

AN ECONOMIC ANALYSIS OF THE INSTITUTIONS
RELATED TO THE LAND RENTAL MARKET OF
RURAL KWAZULU-NATAL

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DECLARATION

I hereby declare that the work presented in this thesis is original. Where material from different sources has been used, due acknowledgement is made. This thesis has not been submitted to any other university for the purpose of award of a degree.

Anita Kumar

ABSTRACT

Previous studies by Thomson (1996) and Crookes (2002) in land rental markets of rural KwaZulu-Natal were based on the premise that rental markets brought about efficiency and equity gains. Indeed these gains were proven by econometric analyses in both studies. Poor households that lacked the labour, time and other resources to farm land prior to the introduction of the rental market, tended to leave their arable land idle. In participating in rental transactions, land transferred from these poor households to households with the resources and the willingness to farm; and rental income was earned by the poor households.

The current 2003/4 survey sought to evaluate the gains in two new areas, Mhlungwini in the Estcourt District and Duduza in the Bergville District, not covered in previous studies. Institutional interventions, related to the land rental market, in Mhlungwini and Duduza, had started in 2000 and 1993 respectively. Equity and efficiency gains were again proven as Lyne (2004) reports.

While Chapter 2 provides an in-depth review of literature related to the theory of economic institutions, Chapter 3 applies this knowledge to Thomson's (1996) pilot project on institutional reform. This project, in terms of its action research that bore the ex ante transaction costs of willing participants, set in motion a process of institutional change leading to the development of the land rental market. The introduction of a formal contract, approved by the tribal authorities, served to give credence to rental transactions. In addition, institutional changes were made to reduce the likelihood of crop damage by

stray cattle on arable land, in order to encourage willingness of households to lease in land. Recommendations were made by Thomson (1996) to further increase the exclusivity of arable land property rights.

Options were evaluated by the author for institutional reform of communal grazing resources. This is to prevent degradation of grazing land caused by overstocking. Recommendations were made to promote sustainable use of the land.

Chapter 4, apart from briefly analyzing the current survey results, provides two comparative studies of institutional reform, the first related to Australian water resources and the second related to land registration experiences in Africa. The last section of the Chapter evaluates a proposal for introduction of formal financial services to rural farmers.

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Chapter 1

INTRODUCTION

1.1 Background

Rural KwaZulu-Natal is a region affected by population pressures and poverty. Thomson (1996) found that arable land in the region was being left idle and theorized that a land rental market would enable transfers of land and thus improve allocative efficiency. A rental market was expected to transfer land from those unable or unwilling to farm it to those that were able and willing to farm. It must be noted that, as Crookes and Lyne (2003:579) say, land sale markets, as opposed to rental markets, would lead to the creation of a landless class. Intuitively, one can see that with uncertain property rights pertaining to arable land, which is held under customary tenure in rural areas, the introduction of a land sale market could lead to distress sales as households try to obtain a price for land allocated to them. A further disadvantage could be that outsiders would buy this land, thus denying farming opportunities to the rural poor. Thomson's study, which started in 1993, was commissioned by the University of Natal and financed by the Development Bank of Southern Africa to develop a rental market for cropland in two communal sub-wards of the Bergville District, Maphophameni in Amazizi and Moyeni in Amangwane. The map at the end of this Chapter shows the location of the Bergville District.

This pilot project on stimulating a land rental market started with action research by Thomson to introduce institutional changes. Thomson got the tribal authorities to openly support the land rental market in mass meetings attended by the community. Participatory, voluntary discussions were then organized by an employed extension officer to reveal the advantages of land rental to potential participants. The names of willing lessors and lessees were recorded after each meeting. If parties agreed to sign rental contracts, they were transported to the tribal court.

The two major risks, related to the rental contract, identified in rental transactions, were firstly, risk of loss of land by the lessor to the lessee in case of unfair possession of the land and secondly, risk of loss of land by the lessee to the lessor upon investments having been made on the lessor's soil and/or before harvesting of the crop planted by the lessee. Apart from these contract-defection risks, lessees carried the risk of crop damage by stray cattle belonging to cattle farmers. While the introduction of lease agreements that would be filed by the tribal secretary lowered contractual risks, changes in grazing institutions were required to lower the risk of crop damage. A rules committee comprising mostly crop farmers and cattle farmers was elected and rules were introduced concerning a planting date after which cattle farmers would have to remove their cattle from arable land; and fines and compensation to be paid upon damage of crops after this planting date. Thomson (1996) recommends that crop farmers be given the further right to impound livestock.

1.2 Objectives

This thesis analyses Thomson's (1996) work in the context of the theory on the Economics of Institutions. Thomson's approach to bringing about institutional change with respect to a rental market in arable land is evaluated.

The institutions surrounding the use of communal grazing land form an interesting side issue to the primary analysis of institutions related to arable land. Since the use of communal grazing seems to be a regime of open access, various options for institutional reform are considered, to make communal grazing sustainable in the long run. This is because, with increasing population pressures, open access, with its tendency to encourage overstocking could lead to rapid degradation of the resource. The institutions that would be suitable to use of this resource are different from those that have been deemed suitable for use of arable land. This analysis thus offers the possibility of an interesting comparison of institutions appropriate for different types of natural resources. It will be interesting to see if the concept of a rental market would be of value to

communal grazing land. A further connection between institutions related to communal grazing and the arable land rental market is that in limiting investments in cattle, the grazing institutional reform proposed would reduce the likelihood of crop damage by stray cattle on arable land. Economic theory is brought to bear upon the analysis of communal grazing institutions in making proposals for reform.

The results of a follow-up study conducted by Crookes (2002), in Thomson's study areas, are discussed, in order to ascertain the impact over time of Thomson's initial institutional changes. The follow-up study will determine if benefits of the rental market have been sustained over time and will facilitate appropriate recommendations for the future.

The current 2003/4 survey was conducted in two new study areas, Mhlungwini in the Estcourt District and Duduza in the Bergville District. The results from this survey will indicate whether the rental market interventions can be successfully extended to other areas of rural KwaZulu-Natal. The map at the end of this Chapter shows the location of the Estcourt District and the Bergville District.

The first objective of the thesis is to provide an in-depth literature review of the theory on the Economics of Institutions that is deemed to be relevant to this study. The second broad objective, in summary, is to thoroughly discuss and evaluate the initial approach used by Thomson to reform institutions, and to consider the performance of the rental market, over time and between areas. The analysis of communal grazing institutions, which is treated as a side issue to the primary issue of institutions related to the arable land rental market, falls within the second objective. The third objective relates to two comparative studies of institutional reform, reform for Australian water resources and the introduction of land registration in African countries. Relevant lessons from these two reform experiences are extended to the rural KwaZulu-Natal land rental market. The fourth and final objective is to evaluate proposals for the introduction of formal financial services to communal farmers in South Africa. It must be noted that 'communal farmers' refers to farmers that live in rural areas under customary tenure.

1.3 Methodology

The literature review of the theory on the Economics of Institutions was based primarily on books available at the university libraries. All aspects of the literature were consulted in order to select and discuss those parts of the theory most interesting and relevant to the study. Thomson's (1996) study was then thoroughly analysed using this base of theory. All articles, pamphlets, theses or dissertations pertaining to previous work done on land rental market institutions of rural KwaZulu-Natal were researched in order to contribute to fulfilling the second objective described in Section 1.2 above.

Section 4.1.2 provides the methodology of the current 2003/4 survey and the data analysis, thereof. The econometric results from the data analysis, Lyne's (2004) report and the author's knowledge gained from the empirical research were used to discuss the important implications of the current survey.

Extensive research in the library yielded the information for the two comparative studies of institutional reform, reform for Australian water resources and the introduction of land registration in rural Africa. The important lessons from these studies were then extended to the KwaZulu-Natal land rental market, where applicable. Online research led to the discovery of proposals by the government to introduce formal financial services to communal farmers in South Africa. These proposals were studied and analysed in order to evaluate their appropriateness in the KwaZulu-Natal context.

The final concluding Chapter provides conclusions and recommendations related to the major sections in the thesis. Major learning points are discussed. The outlook for the future includes further research and interventions in various areas.

1.4 Structure of the thesis

Thomson's study, introduced in Section 1.1, is described in detail in Chapter 3. While Chapter 2 provides relevant theory on the Economics of Institutions, this theory is used to analyse and evaluate Thomson's study in the first section of Chapter 3. The second section of Chapter 3 describes the implications of a subsequent study by Crookes (2002), conducted in Thomson's study areas. The study, funded by the Lima Rural Development Foundation, sought to evaluate the impact over time of Thomson's institutional changes. It was found that the average number of transactions per lessee had increased from 1,17 in 1993/4 to 2,4 in 1999/2000, indicating the emergence of a farmer class. However, with the lack of the right to impound stray livestock, a large percentage of crop farmers still suffered from crop damage by stray cattle.

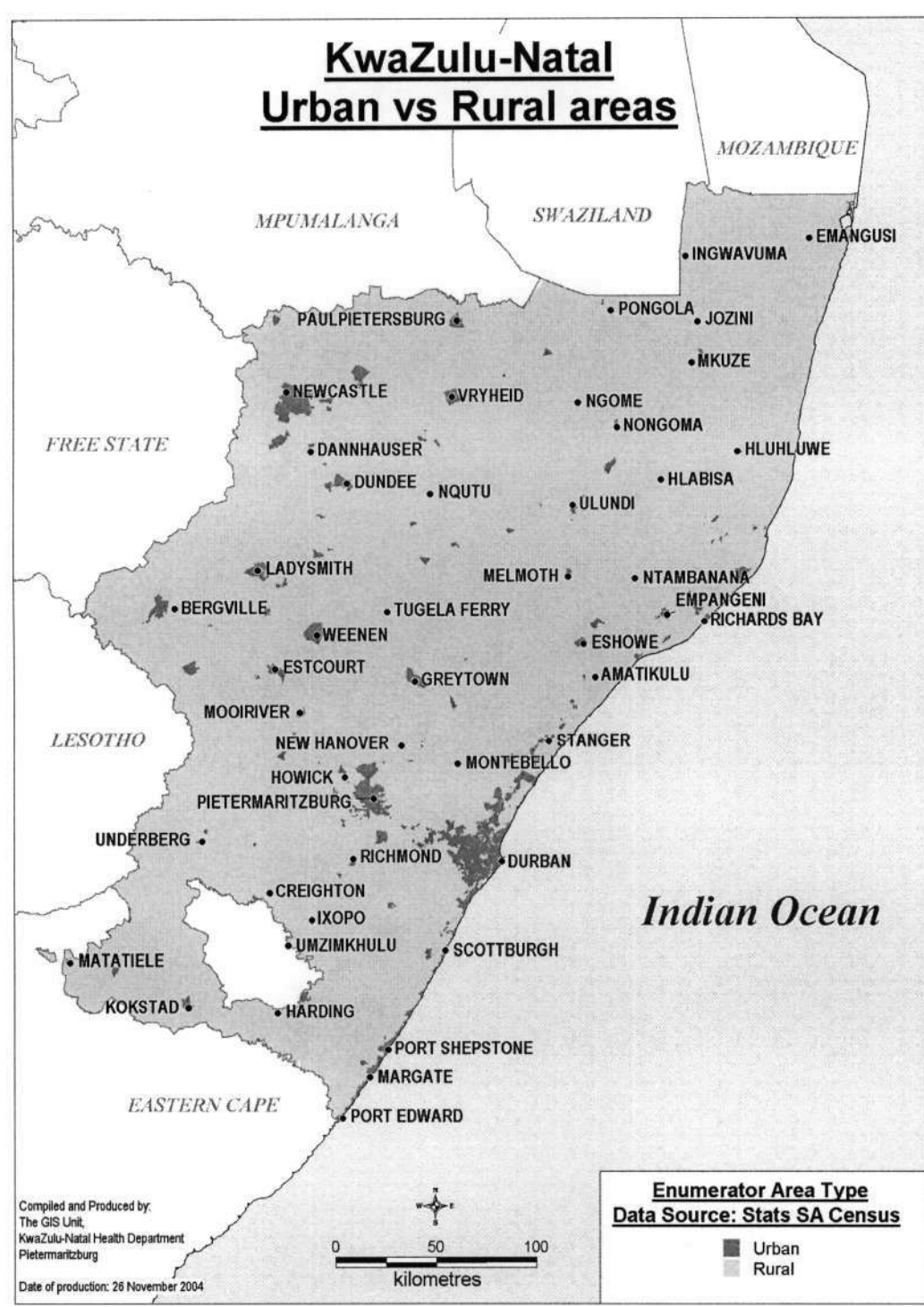
A good part of Chapter 3, namely Sections 3.1.7 and 3.1.8 is devoted to the analysis of institutions related to communal grazing land.

It may have been noticed that although this study involves the analysis of institutions, markets are highly endorsed to improve allocative efficiency. This is because this study is based on New Institutional Economics that acknowledges the approaches of Neoclassical Economics. Some of the main sections of Chapter 2 deal with a comparison of various property regimes; the factors necessary for the propagation of institutions; and the use of collective action to bring about institutional change.

The current 2003/4 study is analysed in Chapter 4. This study was funded by a USAID/South Africa grant to the Lima Rural Development Foundation. Professor M.C. Lyne at the University of KwaZulu-Natal's Agricultural Economics Department, in association with Lima, undertook the empirical research, with the assistance of the author and another student. Professor Lyne then prepared a report in May 2004, which drew on work done by himself, me and the other student. The two study areas chosen, Mhlungwini in the Estcourt District and Duduza in the Bergville District had been exposed to the land rental programme since 2000 and 1993 respectively. The aim of the study was to evaluate the impact of the institutional change.

Chapter 4 then goes on to relate the lessons learnt from institutional reform for Australian water resources to the KwaZulu-Natal land rental market. Challen's (2000) concept of quasi-option value, in institutional change for water resources, would be commended as a valuable concept to consider for any organization attempting institutional reform through collective action. The following section in Chapter 4 looks at land registration experiences in African countries as a reform aimed at increasing certainty and specification of property rights. The Chapter ends with a section on the analysis of credit and insurance institutions appropriate to rural KwaZulu-Natal farmers. This section is important for policy making given that proposals have been made by the Department of Agriculture to offer formal financial services to rural farmers, who have, so far, been served by informal institutions.

Map 1 (KwaZulu-Natal Department of Health, 2003)



Chapter 2

THEORY ON THE ECONOMICS OF INSTITUTIONS

2.1 Introduction

This Chapter provides a base of theory on the Economics of Institutions, in order to facilitate an informed analysis of previous work done on the land rental market of rural KwaZulu-Natal and of the current situation. The analysis will then be used to make recommendations for the future. Not all of the theory on the Economics of Institutions is covered but only that which is relevant to the issues of the study. It must be noted that this study is based on New Institutional Economics, which acknowledges the neoclassical approach and incorporates Transaction Cost Economics among various other sub-fields of Economics.

Some of the main issues in the study are the nature of property rights to arable land, which in turn influence willingness to lease out or lease in arable land; the enforcement of rental contracts in arable land; crop damage by stray cattle on arable land and the enforcement of the exclusive rights of the crop farmers in punishing the owners of the stray cattle; and the institutional structure appropriate for the use of communal grazing land.

The Chapter serves to explain several basic, but essential, concepts in the theory. Further, it discusses what is meant by institutional analysis, the ways in which an institution comes into being, institutional reform and the requirements for progressive institutional change. Institutional change is important to the study since the development of a rental market in arable land involves, and is, in itself, institutional change. Recommendations for an alternative institutional structure for communal grazing land would also, evidently, entail institutional change.

2.2 Property rights

A right is the existence of a social mechanism that protects the right holder's claim to a future benefit stream, by imposing duties upon others to respect that right (Bromley, 1992). It is evident that a right is only effective in so far as others are compelled to perform their duties.

To have property is to have control over a future benefit stream. For example, when one purchases land, they actually purchase the benefit stream (Bromley, 1991:15). In general, the State agrees to protect the rights of the property owner, not only by imposing duties on others with respect to the property but also by legally enforcing those duties. Legal enforcement generally means punitive action taken by the State towards the offender. Thus one can see the inextricable relationship between property rights on the one hand, and the law and its enforcement, on the other.

In rural KwaZulu-Natal, crops are damaged by stray cattle on arable land and in the case of the rental market, land could be unfairly possessed by the lessee (the party leasing in land). Legal precedents that punish the owners of stray cattle and the unfair possession of land are important in order to enforce property rights and thereby encourage rental market transactions.

2.3 Rules

The explanations of property rules and liability rules that follow are based on a discussion by Tietenberg (1992:65).

“Property rules specify the initial allocation of the entitlement” (Tietenberg, 1992:65). In applying property rules, the court (or other authority) places an injunction against violating a certain property right. In the case of two conflicting property rights, the court decides which right is pre-eminent. In the absence of a court decision the entitlement is naturally allocated to the party which can most easily seize it.

Liability rules are rules which award monetary damages, after the violation of a property right, to the injured party. The amount of the award corresponds to the amount of damage caused. The approach relies on a case-by-case determination based on the unique circumstances for each case. Early decisions create precedents for later ones. Expenses such as court time, lawyers' fees, etc. form part of transaction costs; transaction costs are discussed in Section 2.7. An alternative to this approach is the establishment of statutes and regulations.

It can be seen that property rules are necessary in KwaZulu-Natal to prevent cattle farmers from allowing their cattle to stray into the fields of crop farmers. Thomson's (1996) interventions to develop a rental market in arable land in rural KwaZulu-Natal will be seen in the next Chapter to include the introduction of grazing rules to strengthen the exclusive rights of crop farmers.

At first glance, the establishment of statutes and regulations may seem more favourable in terms of lower transaction costs than a case-by-case determination, as with liability rules. It must be realised that, in real world situations, liability rules, over time, often lead to the creation of a comprehensive set of legal precedents; these legal precedents can then form the basis of statutes and regulations in the future. While statutes and regulations are common in the modern economy, liability rules are far more appropriate in the rural KwaZulu-Natal situation, where land is held under customary tenure and governed by tribal authorities. However, it is important that legal precedents be established over time based on these liability rules. This is important in order to reduce uncertainty of legal outcomes.

2.4 Property regimes

Property regimes have to do with who owns, controls, manages and uses the property. In rural KwaZulu-Natal, communal grazing land is characterized by open access, while with arable land that is allocated to households, it is not easy to define the property regime that applies. The control, management and use of arable land have elements related to more

than one property regime. Section 3.1.1 describes the system of property rights that applies to the arable land.

2.4.1 State property regime

In a state property regime, management and control lie in the hands of the state, while members of society make use of the resources. Examples are the “tree growing associations” created experimentally in West Bengal (and elsewhere in India) that consist of groups of landless or marginal farmers who are given a block of public land for tree planting; the farmers are not granted land titles, but given usufruct rights on the land and ownership rights of its produce (Cernea, 1985, cited in Bromley, 1992 :10).

2.4.2 Private property regime

Individual or private property regimes are perhaps the most familiar regimes: ownership, control and use all lie in the hands of an individual. It must be noted, however, that private property need not be individual property. Bromley (1991:24) points out that all corporate property is private property, and yet it is administered by a group. The appeal of a private property regime lies in the fact that the individual or group owner makes all the management decisions and the investments, and good stewardship returns private rewards (Bromley,1991:24). Thus it can be seen that private property regimes seem to hold the highest incentives for efficient management and use of the property.

However, a private property regime may not always be in line with the achievement of social goals. Bromley refers to the Latin American example where the private property regime has concentrated ownership of 80% of the land in the hands of 5% of the families:

Private property is the legally and socially sanctioned ability to exclude others – it allows the fortunate owner to force others to go elsewhere. Additionally, we are often told that private property leads to the “highest and best use of land”. With large segments of Latin America’s best agricultural land devoted to cattle ranching while food crops fight for survival on steep and rocky

mountain sides, sceptics should be excused if they challenge that particular conclusion. (1991:25).

2.4.3 Common property regime

“Common property represents private property for the group of co-owners since all others are excluded from use and decision making” (Bromley,1991:25). Individuals have rights and duties in a common property regime. In both common and private property regimes, non-owners are excluded. Common property can thus be viewed as corporate group property. “Property-owning groups are social units with definite membership and boundaries, with certain common interests, with at least some interaction among members, with some common cultural norms, and often their own endogenous authority systems” (Bromley,1991:26). A tribal group holding customary ownership of certain natural resources such as farmland and grazing land is a possible example (Bromley,1991:26).

Bromley (1991:27) points out that a viable common property regime has a built-in structure of economic and non-economic incentives that encourages compliance with existing conventions and institutions. Like with any property regime, the effectiveness of property rights has to be maintained by an authority system that punishes a failure in compliance. Compliance is an important factor that will be considered in discussing common property as a regime suitable for governing the use of rural KwaZulu-Natal’s communal grazing land. If property rights are not upheld, common property degenerates into the open access regime discussed in the next section.

