs and Hired Labour

For each Land User, list the total cost of key variable inputs used for the 1997/1998 growing season and the cost of hired labour for both Summer (September – March) and Winter (April – August).

LAND USER ID	KEY INPUTS	TOTAL COST OF INPUT	PURCHASED ON CREDIT OR LOAN	SOURCE OF CREDIT
	Fertilizer			
	Seed			
	Seedlings			
	Chemicals			
	Summer Hired Labour			
	Winter Hired Labour			
	Fertilizer			
	Seed			
	Seedlings			
	Chemicals			
	Summer Hired Labour			
	Winter Hired Labour			
	Fertilizer			
	Seed			
	Seedlings			
	Chemicals			
	Summer Hired Labour			
	Winter Hired Labour			
1 = De jure household head, etc.		Rand	1. Yes 2. Not 3. Don't know	1. Money Lender 2. Friend or relative 3. KFC 4. Milling Co. 5. Stockvel 6. Supplier 7. Bank 8. Other

B. Family Labour

For each Land User, record all household labour supplied to his or her crop production. Record the identification number of the household worker and the average number of hours supplied per day for the entire season by the Land User herself and by other household members, for both Summer and Winter.

LAND USER ID AND NAME(S)	SUMMER LABOUR (Sept – March)		WINTER LABOUR (April – August)	
	ID CODE OF HOUSEHOLD MEMBER SUPPLYING LABOUR	AVG # OF HOURS SUPPLIED PER DAY	ID CODE OF HOUSEHOLD MEMBER SUPPLYING LABOUR	AVG # OF HOURS SUPPLIED PER DAY
	Land User		Land User	
	Land User		Land User	
	Land User		Land User	

FIXED LAND IMPROVEMENTS

Ask Land Holder about fixed improvements made on the parcel. Also, inquire about investments made on communal grazing land. For communal grazing land, note if investment was voluntary, forced, or made by government.

LAND TYPE	TYPE OF INVESTMENT	WHO MADE INVESTMENT	TOTAL COST (or value or contribution)	FINANCING?	SOURCE OF CREDIT
Residential Land					
Cropped Land					
Exclusive Pasture Land					
Communal Grazing Land *(Voluntary, Forced, or Gov't)*					
	Specify (eg housing, silos, milking parlors, barns, fences, boreholes, etc.)	1. Land Holder 2. Group 3. Previous Owner 4. Government 5. Other _____	In Rand, cash costs plus value of in-kind materials	1. Pooled capital and labour from group 2. Borrowed cash to pay 3. Paid over time	1. Money Lender 2. Friend or relative 3. KFC 4. Milling Co. 5. Stockvel 6. Supplier 7. Bank 8. Government 9. Other

Thank you for your assistance.

APPENDIX C:

ABRIDGED DATA SET

DATA SET

VARIABLE NAMES AND DEFINITIONS:

HHID = Household ID (Identification number)

YEAR = Year of acquisition of parcel (-1 = don't know)

REGNOW =
1 If parcel is currently registered,
2 If parcel is not currently registered,
3 If don't know.

REGOWN = If the parcel IS registered:
1 If the household owns the title deed,
2 If the household does not own the title deed,
3 If the household doesn't know.

BOUNDRY = If the parcel is not registered:
1 If the boundaries have been demarcated,
2 If the boundaries have not been demarcated,
3 If the household doesn't know.

HLRTREES =
0 If the land holder is not allowed to plant trees,
1 If the land holder can plant trees without authorization,
2 If the land holder can plant trees dependent upon the chief's approval,
3 If the land holder can plant trees dependent upon the community authority's approval,
4 If the land holder can plant trees dependent upon the government's approval,
5 If the land holder can plant trees dependent upon the household head's approval,
6 If the land holder does not know whether he/she can plant trees on their parcel.

HLRBUILD = 0 If the land holder is not allowed to build structures,
1 If the land holder can build structures without authorization,
2 If the land holder can build structures dependent upon the chief's approval,
3 If the land holder can build structures dependent upon the community authority's approval,
4 If the land holder can build structures dependent upon the government's approval,
5 If the land holder can build structures dependent upon the household head's approval,
6 If the land holder does not know whether he/she can build structures on their parcel.

HLRBEQ = 0 If the land holder cannot bequeath,
1 If the land holder can bequeath without authorization,
2 If the land holder can bequeath dependent upon the chief's approval,
3 If the land holder can bequeath dependent upon the community authority's approval,
4 If the land holder can bequeath dependent upon the government's approval,
5 If the land holder can bequeath dependent upon the household head's approval,
6 If the land holder does not know whether he/she can bequeath.

HLRLEASE = 0 If the land holder cannot lease the land out,
1 If the land holder can lease out the land without authorization,
2 If the land holder can lease out the land dependent upon the chief's approval,
3 If the land holder can lease out the land dependent upon the community authority's approval,
4 If the land holder can lease out the land dependent upon the government's approval,
5 If the land holder can lease out the land dependent upon the household head's approval.
6 If the land holder does not know whether he/she can lease out the land.

HLRSELL = 0 If the land holder cannot lease the land out,
1 If the land holder can sell the land without authorization,
2 If the land holder can sell the land dependent upon the chief's approval,
3 If the land holder can sell the land dependent upon the community authority's approval,
4 If the land holder can sell the land dependent upon the government's approval,
5 If the land holder can sell the land dependent upon the household head's approval.
6 If the land holder does not know whether he/she can sell the land.

OLRGRAZE = 0 If others cannot graze on this parcel during winter,
1 If others can graze livestock on this parcel during winter without authorization,
2 If others can graze livestock on this parcel during winter dependent upon the chief's approval,
3 If others can graze livestock on this parcel during winter dependent upon the community authority's approval,
4 If others can graze livestock on this parcel during winter dependent upon the government's approval,
5 If others can graze livestock on this parcel during winter dependent upon the household heads approval,
6 If the household does not know whether others can graze on their parcel during winter.

LRFENCE = 0 If the land holder cannot exclude others by fencing,
1 If the land holder can exclude others by fencing off his/her parcel without authorization,
2 If the land holder can exclude others by fencing dependent upon the chief's approval,
3 If the land holder can exclude others by fencing dependent upon the community authority's approval,
4 If the land holder can exclude others by fencing dependent upon the government's approval,
5 If the land holder can exclude others by fencing dependent upon the household head's approval,

		6 If the land holder does not know whether he/she can exclude others by fencing off the parcel.
LANDVALU	=	Value of the parcel of land (Rands/hectare)
TYPE	=	1 Denotes all government land reform projects, 2 Denotes all Cash or Inheritance transactions, 3 Denotes all mortgage bond transactions.
PRIVATE	=	0 Denotes all government land reform projects, 1 Denotes all private transactions (Cash, Inheritance and mortgage loans)
HHLDSIZE	=	Household size (number of members living on parcel).
DEPENDP	=	Proportion of dependents in the family.
EDTENP	=	Proportion of matriculants within the family.
LIQUID	=	Liquidity of the household
LGLIQUID	=	Natural log of the liquidity
ASSA	=	Assurance
ASSB	=	Assurance
ASSC	=	Assurance
ASSD	=	Assurance
ASSURE	=	Assurance of tenure variable
BREADTH	=	Breadth of tenure variable
TENMAX	=	Tenure security variable (Assurance and Breadth)
CROP01	=	
DURABLES	=	Number of durable goods owned by the household measured by the number of TV's and refrigerators.

AEVISIT	=	Number of visits per month made by an agricultural extension officer.
AGRICRED	=	Dichotomous dependent variable: 0 = No agricultural borrowing, 1 = Agricultural borrowing.
PROJECT	=	Project locations: 1 = Isibonelo Community (Winterton), 2 = Amaswazi Community (Drakensberg), 3 = Ingome Community (Greytown), 4 = Impumelelo Community (Muden), 5 = Cash and inheritance cases, 6 = Mortgage loan financed cases (Ithala Bank).
AGCRED	=	Value of the agricultural loan (Rands).
GAPRIV	=	0 = Denotes government land reform projects, 1 = Denotes private transactions.
Zi	=	Denotes Zi (see equation)
PROB	=	Probability that household will borrow for agricultural purposes.

HHID	YEAR	REGNOW	REGOWN	BOUNDARY	HLRTREES	HLRBUILD	HLRBEQ
101	1997	1	2	.	3	3	3
102	1997	1	2	.	1	1	1
103	1997	1	2	.	1	1	3
104	1997	1	2	.	1	1	1
105	1997	1	2	.	.	.	.
106	1997	1	2	.	6	6	6
107	1997	1	2	.	1	1	1
108	1997	1	2	.	1	1	1
109	1997	2	.	1	1	1	1
110	1997	2	.	1	1	1	1
111	1997	3	3	1	6	3	6
112	1997	1	2	.	1	1	6
113	1997	3	.	1	.	.	.
114	1997	1	2	.	.	.	.
115	1997	2	2	.	1	1	1
116	1997	1	2	.	6	1	1
117	1997	3	2	.	.	.	.
118	1997	3	.	.	1	1	1
119	1997	3	3	1	1	1	1
120	1997	1	2	.	1	1	1
121	1997	3	2	.	1	1	1
201	1997	1	2	.	1	1	1
202	1998	1	2	.	6	0	1
203	1997	1	2	.	1	1	1
204	1996	3	2	.	1	1	0
205	1998	1	1	.	0	0	1
206	-1	1	2	.	1	0	1
207	-1	1	2	.	1	1	1
208	1998	1	2	.	6	0	1
209	1998	1	2	.	1	6	1
210	-1	3	3	1	1	1	1
211	-1	3	2	.	1	1	1
212	1998	1	2	.	1	1	1
213	1998	1	2	.	1	1	1
214	1998	1	2	.	1	0	1
215	1998	1	1	.	1	0	1
216	1997	1	2	.	1	1	1
217	1998	1	2	.	1	1	1
218	1997	1	2	.	1	0	1
219	1998	1	2	.	1	1	1
220	1997	1	2	.	1	0	1
300	1997	1	1	.	3	3	0
301	1998	3	.	1	0	3	0