It must be noted that sometimes, it may be disadvantageous to have stringent, rigid rules on the use of the property since this sort of inflexibility would preclude adequate responses to changes in market conditions. For example, if quotas were imposed on each user, thus defining the limits of use of the resource, an increase in market demand (seasonal or otherwise) would not bring about an appropriate response of increased supply. Thus there seems to be a conflict between the objective of flexibility in

production and the existence of well-defined and well-enforced rules. However, a transition from common property to open access as a result of inadequate rules or their enforcement is seldom a feasible option.

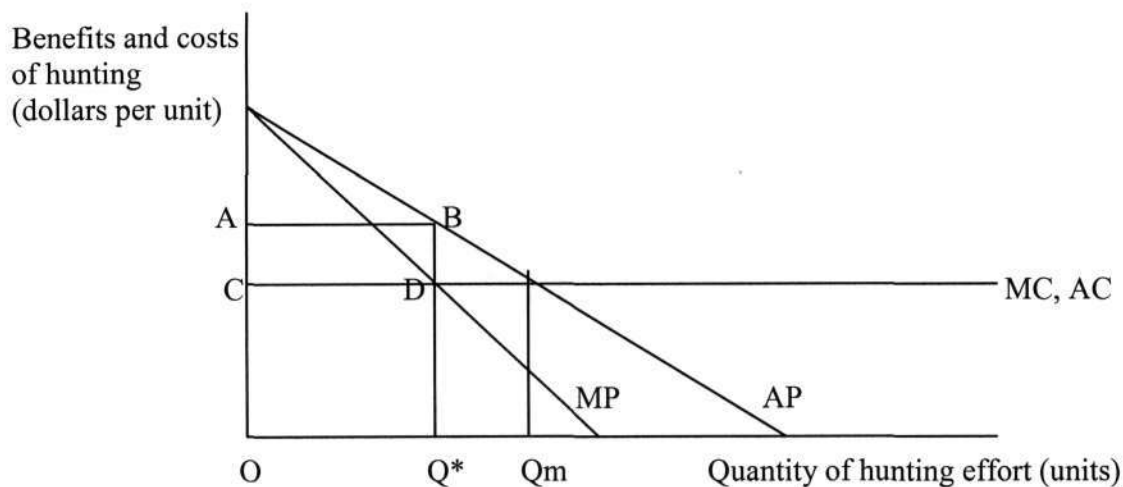
A possible advantage in common property is that the group leaders could have benevolent intentions towards the users; social goals such as equity rather than individual goals could be considered in making management decisions. Since the rules would be made by agents who are part of the regime, and who know their users, rules could be designed and adapted over time to benefit the user community. This possibility of modification of rules, contributes to the flexibility factor. In practice, common property group leaders are the authority system in this regime, and are responsible for enforcing rules. It can be seen that rules and their enforcement, as discussed in this regime, take the place of the law and its enforcement, as we know it in modern life.

2.4.4 Open access regime

In a sense, there are no property rights in this regime since there are no duties imposed as with other regimes. A resource under open access is exploited on a first-come-first-served basis. "Everybody's access is nobody's property" (Bromley, 1992:13). There is no element of authority in open access. Since access is free to all, there is no incentive on the part of the users to conserve or invest in the resource.

Tietenberg (1992:54) elaborates on unrestricted hunting rights to the American bison as an example of open access. The figure below depicts a constant marginal cost ($MC=AC$) of hunting activity. The benefits derived are reflected in the average product (AP) curve. AP is calculated by multiplying, for each level of hunting activity, the (assumed constant) price of bison by the amount harvested and dividing this revenue by the number of units of hunting activity. The average product curve is downward-sloping because the greater the amount of hunting effort expended, the smaller is the resulting population size of bison. A smaller bison population means that more units of hunting activity are required to harvest the same amount of bison.

Figure 2.4.4



The efficient level of hunting is Q^* where MP (marginal product) = MC , implying that net benefits are maximised. This allocation would yield society a scarcity rent equal to area $ABDC$. As Amosweb (2004) says, efficiency is achieved when the resource price, i.e. the benefit society is willing to pay for the resource today, is equal to the sum of marginal cost and scarcity rent. Scarcity rent is defined as “the marginal opportunity cost imposed on future generations by extracting one more unit of a resource today” (Amosweb, 2004). However, individual hunters without exclusive rights, would exploit the resource until their $AP = AC$. They would thus expend effort of Q_m . This inefficient allocation results because individual hunters cannot appropriate the scarcity rent; the scarcity rent would benefit hunters in the future. The opportunity cost of over-exploitation is not part of the hunters’ decision-making process in this open access regime.

2.5 Conversion from open access to common property

Given the over-exploitation that is likely to occur with resources under open access, Bromley (1991:33) says, “With open access regimes the necessary precondition for any successful policy prescription is that the property regime be converted away from open

access.” This conversion will involve work to establish a new set of rules. With respect to user characteristics, the conversion from open access to common property requires that (a) the user group is small, (b) users are reasonably homogeneous in socio-economic characteristics and (c) users reside in close proximity to the resource. (Bromley, 1991:33-34).

2.6 Property rights and economic efficiency

“In an economy that is otherwise conducive to efficiency (that is, that does not include monopolies, nonrivalry in consumption, or continually declining cost curves), nonattenuated property rights ensure Pareto-efficiency”; and a set of nonattenuated rights according to Randall (1987:157-158) is:

- 1) completely specified, so that it can serve as a perfect system of information about the rights that accompany ownership, the restrictions on those rights and the penalties for their violation. It must be noted that even owners face certain restrictions, so that the rights of non-owners or other owners can be protected.
- 2) exclusive, so that all rewards and penalties resulting from an action accrue directly to the individual empowered to take action (that is, the owner).
- 3) transferable, so that resources may gravitate to their highest-value use.
- 4) enforceable and completely enforced since an unenforced right is no right at all.

Randall (1987:158) points out that:

specification, transfer and enforcement are all costly activities, and the pursuit of perfection in these activities may result in prohibitive (transaction) costs... In a more realistic economic model, Pareto-efficiency can be achieved if, in addition to all the other necessary and sufficient conditions, the investment in specification, transfer and enforcement of property rights proceeds to the point at which the marginal conditions for efficiency are satisfied.

Recommendations will be made in subsequent Chapters of this thesis to increase the level of nonattenuation of property rights pertaining to both arable land and communal grazing land. The concept of nonattenuation is useful since institutional reform does not necessarily involve a shift from one property regime to another; sometimes institutional

change that simply aims to increase the nonattenuation of rights is more appropriate to increasing efficiency. While with communal grazing land, a more suitable property rights regime will be proposed, with arable land, institutional reform has simply lowered the attenuation (increased the nonattenuation) of property rights within the context of the existing property regime. The element of transferability, which is the third point in the list above, is related to the achievement of allocative efficiency and strongly supports the argument for the relatively new institution of a rental market in arable land.

2.7 Transaction costs

Before attempting to define transaction costs, it has to be noted that several authors have commented on the elusiveness of the definition of the concept.

Williamson (1985:19, cited in Hodgson, 1993:81) said, "Transaction costs are the economic equivalents of friction in physical systems". They can be described as the "costs of running the economic system" (Arrow, 1996, cited in Rao, 2003:7) and have been said to "generally impede and in particular cases block the formation of markets".

Transaction costs include *ex ante* costs of negotiating and forming a contract or agreement, *ex post* costs of monitoring and enforcing a contract or agreement, and search and information costs. It may be noticed that search and information costs are often *ex ante* costs. (Rao, 2003:8). Dahlman (1979:148, cited in Hodgson, 1993:82) points out that these three classes of transaction costs "reduce to a single one - for they all have in common that they represent resource losses due to lack of information". It must be noted that the concepts of fixed costs and variable costs apply to transaction costs just as they apply to costs in traditional economic analyses. It will be seen in Chapter 3 that external interventions to stimulate the land rental market, that have borne the fixed transaction costs of entering the market on behalf of the rural participants, have greatly encouraged the development of the market.

“The fundamental premise of Transaction Cost Economics is that transaction is the basic unit of analysis, and that economic governance is a prerequisite for economic resource optimisation and enhancing economic efficiency” (Rao, 2003:5). The next section explains the concept of governance.

2.8 Markets, hierarchies and governance structures

Dow (1993:106) says:

I will take market exchange to mean transactions between two independent owners of related physical assets... The alternative to market exchange is hierarchy, defined as an arrangement where one agent takes over ownership of all relevant physical assets and supervises the activities of the other party. This latter agent thus functions as the subordinate of the asset owner. With independent ownership, transaction costs arise through bilateral bargaining between asset owners in an environment where frequent adaptation to new contingencies is needed. ... The central explanatory hypothesis of TCE (Transaction Cost Economics) is that governance structures having lower transaction costs will be adopted, other things being equal. Market exchange emerges when bargaining costs are small (assets are ... unspecialised) but hierarchical distortions would be large (effort is costly to monitor, or the firm would be hard to manage). Conversely, hierarchy emerges when bargaining costs loom large (assets are... specialised), but the incentive problems arising under hierarchical control are mild and authoritative coordination is easily achieved.

The market versus hierarchy argument can, in general, be applied to the first possibility of two firms transacting in a vertical production relationship versus the second possibility of one firm controlling both the (related) production functions. It is thus often used to evaluate the potential for a merger between two related firms. With respect to the farming of arable land in KwaZulu-Natal, the assets are relatively unspecialised, i.e. the land in a certain rural area is not subject to a large degree of variability. Further, a peasant's effort would be costly to monitor. Thus market transactions would be quite suitable. However, it can be noted, with the example of arable land, that in certain developing countries, a landlord class pays wages to a landless class of peasants who work on the land for the landlord. This institution is evidently socially disadvantageous in terms of equity, leading one to recommend market exchange in the case of arable land farming.

A governance structure is defined as:

... a binding agreement regulating the contractable actions of coalition members, and specifying an authority structure to decide actions not explicitly covered in advance. A governance structure also usually distributes claims on contractable payments streams and may determine the pattern of physical asset ownership. (Dow, 1993:107)

Dow (1993:107) provides a helpful relationship between the concept of governance structure and transaction costs in saying, “a governance structure gives rise to transaction costs because (and to the extent that) it is an imperfect substitute for complete and costless contracts.” With regard to contractibility, Dow (1993:108) says “an action is contractable if third parties are willing and able to deter any deviations from prescribed behaviour.” Further, non-contractibility is supposed by the author to occur when:

- 1) Third parties cannot verify compliance.
- 2) Third parties cannot impose adequate penalties for deviation.
- 3) Third parties lack personal incentives to carry out costly enforcement activities.

The three factors listed above are important considerations in attempting to increase certainty in the KwaZulu-Natal arable land rental market. Clearly specified and well-enforced rules can be expected to create legal precedents, which will increase enforcement certainty and thus reduce contract risks such as unfair possession of the land. This in turn will increase contractibility and thus encourage the development of the rental market.

In response to the common argument that private enforcement procedures that do not depend upon the courts (these would include reputational effects and threat of termination of business relationship) are important, Dow (1993:109) points out that:

Governance structures matter precisely because private ordering is only an imperfect substitute for costless third party enforcement.... Writers using the TCE (Transaction Cost Economics) approach routinely appeal to termination threats as a private enforcement technique, often without recognising that retaliation of this sort imposes costs on the enforcer as well. It is ...vital to show that private agents have an incentive to carry out any required punishment once a violation has occurred.

In analysing the KwaZulu-Natal rental market, it will be argued that reputational effects become more significant as the rental market expands. However, third party enforcement will be seen to be essential both in the short term and in the long term to protect the rights of rental market participants.

2.9 Bounded rationality, opportunism and asset specificity

An important concept in Transaction Cost Economics is 'asset specificity' that occurs to the extent that "one or both parties to the transaction make investments in equipment and machinery that involve design characteristics specific to the transaction and which have lower values in alternative uses" Joskow (1987:283). Joskow (1987:282) hypothesizes that the greater the value of "relationship-specific" investments, the greater will be the duration of the contract desired, i.e. repeated bargaining is unattractive when there are significant asset specificities. Joskow (1987) presents results of a sample of coal contracts that prove his hypothesis.

It can be reasoned that the party making the investments, in particular, will desire a long term contract in this situation, in order to be able to fully realise the benefits of their investments.

At this point, it is appropriate to consider the well-documented concepts of bounded rationality and opportunism in Transaction Cost Economics. Bounded rationality simply means that parties are rational, but their rationality is limited by imperfect information. Opportunism occurs when parties act in self interest at the expense of other parties that they conduct business with. Once a party has made relationship-specific investments, the sunk costs of the investments act to lock in the investing party into the existing business relationship; this means that the other party could behave opportunistically and thus disadvantage the investing party. Thus the party that invests puts itself in a vulnerable position. An example of this would be when a supplier makes relationship specific investments and once he/she is thus locked into the relationship, the customer, in a

repeated bargaining scenario, offers and is able to get away with, paying a lower price in subsequent transactions with this supplier (Lyons, 1994:259).

Since information is imperfect and opportunism could result, the party faced with a potential plan or decision on creating potential asset specificities through its investments, will perhaps choose to invest in assets that are more flexible than specific, i.e. assets that could easily be incorporated in other business relationships. Lyons (1994:315), in discussing his results on a survey of sub-contracting firms in UK engineering, concludes that “although exactly one-half of firms admitted to the existence of an ideal, specialised production technology, only 40% of those said they were currently using or planning to use it”.

Bounded rationality and opportunism together often contribute to transaction costs. Examples of this could be *ex post* legal costs incurred to resolve disputes related to opportunistic behaviour, or *ex ante* costs incurred in drawing up a detailed, complex, formal contract. The other way in which transaction costs reveal themselves (due to the existence of bounded rationality and opportunism) is evident in the empirical example of the sub-contracting firms in Lyons’s study: the ideal, specialised assets would simply not be used. There is thus a potential production efficiency loss in this situation.

In the KwaZulu-Natal situation, the existence of a long-term, enforceable contract would encourage lessees (those who hire in arable land) to make investments in the lessors’ (those that lease out the land) land that are expected to yield benefits over the long term. The benefits of applying lime to soil, for example, are expected to last up to three years; this would evidently be a relationship-specific investment.

2.10 Institutions

Schotter (1981:11) states that “a social institution is a regularity in social behaviour that is agreed to by all members of society, specifies behaviour in specific recurrent situations, and is either self-policed or policed by some external authority”.

Bush (1987:511) says:

Society may be thought of as a set of institutional systems. An “institutional system,” in turn, may be thought of as a set of institutions. And an institution may be defined as a set of socially prescribed patterns of correlated behaviour. In each of the above sentences, the terms “set” refers to functionally interrelated elements.

To elaborate, an institution would not describe a type of behaviour by an individual at some particular point in time, but would describe a behaviour pattern that is adhered to by a substantial proportion of society’s members on a regular basis and that contains within it inter-related elements of behaviour. Institutions are crucial in maintaining rights and duties in property regimes. For example, without society’s agreement upon behaviour that respects the rights of owners in a private property regime by excluding use of the resource by non-owners, private property rights would not be maintained.

Institutions determine the levels of efficiency and sustainability of the use of natural resources; and the extent to which property rights are nonattenuated. Modern institutional reform tends to be aimed at reducing the attenuation of property rights, and this is the case with the rural KwaZulu-Natal land rental market as well.

Closely related to the concept of institutions is the concept of social norms. Axelrod (1986:224) defines a norm thus: “A norm exists in a given social setting to the extent that individuals usually act in a certain way and are often punished when seen not to be acting in this way.”

2.11 Norms games

Axelrod (1986) speaks about the growth or decay of a norm, where the existence of a norm is a matter of degree. His analysis may be very useful in many real world situations, where norms are not perfectly and completely followed by members of society. The implication is that when there is a norm, there is usually opportunity for defection. In Axelrod’s analysis, a player’s strategy consists of two parameters, boldness and vengefulness. A player will defect (in his self-interest) when the probability of his

defection being witnessed by someone in society is less than his boldness. Vengefulness is the probability that the player will punish someone seen defecting.

Axelrod performs a computer simulation of the process of evolution of a norm, the evolution being either growth or decay of the norm. In the case of a defection, the defecting player is assumed to get a payoff of 3 points, while all others in the population are hurt slightly, obtaining a payoff of -1 each. The negative payoff of punishment is high: -9 ; the enforcement cost paid by the punisher is -2 . In this simulation, at first, boldness levels fell dramatically due to a high level of vengefulness in the population. Gradually the vengefulness fell because the boldness levels fell. "The reason for this is that to be vengeful and punish an observed defection requires paying an enforcement cost without any direct return to the individual" (Axelrod,1986:22). Once vengeance became rare, boldness rose again and in Axelrod's simulation, the norm was completely destroyed and the destruction of the norm was a stable outcome.

The first thing that might occur to an observer of Axelrod's game is that the collapse of the norm in the simulation could have been prevented if the assumptions were different. Considering the payoff assumptions, it can be suggested that there should be no enforcement cost borne by the punisher. An even better alternative would be to ensure a positive payoff for the punisher, not only to compensate him/her for the payoff of -1 suffered due to the defection, but also to reward him/her for punishing behaviour that yielded negative payoffs for others in society. For example, if the payoff of enforcement were now assumed to be a positive 3, the simulation exercise is likely to obtain very different results. With the incentive for vengeance now being positive and sufficiently high, vengeance would remain high, thus reining in defection and leading to the establishment of the norm.

In the case of KwaZulu-Natal crop farmers suffering crop damage by stray cattle on their fields, it will be seen that it is important to ensure a sufficiently high level of incentive to punish. High legal costs and uncertain verdicts that do not compensate the crop farmers would discourage punishment of the owners of stray cattle and vengeance would be low, as indeed is the case. A net positive payoff for the punisher, in this case, the crop farmer,

would be ideal in keeping vengeance high and thus lowering the incidence of stray cattle on arable land.

Axelrod (1986:230) mentions other mechanisms that support norms. He implies that 'dominance' of one group over another could lead to high possible levels of both vengefulness and defection on the part of the dominant group, while the subordinate group would have to live with the negative payoffs associated with this 'dominance'. He gives the example of politically and economically powerful communities dominating weaker sections of society, with the legal system perhaps favouring the rich. Such a situation can be judged to be inequitable and harmful to society as a whole. In rural KwaZulu-Natal, cattle farmers tend to be wealthy, dominant members of society and are often not penalised when their stray cattle damage crops on the arable land of crop farmers.

The mechanism of 'social proof' informs individuals as to how to behave, given the actions of others in society. This refers to conformist behaviour as people fulfil their psychological need to fit in and be part of a group.

"'Membership' in a group working together for a common end" (Axelrod, 1986:232) would help to unite people in a goal to support a certain norm; in this case, the group can join forces to punish defectors, thus strengthening the vengeance factor. Axelrod (1986:233) points out that individuals that choose to be members of a group are likely to be co-operation oriented and thus unlikely to defect. The mechanism of membership will be important in this study in the consideration of an alternative property regime, specifically, common property with an elected management, for the use of communal grazing land.

A 'law', in its formalisation of a norm, supports the norm with the power, authority and duty of the State to punish defection.

Finally, and importantly, the 'reputation' of an individual is staked when (s)he chooses to defect. A defection causes others to form negative expectations about the future

behaviour of the defecting individual. As an example, reputation is an important factor in landlord-tenant relationships in certain parts of India, and particularly if the tenure agreement is a long-term one, the tenant has little incentive to defect on rent payments. In the case of KwaZulu-Natal, the growth and proliferation of the land rental market in the rural community will make reputational effects more important and thus lower the likelihood of contract defection by either lessors or lessees.

2.12 Old Institutionalism, New Institutional Economics and Neoclassical Economics

The original Institutionalists started the study of institutions, at least partly, as a critical reaction to the defects of neoclassical theory in application. In the 1960s and 1970s, a new approach to the study of institutions emerged, referred to as New Institutional Economics; here the approaches used are derived from various sub-fields within economic history, the theory of the firm and industrial organisation, law and economics, etc. (Challen 2000:6). “Apart from recognising transaction costs and institutional arrangements other than markets, methodologies of the New Institutional Economist still reflect neoclassical influences in many other respects (Kay, 1997:19) that would include the central assumptions of motivation and rationality” (Challen 2000:6). Rao (2003:88) goes so far as to say “NIE (New Institutional Economics) seeks to integrate the Economics of institutions with Neoclassical Economics; it incorporates Transaction Cost Economics (TCE), Political Economy and Behavioural Economics (in addition to a few other approaches)”.

Gruchy (p.26-27), a 1977 writer, in discussing “the future of Institutionalism”, made the point that the obsolescence of Economics can be prevented “by opening Economics to the contributions of the other social sciences, and by making Economics more relevant to the problems of the changing socio-economic system”. He seemed to be particularly concerned with Economics as a guide to public policy.

North (1990:20) discusses the deficiencies of the rational choice approach of Neoclassical Economics, as it relates to institutions:

Human behaviour appears to be more complex than that embodied in the individual utility function of economists' models. ... we find that people decipher the environment by processing information through pre-existing mental constructs through which they understand the environment and solve the problems they confront. Both the computational abilities of the players and the complexity of the problems to be solved must be taken into account in understanding the issues.