HLRLEASE	HLRSELL	OLRGRAZE	LRFENCE	LANDVALU	TYPE	PRIVATE	HHLDSIZE
3	0	0	1	1987.89	1	0	.
0	0	0	1	1987.89	1	0	6
3	0	0	1	1987.89	1	0	6
0	0	0	1	1987.89	1	0	10
.	.	.	.	1987.89	1	0	7
0	0	2	1	1987.89	1	0	7
3	3	1	1	1987.89	1	0	8
3	3	2	1	1987.89	1	0	9
0	1	2	1	1987.89	1	0	5
3	3	2	1	1987.89	1	0	9
3	6	6	1	1987.89	1	0	6
3	3	0	1	1987.89	1	0	4
.	.	.	.	1987.89	1	0	6
.	.	.	.	1987.89	1	0	3
3	3	1	1	1987.89	1	0	7
3	3	0	3	1987.89	1	0	9
.	.	.	.	1987.89	1	0	5
0	0	2	1	1987.89	1	0	6
0	3	0	1	1987.89	1	0	4
3	0	2	1	1987.89	1	0	3
0	0	2	1	1987.89	1	0	5
0	0	1	1	1935.93	1	0	1
1	0	0	1	1935.93	1	0	11
0	0	6	1	1935.93	1	0	1
0	.	0	1	1935.93	1	0	7
6	0	0	1	1935.93	1	0	6
6	0	0	1	1935.93	1	0	6
0	0	1	1	1935.93	1	0	3
2	0	6	1	1935.93	1	0	4
0	0	0	1	1935.93	1	0	7
0	0	0	1	1935.93	1	0	2
0	0	0	1	1935.93	1	0	6
0	0	0	1	1935.93	1	0	8
0	0	0	1	1935.93	1	0	3
0	0	0	1	1935.93	1	0	3
6	0	0	1	1935.93	1	0	3
0	0	0	1	1935.93	1	0	11
0	0	0	1	1935.93	1	0	10
2	2	0	1	1935.93	1	0	11
0	0	0	1	1935.93	1	0	9
1	1	0	1	1935.93	1	0	1
0	0	0	3	1315.24	1	0	.
0	0	0	0	1315.24	1	0	6

DEPENDP	EDTENP	LIQUID	LGLIQUID	ASSA	ASSB	ASSC	ASSD	ASSURE
.	.	2000	3.3	1	0	0	1	2
0.83	0	3850	3.59	1	0	0	1	2
0.67	0	12000	4.08	1	0	0	1	2
0.4	0	144050	5.16	1	0	0	1	2
0.43	0	9000	3.95	1	0	0	1	2
0.71	0	13200	4.12	1	0	0	1	2
0.5	0	22968.48	4.36	1	0	0	1	2
0.56	0	8280	3.92	1	0	0	1	2
0.4	0	22834.32	4.36	1	0	0	1	2
0.56	0	7200	3.86	1	0	0	1	2
0.17	0.33	28710.6	4.46	1	0	0	1	2
0.5	0	11484.24	4.06	1	0	0	1	2
0.83	0.17	18000	4.26	1	0	0	1	2
1	0	16823.88	4.23	1	0	0	1	2
0.57	0	8400	3.92	0	0	0	1	1
0.44	0	17226.36	4.24	1	0	0	1	2
0.6	0	4800	3.68	0	0	0	1	1
0.5	0	13680	4.14	0	0	0	1	1
0.5	0	6060	3.78	1	0	0	1	2
0.33	0	3480	3.54	1	0	0	1	2
0.4	.	660	2.82	0	0	0	1	1
0	1	2400	3.38	1	0	0	1	2
0.27	0.09	17226.36	4.24	1	0	0	1	2
0	1	6000	3.78	1	0	0	1	2
0.57	0	150	2.18	0	0	1	1	2
0.67	0	2400	3.38	1	1	0	1	3
0.67	0	11040	4.04	1	0	0	1	2
0	0.33	2640	3.42	1	0	0	1	2
0.5	0.25	10320	4.01	1	0	0	1	2
0.43	0.29	2400	3.38	1	0	0	1	2
1	0	12000	4.08	1	0	0	1	2
0.83	0	8542.12	3.93	0	0	0	1	1
0.75	0	12000	4.08	1	0	0	1	2
0.33	0	2400	3.38	1	0	0	1	2
0.33	0.33	200	2.3	1	0	0	1	2
0.33	0	5742.12	3.76	1	1	0	1	3
0.82	0	14400	4.16	1	0	0	1	2
0.6	0.2	14400	4.16	1	0	0	1	2
0.73	0.09	17800	4.25	1	0	0	1	2
0.78	0	1500	3.18	1	0	0	1	2
0	1	0	0	1	0	0	1	2
.	.	0	0	1	1	0	1	3
0.67	0	12600	4.1	1	0	0	1	2

BREADTH	TENMAX	CROP01	WEALTH	AEVISIT	AGRICRED	PROJECT	AGCRED
4	8	0	0	0	0	1	0
5	10	1	1	0	0	1	0
4	8	0	0	0	0	1	0
5	10	1	0	0	0	1	0
1	2	1	0	0	0	1	0
4	8	1	0	0	0	1	0
6	12	1	2	0	0	1	0
6	12	1	0	0	0	1	0
7	14	0	0	0	0	1	0
6	12	0	1	0	1	1	12000
6	12	0	0	0	0	1	0
6	12	1	0	0	0	1	0
1	2	1	1	1	0	1	0
1	2	0	0	0	0	1	0
6	6	0	0	0	0	1	0
6	12	0	0	0	0	1	0
1	1	1	1	0	0	1	0
5	5	1	0	0	0	1	0
6	12	1	0	0	0	1	0
5	10	1	0	0	0	1	0
5	5	1	0	0	0	1	0
5	10	1	0	0	0	2	0
5	10	1	0	0	0	2	0
5	10	0	0	0	0	2	0
3	6	0	0	0	0	2	0
5	15	1	0	0	0	2	0
5	10	1	0	0	0	2	0
5	10	1	0	0	0	2	0
5	10	0	0	0	0	2	0
5	10	1	0	0	0	2	0
5	10	0	0	0	0	2	0
5	5	1	1	0	0	2	0
5	10	0	0	0	0	2	0
5	10	0	0	0	0	2	0
5	10	0	0	0	1	2	800
5	15	0	0	0	0	2	0
5	10	1	0	0	0	2	0
5	10	1	0	0	0	2	0
6	12	0	0	0	0	2	0
5	10	1	0	3	0	2	0
7	14	0	0	0	0	2	0
2	6	0	0	.	1	3	4065
1	2	0	1	0	0	3	0

GAPRIV	Zi	PROB
0	.	.
0	-4.1	0.02
0	-5.34	0
0	-4.3	0.01
0	-6.57	0
0	-5.32	0
0	-2.1	0.11
0	-4.67	0.01
0	-4.02	0.02
0	-3.55	0.03
0	-2.99	0.05
0	-4.58	0.01
0	-4.56	0.01
0	-6.41	0
0	-5.82	0
0	-4.48	0.01
0	-5.78	0
0	-5.88	0
0	-4.75	0.01
0	-5.28	0.01
0	.	.
0	-1.33	0.21
0	-4.49	0.01
0	-1.09	0.25
0	-6.87	0
0	-4.42	0.01
0	-4.98	0.01
0	-4	0.02
0	-3.98	0.02
0	-4.22	0.01
0	-4.96	0.01
0	-4.85	0.01
0	-4.96	0.01
0	-5.38	0
0	-4.68	0.01
0	-4.19	0.01
0	-4.91	0.01
0	-4.1	0.02
0	-4.1	0.02
0	-5.5	0
0	-2.61	0.07
0	.	.
0	-5.33	0