Although New Institutional Economics acknowledges the neoclassical approach, it is a broader approach in that it takes into account psychological, anthropological and cultural factors. Seemingly in line with this, Rao (2003:90) warns against replicating models of institutions from one cultural setting to another.

Indeed a consideration of institutions is essential for the modern Economist in a vast array of empirical Economics research initiatives. New Institutional Economics can thus be seen to broaden the scope of research in the discipline of Economics.

Heiner (1983, cited in North, 1990:23) argues that the gap between the competence of the agent in deciphering problems and the difficulty in selecting the most preferred alternatives is a major key to explaining human behaviour:

The greater the gap, the more likely the agents will impose regularised and very limited patterns of response to be able to deal with the complexities and uncertainties associated with that gap. ... this uncertainty not only produces predictable behaviour but is the underlying source of institutions. Heiner's essay is unique in its attempt to connect uncertainty and behaviour with the creation of institutions.

Thus Heiner explains the evolution of certain institutions existing in the real world. It is interesting to this study that the uncertainty serves to limit behaviour. Intuitively, it is as if, in a situation of uncertainty, the safest option is to do nothing. In the case of the KwaZulu-Natal land rental market, the initial inactivity, i.e. the rarity of rental contracts, found by Thomson (1996) prior to rental market interventions, is explained well by the factor of uncertainty, specifically uncertainty regarding the approval of rental market transactions by the tribal authorities. Further, it will be seen in the next Chapter that uncertainty regarding potential legal outcomes deters participants in the rental market

from reporting the matter to the tribal authorities when they are affected by contract defection such as unfair possession of land by the other party, or when their crops are damaged by stray cattle belonging to cattle farmers.

2.13 Institutional analysis

Institutional analysis often involves a comparison of alternative institutional structures, drawing on transaction costs theory and organisational theory. This would be a static analysis. The dynamic dimension of institutional analysis takes account of the fact that transaction costs arise even by virtue of institutional change, in the form of transition costs (Challen, 2000:7). In other words, transition costs are the transaction costs that are incurred in shifting from one institutional structure to another; and dynamic institutional analysis helps to determine the net benefit of a certain institutional change by analysing the costs of the transition. Closely related to the possibility of transition costs is the concept of path-dependency. Path dependencies can be defined as “occurring where opportunities for institutional reform are constrained by the current institutional structure” (Challen, 2000:7). An institutional status quo creates vested interests for certain groups within society who resist institutional changes that threaten these interests (Challen, 2000:7). Even if there were no transition costs created by vested interests, other transition costs could exist; path-dependencies occur frequently in the real world. The advantage of a path dependency, with respect to institutional reform, is that, once a more efficient institution is put in place, path dependencies can serve to maintain the new and better institution.

In the next Chapter, it will be seen that institutional reform aimed at reducing crop damage by stray cattle would entail significant transaction costs if stray cattle were required to be impounded until payment of a fine by the cattle owner(s). These transaction costs can be seen to be transition costs of the reform.

Institutional analysis is essential to making suitable decisions with regard to institutional reform. Rao (2003:90) provides three aspects of a static analysis of institutions: 1) the

formal rules of the game, 2) the informal norms of behaviour that supplement, complement and modify institutions; and 3) the effectiveness of enforcement mechanisms.

The argument that, in a market environment, efficient institutions based on efficient property rights tend to emerge, has been criticised by pointing out that the market itself, far from being the 'neutral' environment where efficient institutions are selected, is in itself also an institution, the survival and the existence of which depends on these institutions. (Pagano, 1991:462)

In other words, the existence of a market does not necessarily lead to the emergence of an efficient institutional structure. In fact, the market may not even exist if existing institutions did not facilitate market exchange. While the relationship between institutions and the market will be demonstrated in this study, it will be seen by the end of the thesis that institutional analysis is far more complex than simply recommending the market system in every case.

Given that the market in itself is an institution, a question then occurs: how do institutions come into existence? The next two sections answer this question.

2.14 The origin and propagation of institutions

There are two ways in which institutions can come into existence:

Some are, according to Menger (1985:133), '...the result of a common will directed toward their establishment (agreement, positive legislation, etc.), while others are the unintended result of human efforts aimed at attaining essentially individual goals,' The first are, in Menger's terminology, institutions of *pragmatic* origin, and the second institutions of *organic* origin. (Vanberg, 1989:26)

Despite acknowledging both origins, Menger primarily saw institutions "as arising out of the selfish interaction of a myriad of individual economic agents, each pursuing his own self-interest" (Schotter, 1981:4), i.e. Menger believed the institutions of organic origin to be far more prevalent than those of pragmatic origin. On the other hand, Commons

defined an institution as “collective action in control, liberation and expansion of individual action” (Vanberg, 1989:32).

Vanberg (1989) sees Commons’ theory as falling into two parts. The first part, the theory of property rights talks about how socially enforced rules impose a constraint on the individual, but also by simultaneously constraining others, serve to “liberate the individual by securing a protected domain of action, because, as Commons (1950:35) argues, ‘the only way in which liberty can be obtained is by imposing duties on others who might interfere with the activity of the liberated individual’” Vanberg (1989:34). Thus every individual in the society is simultaneously controlled and liberated by collective action. The expansion of individual action, in Commons’ definition and theory, happens as “organised collective action allows individuals to accomplish things and to realise gains which could not be achieved by separate individual effort” (Vanberg, 1989:34).

Witt (1989:593,594) distinguishes between the two traditions alluded to above: “the *Smith-Menger-Hayek conjecture* of a spontaneous, i.e. unintended and unplanned, emergence of institutions” versus “the *Olson-Buchanan-Tullock conjecture*” that “some kind of collective action would be required for an institution to emerge”.

To the extent that a norm can be considered an institution, it can be observed from the discussion of norms games in Section 2.11, that there are two necessary elements constituting institutional change: emergence of novelty, i.e. the new institution, and propagation thereof. It can be said that for progressive institutional change to take place, firstly, the novelty emerging must be a beneficial one and secondly, the novelty must be successfully propagated so that the institution becomes entrenched in the community.

Analysing the individualist (organic) approach, Witt (1989) outlines two assumptions:

- 1) “The individual probability of adopting a new behavioural regularity $f(a)$ is the larger, the larger the individual net benefit from choosing “a” rather than “n” is assessed, provided the net benefit is positive; otherwise $f(a) = 0$ ” (Witt, 1989:595).

In the above statement, “a” is the decision to adopt a new institution and “n” is the decision not to adopt.

- 2) “The extent to which an individual is able to improve his position by adopting a behavioural regularity depends on the relative frequency $F(a)$ with which other individuals in the population have already adopted (or in certain cases can be expected to adopt) the respective regularity or regularities.” (Witt, 1989:596)

Assuming that agents behave identically, Witt (1989:596) postulates that the probability $f(a)$ for each individual depends on the observed level of $F(a)$ in the population:

$$f(a) = \phi [F(a)]$$

“For the population as a whole, however, each individual decision in favour of option “a” changes the composition of adopters and non-adopters.” (Witt, 1989:596)

Four possible cases of institutional propagation that Witt (1989:597) imagines fall under two assumptions that he makes:

- 1) $\phi [F(a)] > 0$ for $F(a) = 0$ and in the entire interval $[0,1]$
 - a) $\phi > 0$, or
 - b) $\phi < 0$, or

- 2) $\phi [F(a)] = 0$ for $F(a) = 0$ and $0 \leq \phi < 1$ in the neighbourhood of $F(a)=0$ such that the graph of $\phi [F(a)]$
 - c) remains below the 45° -line in the interval $[0,1]$ or
 - d) intersects the 45° -line from below at a point F^{**} , $0 < F^{**} \leq 1$.

The following three figures (Witt, 1989:598,9) illustrate the four cases:

Figure 2.14a

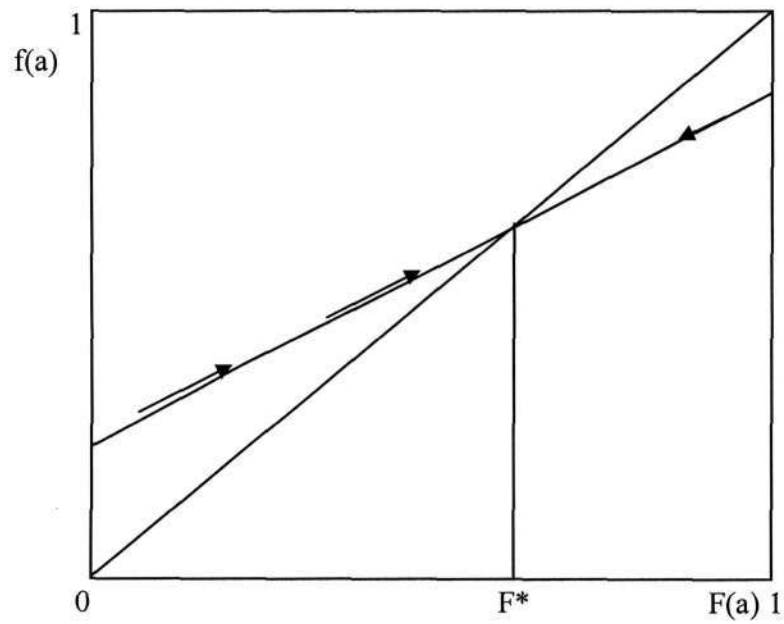


Figure 2.14b

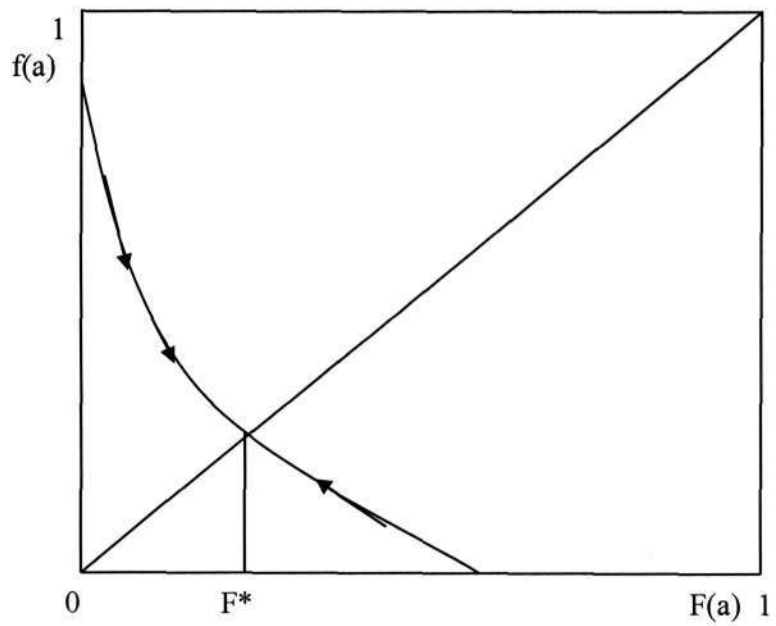
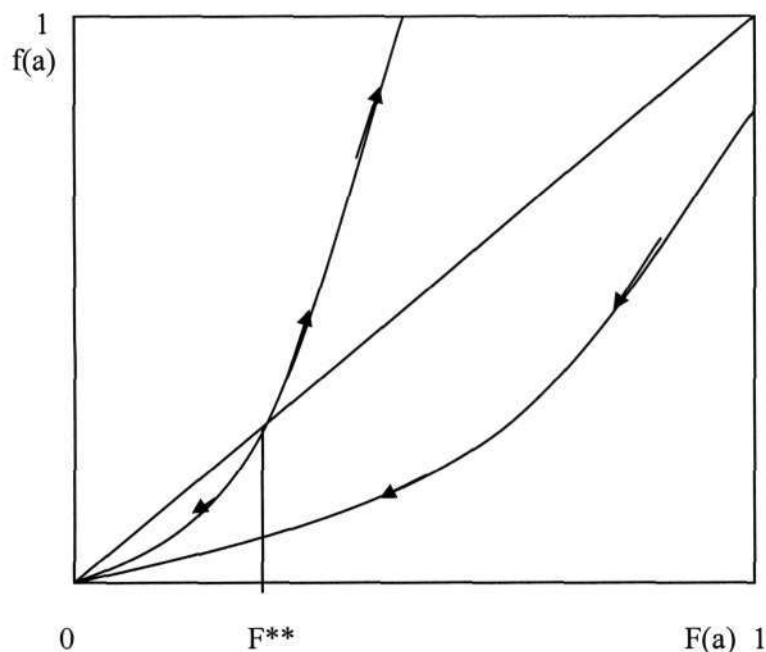


Figure 2.14c



In the above figures, “all points on the 45° -line represent situations in which, in the mean, the prevailing relative frequency $F(a)$ is just maintained by the individual decision, i.e. propagation equilibria F^* of an institution” (Witt, 1989:597). Figures 2.14a and 2.14b illustrate cases a) and b) respectively, while figure 2.14c shows case c) as the curved line on the right side of the box and case d) as the curved line on the left side of the box. In case a), individuals find the new institution attractive right from the beginning and the institution, in fact, becomes more and more attractive as it propagates further into the society. Witt (1989:598), however, suggests that an equilibrium point F^* might be reached in this case, given that some members of society will not want to adopt the institution. University education among city dwellers could be an example. Case b) is a partial propagation of the institution: initially, levels of adoption are very high and drop as the propagation picks up. Equilibrium is at F^* . The taking up of MacDonalds fast food franchises by franchisees in a developing country could be an example. Case b) is thus a case of institutional pluralism, where the new institution “finds a niche for survival” (Witt, 1989:607).

Cases c) and d) are very different scenarios from a) and b). Case c) is “an institution that cannot gain a foothold in the population” (Witt, 1989:599). This is because $f(a)$ is always less than $F(a)$. Case d) is interesting. It shows that the institution starts to become attractive and propagates completely after F^{**} is reached. The irony is that since $\phi [F(a)] < F(a)$ between 0 and F^{**} , it is not in any individual’s self-interest to adopt the institution in this state, i.e. below the point of F^{**} .

F^{**} is referred to as a ‘critical mass’ or critical relative frequency by Witt (1989:599). If the society remains below the point of F^{**} , the institution can be seen to “not gain a foothold at all”, as with case c).

Witt (1989:605) thus suggests collective action as a solution for case d):

The outlook for future self-reinforcement (of the institution) may attract organisers, leaders, ... political entrepreneurs, who, for the most diverse motives, specialise in eliciting and arousing interest, producing agreements, and arranging alliances. They operate as “diffusion agents”, engaged in the propagation of a new institution which, in effect, means doing away with the independence and isolation of the individual adoption decision... All that these agents have to achieve is to induce a sufficient number of other agents to expect that collective adoption will come about, so that the expectation becomes self-fulfilling: just a little more than the critical mass.

Witt (1989:608) also suggests that through collective action, tastes can be modified so that situation c) can be transformed into d) and once a critical mass of the population is convinced to adopt, the institution will self-propagate.

It will be interesting to see which of the four cases applies to the new and developing institution of the KwaZulu-Natal land rental market. Case d) is particularly interesting to the study in that collective action is essential, at least in the initial stages, in order for the institution to gain a foothold in the society and to become established.

2.15 Creation of an institution in a two-person society

This section explains the simple, static prisoner's dilemma game and then analyses a "supergame" which is a series of repeated prisoner's dilemma games between two players. The repetition involved in the supergame leads to a certain regularity in the behaviour of the two players and an institution is thus created.

In the well-known prisoner's dilemma game, each of the two players has two strategies to choose from: the cooperative strategy and the noncooperative strategy. The cooperative strategy would involve silence and thus a refusal to implicate the other prisoner, while the non-cooperative strategy would involve implicating the other prisoner in own self-interest. In Schotter's (1981) model, the payoff for each prisoner as an individual, acting in self-interest, is at a possible high level of 9. This high payoff is possible for each prisoner upon playing the non-cooperative strategy only if the other prisoner plays the cooperative strategy; the prisoner playing the cooperative strategy in this case gets a payoff of 0. If both prisoners cooperate with each other and thus refuse to implicate each other in the crime, the payoffs would be an equal amount of 8 for each prisoner. The fourth possibility with the lowest payoffs (6,6) entails both prisoners adopting the noncooperative strategy. Schotter (1981:55) sets out the matrix below, illustrating payoffs under the four possible combinations of strategies.

Figure 2.15

		Agent 2	
		Cooperative Strategy	Noncooperative strategy
Agent 1	Cooperative strategy	8,8	0,9
	Noncooperative strategy	9,0	6,6

It is evident that while total benefit is maximised when both prisoners play the cooperative strategy, individual benefit to one prisoner is maximised upon playing the non-cooperative strategy while the other prisoner plays the cooperative strategy. Extending the prisoner's dilemma game to various empirical situations, it can be said that the highest benefit to society occurs when both parties play the cooperative strategy. However, each party would be tempted to play the non-cooperative strategy in attempting to maximise individual benefit.

Schotter (1981:56) analyses a "supergame", defined by the repeated play of a prisoner's dilemma game, in which each player "will have to choose a 'mode of behaviour' that will govern his actions over the entire infinite horizon of the game". In this analysis, assuming a cooperative mode of behaviour, player 1 will play the cooperative strategy (S1) as long as player 2 also plays S1, but if player 2 deviates in period t , player 1 will play the non-cooperative strategy (S2) in every period $t+1$ onward. Thus player 1 is willing to cooperate as long as player 2 also cooperates; noncooperation is punished by player 1, using S2. In other words, S2 is the policing strategy. Punishment in this "supergame" is eternal, i.e. once one player starts to play S2, the other player will respond with S2 and will never change strategy.

Schotter (1981:58) also describes the *masochistic* and the *sadistic* modes of behaviour. The masochistic mode occurs when player 1 plays S1 as long as player 2 punishes him by playing S2, but will play S1 if player 2 ever fails to punish him. To explain the sadistic behaviour, assuming player 2 to be the sadist, player 2 will punish player 1 as long as player 1 cooperates; if player 1 ever plays S2, player 2 will play S1. This combination of sadism, on the part of player 2 and masochism, on the part of player 1, can give rise to a sadomasochistic convention. One can see that although sadistic and masochistic modes of behaviour are theoretical possibilities, they are unrealistic and illogical in most empirical situations and henceforth, only the cooperative mode of behaviour shall be considered in the analysis.

To re-iterate, in the cooperative mode of behaviour, each player is willing to cooperate with the other as long as the other cooperates, and each player will react by punishing the

other (eternally) in case of noncooperation. This supergame thus makes more sense intuitively than the sadomasochistic supergame, as Schotter (1981:58) points out. In this supergame, since punishment is eternal, once started, the deviating player also chooses S2 eternally from period t onwards, since he knows that the other player's response in period $t+1$ and onwards is going to be S2. In other words, the cooperative mode of behaviour can result in the establishment of a cooperative convention when both players cooperate infinitely. On the other hand, if either player ever plays the non-cooperative strategy, the other player will respond with the non-cooperative strategy as punishment and since this punishment is eternal, the result is the establishment of a non-cooperative convention in society.

Schotter (1981:60) points out that unlike the static prisoner's dilemma game, the supergame contains a future in which deviating actions are punished and the policing possibility can be used to keep players in line. As the supergame unfolds, norms of behaviour are created, which lead to the establishment of a social institution. The past or the history of the game gives each player information of the other player's actions. The past can thus cause the two players to trust each other, leading to a cooperative convention or it can cause the players to mistrust each other leading to a noncooperative convention.

The basis upon which norms change in our model is then strictly historical. We allow no other basis upon which people can draw their inferences about one another. This procedure defines the norm updating rule, which describes how norms are changed from period to period based on the information contained in the common observation of the players. (Schotter, 1981:72).

Schotter (1981:79) states that "the actions of the players consistently reinforce the beliefs of the players and our equilibrium notion has the self-fulfilling characteristics typical of all rational expectations equilibria". To demonstrate this, one can consider the example of a norm such that each player expects the cooperative convention to be adhered to with probability 1. Consequently, player 1 would expect player 2 to cooperate as long as he himself cooperates, with probability 1, and player 2 would expect player 1 to cooperate as long as he himself cooperates, with probability 1. In this situation, both players would

behave according to the cooperative mode of behaviour, which is what they both expected to observe.

Generalising Schotter's analysis, it can be said that past behaviour seems to be an important guide for future behaviour in the creation of institutions. In fact, one might go as far as to say that expectations, in being self-fulfilling, can themselves give rise to institutions being established. It must be noted that policing (the possibility of punishment) played an important role in promoting cooperative behaviour in the model.

Looking at the prisoner's dilemma matrix, one can imagine a scenario where such a game is played continuously: for example, two con artists in partnership that tend to get caught by different police departments from time to time, i.e. every few years or so. Although the maximising strategy for each individual might be the noncooperative one, since the prisoners are in long-term partnership, they would realise that the most beneficial and lowest-risk convention to be established between themselves would be that of cooperation. The cooperative strategy, does indeed have the highest sum of payoffs for both prisoners put together, i.e. $8+8=16$, in the matrix. Since the relationship between the players is a long term one, neither individual has incentive to deviate from the cooperative mode of behaviour. In fact, this situation can be seen to be an extreme example of Axelrod's (1986) view of 'reputation' as a mechanism that supports a norm. It is apparent that if one of the prisoners were to implicate his partner in this game, he stakes the entire future relationship with his partner; in fact, he might even risk extremely *vengeful action on the part of the partner*.