HHID	YEAR	REGNOW	REGOWN	BOUNDARY	HLRTREES	HLRBUILD	HLRBEQ
302	1998	3	.	1	0	1	0
303	1998	3	.	1	0	1	0
304	1998	3	3	1	0	1	0
305	1998	2	.	1	0	1	0
306	1998	3	.	1	0	2	0
307	1998	1	3	1	0	1	0
308	1998	3	.	1	0	1	0
309	1977	1	3	.	1	1	0
310	1998	3	3	1	0	1	0
311	1998	3	3	3	0	1	0
312	1998	1	3	.	0	1	0
313	1998	3	3	1	0	1	0
314	1998	1	2	.	0	1	0
315	1998	3	.	1	0	1	0
316	1980	1	1	.	0	1	0
317	1997	1	1	.	0	1	0
318	1998	1	3	3	0	1	0
319	1998	1	2	.	1	1	0
320	1998	2	.	1	0	1	0
321	1998	2	.	1	0	1	0
322	1968	3	3	1	0	0	0
323	1998	3	.	1	0	1	0
324	1962	3	3	1	0	1	0
325	1998	1	2	.	0	3	0
326	1998	1	3	.	0	1	0
327	1967	3	3	1	0	1	0
328	1998	1	2	.	0	1	0
329	1997	3	.	2	0	5	0
330	1998	3	.	1	0	1	0
331	1998	1	2	.	0	1	0
332	1998	2	.	1	0	1	0
333	1999	1	2	.	0	1	0
334	1961	3	.	1	1	1	0
335	1998	3	3	1	0	1	0
336	1935	3	3	2	0	1	0
337	1997	3	3	2	0	1	0
338	1996	1	1	.	1	3	0
339	1998	2	.	1	0	1	0
340	1958	3	3	1	0	1	0
341	1996	1	3	.	0	3	0
342	1998	3	3	.	0	3	0
343	1996	1	1	.	0	3	0
344	1995	1	1	.	0	3	0

HLRLEASE	HLRSELL	OLRGRAZE	LRFENCE	LANDVALU	TYPE	PRIVATE	HHLDSIZE
0	0	0	0	1315.24	1	0	9
0	0	0	0	1315.24	1	0	5
0	0	0	0	1315.24	1	0	9
0	0	0	0	1315.24	1	0	3
0	0	0	0	1315.24	1	0	3
0	0	0	0	1315.24	1	0	4
0	0	0	1	1315.24	1	0	1
0	0	0	0	1315.24	1	0	6
0	0	0	0	1315.24	1	0	5
0	0	0	0	1315.24	1	0	3
0	0	0	1	1315.24	1	0	6
0	0	0	0	1315.24	1	0	2
0	0	0	0	1315.24	1	0	10
0	0	0	0	1315.24	1	0	9
0	0	0	0	1315.24	1	0	15
0	0	0	3	1315.24	1	0	3
0	0	0	0	1315.24	1	0	7
0	0	0	0	1315.24	1	0	8
0	0	0	0	1315.24	1	0	6
0	0	0	0	1315.24	1	0	5
0	0	0	1	1315.24	1	0	4
0	0	0	0	1315.24	1	0	9
0	0	0	1	1315.24	1	0	9
0	0	0	1	1315.24	1	0	4
0	0	0	0	1315.24	1	0	7
0	0	0	0	1315.24	1	0	10
0	0	0	1	1315.24	1	0	8
0	0	0	0	1315.24	1	0	8
0	0	0	0	1315.24	1	0	7
0	0	0	0	1315.24	1	0	8
0	0	0	1	1315.24	1	0	7
0	0	0	1	1315.24	1	0	12
0	0	0	1	1315.24	1	0	6
0	0	0	0	1315.24	1	0	5
0	0	0	1	1315.24	1	0	8
0	0	0	1	1315.24	1	0	3
0	0	0	3	1315.24	1	0	3
0	0	0	0	1315.24	1	0	9
0	0	0	1	1315.24	1	0	7
0	0	0	1	1315.24	1	0	6
0	0	0	1	1315.24	1	0	5
0	0	0	1	1315.24	1	0	5
0	0	0	3	1315.24	1	0	7