Thus the history of a game is vital in determining the institution that is established.

It is important to note that the equilibrium institution attained may not be the most efficient one. Hodgson (1989:565), in considering empirical institutional change, points out that "inefficient equilibria can and do persist for long periods of time":

We cannot even always predict the direction of change, since less efficient equilibria can replace more efficient ones if one faction begins to cheat on a cooperative agreement. The theory of repeated games (thus) only raises the possibility of an efficient equilibrium...

The above analysis of both the prisoner's dilemma game and the supergame involved an individualist/organic approach to institutional change. Extending the analysis to empirical situations, the convention most beneficial to society would be the cooperative convention where the total payoff is maximised. However, this may not be the convention achieved through the individualist approach, leading one to conclude that there is often an important role that collective action can play in the real world, in directing institutional change towards greater efficiency.

Section 3.1.8 uses the prisoner's dilemma matrix to analyse the open access property regime of communal grazing land in rural KwaZulu-Natal. Collective action is then recommended to bring about institutional reform that would make resource use more sustainable.

2.16 Institutional reform in practice and a principle underlying the quality of an institution

Empirical findings show that institutional quality has a significant impact on a country's economic performance (International Monetary Fund, 2003:111). "Specifically, improvements in institutions lead to higher incomes, stronger growth, and lower growth volatility" (International Monetary Fund, 2003:112). The analysis supports convergence effects, where low-income countries, starting from a lower level of institutional development, benefit more from institutional change than their more developed counterparts. The International Monetary Fund (2003:112) makes the point that institutions change gradually in most cases. Some relevant elements of high-quality institutions mentioned are:

- 1) Protection of property rights, with the rule of law upheld and corruption reined in.
 - 2) Promotion of social cohesion and stability, guarding against extremes of poverty and reducing civil conflict.
-

However, it is recognised by International Monetary Fund that actual details of institutional design would have to suit individual countries' specific sets of circumstances. "The concept of international "best practice" is unlikely to be meaningful when applied to detailed specifications of institutional reforms" (International Monetary Fund, 2003:117).

A question might then be asked: is there a theoretical principle underlying the 'quality' of an institution? Bush (1987:514) has an answer:

The institutional structure of any society incorporates two systems of value: the ceremonial and the instrumental... ceremonial values correlate behaviour within the institution by providing the standards of judgement for invidious distinctions, which prescribe status, differential privileges, and master-servant relationships... they (ceremonial values) are accepted on authority and regarded as absolute.

On the other hand,

Instrumental values correlate behaviour by providing the standards of judgement by which tools and skills are employed in the application of evidentially warranted knowledge to the problem-solving processes of the community... As new patterns of behaviour are required to accommodate the absorption and diffusion of new technology, instrumentally warranted patterns of behaviour must change accordingly... The process is self-correcting by virtue of the fact that the processes of inquiry upon which the problem-solving processes depend involve a conscious awareness of the method by which behaviour is correlated. (Bush,1987:515)

It is important to know that Bush's (1987:522) definition of technological change is "the change in 'prevalent habits of thought' associated with a given state of the arts and sciences". Bush (1987:523) says, "'technology" is broadly conceived in the institutionalist literature...consistent with the "holistic" nature of the institutionalist methodology, which facilitates an understanding of the workings of the economic system as a cultural process".

Bush (1987:535) argues that "progressive" institutional change takes place when ceremonially warranted values are displaced by instrumentally warranted values in the correlation of behaviour. In rural KwaZulu-Natal, crop farmers suffering from crop

damage by stray cattle are often reluctant to take action against the cattle owners since cattle farmers tend to be powerful members of society. This unfair, preferential treatment of cattle farmers can be said to be based on ceremonially warranted values. Institutional changes in the region by Thomson (1996) have sought to replace these values with instrumentally warranted values in encouraging the enforcement of the exclusive property rights of crop farmers to arable land.

Bush points out two important limits to progressive institutional change (1987:540-541):

- (a) the community's capacity to understand and learn the adaptive skills necessary to absorb technological innovation.
- (b) The principle of minimal dislocation:

While technological change always involves dislocation in the institutional structure, the interdependence of the institutional structure is such that "progressive" institutional change is possible only if it involves a minimal dislocation of the behavioural patterns of the community... Care must be taken not to displace ceremonial practices that encapsulate instrumental activities vital to the problem-solving processes of the community.

The first limit reveals that the community has an important role to play in the process of institutional change. It is evident that, even with institutional change engendered by collective action, it is vital to win the support of the community for any rules, programmes, etc. to be implemented and further to involve them in understanding the process of change. The community need to become active participants in bringing about institutional change. Relating this to Witt's case d) in Section 2.14, one can see that although collective action is recommended in order to achieve critical mass, this collective action is aimed at creating expectations in individuals in the community that a sufficient number of people in the community will indeed adopt the institution.

The second limit, the principle of minimal dislocation, is stressed as an important one to be considered in a social or economic planning process (Bush, 1987:542). Further, "those habits of thought that make instrumental valuing possible are most likely to be nurtured in a system of democratic self-governance... because democracy encourages the development of distinctively human potentialities for creative and reflective use of the

mind... because it engenders an experimental approach to social change (Bush, 1987:543).

On the whole, Bush (1987) advocates a process of institutional change that actively involves members of the community; presumably, he would not recommend that an economic or social plan be imposed on, for example, a rural community with no respect for existing customs and traditions.

In the case of the KwaZulu-Natal land rental market, a participatory approach that makes gradual changes to existing institutions would be recommended for a process of institutional reform that is in line with both the principle of minimal dislocation and the preference for democratic self-governance.

The next Chapter reviews previous work done on the land rental markets of rural KwaZulu-Natal. Further, it analyses the situation and the work done using the body of theory covered in this Chapter.

Chapter 3

A LITERATURE REVIEW OF AND ANALYSIS OF PREVIOUS WORK DONE ON LAND RENTAL MARKETS OF RURAL KWAZULU-NATAL

3.1 A description and analysis of the work done by Thomson (1996) towards completion of a Ph.D. thesis

3.1.1 Introduction

To introduce the property rights regimes and the governance structure related to rural KwaZulu-Natal land, the following, general, description of customary land tenure is useful:

Before colonisation and the creation of contemporary nation states, land in most parts of Africa was governed by traditional procedures and rules on land utilisation, access and transfers commonly known as *tribal, traditional or customary land tenure*. Being traditional, the procedures and rules were social constructs whose essential elements were passed verbally, by way of example or practice from generation to generation belonging to a particular community or tribe. In the course of transmission over time, as well as through experiments, good workable elements of the tenure system are retained and poor ones dropped to suit new socio-geopolitical and climatic conditions. In other words, customary land tenure systems, like any other social constructs, were dynamic rather than static but retained key elements. ...

... New households would usually be allocated their own pieces of land for erection of homesteads or cultivation out of the family or clan reserves. Otherwise, the chief or headman would give them *land from the general tribal reserves*. All pieces of land acquired through allocation by the chief or headman or by inheritance, remained, in perpetuity, the exclusive property of the concerned households as long as the allottee continued to belong to the community and actively utilised the land. Unallocated land was accessible to all and was utilised for communal activities such as grazing, hunting and forestry (Kalabamu, 2000:307).

It is favourable to the objective of institutional reform that customary land tenure systems are dynamic rather than static, since this indicates that institutional changes can be made within the context of customary tenure.

It must be noted that rural land held under customary tenure is referred to as communal land by several authors. Further, it is useful at this stage to note that in rural KwaZulu-Natal, arable land is allocated to households by the tribal authorities while communal grazing land is unallocated land that is accessible to everyone.

With respect to allocated land, it is known that “customary tenure is usually secure in the sense that individuals who comply with tribal rules can retain possession of their land” (Thomson, 1996:88). Anyone wishing to dispossess a household of their land must show very good cause for doing so (Low, 1986:108, cited in Thomson, 1996:88). Households have the right to bequeath land to an heir (Thomson, 1996:88).

It is hard to classify the arable land as falling under any one particular property regime since the nature of control and use of arable land has elements related to more than one property regime. Institutional reform efforts by Thomson (1996) were aimed at increasing the nonattenuation of property rights of arable land rather than changing the property regime outright. With communal grazing land, however, recommendations will be made for institutional reform to shift the property regime from open access to one of common property.

3.1.2 The argument for a land rental market

Population pressures and poverty characterise the rural KwaZulu-Natal region; and yet land is often left idle. In advocating a land rental market over a land sale market to improve allocative efficiency, Lyne, Thomson and Ortmann (1996:12) say that “rental markets offer a more equitable solution to unequal resource endowments and land under-utilisation in regions where the consequences of distress sales are unacceptable”. A land

sale market would have the inequitable result of the creation of a landless class of rural people. Rental markets are considered equitable in that households poor in terms of labour, time and farming resources are able to earn rent by leasing out allocated land and efficient in that land is thus transferred to those more willing and able to farm. To elaborate, allocative efficiency occurs as land is transferred from households who would leave it idle or under-utilised to households that would utilise it; in this way productivity of the land is increased and total agricultural output of the area increases.

Challen (2000:45) sets out the distinction between “idiosyncratic” and “non-specific” transactions and argues that the former type of transactions is best suited to an administrative system for resource allocation while the latter lends itself easily to a market system for resource allocation. It must be noted that, in the case of the land under customary tenure, the initial allocation has already occurred and the two systems being debated will, in fact, re-allocate resource use rights. Idiosyncratic transactions involve high transaction-specific investments:

Outcomes are relatively uncertain without investing in information that is specific to each individual transaction and the contracting process would typically be more complicated due to such factors as greater numbers of interested parties or the need to develop complex contracts with provisions that are contingent upon uncertain outcomes to the transactions. The consequently high transaction costs would reduce the efficiency of market processes in efficiently allocating a resource, and re-allocation by administrative decision may produce a more efficient outcome under such circumstances. (Challen, 2000:46)

The three basic elements of the type of transactions that would suit the administrative re-allocation then, are uncertain outcomes, a large number of interested parties and the need for complex contracts. All three elements would increase the transaction costs of a possible market re-allocation, than would otherwise be the case. Challen (2000:46) gives groundwater as an example of a resource where there is a large number of interested parties; this is because a certain re-allocation of groundwater extraction rights between two users has the potential to alter the spatial pattern of groundwater use and hence the availability of groundwater to other users with wells close to those of the two parties involved in the transaction. With non-specific transactions, on the other hand, a re-

allocation would have no external effects. These transactions have predictable outcomes that are easily factored into the contract between the two parties. Non-specific re-allocations thus involve low transaction costs.

Challen (2000:45) points out that the difference between the two types of transactions would be gradational, in practice. It is easily seen that there may be certain situations where institutional change can move the type of transactions from a rather idiosyncratic level to a much more non-specific level. In fact, Thomson's work in rural KwaZulu-Natal focussed precisely on increasing certainty in the (arable) land rental markets, thus making outcomes more predictable, and lowering transaction costs.

Since there are no external effects of note with a household leasing out arable land, the interested parties can be seen to comprise simply the lessor and the lessee themselves. Further, there is no real need for complex contracts in the land rental market. Thus land rental transactions can be seen to be inherently market-oriented. However, Thomson's work did contribute greatly to encouraging the development of the market, as will be seen shortly.

It must be noted that while arable land will be the primary type of land under consideration in this Chapter, the institutional issues surrounding communal grazing land will also receive brief attention. Upon analysis of these issues, one can expect to arrive at the conclusion of whether or not communal grazing land is suited to rental market transactions.

3.1.3 Brief description of Thomson's study

The assignment was conducted in three study areas – Upper Tugela Catchment, Tugela Ferry and Mvoti Valley. Action research was conducted in two tribal wards in the Upper Tugela Catchment, namely the unplanned ward of Amangwane and the Betterment Planned ward of Amazizi. Betterment Planning was a government programme that separated arable and residential allotments, and which relocated households to village

settlements (Yawitch, 1981:48-9; Davenport, 1987, cited in Thomson, 1996:54). The remaining land in both areas is set aside for communal grazing (Thomson, 1996:54).

The sub-ward of Maphophameni in Amazizi and the sub-ward of Moyeni in Amangwane were designated for study purposes. The action research aimed to facilitate the institutional changes needed to support a rental market in arable land.

Previous research suggested to Thomson that the rental market for arable land was constrained by high transaction costs and uncertainty. The main cause of uncertainty seemed to be the risk of loss of land by the lessor (the household that leases out its land) to the lessee (the household leasing in the land). Based on this view, a series of institutional changes were introduced in the Upper Tugela Catchment during September 1993. It is interesting to note that Thomson repeatedly refers to transaction costs in the land rental market as “including risk”. It is immediately evident that the risk of, for example, the lessor losing land, entails potential costs such as search for a reliable lessee, dispute resolution costs, etc.

A total of four household surveys were conducted in the Upper Tugela Catchment between December 1993 and February 1996... Two distinct types of information were gathered from households. Firstly socio-economic data were collected in order to test the impact of land rental on household welfare and the allocation of farm resources. Second, data relating to property rights was assembled to gauge household perceptions about tenure security. Additional information was obtained during meetings with tribal authorities and agricultural extension officers in the study areas. (Thomson, 1996:52).

3.1.4 Initial institutional changes

Thomson gained permission to promote a rental market for arable land from the chief and tribal councillors in each tribal ward. The tribal councils and secretaries were trained to draw up lease agreements. The legal implications of the lease agreements were discussed in detail with the tribal councils, with major emphasis placed on the rights of lessors and

lessees with regard to leased land. Councillors were given a clear understanding of the lease agreements to enable them to settle any land rental disputes.

The rental market was sanctioned through a simple and well-publicised tribal decree. Mass meetings were held, where the chiefs publicly approved a rental market. Thomson says that this kind of open support by the tribal councils of the rental market reduced risk in the market. The meetings also gave the communities an opportunity to pose questions.

Proforma lease agreements (simple one page documents) were signed in triplicate by lessor and lessee and approved by the tribal secretary on behalf of the chief and his councillors. Copies were kept by lessor and lessee and the original filed by the tribal secretary. The aim of the lease agreements was to provide security for both lessor and lessee.

Presumably, at this stage, with regard to the formal, legal nature of the contract, Thomson was primarily thinking about security for the lessor based on previous research indicating the risk of loss of the lessor's land. However, even without considering this risk, the formal, legal nature of the contract can be said to be preferable in encouraging participation in the rental market.

Rental transactions were facilitated by identifying potential lessors and lessees. An extension officer was employed to organise voluntary meetings attended by small groups of households in the study areas... A 'small group' approach was adopted to encourage participatory discussion about the advantages of a rental market in land, the rights and obligations of lessors and lessees and, the procedures to formalise written contracts and to settle disputes. The names of willing lessors and lessees were recorded after each meeting. This process revealed that many potential lessors were still reluctant to openly declare their willingness to lease out arable land. (Thomson, 1996:85)

The potential lessors and the potential lessees were then introduced and encouraged to negotiate voluntary transactions. If parties agreed to sign lease agreements, they were transported to the tribal court. The signed lease agreements were then stamped and authorised by the tribal secretary.

Thomson's action research can thus be said to have carried the burden of ex ante transaction costs related to search, information, negotiation and bargaining, on behalf of potential participants. It is interesting, that on the one hand, the tribal authorities readily sanctioned the rental market and on the other hand, some potential lessors were still "reluctant to openly declare" their willingness to lease out arable land. However, the action research, in actual fact, resulted in a much greater willingness on the part of the lessors to lease out land.

It is often acknowledged in dealing with rural reform programmes, particularly in developing countries, that it is vital to increase stores of knowledge and information. The marginal value of one additional unit of information can be seen to be extremely high in most rural contexts.

Cousins (1994:43), in his publication on institutional change for rural development, criticises the conventional approach adopted by consultancies that is a prescriptive and expert-driven approach, where outputs take the form of lengthy reports and sets of recommendations. "The second approach accepts that uncertainty and complexity are a part of the system, and that the appropriate response is to learn and act sequentially in a process of action research... the aim therefore is not to produce a definitive set of recommendations for implementation, but to facilitate interactions between relevant groups of actors." (Cousins, 1994:43). Cousins says the latter approach is catalytic and facilitatory and describes the interaction as collegiate rather than consultative (1994:44). The style of work involves the consultancy team acting as catalyst and facilitator of co-learning amongst networks of actors and institutions. Outputs are focussed on building on-going processes leading to further learning and action.

Cousins' views thus lend enormous support to Thomson's "collegiate", learning-oriented, approach. It is likely that those initial meetings and facilitated interactions greatly served to open up possibilities in the minds of potential rental market participants. If North (1990:20) is right in his previously quoted view in Section 2.12 that "people decipher the environment by processing information through pre-existing mental constructs", Thomson's action research can be seen to have significantly contributed to changing the

mental constructs of the potential participants and thus to influencing future behaviour and norms.

In reference to Commons's view of institutions described in Section 2.14, the collective action initiated by Thomson can indeed be said to have liberated and expanded individual action. The potential lessors that were reluctant to 'openly' declare their willingness to lease out land might never have entered into rental transactions without the collective action.

3.1.5 The relationship between tenure security and rental market activity

Thomson draws attention to the unfavourable state of tenure security in communal areas, when tenure security is defined as the ability to internalise the benefits of investment in the land, or the ability to transact land.

Secure tenure can be understood as being related to the set of nonattenuated property rights discussed in Section 2.6, i.e. in general, the greater the degree of nonattenuation, the greater is the tenure security enjoyed. This is important from an efficiency point of view, as discussed in the section. One can suggest from Thomson's analysis that although households in rural areas have some of these rights, the extent of nonattenuation of property rights needs to be greater.

In the description of customary tenure provided at the commencement of this Chapter, individuals *seem* to have exclusive rights to use land, once land has been allocated/bequeathed to them. Thomson's action research work described so far, was valuable in giving households the right to transfer land, with the approval of the tribal authorities. Thomson admits that although it was initially assumed that the lessors carried the greatest risk in a rental transaction, upon his actions to stimulate the rental market, it was found that relatively few households actually agreed to lease *in* additional land, although lessors' willingness to lease out land greatly improved upon introduction of legally binding lease agreements.

The reason behind the lessees' unwillingness to lease in land and the actual level of exclusivity of rights will become clear in the discussion of tenure security that follows. It must be borne in mind that the discussion is concerned with the rights of crop farmers to arable land allocated/transferred to them.

Thomson talks about three elements of tenure security – breadth, duration and assurance:

1) Breadth of rights

The broad definition of tenure security, otherwise known as the breadth of rights includes rights to use, transfer and exclude others (Thomson, 1996:89). The training provided to tribal councils regarding rights of lessors and lessees and enabling them to resolve disputes with an understanding of the legal implications of the contracts, may seem to have brought about complete specification and enforceability of rights. But Thomson points out an important problem with the breadth of rights making up tenure security:

...tenure security was not improved for lessees as property rights to land were not fully exclusive. Under communal tenure, households have individual usufruct to arable land and communal usufruct to grazing land... In winter all land becomes communal and stock-owners are entitled to graze their livestock on the stover left by crop farmers.

Virtually all of the respondents in the follow-up survey stated that they could not exclude stock-owners from their cropland during winter. Several farmers have attempted to privatise their stover by fencing off their arable land. However, this action was forcefully resisted by members of the community. Stock-owners destroy and steal the fencing so that their livestock can have access to winter grazing. Some farmers have responded by employing guards to protect their property. In one case, a progressive farmer who attempted to harvest green stover from his land to feed his own livestock during winter was fined R200 by the tribal authority.

Another major problem encountered by emerging farmers is that livestock introduce weeds into their arable land. This increases the cost of weed control and reduces the value of investment in fertiliser... To overcome these problems, progressive farmers have bought or rented land outside of the communal areas where they have exclusive rights to land.

According to customary law, the chief is supposed to announce a date after which farmers are allowed to start ploughing and planting operations... Although stock-owners are supposed to

remove their cattle from arable areas, this law is not well enforced. As a result planting operations are often delayed and yields are reduced. Stock-owners are unwilling to withdraw their cattle to the more distant summer grazing areas due to the risk of stock theft. (Thomson, 1996:89-90)

Thomson (1996:8) points out that tenure institutions in Africa reflect social relationships that are shaped by lobby groups, for example crop and livestock farmers competing for the same agricultural land. It must be understood that cattle tends to be a store of value or an investment for relatively wealthy farmers in rural areas. Crop farmers that do not possess cattle, on the other hand, are less well off financially. Thomson hints in his work that cattle farmers enjoy a greater degree of respect in society and would have greater lobbying power in influencing tribal decisions. Thomson clearly argues in favour of the crop farmers' rights and recommends that "exclusive land rights to crop farmers be enforced and preferably extended to include the winter months" (1996:91).

The possibility of crop damage by cattle greatly explains reluctance of lessees to enter rental agreements. The livestock problem reduces specification, exclusivity and enforceability of rights of crop farmers.

2) Duration of rights:

Duration refers to the length of time that a given property right is legally valid. For short-term investments, tenure security is less of an issue, but where substantial investment is made in fertilising soils, duration is important. Several farmers... indicated a preference for lease agreements longer than three years but were not convinced that long-term rental contracts would be upheld by tribal courts if lessors decided to terminate the contract early. Again, farmers perceived that they would be unable to realise the benefit of their investment. (Thomson, 1996:91)

The aspect of duration of rights is closely related to asset specificity (as described in Section 2.9) and the preference for a long term contract rather than repeated bargaining. The investment in the fertilising of soil is a highly relationship-specific investment; once a lessee has made such an investment in the soil of a particular lessor, (s)he is locked into

that relationship and is vulnerable to opportunism. Indeed this is manifested in reality as will be seen in the explanation of 'Assurance of rights' that follows.

3) Assurance of rights:

Assurance implies that the right to use land is held with varying degrees of certainty, both in the present and the future. Tenure is insecure if legal procedures to settle land disputes are vague or their outcomes are uncertain. Several lessees mentioned previous cases where lessors had reclaimed their land after the tenant had improved its fertility. One case involved a progressive farmer who managed to negotiate a long-term lease. The lessor noted his high yields and reclaimed half of the rented land the following season. The contract was terminated... The fact that the tenant did not appeal to the tribal court could indicate a common perception that rental contracts were not condoned in customary law. Two-thirds of the households interviewed in the Upper Tugela Catchment during the baseline survey believed that they would be dispossessed of their land if they did not farm it themselves.

In a second case, a lessor attempted to reclaim his land before the crop was harvested. The ensuing dispute was also settled out of the tribal court and the aggrieved tenant terminated the arrangement. These disputes set unfavourable precedents for potential lessees and may explain why most of the rental transactions observed in the survey were confined to agreements between close friends and neighbours – to reduce moral hazard as well as transaction costs. (Thomson, 1996:92)

With perceptions that it is forbidden to rent land, and uncertainty of enforceability of rights, it is no surprise that lessees would be reluctant to lease in land. To solve the asset specificity problem in particular, lessees must be given the option of a long-term contract and the enforceability right, thereof (to prevent repossession of land by the lessor, before expiration of the contract). With contracts having becoming more formal and legally binding in nature since Thomson's efforts, presumably, perceptions have changed greatly and tenure security has improved in the area. Section 3.2, which discusses the results of a subsequent study in the area, shows that this has indeed happened.

3.1.6 Stray livestock

Since crop damage by stray cattle is such an important issue that cannot be dealt with through arable land rental contracts, it is important to explore the problem further. Thomson (1996:93) mentions three reasons for the problem:

- 1) Claimants have to incur court fees. There were cases reported where the tribal authority had fined stock-owners but did not compensate the plaintiff.
- 2) Households do not have the right to impound livestock that damage their crops. It is thus difficult to establish the livestock owner's identity.
- 3) Since the distribution of cattle is skewed in favour of relatively wealthy men, some crop farmers (mostly women) are afraid to seek redress for crops damaged by stray livestock. In one case, a progressive farmer refused to support a proposed crop farmer lobby as he feared for his safety.

As indicated in Section 2.11 that discusses norms games, the incentive for punishment needs to be sufficiently high in order for the likelihood of defection of a norm to be minimal. In this case, the norm would be respect for the exclusive rights of crop farmers by cattle farmers in preventing their cattle from straying onto arable land. Since the payoff to the crop farmer in punishing defection of this norm is often negative in the KwaZulu-Natal situation with expensive litigation and lack of compensation, the incentive for punishment is low and the level of defection is high. Further, the dominance of cattle farmers in society causes them to get away with a high level of defection with the less powerful crop farmers exercising a low level of "vengefulness", using Axelrod's (1986) terminology.

In the unplanned ward, Amangwane, the incidence of crop damage by stray cattle was found by Thomson to be much lower than in the planned ward, Amazizi. This is possibly due to the fact that arable allotments in Planned areas are often located some distance from the homestead and are therefore harder to protect. This also explains the much lower incidence of fencing and lower incidence of employed guards in Amangwane as households can police their fences and crops themselves.

It is unfortunate that crop farmers have to bear private enforcement costs in terms of fencing and guards, due to the failure of the governance structure to protect property rights. A lessor's nonattenuated right to transfer use of land is constrained by the lack of protection of the lessee's use rights, in this case, by the failure to prevent crop damage by livestock. Thus both lessors' and lessees' rights are compromised in this enforcement failure, and the high transaction costs resulting from the need for private enforcement act as a hindrance to the growth of the land rental market.

The next two sections analyse grazing rights with respect to communal grazing land; recommendations will be made to make the use of this land more efficient and sustainable. Specifically, the recommendations will pertain to institutional reform to put in place a more suitable property regime to govern the use of this natural resource. This analysis offers an interesting comparison with the institutions deemed suitable for arable land use. The potential for a market in grazing land will be considered. Apart from being an interesting side issue for comparison with the main issue of arable land, institutional reform for grazing resources, in limiting investments in cattle, can be expected to lower incidence of stray cattle on arable land.

3.1.7 Summary of Crotty's (1983) study on communal grazing in KwaZulu-Natal

This summary of Crotty's (1983) study is important in introducing the problems associated with the use of KwaZulu-Natal's communal grazing land, which is unallocated land. Crotty looks at the negative consequences of the open access property regime related to the use of communal grazing resources and evaluates various potential options for institutional reform. The next section will analyse the situation and make recommendations for an alternative property regime to be put in place to make the use of communal grazing land more efficient and sustainable.

Grave institutional weaknesses depress the productivity of KwaZulu-Natal pastures and cattle; they give rise to the husbandry malpractices that are the cause of low output and that include overstocking, low offtake of cattle, continuous instead of rotational grazing,

and the natural selection of stock by their ability to survive under harsh conditions instead of according to their productivity (Crotty, 1983:7).

Income derived from work outside KwaZulu-Natal, is saved and invested in KwaZulu-Natal. Crotty (1983:8) says that incomes in KwaZulu-Natal bear little relation to the value of output produced in the region, i.e. a large proportion of the total income is earned from work outside of the region. A popular form of investment for those earning the incomes is livestock. "KwaZulu-Natal's failure to achieve even a modicum level of beef production from its extensive pastoral resources is not due to any lack of skill or of other resources, but simply due to the inappropriateness of traditional institutional arrangements" (Crotty, 1983:9).

Crotty (1983:16-22) discusses (a) the registration of grazing rights and (b) the taxation of grazing rights, among options for institutional reform. Under the first approach, grazing rights now being exercised on specific areas of land would be registered. No additional stock would be allowed on to that land. Individuals who already had stock on the land and wished to keep more, as well as persons who had no stock on it but wished to keep some, would be allowed to do so only if they bought the equivalent grazing rights from those possessing and willing to sell them. This arrangement is deemed, by Crotty, to be likely to lead to collaboration by the holders of registered grazing rights to reduce stocking levels. This opinion is understandable; once grazing rights are registered, the property regime would no longer be one of open access and the sustainability of the resource use would become of interest to the users. The opportunity cost of over-exploitation, as discussed in Section 2.4.4, would become part of the users' decision-making process. The collaboration of users to reduce stocking levels, foreseen by Crotty, assumes a sense of group membership among the users. The concept of group membership will be important in the next section in making recommendations.

Evidently, the problem possible with the first approach is that attempts by poorer farmers to acquire grazing rights could be futile, if those possessing them are unwilling to sell them. This would lead to the creation of a wealthy class of farmers – those that possessed extensive grazing rights.

Referring to experiences in Ireland and Latin America, Crotty (1983:19) attributes agricultural failure in these countries to “the super-imposition of an alien capitalism on an indigenous, non-capitalist structure”. Crotty believes that individualisation of grazing rights would lead to concentration of ownership in the hands of those who have lived longest and who have saved or inherited the most. This is because people would naturally perceive grazing rights to be a very attractive form of asset/investment to hold, and would not give them up until they died (the value of the asset acting as a form of medical insurance). Crotty theorizes that the value of the asset would ensure the best medical attention for its owners and thus increase their life expectancy leading to inheritance by heirs of already advanced age. Possession of land and stock would thus become increasingly concentrated into the hands of a small minority of older people who would be unlikely to respond to market opportunities for increasing output. The end result would be incompetence and inefficiency (Crotty, 1983:18,19). With respect to KwaZulu-Natal in particular, Crotty says the individualisation of grazing land tenure would result in lack of growth of agriculture and political instability.

The second approach is the taxing of grazing rights, or – what is the same thing – grazing animals. The proceeds of the tax could be transferred to the central government; or some or all of them could be expended locally according to criteria determined centrally. Crotty (1983:21) notes the Transkei experience where taxes that are transferred to the central exchequer are opposed by livestock owners and other local agents. Indeed, it makes little sense to tax and thereby take income out of a rural, low-income community. Crotty points out that even if the tax revenue is used locally but in ways that are centrally determined, members of the rural community might not view the reform favourably.

3.1.8 Important implications of the above study and recommendations for a new institutional structure for communal grazing land

Thomson (1996:106) found that “there was no de facto evidence of rules restricting the number of livestock that individuals could graze on unallocated land”. Thus communal grazing land is an open access resource.

Even in the present time, i.e. at the time of the 2003/4 study, it is known that large numbers of the community work outside of rural KwaZulu-Natal and remit money to their families; and livestock is a popular form of investment. “In many cases, stock-owners work and reside in urban areas” (Thomson, 1996:94). From Crotty’s study, it looks as if the existing open access property regime was causing cattle farmers to invest in cattle with little or no potential feed expenses to be incurred. It is evident that in this situation, there would be over-investment in cattle; inefficiency can be expected to result from costs of maintaining cattle being kept artificially low. In other words, the revenues and/or the output resulting from the cattle do not have to be too high for a household to make the investment decision. Investment in cattle would take place even if productivity were very low.

In general, it is known that with respect to use of various natural resources, open access is a satisfactory property regime until population pressures increase demand for the resource and work to make resource use under open access unsustainable in the long run. Resource degradation is an important threat in the long run. This is exemplified in the over-utilisation of grazing resources in the Upper Tugela Catchment leading to soil erosion within the Tugela River catchment area (Integrated Planning Services, 1991, cited in Thomson, 1996:106).

Challen (2000:32) sets out the following “payoff matrix for two graziers of a common pasture faced with a decision of whether to increase stocking rates”:

Challen (2000:32) points out that “more complex models, such as used by Stevenson (1991:8-38), can be used to show that the process of adding extra cows will continue under these decision-making arrangements until payoffs are reduced to zero for both graziers”. In view of this, collective decision making and coordination are recommended to restrain individual behaviour and thus maximise benefits to society.

In support of collective action, as opposed to the individual/organic creation of institutions, one can quote from Challen (2000:34):

For a decision of allocation of fish stocks amongst nations, it may readily be imagined that the transaction costs associated with a negotiated decision between national governments, supported by bioeconomic information collected by state agencies, would be substantially lower than if the same decision were to be made by agreement amongst individual fishermen from multiple countries, each with very limited knowledge of the total fishery.

Thus Crotty is right in recommending institutional reform (through collective action) with respect to communal grazing use rights. As indicated earlier, individual cattle farmers may not be aware of and/or concerned about the long run impact of over-exploitation of grazing resources. Collective action is thus needed to make resource use sustainable. One can agree with Crotty’s criticisms of the individualized property rights, resulting from the first approach, i.e. registration of grazing rights. The second approach, however, holds more promise. The obvious solution to problems with the second approach, i.e. the taxing of grazing rights, would be, firstly to ensure that tax revenue is indeed used for the benefit of the local community and secondly, to involve potential taxpayers (the cattle farmers) in a participatory approach where joint decisions are made concerning the use of the revenues. One of the options would be to use the revenue to improve and invest in grazing land. This would directly benefit the taxpayers.

The common options that have been considered, in previous studies, with respect to use of grazing land are registration of grazing rights, quotas restricting the number of cattle to be owned and taxation of grazing rights. All three options, while suffering from various weaknesses, will, at the very least, be effective in limiting investment in cattle and thus

limiting communal grazing land use. However, the benefit of restricted land use has to be weighed against the reality of high transaction costs in practice associated with enforcement of the rules necessary. Indeed, “when user groups are large, cattle taxes and quota restrictions are unlikely to provide stable solutions to overstocking as there are strong incentives for individual users to break the rules” (Runge, 1981; Lyne and Nieuwoudt, 1990; cited in Thomson, 1996:107). One solution would be to employ a full time guard who would check for a certificate or a stamp marking the animal that would indicate registration, taxes paid or falling within a quota. This would be an expensive solution to the enforcement problem and would be more feasible in an area where communal grazing is one large piece of fenced land, with just one entrance to be policed.

In the future, as population increases further, and pastoral resources become more valuable, the above solution might become a feasible option for enforcement. As argued before, taxation by the government seems to be a potentially advantageous reform. The tax could be looked at as being similar to a tax on road use, which is common in many countries. The tax would force pastoral farming to become more efficient and productive, in raising the cost of maintaining cattle, and would force out the less efficient farmers. It would thus reduce resource degradation and make land use sustainable in the long run.

The main problem with registration, quotas or taxation, other than the high costs of enforcement, is that the imposition of any of these schemes by the government, in the context of customary tenure, is unlikely to enjoy support by the rural community; in a worst case scenario, there could be opposition to the scheme. Further, there would be inflexibility (as discussed in Section 2.4.3) under the regime with users being unable to respond to market changes; the government is unlikely to be able to make quick and flexible changes if and when required. A more suitable institutional structure would be more flexible and would be one that gave the rural community a greater sense of ownership and control with respect to communal grazing land.

Two other options for reform can be considered – individual private property and common property. As Thomson (1996:107) points out, “it is not feasible to privatise grazing land by splitting up and reallocating the commons to individuals... it would not

be economically viable for beneficiaries to fence off and raise livestock on such small areas of poor quality land". This lends support to common property as a more suitable regime.

As mentioned in Chapter 2, "common property represents private property for the group of co-owners" (Bromley, 1991:25). Thus a common property regime can be defended, using an argument for privatising the commons:

Lyne and Nieuwoudt (1990) suggest that privatising the commons provides the only stable solution to economic overstocking. This would internalise the cost of resource degradation, thereby reducing stocking rates. The low incentive to invest in grazing resources would also be overcome, as the benefits of investment in herd and pasture quality would be internalised. (Thomson, 1996:107).

Section 2.5 provides three requirements for conversion from open access to common property: (a) a small user group, (b) users are reasonably homogeneous in socio-economic characteristics and (c) users reside in close proximity to the resource. (Bromley, 1991:33-34). Requirements (a) and (c) are not met in the KwaZulu-Natal situation with the large number of cattle farmers and the fact that they do not reside close to the communal grazing land. Requirement (c) is important in light of the high potential enforcement costs when the requirement is not met.

In providing a solution to the problem of a large user group, Thomson (1996:108) argues in favour of a non-user, elected, management committee making decisions for the members, the actual users. A small management committee would make decisions more efficiently than the entire, large, user group. He points out that the transaction costs of negotiating and enforcing rules would be high, if the entire user group comprised the management.

With reference to requirement (c), cattle farmers not only do not have houses in close proximity to the resource, they often do not even reside in the rural areas. The elected management committee, on the other hand, would reside in the rural areas. If deemed

necessary for the objective of enforcement, the committee could be provided housing by the tribal leadership, close to the grazing land if it is possible.

Any of the options discussed previously – registration of grazing rights, quotas and taxes – could be incorporated, albeit in different forms, within the common property regime with the elected management committee discussed. The management committee could involve the users in a decision-making process and thus determine ways to limit stocking levels in order to make resource use sustainable. The committee would introduce rules that the users would have to abide by.

In the previous section, it was theorised by Crotty that registration of grazing rights would lead to collaboration by the holders of grazing rights to reduce stocking levels. The sense of group membership that this type of collaboration would necessitate, is, in fact, formalised in the proposed common property regime.

It is recommended that each farmer be required to pay a monthly grazing resource fee per unit of cattle owned. This money collected by the management committee could be spent on improving and investing in pastoral resources and/or for other expenses incurred in management, including enforcement of rules. It may be noticed that this resource fee is similar to the concept of a tax.

In terms of enforcement, reputational effects, as mentioned in Section 2.11, would contribute to keeping farmers from defecting in terms of, for example, investing in cattle above the restricted level, or, defecting on payments required by the committee. The proposed property regime can be expected to increase the stock of knowledge, in making farmers more aware of the long term repercussions of unsustainable resource use, and thus to make them more responsible on a personal level. A long run cooperative convention is likely to emerge as a result of the institutional reform. It is evident that enforcement would be needed in the form of penalties such as fines to be paid to the management committee, in case of defection. Such potential penalties would, incidentally, enhance the reputation effect further.

In terms of policing, i.e. identifying defectors, Section 2.11 explains that membership in a group can strengthen the vengeance factor, and therefore farmers who, for example, invest in new cattle against the rules, are likely to be reported by other farmers. However, co-operation is likely with the sense of group membership inherent in this regime.

With regard to natural resource management, Carney and Farrington (1998:38) recommend “common pool resource management groups”, (which are, in effect, common property regimes) since they have ready access to information about members’ needs, and they can react quickly to changes. Carney and Farrington (1998:41) further point out the relative inability of poor people to spend long periods of time in participatory planning sessions and that capacity for management often needs to be developed through training in negotiation, conflict resolution, record keeping, etc. Their views thus lend support to Thomson’s recommendation of a small, non-user management. It is further recommended that this management receive adequate training to be able to handle their responsibilities.

Thomson says that without a non-user management committee, in a common property regime, “more effective farmers would not be able to acquire additional grazing, as potential buyers or lessees would have to identify and negotiate with all users” (Lyne, 1995; cited in Thomson, 1996:108). This indicates that he saw the value of a market in grazing land. This is related to the flexibility factor mentioned in Section 2.4.3. A common property regime, with its group ownership, would, firstly, facilitate cattle farmers knowing each other and having relatively easy access to each other. Secondly, a small non-user management would facilitate quick, inexpensive, objective and perhaps equitable decision-making. In such a regime, cattle farmers could easily exchange grazing rights with each other to suit their liquidity and investment preferences respectively, at each point in time; a second-hand market in cattle might develop so that farmers who lack the time and/or resources to maintain cattle could sell them to a more efficient/able farmer. The flexibility would also come about from the management committee adapting rules to suit changing needs of the user group; for example, a short term increase in foreign demand for beef (due to various international factors) could be accommodated by increasing farmers’ grazing rights in the short term. This flexibility

could not be expected in a state regime with the government controlling the use of the resource.

It is easy to see why Thomson would recommend a non-user group to be elected as management as opposed to a small number of users; the small number of users could use their management authority to suit self-interest as opposed to the interests of the entire user group. It is interesting to note that Bromley (1991:26) sees the customary tenure system as a common property regime with management authority vested in the group's leaders, i.e. the tribal authority. It is not clear whether Thomson expected the non-user, management committee to consist of tribal staff, non-cattle farmers in the village, or government extension officers. It is recommended that tribal staff be effectively trained by the Department of Agriculture for the purpose and the committee consist of mostly trained tribal staff and a government extension officer(s) who will play a quasi-supervisory role in the committee and will report back to the Department on important issues.

In summary, the proposal for a common property regime, with a small, elected, non-user management committee, to govern communal grazing land has several advantages over other options for institutional reform. Two main advantages are the sense of group membership and the flexibility inherent in the regime. Further, in answer to the research question regarding the possible benefits of a market in communal grazing land, it has been ascertained that there are benefits to both a market in grazing rights and a second-hand market in cattle. The potential for the operation of these markets in the proposed property regime contributes to the flexibility factor of the regime.

3.1.9 Transaction costs in the arable land rental market

Since high transaction costs can hinder market transactions, in order to stimulate a rental market in arable land, it is advantageous to minimise transaction costs. Thomson (1996) in referring to transaction costs in the land rental market, sees them as "including risk". Risks that have been mentioned are the risk of possession of the lessor's land by the

lessee, the risk of losing land to the lessor before the end of the duration of the contract (this is mainly the risk of loss of sunk costs in asset-specific investments) and the risk of crop damage by stray livestock. The first two risks can be seen to entail search and information costs in identifying reliable households with whom to enter into rental agreements. This is to reduce moral hazard and opportunism. These two risks can also be seen to involve enforcement costs to penalise defection on the agreement to obtain a fair legal decision on land ownership/control and to compensate the aggrieved party where necessary. The risk of crop damage would entail enforcement costs to penalise cattle farmers and to compensate crop farmers.

It is thus evident firstly, that farmers must be aware of their rights and duties with respect to leasing land and that these rights will be enforced by the customary courts. The existence of a formal, legal contract is important in reducing uncertainty of rights and duties. With the potential of fair settlement in tribal courts, search and information costs would reduce as the importance of personal trustworthiness of the lessor/lessee would go down. It is important that legal fees and other dispute resolution expenses be as low as possible, and that the aggrieved party be financially compensated in a fair and just manner. If enforcement is not reliable, parties would be less likely to enter into rental agreements.