DEPENDP	EDTENP	LIQUID	LGLIQUID	ASSA	ASSB	ASSC	ASSD	ASSURE
0.67	0	17092.2	4.23	1	0	0	1	2
1	0	4200	3.62	1	0	0	1	2
0.78	0	2400	3.38	1	0	0	1	2
0.67	0	6000	3.78	1	0	0	1	2
0.67	0	10080	4	1	0	0	1	2
0.5	0.25	2400	3.38	1	0	0	1	2
0	0	720	2.86	1	0	0	1	2
0.67	0	200	2.3	1	0	1	1	3
0.6	0	7200	3.86	1	0	0	1	2
0.33	0	0	0	0	0	0	1	1
0.5	0	2400	3.38	1	0	0	1	2
0	0	0	0	1	0	0	1	2
0.7	0.1	10440	4.02	1	0	0	1	2
0.67	0	4800	3.68	1	0	0	1	2
0.67	0	13050	4.12	1	1	1	1	4
0.67	0.33	10800	4.03	1	1	0	1	3
0.71	0	5400	3.73	1	0	0	1	2
0.63	0	5742.12	3.76	1	0	0	1	2
0.67	0	3600	3.56	1	0	0	1	2
0.2	0	17092.2	4.23	1	0	0	1	2
0.5	0	15600	4.19	1	0	1	1	3
0.44	0	13320	4.12	1	0	0	1	2
0.67	0	2400	3.38	1	0	1	1	3
0.75	0	6000	3.78	1	0	0	1	2
0.14	0	8400	3.92	1	0	0	1	2
0.8	0	2400	3.38	1	0	1	1	3
0.25	0	888	2.95	1	0	0	1	2
0.38	0	3600	3.56	0	0	0	1	1
0.71	0	7800	3.89	1	0	0	1	2
0.38	0.5	7800	3.89	1	0	0	1	2
0.86	0	6000	3.78	1	0	0	1	2
0.58	0.08	22440	4.35	1	0	0	1	2
0	0	6354	3.8	1	0	1	1	3
0.8	0	6000	3.78	1	0	0	1	2
0.75	0	1608	3.21	0	0	1	1	2
0.67	0	2400	3.38	0	0	0	1	1
0.33	0	2400	3.38	1	1	1	1	4
0.56	0.11	200	2.3	1	0	0	1	2
0.14	0	3600	3.56	1	0	1	1	3
0.67	0	7200	3.86	1	0	1	1	3
0.2	0	3600	3.56	0	0	0	1	1
0.6	0	6500	3.81	1	1	1	1	4
0.14	0	2400	3.38	1	1	1	1	4

BREADTH	TENMAX	CROP01	WEALTH	AEVISIT	AGRICRED	PROJECT	AGCRED
1	2	0	0	0	0	3	0
1	2	0	0	0	0	3	0
1	2	0	0	0	0	3	0
1	2	0	1	0	0	3	0
1	2	0	0	0	0	3	0
1	2	0	1	0	0	3	0
3	6	1	0	0	0	3	0
1	3	0	5	0	0	3	0
1	2	0	0	0	0	3	0
1	1	0	1	0	0	3	0
3	6	0	0	0	0	3	0
1	2	0	0	0	0	3	0
1	2	0	0	0	0	3	0
1	2	0	0	0	0	3	0
1	4	1	1	0	0	3	0
2	6	0	1	0	0	3	0
1	2	0	0	0	0	3	0
1	2	0	1	0	0	3	0
1	2	0	0	0	0	3	0
1	2	0	0	0	0	3	0
3	9	1	0	0	0	3	0
1	2	1	0	0	0	3	0
3	9	1	0	0	0	3	0
3	6	0	0	0	0	3	0
1	2	0	0	0	0	3	0
1	3	1	0	0	0	3	0
3	6	0	0	0	0	3	0
1	1	0	0	0	0	3	0
1	2	0	0	0	0	3	0
1	2	0	0	0	0	3	0
3	6	0	0	0	0	3	0
3	6	0	2	0	0	3	0
3	9	1	0	0	0	3	0
1	2	0	0	0	0	3	0
3	6	0	0	0	0	3	0
3	3	0	0	0	0	3	0
2	8	0	1	0	0	3	0
1	2	0	0	0	0	3	0
3	9	0	0	0	0	3	0
3	9	1	0	0	0	3	0
3	3	1	0	0	0	3	0
3	12	0	0	0	0	3	0
2	8	0	0	0	0	3	0

GAPRIV	Zi	PROB
0	-6.4	0
0	-6.77	0
0	-6.92	0
0	-5.52	0
0	-6.54	0
0	-4.75	0.01
0	-6.46	0
0	-1.61	0.17
0	-6.63	0
0	-8	0
0	-6.15	0
0	-8.96	0
0	-6.13	0
0	-6.74	0
0	-4.94	0.01
0	-3.25	0.04
0	-6.7	0
0	-5.54	0
0	-6.81	0
0	-6.4	0
0	-5.08	0.01
0	-6.47	0
0	-5.57	0
0	-5.91	0
0	-6.59	0
0	-6.72	0
0	-6.41	0
0	-7	0
0	-6.61	0
0	-4.58	0.01
0	-5.91	0
0	-2.92	0.05
0	-5.32	0
0	-6.68	0
0	-6.25	0
0	-6.72	0
0	-4.61	0.01
0	-7.12	0
0	-5.46	0
0	-5.28	0.01
0	-6.62	0
0	-4.73	0.01
0	-5.76	0