Thomson (1996:98) indicates that rental transactions negotiated between strangers, as opposed to between friends or family members, increased from about one-fifth to about one-third of all transactions, upon extension efforts (described earlier) to match the contracting parties. "It is clear that 'outside' agents, like government extension officers, could do much to reduce private transaction costs" (Thomson, 1996:98). Thomson (1996:99) describes the existence of ex ante search, information and negotiation costs in the market:

...in 60% of cases lessees approached lessors for land to rent. Prior to 1994, lessees had to actively seek out lessors as the latter were often reluctant to advertise their land available for leasing. These search costs no doubt contributed to the absence of contracts between strangers prior to 1994. On average, parties met 2.3 times to negotiate rental contracts, and each visit entailed a trip, usually a walk, of 1.6 kilometres.

It is easily seen that Thomson's extension efforts, in facilitating meetings between prospective lessors and lessees and taking care of transport arrangements, would have greatly reduced transaction costs for the parties that entered into contracts as a result of those meetings. With regard to the reliability/trustworthiness issue, one can argue that reputational effects become important in the long run, as defection on a contract, for example, on the part of a lessee could result in inability to secure future contracts in the market. It is evident that the more active the rental market, the greater the importance of reputation.

It is recommended that the tribal authorities encourage the development of the rental market by keeping lists of willing potential lessors and lessees and their contact information in order to reduce search costs. While the existence of a formal contract is encouraging, it is vital to ensure fair and just enforcement in case of disputes. It is further recommended that legal outcomes of disputes be well-publicised, with a view to increasing certainty in the market. In general, the tribal authorities should be a valuable source of information to members of the rural community. As some Transaction Cost Economists would agree, almost all transaction costs can be related to some lack of information. With a proliferation of information in the community, reputational effects can be seen to further intensify, thus lowering incentives to defect on contracts or to otherwise behave in unethical ways.

3.1.10 Adaptive strategies to change grazing institutions that affect crop farmers

The importance of tenure security and the problems caused by stray livestock were discussed with the Amangwane Tribal Council. The councillors agreed to enforce new grazing rules provided that the rules were established by the community. A series of four community workshops were held in Moyeni to try and resolve this issue during May and June 1995. Radio Zulu was used to 'advertise' the dates of the workshops with great success – over 200 people attended the first meeting including senior tribal council members and prominent community leaders. (Thomson, 1996:100).

During the second workshop, it became clear that there was confusion over customary land rights:

Planting dates – the date when livestock have to be removed from arable allotments were unknown or unenforced. Participants could not reach consensus on their rights to fence off arable land, to impound stray livestock, or to claim compensation for crops damaged by stray livestock. Dispute procedures and compensation rates for damaged crops were unknown. (Thomson, 1996:101).

In the fourth workshop, a committee was elected to investigate and establish livestock grazing rules. The committee comprised nine community delegates representing the two interest groups – crop farmers and stock-owners; Government and non government organisations were also represented in an advisory capacity. The following rules were recommended to the Amangwane Tribal Council and were applied to the whole of Amangwane (Thomson, 1996:102):

- 1) Ploughing commences on 1 October every year. After this date all livestock must be removed from arable allotments.
- 2) Households are able to claim compensation for crops damaged by stray livestock after 1 October. If parties are unable to settle out of court, the dispute can be taken to the tribal authority. If found guilty, the stock-owner will be fined R10/ plant damaged as compensation to the crop farmer and pay a R20 court fee.

The 'Rules Committee' did not feel that it was necessary for households to be given the right to impound livestock. Information on the rules was disseminated in the community through radio, posters and pamphlets. The radio broadcasts had a tremendous impact on neighbouring communities - representatives from these communities approached field staff requesting that the project be expanded to include them (Thomson, 1996:103).

With crop farmers' rights thus made more exclusive in the summer months, the cost of grazing in summer goes up, thus making cattle a more costly investment to maintain. As Thomson (1996:103) points out, the enforcement of the rules can be expected to lower stocking rates. Lower stocking rates will, in turn, have a favourable impact on the use of communal grazing land.

As recommendations for the future, Thomson (1996:128) suggests that exclusive rights be extended to include winter months by allowing crop farmers to fence off arable land and that crop farmers be given the right to impound stray livestock.

Enforcement might be facilitated by erecting livestock pounds, and employing people to administer them and to assess crop damages. If stock-owners refuse to pay compensation promptly, impounded livestock could be auctioned off with the stock-owner receiving whatever remains after deductions have been made for compensation and court fees. (Thomson, 1996:103).

While Thomson's recommendations may seem severe, they can be seen to be essential, considering the need for protection of the valid property rights of crop farmers; and in the interests of equity, given that crop farmers are a financially weaker section of society than cattle farmers. Further, the recommendations will contribute to a more sustainable use of the presently scarce communal grazing land by lowering stocking rates.

3.1.11 Impact of the grazing institutional changes on tenure security

Upon establishment of clear grazing rules and dispute procedures as described in the above section, the percentage of households that experienced problems with stray livestock fell from 71% in 1995 to 31% in 1996. More crop farmers fenced off their arable land and employed guards, thus protecting their rights.

Nearly one-half of the aggrieved respondents who took no action against stock-owners were unable to identify the guilty party because they were not allowed to impound the stray livestock... This highlights the value of an approach based on small incremental changes to customary institutions. Adaptive strategies facilitate an on-going process of recommendations based on observed problems. (Thomson, 1996:105)

Thomson thus indicates that further changes are required; he presumably had in mind further sets of participatory problem-solving processes to achieve progressive institutional reform.

Indeed, Thomson's approach is very much in line with Bush's opinions on institutional reform as described in Section 2.16. One can view the community's initial uncertainty as to their rights to lease land as being related to their ceremonial values, in particular, respect for the authority of their tribal leaders and for customary practices; and perhaps acknowledgement of the higher status of cattle farmers (as relates to the lack of exclusivity of arable land rights). It is very interesting to note the flexibility of the tribal authorities in accommodating and even contributing to valuable changes in institutions and their eagerness to encourage a democratic process to engender institutional reform. This openness to progressive institutional change can be said to have been demonstrated clearly in both the tribal sanctioning of the rental market in arable land and in the acceptance by the Amangwane tribal councillors of the new grazing rules established by the community.

In reference to Section 2.16, accepting Bush's definition of technological change as "the change in prevalent habits of thought", Thomson's participatory problem-solving approach did indeed increase the community's capacity to learn the adaptive skills necessary to absorb technological innovation. In other words, Thomson's approach can be said to have increasing returns with regard to future institutional reform, as the community has already been introduced to the idea of democratic, creative and reflective use of the mind to bring about social change. Further, Thomson's approach can be commended for involving minimal dislocation of the community's existing behavioural patterns.

3.2 Implications of a subsequent study in the year 2000, based on the article by Crookes and Lyne (2003)

The following is quoted from an article by Crookes and Lyne (2003:580), which is based on Crookes's (2002) Masters thesis:

...institutional change is a long-term process... This study built on Thomson's work by revisiting his research sites to establish whether or not his efforts had sustained a rental market in arable

land. The objective was to examine changes in market performance and to consider the government's role in sustaining these markets.

The year 2000 study succeeded in including almost one quarter of Thomson's respondents in the sample (Crookes and Lyne, 2003:581).

The number of rental transactions and market participants in Amangwane increased sharply in 1995/96 upon Thomson's efforts to reduce transaction costs and to strengthen crop farmers' exclusive rights; these numbers fell to a certain extent after he withdrew from the area, as households had to bear search, information and negotiation costs themselves (Crookes and Lyne, 2003:591). However, the average number of transactions per lessee increased from 1,17 in 1993/4 to 2,4 in 1999/2000 and the average area rented increased from 1,25 to 2,81 ha; "lessees appear to be consolidating land by hiring from several different lessors, illustrating the emergence of a farmer class" (Crookes and Lyne, 2003:581).

It is clear that Thomson's action research, in bearing the fixed transaction costs (of search, information and negotiation) of participating in rental transactions, encouraged many participants to enter the market, who otherwise would not have done so. Having thus entered the market, the only further costs would be enforcement costs, which would not even be necessary except in cases of defection on the agreement. One can imagine that these initial participants were at a tremendous advantage in bearing little or no ex ante costs. With respect to the emerging farmer lessees, it can be hypothesized that the opportunity to participate in the rental market, greatly improved the income and cash flow situation in their household thus increasing their ability to hire further areas of land in subsequent years. Those that were unable to take advantage of the opportunity at that time might have lacked the resources to enter the market after Thomson's withdrawal, thus leaving them outside of the market even if they were willing to participate.

It seems unfortunate that Thomson's efforts were not continued on an appropriate level in subsequent years. Referring to Thomson's implied recommendation, in Section 3.1.9, outside agents such as government extension officers could have continued his work in

offering potential market participants the opportunity to enter the market by bearing their ex ante costs. This would have had important equity benefits in the community, as compared to the possible formation of a minority elite farmer class.

In terms of duration of rights and asset specificity, as discussed in Section 3.1.5, lessees, in the year 2000, were more willing to make long term investments, for example in liming the soil of the lessors' land; the use of written contracts had served to reduce moral hazard and encourage longer-term contracts (Crookes, 2002:55).

With regard to transactions with strangers, which might be considered important for further development of the rental market, both lessors and lessees indicated that they would be more willing to enter into agreements if they were introduced by an authoritative figure such as an extension officer or a tribal staff member, who is prepared to witness the rental agreement (Crookes, 2002:77). This suggests that a formal, legal contract could greatly reduce risk perceptions. Indeed, most "respondents stated that they would document their transactions if pro forma lease agreements were readily available, and if the local extension officer helped them to complete the form and lodged a copy with the tribal secretary" (Crookes, 2002:76). This suggests that pro forma agreements were not readily available and that respondents needed help completing the forms.

It may have been noticed that Thomson's efforts to establish new grazing rules were made in the unplanned Amangwane ward as opposed to the planned Amazizi ward. Comparing the results of Thomson's 1996 survey (Thomson, 1996:105) with those of the 2000 study (Crookes, 2002:76), a smaller percentage of the year 2000, Amangwane ward respondents employed guards or erected fencing to protect their arable land, a larger percentage suffered crop damage from stray livestock and a smaller percentage of aggrieved crop farmers received compensation from the tribal authority. While Crookes (2002:52) points out that only 7% of aggrieved crop farmers reported the matter to the tribal authority, it is interesting that all of the reported cases were settled in favour of the crop farmers. The majority of the aggrieved crop farmers took no action; this is important in light of Thomson's recommendation towards impounding stray livestock. Without this right, a crop farmer would perhaps not be able to identify the stockowner with certainty

and would not be able to prove the case in court. With the introduction of this right, crop farmers are likely to be much more assured of the exclusivity of their rights and of their right to legal recourse in case of crop damage.

The next Chapter will involve an analysis of the current situation in KwaZulu-Natal before going on to provide two comparative studies of institutional reform and to evaluate proposals for formal credit and insurance institutions for rural South African farmers. Lessons will be drawn from the two comparative studies for application in the KwaZulu-Natal context.

Chapter 4

ANALYSIS OF THE CURRENT 2003/4 KWAZULU-NATAL STUDY, TWO COMPARATIVE STUDIES OF INSTITUTIONAL REFORM AND AN EVALUATION OF FORMAL CREDIT AND INSURANCE PROPOSALS FOR RURAL FARMERS.

4.1 Analysis of the current 2003/4 KwaZulu-Natal study

4.1.1 Introduction

Thomson's study as described in Section 3.1 was commissioned by the University of KwaZulu-Natal and financed by the Development Bank of Southern Africa to develop a rental market for cropland in the Bergville District; in 1999 the Lima Rural Development Foundation (Lima) was awarded a USAID/South Africa grant to expand on this pilot project (Lyne, 2004:1). The subsequent 2000 study referred to in Section 3.2, was funded by Lima.

By 2002, Lima had expanded the land rental programme into six communal areas within the Bergville and Estcourt Districts and, with continued financial support from USAID, embarked on a much more ambitious plan to cover the entire Ladysmith region by inducting extension staff from the Department of Agriculture into the programme. (Lyne, 2004:1).

The current 2003/4 study was funded by Lima, mainly, in order to examine the impact of rental market intervention efforts undertaken. The two areas chosen, Mhlungwini and Duduza, are from the Estcourt and Bergville Districts respectively; a map of KwaZulu-Natal is provided at the end of Chapter 1 to show the two districts and to distinguish between rural and urban areas. Empirical research was undertaken by the author, Professor M.C. Lyne at the University of KwaZulu-Natal's School of Agricultural

Sciences and Agribusiness, and Jabulile Mthembu, another student. A report of the results was prepared by Professor M.C. Lyne in May 2004.

4.1.2 Methodology

The author participated in the survey, under the mentorship of Professor M.C. Lyne. The work done on the survey is described in chronological order.

The questionnaire was drafted using previous questionnaires as a guide, namely the ones used by Thomson, D N (1996) and Crookes, T J (2002) in their surveys. The questionnaire was then modified several times to suit the exact needs of the current survey and finalized. The questionnaire used appears in Appendix A.

Four enumerators were hired by Lima – two enumerators covered each of the two areas. The enumerators had to be bilingual; they were required to translate the questions into Zulu and then record the responses given by the respondents on the questionnaire. There was a training process to ensure that the enumerators understood the questions and the set of possible responses that could be expected. Professor Lyne, two members of LIMA staff, the enumerators and the author were present. The enumerators were given copies of the final questionnaire to read and understand. A role-play was performed, with some enumerators playing the role of the respondent and the others playing the role of the interviewer. The enumerators were encouraged to ask questions in order to gain clarity on the details of the questionnaire. Guidance was also given on how to code responses.

A set of 150 sample households to be interviewed were selected using a random method of selection:

A stratified random sample design was employed. The study population was divided into four strata defined first by area (Mhlungwini in the Estcourt district and Duduza in the Bergville district) and second by client status (Lima client or non-client). Random samples were drawn from lists of households in each stratum. For clients, the lists were extracted directly from district records maintained by Lima. Non-clients were listed by matching each client with a non-client

neighbour identified by Lima staff. Forty households were selected from each list using a table of random numbers. (Lyne, 2004:1).

While 149 households were located and interviewed, two completed questionnaires were unusable. Thus data was captured from a total of 147 questionnaires.

Enumerator, Vilikazi was accompanied to approximately ten houses in the Mhlungwini area to interview respondents. As Lyne (2004:1) says, the author spent time in the field to become acquainted “with the realities of eliciting data from rural households”. Further, this was an invaluable experience in understanding the life circumstances of the respondents and the issues that they face.

After the sample households were interviewed, data was captured from the questionnaires onto a Microsoft Excel file. Each type of information on the questionnaire was given a variable name and a number was assigned to each possible answer. With open-ended questions, various possible answers that were considered to be common, valid and/or important were given variable names and numbers were assigned to them. Thus quantitative, as well as qualitative information could be subjected to econometric analysis.

The sample survey data was cleaned. This was done by examining the descriptive statistics (of all variables) for any abnormal values that could have resulted from errors in the data capturing process; these values were then looked up in the questionnaires and the few errors that were detected were corrected. Univariate analyses were then conducted, using the Statistical Package for Social Sciences, V11.5. The analyses conducted relate to Sections, 5.2.2, 6, 7, 9 and 10 in the Questionnaire (See Appendix A). With regard to Sections, 5.2.2, 6, and 7, descriptive statistics were generated for the usage of purchased farm inputs, their costs; the ownership of farm and household assets and for on-farm improvements. T-tests were used to compare these assets and investments, firstly by area and secondly by client status. For example, the mean cost of chemicals purchased by Lima clients was approximately four times as much as the cost incurred by non-clients. The t-test for equality of the means revealed significance at the 5% level. With regard to

Sections 9 and 10, the t-test was applied to questions 9.1 to 9.4 by client status. Question 9.5, apart from “Yes” and “No” responses, had received quite a few “I don’t know” responses from survey respondents. This question was analysed using the “Frequencies” command, subject to various filters such as question 9.4 being answered in the affirmative. This was evidently to see the opinions about Department of Agriculture extension officers of those respondents who could get farming information when they needed it.

Although the amount of information obtained from the survey is extensive, only a proportion of it was analysed in Lyne’s (2004) work, and only a small part of the total information will be discussed and analysed in the next section. This is to keep the contribution of the current survey relevant to the purposes of economic institutional analysis in this thesis. Further, since the study areas surveyed were new, there was no scope for valid inter-temporal comparison with any previous studies.

4.1.3 Important implications of the 2003/4 study and recommendations

The table below appears in Lyne’s (2004:7) report:



Table 4.1.3a Breadth and assurance of property rights to farmland, Mhlungwini vs. Duduza

Perception of property rights	Units	Mhlung-wini (n=71)	Duduza (n=76)	Absolute t-value
Cannot build structures on cropland	%	94.37	50.00	6.94***
Can build without TA ¹ consent	%	0.00	34.00	6.25***
Cannot plant trees on cropland	%	88.73	40.79	7.03***
Can plant without TA consent	%	5.63	53.95	7.57***
Cannot fence cropland	%	1.41	5.26	1.31
Can fence without TA consent	%	88.73	90.79	0.41
Cannot bequeath cropland	%	9.86	1.32	2.25**
Can bequeath without TA consent	%	70.42	89.47	2.93**
Cannot lease out cropland	%	19.72	23.68	0.58
Can lease out with TA consent	%	52.11	40.79	1.38
Can lease out without TA consent	%	26.76	34.21	0.98
Cannot sell cropland	%	92.96	80.26	2.30**
Can sell without TA consent	%	2.82	2.63	0.07
Assurance of property rights	Units	Mhlung-wini (n=71)	Duduza (n=76)	Absolute t-value
Stray cattle in cropland?	%	82	67	2.05**
If yes, did they cause damage?	%	98	94	1.11
If yes, did you seek redress from TA?	%	32	21	1.25
If yes, were you awarded compensation?	%	29	0	2.58**
	%			
Rules to limit livestock on commonage?	%	1	0	1.00
If yes, are penalties applied?	%	0		

** Significant at the 5% level of probability

*** Significant at the 1% level of probability

¹Note: TA denotes the tribal authorities.

It is important to note that Mhlungwini was not introduced to the land rental programme until 2000 whereas Duduza was introduced in 1993; further, Mhlungwini is Betterment Planned while Duduza is unplanned (Lyne, 2004:2). It is immediately evident from the table that respondents in Duduza have significantly stronger, perceived property rights to arable land than those in Mhlungwini. One might reason that this is due to the longer duration of the rental programme in existence in Duduza. Although the incidence of stray cattle is higher in the Betterment Planned Mhlungwini (since households would be better able to police fields in the unplanned Duduza), a smaller percentage (21%) of those that suffered crop damage sought redress from the tribal authorities in Duduza and none of them were compensated. The table on the next page provided by Lyne (2004:8) sheds further light on the situation:

Table 4.1.3b Breadth and assurance of property rights to farmland, Lima clients vs. non-clients

Perception of property rights	Units	Lima Clients (n=77)	Non-Clients (n=70)	Absolute t-value
Cannot build structures on cropland	%	71.43	71.43	0.00
Can build without TA ¹ consent	%	18.00	17.00	0.16
Cannot plant trees on cropland	%	61.04	67.14	0.77
Can plant without TA consent	%	33.77	27.14	0.87
Cannot fence cropland	%	5.19	1.43	1.29
Can fence without TA consent	%	89.61	90.00	0.08
Cannot bequeath cropland	%	10.39	0.00	2.97***
Can bequeath without TA consent	%	74.03	87.14	2.04**
Cannot lease out cropland	%	23.38	20.00	0.49
Can lease out with TA consent	%	46.75	45.71	0.13
Can lease out without TA consent	%	27.27	34.29	0.92
Cannot sell cropland	%	88.31	84.29	0.70
Can sell without TA consent	%	2.60	2.86	0.96
Assurance of property rights	Units	Lima Clients (n=77)	Non-Clients (n=70)	Absolute t-value
Stray cattle in cropland?	%	68	81	1.95**
If yes, did they cause damage?	%	98	95	0.94
If yes, did you seek redress from TA?	%	37	17	2.41**
If yes, were you awarded compensation?	%	17	22	0.32
Compensation out of court?	%	22	9	1.51 ⁺

** Significant at the 5% level of probability

*** Significant at the 1% level of probability

¹Note: TA denotes the tribal authorities.

It is extremely interesting that Lima clients seem to almost consistently have perceptions of weaker property rights than non-clients. On the other hand, they are more likely to

seek redress and/or obtain compensation for damages. As Lyne (2004:7) says, “the inference is that Lima managed to bring unlikely participants into the rental market, and created greater assurance about exclusive rights to cropland and compensation for damages caused by stray livestock”. Given that Lima clients have perceptions of relatively weak property rights while Duduza respondents have perceptions of relatively strong property rights, it can be presumed that the favourable perceptions in Duduza are more due to the fact that it is unplanned, while Mhlungwini is Betterment Planned than due to the fact that Duduza has been exposed to rental market interventions for a longer period of time than Mhlungwini. In other words, the proximity of the field to the household serves to strengthen perceptions of rights. On the other hand, the lack of compensation for crop damage in Duduza indicates that tribal authorities expect households to be fully responsible for policing their own fields.

Lyne (2004:16) talks about Lima’s successes as demonstrated in the two areas:

...very few (10%) of Lima’s clients dropped out of the market over the project’s three-year lifespan. Amongst non-clients, less than 20% of the sample households engaged in a rental contract and 25 of these attributed their contracts to Lima’s presence and work in the district. ...Lima clients transacted larger areas than non-clients, are much more likely to engage in impersonal and long-term contracts, and were not concerned about declaring income or crop shares earned from leasing land out. In addition, 25% of the client households had developed sufficient confidence in the market to renegotiate their contracts without further assistance from Lima.

The survey revealed only one dispute experienced by a household in the sample and further questioning revealed that the claim was not entirely valid. This indicates that the formal, legal nature of the contract and the expansion of rental market activity have served to enhance reputational effects, i.e. both lessors and lessees would be reluctant to defect on an agreement when it is backed by authority and when future relationships are important for continuing to engage in rental transactions. However, Lyne (2004:9) makes the point that “the integrity of rental contracts will remain uncertain until confirmed by legal precedents established in customary courts”.

The small percentage of aggrieved crop farmers seeking redress from tribal authorities for damage by cattle and the small percentage thereof that were compensated, suggest that tribal authorities need to be convinced of the importance of exclusivity of crop farmers' rights. This is important so that further measures such as impounding of stray cattle or extending of exclusive rights to the winter months can be taken in the future in the interest of crop farmers' rights.

In terms of disputes between lessors and lessees, a recommendation for the future would be to request the tribal authorities to have a government extension officer present at the time of a dispute in order to ensure fair and just legal precedents.

The low percentage, approximately 20%, of households among both Lima clients and non-clients, as shown in Table 4.1.3b, indicating that they cannot lease out cropland suggests that the new institution of the land rental market, introduced through Lima's work in the area, is catching on in the rural population. Referring to Section 2.14, relating Witt's (1989) views to the current study, one might conjecture that collective action, in this case, by Lima, has caused land rental to gain a foothold in the population. Referring to Witt (1989:608), it can be said that once a critical mass of the population is convinced to adopt, the institution will self-propagate. It must be noted that this 'critical mass' is defined by the ability of the institution to self-propagate, once the mass is reached. Although it is a positive sign that Lima clients have started to re-negotiate contracts on their own, given the weak property rights perceptions as shown by Table 4.1.3a and the low rate of rental market participation by non-clients, as indicated by Lyne (2004:16), it is possible that the level of critical mass has not been reached, and even now, if rental market interventions were to stop, the new institution is at risk of gradually falling away. This risk is especially valid given the low level of exclusivity of crop farmers' rights even in the present time.

However, as cautioned earlier, proper legal precedents are necessary to uphold rental contracts and for the new institution of land rental to propagate further. It is also evident that a few more years of work are needed to improve perceptions further and to thus bring rental activity up to or close to its full potential, i.e. where all willing lessors and lessees

are market participants. All three studies, by Thomson (1996), Crookes (2002) and Lyne (2004), report equity and efficiency gains from the land rental market, using econometric analysis of relevant variables. Equity was evidenced in that land transferred from resource-poor households to those that were better endowed, the rent providing income to the poor households. Efficiency was evidenced in that land transferred from the poor households that were also likely to lack labour, time and equipment to farm the land to households that were better able to farm it thus increasing the total agricultural output produced by the community. Improving rental activity further will enhance these gains to the rural community.

4.2 A comparative analysis based on institutional reform for Australian water resources

4.2.1 Introduction

Challen (2000) in his book on institutional reform for Australian water resources, specifically in the Murray-Darling Basin, implies that while neoclassical economic theory supports private property rights and market allocation to allocate water to its best possible use, the practical realities of water use necessitate the consideration of alternative institutional arrangements.

The currently existing institutional hierarchy involves a top level of common property amongst the state and commonwealth governments; a second level of state property where each state controls a share of the total resource; a third level of common property amongst groups of irrigators sharing infrastructure for water supply and a fourth level of private water entitlements of individual irrigators (Challen, 2000:63). It is thus seen that allocation of water is inherently complex in nature.

At the time of commencement of Challen's research, institutional reform was taking place in terms of a new market system for reallocation of water entitlements between the private water users and initiatives to privatise government-owned irrigation schemes

(Challen, 2000:204). Challen (2000), however, implies that there are complexities in resource use that constrain privatisation and/or well-specified rights of irrigators. One of the complexities is that irrigation has a negative impact on the environment. Further, environmental management demands the use of water. Thus environmental concerns create a demand for the water that competes with the demand for water for irrigation purposes. Challen (2000) implies that allocation of water entitlements to both group and individual irrigators would have to depend on environmental needs and could thus change with time.

A government regulatory agency has two functions: (1) determining the institutional (property-right) structure for use of the water resource by the irrigation industry; and (2) maintaining the ecological and environmental 'quality' of the river basin at a predetermined standard. There is imperfect knowledge of hydrological and ecological processes in the river basin. The regulatory agency is unsure of the state of nature that will exist in the river basin in the future: a favourable state of nature in the form of environmental resilience to irrigation; or an adverse state of nature in the form of environmental susceptibility to irrigation. With current knowledge, the government agency can only assign subjective probabilities to possible future states of nature. These probabilities can, however, be revised over time as knowledge of the river basin increases.

(Challen, 2000:152).

With strong, well-specified private property rights, the regulatory agency would have less of a prerogative with respect to adjusting irrigators' water allocations to suit the needs of environmental quality maintenance. In addition to strong private rights, with the market system becoming more dominant in determining resource re-allocation, "a need to participate in water markets to purchase water for environmental purposes would increase the costs to government of achieving environmental objectives" (Challen, 2000:153).

4.2.2 Key lessons

In discussing static transaction costs of a market re-allocation between private water users, Challen (2000:81) identifies three main types of costs: administrative charges associated with trading of water rights; search and information costs of participants; and

to increase over time; there is thus a value associated with the opportunity for learning of the state of nature.

The model, dealing with two periods, with the first institutional reform decision made in the first period, defines the value of learning, the quasi-option value, thus:

...the increase in the maximum expected welfare arising from the prospect of additional information becoming available, subject to a constraint on the first-period institutional decision (Challen, 2000:157).

It is evident that it is relatively easy to estimate the benefits from water use accruing from a certain property right structure. However, with the state of nature unknown, it is hard to quantify the costs of environmental management and any compensation costs from a possible institutional reversal. Challen (2000), in his study, however, implies that time is needed to learn the state of nature and thus to minimise costs; and that this can only be done by placing constraints on the institutional reform decisions for a certain period of time.

Relating this to policy, Challen (2000:202) implies that the government, in knowing the high potential compensation costs involved with a reversal, must move cautiously with regard to institutional reform; gradual change is preferable, at least until there is sufficient information on the state of nature, in order to facilitate a relatively easy reversal if needed. In this way, i.e. in not moving forward with radical institutional reform, the government maintains quasi-option value. The quasi-option value thus “provides a measure of expected benefits from institutional flexibility” (Challen, 2000:207).

4.2.4 Implications for institutional reform in the rural KwaZulu-Natal land rental market

It is interesting to note from Section 4.2.2 that with the new market system for re-allocation of water resources, participants can benefit from government publication of trade prices to alleviate price dispersion. Thus even in a non-rural setting, institutional changes can involve an amount of government support to improve information levels.

This lends support to the fact that the KwaZulu-Natal rental market would benefit from publication of information on willing lessors and lessees and from support from government extension officers with respect to entering into rental market transactions.

As mentioned in Section 4.1.3, the rental market in arable land has been proven to bring about efficiency and equity gains, and there has been no real need, so far, to maintain a quasi-option value in this case of institutional change. In other words, one does not see the possibility of a need for institutional reversal in the case of the land rental market. With regard to communal grazing land, on the other hand, where there is uncertainty regarding various possible drawbacks of options for institutional reform, it is suggested that experiments be conducted to facilitate “learning” of the consequences, both positive and negative, of various reforms, before implementing them. In this case, the definition of quasi-option value can be extended beyond learning over time, for example, learning could take place based on reform in a small sub-ward to test the impact of change. Further, learning could also take place in rural forums, with the participation of the rural community, at the very least with regard to the preferences and potential support of the community for various reforms. For example, willingness to elect a management in a common property regime and to abide by the management’s decisions could be gauged from such a forum.

Land use is different from water use in that reform for water resources would not lend itself readily to being tested in a small cross-section of the population, hence the validity of the inter-temporal concept of the quasi-option value. However, institutional reform for land has the advantage of the impact being effectively observed even in small sections of the population, as a starting point.

One can conjecture that Thomson (1996), at the time of implementation of his action research in the pilot project, did not know with certainty, the extent of the future gains that would result from the land rental market. However, in the present time, based on the equity and efficiency gains from the rental market, demonstrated in the three studies, one is able to recommend that the institutional change be extended to the rest of rural KwaZulu-Natal under customary tenure.

4.3 Lessons for institutional reform in KwaZulu-Natal from land registration experiences in Africa

Numerous studies indicate that a lack of regard for indigenous tenure systems in Africa, and imposing a modern system to replace customary tenure has poor results in many ways. Bruce (2000:26) says that current thinking with regard to institutional change is “more respectful of indigenous tenure, more participatory in its methods, and more ready to accept diversity”. Bruce (2000) implies that favourable rules should evolve within indigenous systems into a common law mode. The establishment of legal precedents, based on the settlement of disputes would be important in such a transformation of rules into a common law mode.

Land titling/registration initiatives undertaken by the government in rural areas, are, in general, aimed at strengthening private property rights in order to facilitate transfer of rights. The transfer of rights would be possible either through a land sale or a land rental market. Further, it is hoped that a greater certainty of rights resulting from land registration will encourage the owners to make investments on their land and thus increase agricultural productivity.

Land Tenure Centre’s (1990:41) study on the Middle Jubba region in Somalia describes the land registration experience in the region: in 1986, the government agricultural office had a registration drive; 60% of the author’s survey sample made an initial application for registering their land at this time. Many villagers who made this initial application believe that their land is registered while 71% of the sample give cost as the primary reason for not registering their land:

Lack of knowledge is another reason why village farmers have not registered their farms: unfamiliar with the workings of government, farmers do not know how to pursue the complicated registration procedure. Finally some farmers say they should not have to register their land with the government because their families have always held this land without a title and they do not need one now. A number of farmers said that if someone (else) wanted to register their (belonging to the respondents) land, then it would be “God’s will” (Land Tenure Centre, 1990:42).

It is evident, firstly that the government had not anticipated the high level of expenses that would be required to make land registration effective, in terms of, for example, hiring extension staff to help farmers with the process, and secondly that rural farmers in the area were simply not ready for the institutional change, neither in terms of affordability of the personal cost of registration, nor in terms of thinking and attitudes. A consequence of the land registration initiative is that outsiders with better information on government procedures have laid claims to the land of the village farmers and several of these claims have been successful, with unfair loss of land on the part of the villagers (Land Tenure Centre, 1990).

Atwood (1990), in his Kenyan study, argues that the land titling/registration initiative has been premature. Atwood (1990:667) cites Bruce (1986:160) in saying that “it is becoming clear in some areas of Kenya that titling has not prevented a convoluted dispute settlement process, since legislation now states that title is only one piece of evidence regarding ownership rights, and that the testimony of local elders will have weight in the settlement of land disputes”.

It is clear from both the Somalian and the Kenyan studies that premature land registration reform, far from increasing certainty of rights, can in fact, create uncertainty. It can be presumed that the institutional change will be extremely costly to reverse in both areas.

It can be seen, retrospectively, that policy makers in the two areas would have done well to maintain a quasi-option value in implementing institutional change. In doing this, policy makers would have been able to learn about the potential problems that would be encountered and the likelihood of the success of the scheme before making a decision on fully fledged institutional reform. Two ways in which this could have been done are (1) village titling under customary tenure, as suggested by Land Tenure Centre (1990:54) and (2) land tenure changes, short of titling, backed up by clear criteria and local dispute settlement mechanisms, as suggested by Atwood (1990:667). Atwood (1990:668) implies that premature adoption of a new institution like titling, and misuse thereof, can cause the failure of the institution in the future when it does, in fact, become appropriate and suitable in the area.

The main lesson for KwaZulu-Natal reform is that non-profit organisations, the Department of Agriculture or other policy makers, should exercise caution when implementing reform in a bid to strengthen property rights and thus improve efficiency. Land registration would certainly not be appropriate in the present time, given the 2003/4 survey evidence indicating strong perceptions related to respect for authority of the tribal leaders and for customary practices and traditions. The gradualist approach to reform used so far, as commenced by Thomson (1996), is evidently to be highly commended in the light of experiences in other countries. However, a recommendation to be made would be to take legal precedents seriously, firstly by ensuring fairness and justice and secondly by ensuring a record of all legal precedents. This is important in a transition, within customary tenure, towards a common law mode that would strengthen property rights effectively and suitably.

4.4 Farmers' credit and insurance institutions in KwaZulu-Natal and an evaluation of proposals to formalise these institutions

Referring to the current survey results, Lyne (2004:13) says:

More than 40% of cash rentals were paid in arrears showing that the land rental market is a partial substitute for an imperfect credit market. Most rental arrangements were, however, not cash transactions (n≈25) but crop sharing arrangements (valid n≈47)... the land rental market is also a partial substitute for an imperfect insurance market.

Crop sharing arrangements do indeed serve to provide the lessees with insurance; in case of bad weather, for example, the loss from failure of the crop would be borne by the lessor as well, in terms of rent foregone for that period. Further, since a crop sharing arrangement results in payment upon harvest and possible sale of crops, the lessor in thus postponing rent due from the lessee, effectively provides credit to the lessee.

The high prevalence of cash rentals paid in arrears and crop sharing arrangements indicates that rural KwaZulu-Natal farmers are highly dependent on these informal sources of credit and insurance.

Ogg (1917:192), in his book on the economic development of modern Europe, compares the development of credit institutions in various countries, as an important aspect of development in the agricultural sector. Given that credit is important to agricultural development, it is important to analyse the institutions that would be appropriate in the present KwaZulu-Natal context to facilitate farmers' access to credit.

In comparing formal, regulated credit markets (RM) with informal, unregulated, credit markets (URM), Chung (1993:6) says that the URM has a simple lower cost delivery system and easier access to farmers, requiring much lower documentation fees, transport costs and incidental costs compared with the RM. In addition, farmers do not have to make as many trips to the lenders as they do in the RM. Sample data from a rural Indian credit market show that average RM borrower transaction costs per credit transaction (59.18 rupees) are far higher than those in the URM (1.00 rupees); it is pointed out that if opportunity costs of borrower time spent in negotiating the loan were included, the gap would be larger (Chung, 1993:7). The RM charged a lower interest rate of around 12.8% per year compared to 34.22% in the URM; the URM is primarily used for urgent and small amounts, while, for larger, production credit, farmers prefer borrowing from the RM (Chung, 1993:7).

The evidence from Chung's study shows that borrower transaction costs served to reverse the benefit of lower interest rates of the RM for a certain range of smaller loan amounts. "Borrower transaction costs are the primary factors to determine the optimal source of credit, along with other factors; this logic then makes it possible to explain the prevalent phenomena in the rural credit markets that small, poor farmers prefer to deal with the URM for small and urgent loans" (Chung, 1993:12).

Given Chung's (1993) information on borrower transaction costs and the low incomes (an average of approximately R200 per month being per capita income) prevalent in rural

KwaZulu-Natal, one can conjecture that very few households, if any, in a certain area, would demand credit from a formal institution. It is important that a sufficient number of people demand credit in a certain rural area if a formal credit institution is to locate in the area. The location of the credit institution is important since proximity to users would serve to reduce transaction costs. However, if the number of people demanding credit in the area is insufficient, it would be unfeasible for the institution to locate in the area. It must be noted that the word “institution” used in the above context refers to the financial establishment that grants credit rather than to a regularity in social behaviour as discussed in Section 2.10.

In fact, Matungul’s (2002:88) survey results on communal farmers in KwaZulu-Natal show that informal sources, such as neighbours, relatives and friends, as opposed to formal sources, were the preferred sources of credit. Recently, formal schemes, i.e. credit co-operatives, initiated to extend loans to some communal farmers in KwaZulu-Natal have proven unsuccessful (Ferrer, 2001, cited in Matungul, 2002:89). The 100% saving level imposed in order to secure an individual loan has been the main deterrent factor for many communal farmers; it might therefore be beneficial for both formal and informal lenders to strengthen their ties with one another and proceed with group lending schemes (Matungul, 2002:89).

Further, several authors, including Donald (1976:27-29), seem to make the point that for the new credit institution to result in increased agricultural production, technology used would have to improve, input markets would have to supply additional inputs at affordable prices and markets for agricultural output would have to be able to absorb the additional output. Thus the policy implication is that the introduction of formal credit would have to accompany a government extension drive to help farmers effectively expand production.

The Credit Guarantee Scheme proposed by the Department of Agriculture (1996) for rural South African farmers seems to be sound in terms of its emphasis on assessment of loan repayment capacity – this is important because a credit scheme should not result in bankruptcy of farmers who are unable to repay loans. The payment capacity of the farmer

would be calculated based on total family income, minus production expenses and living expenses (Department of Agriculture, 1996:199). Another condition for qualification under the guarantee scheme is that the farmer has access to extension services and training (Department of Agriculture, 1996:202) – this is important in order to generate revenue increases so that the benefits of credit access can outweigh the costs, thereof. It can be seen that this condition relates to the aim of increasing agricultural production.

The Ministry for Agriculture and Land Affairs (1998:508), in reference to deepening agricultural development finance, says that “strategies must be highly pluralistic as generalised solutions imposed from the top are subject to high rates of failure”. What this means is that formal credit cannot be expected to suit every farming household in the community and therefore policy must acknowledge and accommodate the fact that more traditional, informal sources of financing will still be of value to many households, even upon introduction of formal credit access. While this may not be a problem for credit policy, when it comes to insurance, institutional pluralism could be a problem.

With insurance, firstly, a sufficiently large number of farmers would have to participate so that the risk-pooling function of the scheme can be fully realised (The Ministry for Agriculture and Land Affairs, 1998:366). Secondly, since the government tends to provide assistance, in general, in case of natural disasters, the incentive to a communal farmer to take out an insurance policy on which premiums will have to be paid must be considered. With regard to a crop insurance scheme proposal, the Department of Agriculture (1996:255) recommends that:

After the system is in place the State should also exercise discipline, meaning that no bailouts will take place to farmers that can get insurance coverage; commercial farmers and emerging farmers involved in market related production. Only subsistence farmers will still need direct State assistance in case of a serious natural disaster.

There is thus an implication that all non-subsistence farmers will absolutely need to take out an insurance policy, to protect themselves in case of natural disasters. There is no possibility of phasing in of the insurance scheme, in a certain area, in this respect. The recommendation is reasonable, considering the unfairness to those that have paid for insurance, if all households were to be equally compensated by the government anyway,

in a time of crisis. It is safe to conclude that insurance should not be introduced at all until all non-subsistence farmers in the area are willing and able to participate and thus forgo government assistance in case of a crisis. It is recommended that workshops be held to assess the ability and willingness of farmers to participate, before introducing formal insurance in a particular area.

Until such a time that it is deemed suitable to introduce an insurance scheme in light of the above considerations, it is evident that informal arrangements such as crop sharing are important. The credit and insurance functions, inherent in crop sharing, are yet another advantage of the development of the land rental market. It is noted that while communal land tenure and the related lack of a land sale market are widely known to be disadvantageous in terms of lack of collateral of communal farmers when approaching a formal institution for credit, a land sale market is also widely known to cause the hardship of landlessness of poor peasants. The rental market by comparison improves equity.

In summary, it can be said that research is needed to assess whether the potential rate of participation would be sufficiently high in the formal credit market and whether a 100% participation rate of non-subsistence farmers would be ensured in the case of the formal insurance scheme. This research would be critical in informing a decision on the introduction of formal credit and insurance to communal farmers. The 100% participation rate is important with insurance since institutional pluralism would not be possible with this scheme.

The next Chapter concludes this thesis and makes recommendations for the future based on information studied and analysed.

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Communal grazing resources reform

While equity and efficiency gains from the rental market in arable land were evidenced in all three studies, namely by Thomson (1996), Crookes (2002) and Lyne (2004), institutional reform for communal grazing land, at present is still at the proposal level. The discussion in Sections 3.1.7 and 3.1.8 made it clear that continued open access would be detrimental to both the productivity of cattle and the sustainability of communal grazing resources in the long run. Further, the State imposition of quotas, registration of grazing rights or taxation is considered unfavourable for various reasons, not least of all because of the probability of high transaction costs associated with the enforcement of rules by the State. Hence, in agreement with Thomson (1996:108), one would recommend a common property regime with a non-user, elected management committee.