HHID	YEAR	REGNOW	REGOWN	BOUNDARY	HLRTREES	HLRBUILD	HLRBEQ
345	-1	2	.	1	0	1	0
346	1998	1	1	.	0	1	0
347	1997	3	3	1	0	3	0
348	1998	1	2	.	1	1	0
349	1997	1	2	.	0	3	0
350	1998	3	3	3	0	1	0
401	-1	1	2	.	1	1	1
402	1929	1	2	.	3	1	0
403	1940	1	1	.	1	1	0
404	1966	1	2	.	3	5	5
405	1984	3	3	1	0	0	3
406	-1	1	3	3	1	1	1
407	1943	1	2	.	1	1	0
408	1979	1	2	.	1	1	1
409	1977	1	2	.	1	1	3
410	1993	1	2	.	1	1	1
411	-1	3	2	3	1	1	0
412	1998	2	.	1	1	1	1
413	1926	1	3	.	1	1	0
414	1980	1	1	.	0	1	1
415	1987	1	2	.	0	1	1
416	1949	1	2	.	1	1	1
417	1997	1	2	.	1	1	0
700	1985	1	1	.	1	1	1
701	1958	1	1	.	1	1	1
702	1997	1	1	.	1	1	1
703	1997	1	1	.	1	1	1
704	1997	1	1	.	1	1	1
705	1997	1	1	.	1	1	1
706	1997	1	1	.	1	1	1
707	1997	1	1	.	1	1	1
708	1997	1	1	.	1	1	1
709	1997	1	1	.	1	1	1
710	1997	1	1	.	1	1	1
711	1996	3	2	3	0	1	0
712	1970	1	2	1	1	1	0
713	1995	3	.	1	0	1	0
714	1998	3	.	3	0	1	0
715	1997	1	1	.	1	1	1
716	1997	1	1	.	1	1	1
717	1997	1	1	.	1	1	1
718	1997	1	1	.	1	1	1
719	1997	1	1	.	1	1	1

HLRLEASE	HLRSELL	OLRGRAZE	LRFENCE	LANDVALU	TYPE	PRIVATE	HHLDSIZE
0	0	0	0	1315.24	1	0	10
0	0	0	0	1315.24	1	0	8
0	0	0	6	1315.24	1	0	3
0	0	0	0	1315.24	1	0	6
0	0	0	0	1315.24	1	0	8
0	0	0	0	1315.24	1	0	9
1	3	0	1	300.67	1	0	11
0	6	0	0	300.67	1	0	5
0	6	0	1	300.67	1	0	4
0	3	0	1	300.67	1	0	2
0	0	0	0	300.67	1	0	7
0	1	0	1	300.67	1	0	6
0	3	0	1	300.67	1	0	7
1	1	0	1	300.67	1	0	11
3	3	0	1	300.67	1	0	10
3	0	1	1	300.67	1	0	4
0	0	0	1	300.67	1	0	17
1	0	0	1	300.67	1	0	4
0	1	0	1	300.67	1	0	5
0	0	0	1	300.67	1	0	17
0	0	0	1	300.67	1	0	8
1	1	0	1	300.67	1	0	4
0	0	0	1	300.67	1	0	4
1	1	0	1	.	2	1	1
1	1	0	1	.	2	1	6
1	1	0	1	4760.97	3	1	7
0	0	0	1	8153.39	3	1	7
1	1	0	1	10248.05	3	1	7
1	1	0	1	12498.86	3	1	7
1	1	0	1	6226.44	3	1	8
1	1	0	1	9970.15	3	1	18
1	1	0	1	9470.82	3	1	5
1	1	0	1	11954.57	2	1	6
1	1	0	1	10419.75	2	1	2
0	0	1	0	164.42	2	1	7
0	0	1	0	164.42	2	1	5
0	0	1	0	164.42	2	1	12
0	0	1	0	164.42	2	1	8
1	1	0	1	10699	2	1	3
1	1	0	1	.	2	1	3
1	1	0	1	9064.22	3	1	3
1	1	0	1	546.62	2	1	4
1	1	0	1	6612.51	2	1	2

DEPENDP	EDTENP	LIQUID	LGLIQUID	ASSA	ASSB	ASSC	ASSD	ASSURE
0.6	0.1	5400	3.73	1	0	0	1	2
0.75	0.13	0	0	1	1	0	1	3
0.67	0	4800	3.68	1	0	0	1	2
0.5	0.17	6500	3.81	1	0	0	1	2
0.5	0.13	6620	3.82	1	0	0	1	2
0.44	0	3120	3.49	0	0	0	1	1
0.45	0.27	19626.36	4.29	1	0	0	1	2
0.6	0	6000	3.78	1	0	1	1	3
0.25	0	10800	4.03	1	1	1	1	4
0	0	4200	3.62	1	0	1	1	3
0.43	0	4900	3.69	1	0	1	1	3
0.33	0	8160	3.91	1	0	0	1	2
0.43	0	7200	3.86	1	0	1	1	3
0.64	0.09	22834.32	4.36	1	0	1	1	3
0.7	0	15260	4.18	1	0	1	1	3
0.25	0	11410.08	4.06	1	0	1	1	3
0.59	0	13200	4.12	0	0	0	1	1
0.5	0	2400	3.38	1	0	0	1	2
0.8	0	12000	4.08	1	0	1	1	3
0.53	0	19200	4.28	1	1	1	1	4
0.5	0	6000	3.78	1	0	1	1	3
0.25	0	3000	3.48	1	0	1	1	3
0.5	0	2400	3.38	1	0	0	1	2
1	0	.	.	1	1	1	1	4
0.67	0.17	400	2.6	1	1	1	1	4
0.14	0.43	1403456	6.15	1	1	0	1	3
0.57	0.43	1538416	6.19	1	1	0	1	3
0.71	0.14	986000	5.99	1	1	0	1	3
0.71	0.29	840937.5	5.92	1	1	0	1	3
0.75	0.13	179600	5.25	1	1	0	1	3
0.83	0	.	.	1	1	0	1	3
0.6	0.4	90000	4.95	1	1	0	1	3
0.67	0.17	42000	4.62	1	1	0	1	3
0	0	64000	4.81	1	1	0	1	3
0.14	0	4800	3.68	0	0	1	1	2
0.4	0	14400	4.16	1	0	1	1	3
0.5	0	12000	4.08	1	0	1	1	3
0.25	0	12000	4.08	0	0	0	1	1
0.33	0	20400	4.31	1	1	0	1	3
0.33	0	8500	3.93	1	1	0	1	3
0.33	0	1079917	6.03	1	1	0	1	3
0.5	0	14650	4.17	1	1	0	1	3
0	0	33742.88	4.53	1	1	0	1	3

BREADTH	TENMAX	CROP01	WEALTH	AEVISIT	AGRICRED	PROJECT	AGCRED
1	2	0	2	0	0	3	0
1	3	0	0	0	0	3	0
2	4	0	0	0	0	3	0
1	2	0	2	0	0	3	0
1	2	0	0	0	0	3	0
1	1	1	1	0	0	3	0
6	12	0	0	0	0	4	0
6	18	0	0	0	0	4	0
6	24	0	0	0	0	4	0
6	18	0	0	0	0	4	0
4	12	0	0	0	0	4	0
7	14	0	0	0	0	4	0
6	18	0	0	0	0	4	0
7	21	0	0	0	0	4	0
6	18	1	0	0	0	4	0
5	15	0	0	0	0	4	0
3	3	0	0	0	0	4	0
5	10	0	1	0	0	4	0
7	21	0	0	0	0	4	0
5	20	1	0	0	0	4	0
5	15	0	0	0	0	4	0
7	21	0	0	0	0	4	0
3	6	0	0	0	0	4	0
7	28	1	2	0	1	5	70000
7	28	1	2	0	1	5	1000
7	21	1	1	1	1	6	800000
5	15	1	2	-1	1	6	1260000
7	21	1	2	1	1	6	1200000
7	21	1	6	-1	1	6	1200000
7	21	1	2	1	1	6	974872
7	21	1	5	1	1	6	1200000
7	21	1	3	10	1	6	125000
7	21	1	1	0	0	5	0
7	21	0	2	0	0	5	0
1	2	0	1	0	0	5	0
1	3	0	0	0	0	5	0
1	3	0	0	0	0	5	0
1	1	0	0	0	0	5	0
7	21	0	2	0	0	5	0
7	21	0	0	0	0	5	0
7	21	1	2	0	1	6	1141414
7	21	0	0	0	0	5	0
7	21	1	2	0	0	5	0

GAPRIV	Zi	PROB
0	-3.99	0.02
0	-8.26	0
0	-6.35	0
0	-3.68	0.02
0	-6.14	0
0	-5.89	0
0	-3.34	0.03
0	-3.6	0.03
0	-2.29	0.09
0	-3.69	0.02
0	-4.81	0.01
0	-4.29	0.01
0	-3.55	0.03
0	-2.3	0.09
0	-3.35	0.03
0	-4.01	0.02
0	-6.28	0
0	-4.23	0.01
0	-2.84	0.06
0	-2.91	0.05
0	-4.18	0.02
0	-3.2	0.04
0	-6.15	0
1	.	.
1	0.59	0.64
1	1.3	0.79
1	1.32	0.79
1	1.2	0.77
1	6.35	1
1	0.68	0.66
1	.	.
1	2.76	0.94
1	-0.68	0.34
1	-0.1	0.48
1	-5.58	0
1	-6.25	0
1	-6.3	0
1	-6.69	0
1	-0.4	0.4
1	-2.93	0.05
1	0.65	0.66
1	-2.79	0.06
1	-0.26	0.43