This committee could take measures to limit investments in cattle, so as to make pastoral resource use sustainable. If this is successful, the grazing land would be sufficient to provide feed for maintenance of the cattle. This would presumably lead to less stray cattle on arable land. Further, if some kind of grazing fee is collected by the committee, this money could be used to invest in the pastoral resources thus making the communal grazing land much more attractive than arable land to feed in. This grazing fee for the use of grazing land could be looked at as similar to the concept of a road tax charged for use of the road.

With regard to efficiency in cattle-related production, the grazing fee would serve to filter out the less efficient cattle farmers and thus contribute to making cattle farming a much more productive activity. In fact, one would imagine that only the truly dedicated, competent cattle farmers would keep cattle if there were fees to be paid; the number of

cattle owners that reside and work outside of the communal areas, and are, in effect absentee owners, might reduce.

It is theorized that the common property regime with its management committee, would facilitate a second-hand market in cattle, with cattle thus moving to its most productive use, resulting in allocative efficiency. It must be noted that a sale of cattle would entail an exchange of grazing rights, in this regime. While the concepts of registration, quotas or taxes could be used within this regime, the cattle farmers' group membership would be more likely to result in co-operative solutions being established with relative ease in this regime, as compared to a state regime.

It is interesting to note that the transfer of grazing rights, that takes place with the sale of cattle, means that there would exist effectively, a market in grazing rights. The less efficient farmers who would be unable to afford grazing fees would presumably surrender their rights to more competent farmers.

It is interesting to conclude that, while the institutions appropriate for communal grazing land are very different from those appropriate for arable land, the concept of the market increasing allocative efficiency is common to both types of land.

5.2 The approach used for institutional reform in the rental market

While markets are widely advocated in various contexts of proposals for institutional reform, not one source of literature researched suggested anything other than the gradualist approach, otherwise known as an incremental or adaptive approach to institutional reform. This approach, together with minimal dislocation and open support from tribal authorities, has served to make the land rental market initiative undertaken in rural KwaZulu-Natal very successful.

Recommendations for the future would be, firstly, to introduce the right to impound stray livestock so as to increase exclusivity of crop farmers' rights by improving enforcement

of their rights. Rules related to adequate compensation for crop farmers must be introduced, publicized and enforced. Secondly, further extension work is needed to bear the initial fixed costs of entering the land rental market for would-be participants, just as Thomson (1996) did. This is essential to give willing participants the opportunity to enter the market; these participants would then just have to bear the much less significant variable costs to stay in the market. Thirdly, tribal authorities should be requested to have a government extension officer present to help with ensuring fair and just legal precedents relating to disputes between lessors and lessees. These legal precedents must then be publicized so as to give the community information on their rights and to increase contractual certainty.

5.3 The current survey

Although the 2003/4 survey yielded a substantial amount of information (See Questionnaire in Appendix A), much of it was not included in this thesis. Some of the information would have been redundant in terms of survey results being very similar and predictable, given previous survey results. Such results would not yield interesting conclusions or necessitate recommendations. Other types of information were simply not considered very relevant to an economic analysis of institutions. Further, since the study areas surveyed were new, there was no scope for valid inter-temporal comparison.

The current survey results, like the previous surveys, once again prove efficiency and equity gains from rental market activity. The low level of exclusivity of crop farmers' rights continues to be a problem. There is evidence that there is a need to strengthen property rights perceptions further with extension work in the future. The recommendations made in the previous section, Section 5.2, can be expected to increase rental market activity and thus improve the welfare of the rural community.

5.4 The comparative studies of reform

The scope of the thesis permitted useful comparisons of firstly, institutional reform of Australian water resources and secondly, land registration experiences in Africa, with the KwaZulu-Natal land rental market.

The comparative studies lead one to conclude that policy prescriptions are not clear-cut especially with those regarding the use of natural resources. Natural resources often have more than one use and more than one group of users. These aspects make natural resources policy complicated. Certainly, one would find it quite a demanding task to make effective policy decisions without a proper awareness of the literature of New Institutional Economics, and thus the tools to analyse institutional implications.

The quasi-option value is an interesting concept used in the study of the water resources reform. In extending the inter-temporal concept of the quasi-option value to applying to cross-sections of the population, one can conclude that the new grazing land institution of common property with an elected management could be tested in a small sub-ward. The impact of the new institution could be evaluated, the institution could be adapted if found necessary, and then successfully be introduced in other communal areas in KwaZulu-Natal.

The land registration experiences reveal the dangers of the existence of institutional pluralism – the simultaneous existence of more than one institution - in certain contexts. In the case of Middle Jubba, the imposition from the top of the modern system of land titling was not only unsuccessful in that many rural farmers did not have the resources to complete the registration process, but also in the fact that farmers who preferred/respected the old institution of tenure often lost their land, i.e. the old and the new institutions could not co-exist. The institutional planning failure was enormous in terms of failure to foresee required expenses and the failure to predict the outcome of outsiders laying claims to rural farmers' land. In cases like this where institutional pluralism is not a possibility, it may seem that there is no scope for a gradualist approach. However, this is not true. Land titling would be more appropriate in a context where

substantial work has already been done, using a gradualist approach to strengthen the definition of private property rights – in such a case property rights would already be so well-specified that titling would be a matter of very simple paperwork involving very little expense. Needless to say, titling would not be a recommendation for rural KwaZulu-Natal at this stage.

5.5 The evaluation of proposals to provide formal financial services

In terms of the Department of Agriculture proposals to provide formal financial services, formal credit access could have positive results for emerging/commercial rural farmers' agricultural production if implemented properly. A government extension drive to help farmers expand production would be important in this regard as well as ensuring that loan recipients have the capacity to repay loans. The smaller farmers for whom the transaction costs of formal credit would be too high, and/or who would not qualify for loans in terms of repayment capacity, could continue to rely on informal credit. Thus this context accommodates institutional pluralism. Research to assess the potential participation rate by rural farmers would serve to determine the feasibility of the introduction of formal credit access in rural areas.

A government insurance scheme, if introduced, would have to be imposed at least on all non-subsistence farmers. This is to avoid government compensation, in case of natural disaster, to farmers that would be expected to take out insurance policies. There is thus no scope for institutional pluralism for the non-subsistence farmers. There is great danger in such a proposal if it is imposed without support from the community. It is thus recommended that participatory discussions be held to involve all non-subsistence farmers in the decision-making process, before implementing the scheme.

The proposed institution of formal insurance should not be introduced at all, until firstly sufficiently large numbers of farmers in the area would be willing participants and secondly, all non-subsistence farmers would be willing to participate. The number of participants would be important in view of the risk-pooling necessary for the scheme to

operate. The insurance organization would have to locate in a rural area in order to facilitate participation by rural farmers and to make their transaction costs affordable. The initiative seems premature at the present time. However, it is acknowledged that there is need for research to assess rural demand for such a scheme.

With the expansion of the land rental market in rural KwaZulu-Natal, the resulting increases in agricultural production and the emergence of a wealthy class of farmers, one can imagine that the provision of formal financial services will become feasible in the region at a certain point in the future.

5.6 Further research

Although the study of institutional reform of Australian water resources may be considered to be somewhat unrelated to the rural KwaZulu-Natal situation, it has been included in the thesis. This is because Challen's (2000) study discusses some very important concepts related to institutional reform, using the example of the water resources. The concepts of 'dynamic institutional analysis' and 'quasi-option value' are illustrated well in the Australian study and can be considered useful when considering any institutional reform initiative. Another good lesson from the study for other reform initiatives is that the costs of institutional reversal in the direction of attenuation of property rights are likely to be prohibitively high.

The Australian study would be a useful reference for future research related to economic institutions governing natural resources.

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APPENDIX A : RENTAL IMPACT QUESTIONNAIRE 2003*

Land: Tribal CPA **Interviewer:** _____

Group: Control _____ **Date:** _____

The information obtained in this questionnaire is strictly confidential and will be used for research purposes by LIMA staff and researchers at the Agricultural Economics Department, University of Natal. The findings will inform government of ways to design programmes aimed at improving farming efficiency and household welfare. Respondents do not have to answer questions – answers are voluntary. The respondent should be a male or female household head.

Respondent's name: _____ Household No.: _____

1 HOUSEHOLD DEMOGRAPHICS (code "don't know" as **DK**)

Household member (note respondent)	Gender (M or F)	Age (years)	Occupation ¹	Wage income (R/Month)	Income remitted (R/Month)	Disability, child support or pension (R/month)	Schooling achieved by adults (Grade)
1. Head							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

¹Occupation should be categorised as: Wage Employed (**WE**); Farmer (**F**); Self-employed (**SE** – e.g. taxi driver, shopkeeper etc); Housekeeper (**H**); Pensioner (**P**) if in receipt of pension; Disabled (**D**) if paid a

disability grant; Unemployed (U) if seeking work; Scholar (S), Infant (I) if too young to attend school; or vagrant (V).

TENURE SECURITY

2.1 What rights can the household exercise on its own cropland? (tick where appropriate):

Response	Right	Build structures	Plant trees	Erect fences to exclude others	Bequeath	Lease out	Sell
No							
Yes, with consent from local authority							
Yes, without approval from local authority							

2.2 Did livestock stray into your cropland after you planted it last season? (Y or N)

2.2.1 If yes, were your crops damaged by the livestock? (Y or N)

2.2.2 If yes, did you seek redress from the local authority? (Y or N)

2.2.3 If yes, were you awarded compensation for the damage? (Y or N)

2.3 If your crops were damaged and you did not seek legal redress, did the owner of the livestock pay you any compensation for the damage? (Y or N)

2.4 Are there rules limiting the number of livestock that people may graze on communal land? (Y, N or DK)

2.4.1 If yes, are penalties applied to people who exceed the limit? (Y, N or DK)

3 CROPLAND RENTAL CONTRACTS

3.1 Is anyone in this household hiring cropland in, or leasing cropland out, this season (including lending/borrowing contracts)? (Y or N)

3.1.1 If yes, how many contracts

3.1.2 For each current contract capture the following information:

Contracts in 2003/4	Is this household lessor or lessee?	Who is the lessor/lessee?		Who facilitated the contract?	Area rented	What type of contract was negotiated?		
		Head or Other	Male or Female	LIMA, DoA or Yourself	(Ha)	Formal ¹	Term ²	Payment ³
1								
2								
3								
4								

¹ Verbal or Written

² One year or less (**Short**), More than one year (**Long**)

³ **Cash** rental, **Crop** payment, **Favour**, **No** payment

⁴ **Family** relative, **Friend** or relative **Stranger**

3.2 If the lessor was a married male, did his wife agree to lease land out? (Y, N or DK) _____

3.3 If the lessor was a female, did all of the other household members agree to lease land out? (Y, N or DK)

3.3.1 If no, which members objected?

3.4 Capture the following information for any current cash rentals and crop sharing arrangements (insert relevant contract No.):

Cash/Crop share leases	Contract No	Contract No	Contract No
Was the cash paid in full before planting? (Y or N)			
How much is the full cash rental for this season? (R)			
Is the crop share a fixed proportion of yield? (Y or N)			
If yes, what is the share? (%)			
Is the crop share a fixed amount of the crop? (Y or N)			
If yes, what quantity must be paid? (specify units)			

3.5 What was the previous use of land hired in this season? (insert relevant contract No.):

Previous land use	Contract No	Contract No	Contract No
Cropland left idle by the lessor? (Y or N)			
Cropland under-utilised by the lessor? (Y or N)			
Veld used for grazing? (Y or N)			
Other: Please specify			

3.6 If the land hired in was previously cropped by the lessor, do you expect to achieve higher yields than what the lessor produced? (Y or N)

3.6.1 If yes, by how much do you expect yields to increase? (x1.5, x2 ,x3, x4)

3.7 Did anyone in this household hire cropland in, or lease it out, in either of the last **two** seasons (including lending/borrowing contracts) (Y or N)?

3.7.1 If yes, capture the following information for the largest rental transactions in each of the past two seasons:

Contracts	Is this household lessor or lessee?	Who is the lessor/lessee?		Who facilitated the contract?	Area rented (Ha)	What type of contract was negotiated?		
		Head or Other	Male or Female			LIMA, DoA or Yourself	Formal ¹	Term ²
2002/3								
5								
6								
2001/2								
7								
8								

¹ Verbal or Written

² One year or less (**Short**), More than one year (**Long**)

³ **Cash** rental, **Crop** payment, **Favour**, **No** payment

⁴ **Family** relative, **Friend** or relative **Stranger**

3.8 If the household has hired cropland in since 2001, what prompted it do so? (tick where appropriate):

Reasons	
To feed extended family	
To increase farm income	
Loss of pension earnings through death	
Loss of wage earnings through death or illness	
Other: Please specify	

3.9 If the household has leased cropland out since 2001, what prompted it do so?

Reasons	
Loss of labour through illness or death	
Loss of labour through wage employment	
Loss of labour though old age	
Insufficient cash to buy seed and fertilizer	
Earn more from rental income than from farming	
Other: Please specify	

3.10 Were any rental contracts negotiated in 2001 or 2002 not renewed? (Y or N)

3.10.1 If yes, why were these contracts terminated? (tick where appropriate):

Reasons	
A dispute	
Death or illness	
Found a better tenant or lessor	
Other: Please specify	

4 RENTAL CONTRACT DISPUTES

4.1 Has there been a dispute over any rental contract in the past two seasons? (Y or N)_____

4.1.1 If yes, what were the reasons?

.....

.....

.....

4.1.2 And what were the outcomes for this household? (tick where appropriate)

Outcome	
Contractual terms amended	
Lost land without compensation	
Lost income/crop without compensation	
Lost crop	
Received compensation for losses	
Other: Please specify	

4.2 Were any other parties consulted to resolve the dispute(s)? (Y or N)

4.2.1 If yes, who? (tick where appropriate)

Party	
People who witnessed the contract	
Traditional Authority (e.g. Induna)	
Customary court	
Magistrate's Court	
Religious leader	
Other: Please specify	

5 LIVESTOCK AND CROPS

5.1 Livestock

Livestock	Number currently owned by all household members	Number sold during past year	Gross income from sales during past year (Rands)
Cattle			
Goats			
Sheep			
Pigs			
Chickens			

5.2 Crops

Crop	Planted on own land <u>this</u> season		Planted on land hired in <u>this</u> season		Gross income from sales <u>last</u> season	Sold to consumer (Y or N)
	(Y or N)	Approx area (ha)	(Y or N)	Approx area (ha)	(R)	
Fallow land						
Total						

5.2.1 If the household left cropland lying idle last season, why did it not rent it out?

Reasons	
Resting the land (fallow)	
Renting is not permitted	
Did not know of any tenants	
Tenants would not pay enough rental	
Other: Please specify	

5.2.2 Expenses and income from crops

Purchased Input	Used (Y or N)	Quantity used <u>this</u> season (specify unit)	Total cost (Rands)	How much was the downpayment? (Rands)
Fertilizer				
Chemicals				
Improved Seed				
Hired: Contractor				
Farm equipment				
Farm labour				

6 FARM AND HOUSEHOLD ASSETS IN WORKING ORDER

Type	Number owned
Motor vehicle	
Tractor	
Plough	
Planter, harrow or cultivator	
Maize mill	
Fridge/freezer	
Radio	
Television	

7 ON-FARM IMPROVEMENTS FINANCED BY THE HOUSEHOLD

Type	Y or N	Type	Y or N
Irrigation		Other: Please specify	
Lime			
Fencing for crops			
Storage Silo			

8 NON FARM ENTERPRISES AND INCOME

Activity	Y or N	Gross income for past year (R)
Hiring out accommodation		
Hiring out contractor services or equipment		
Milling grain		
Baking, brewing or selling meals		
Building or repairing houses		
Block making, stone- or metalwork		
Hawking or shop-keeping		
Repairs and maintenance of cars or houses		
Making furniture or handicrafts		
Other: Please specify:		

9 SOURCES OF AGRICULTURAL INFORMATION

9.1 What is the name of the Department of Agriculture Extension Officer?

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

(a) the past month? _____

(b) the last season? _____

9.3 Has any member of this household attended an agricultural training course or farmers' day during the past three years? (Y or N)

9.4 Can you get farming information when you need it? (Y or N)

9.4.1 If yes, from what sources?

.....

.....

For households that have used LIMA's services to broker rental contracts:

9.5 Do you feel that extension officers from the Department of Agriculture could do the job of brokering rental contracts as well as or better than LIMA? (Y or N)

9.5.1 If not, why not? (tick where appropriate):

Reason for Under-performing	
Are not committed to helping farmers	
Do not have the means to visit farmers and prospective lessors	
Lack the integrity to be a reliable witness to rental contracts	
Do not know what they must do to promote land rental	
Are opposed to the idea of land rental	
Other: Please specify	

10 RECENT DEATHS IN THE FAMILY

10.1 Is the household head in general good health? (Y or N)

10.2 Have there been any deaths in your family over the past two years? (Y or N)

10.2.1 If yes, what were the ages of the deceased? (a) _____ Years

(b) _____ Years

10.3 What were the causes of death?

(a) _____

(b) _____

*Appendix A Note: The formatting of the questionnaire had to be changed to facilitate insertion into the thesis.

APPENDIX B: DATA SET*

LIMA	ID	AREA	ENUM	HHLD	MALES	CHILD
0	29	1	1	5	3	1
1	18	2	3	3	2	1
1	35	2	4	10	5	5
0	30	1	2	7	2	2
ADULTM	ADULTF	ELDER	HEADSEX	HEADAGE	HEADEDU	WE
1	1	2	1	73	4	1
0	0	2	1	74	1	0
1	4	0	1	51	1	0
0	4	1	0	64	2	0
F	SE	H	P	D	U	S
0	0	0	2	0	0	2
0	0	0	2	0	0	1
1	0	2	0	0	2	4
0	0	0	1	0	3	3
I	V	WAGE	REMIT	WELFARE	NOEDU	PRIMRY
0	0	-1	500	1400	2	0
0	0	1649	-1	1400	0	1
1	0	-1	250	0	0	3
0	0	0	0	700	0	0
HIGH	TERTIARY	BUILD	TREES	FENCES	BEQUETH	LEASEOUT
1	0	3	3	1	1	1
1	0	3	2	2	2	3
1	0	2	2	2	2	2
4	0	3	2	2	2	2
SELL	STRAY	DAMAGE	AUTHITY	COMPEN	OWNER	RULES
3	1	1	0	0	0	0
3	0	0	0	0	0	0
3	1	1	0	0	0	0
1	1	1	0	0	0	0
PENAL	CONTRACT	CONTRN	LESSOR1	HEAD1	GENDER1	LIMA1
0	0	0	0	0	0	0
0	1	1	2	1	1	1
0	0	0	0	0	0	0
0	0	0	0	0	0	0
AREA1	FRML1	TERM1	PAYMT1	PARTY1	LESSOR2	HEAD2
.00	0	0	0	0	0	0
3.00	1	1	4	1	0	0
.00	0	0	0	0	0	0
.00	0	0	0	0	0	0

GENDER2	LIMA2	AREA2	FRML2	TERM2	PAYMT2	PARTY2
0	0	.00	0	0	0	0
0	0	.00	0	0	0	0
0	0	.00	0	0	0	0
0	0	.00	0	0	0	0
CONSENTW	CONSENTA	OBJECT	FULCASH1	AMT1	SHFIX1	PERCENT1
0	0	0	0	0	0	.0
3	0	0	0	0	0	.0
0	0	0	0	0	0	.0
0	0	0	0	0	0	.0
SHFIXC1	UNITS1	FULCASH2	AMT2	SHFIX2	PERCENT2	SHFIXC2
.0	0	0	0	.0	.0	0
.0	0	0	0	.0	.0	0
.0	0	0	0	.0	.0	0
.0	0	0	0	.0	.0	0
UNITS2	IDLE1	UNDR1	GRAZE1	IDLE2	UNDR2	GRAZE2
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
HIGHRY	INCR	LAST2	LESSORL1	HEADL1	GENDERL1	LIMAL1
0	.00	0	0	0	0	0
1	4.00	0	0	0	0	0
0	.00	0	0	0	0	0
0	.00	0	0	0	0	0
AREAL1	FRMLL1	TERML1	PAYMTL1	PARTYL1	LESSORL2	HEADL2
.00	0	0	0	0	0	0
.00	0	0	0	0	0	0
.00	0	0	0	0	0	0
.00	0	0	0	0	0	0
GENDERL2	LIMAL2	AREAL2	FRMLL2	TERML2	PAYMTL2	PARTYL2
0	0	.00	0	0	0	0
0	0	.00	0	0	0	0
0	0	.00	0	0	0	0
0	0	.00	0	0	0	0
FEED	INCOME	LOSSP	LOSSW	PROVEMP	LOSSI	LOSSE
0	0	0	0	0	0	0
0	1	0	1	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

LOSSO	CASH	RENT	THEFT	FARMR	USE	DIST
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
RENEW	DISP	DEATH	NEW	DISPT	REASN	AMEND
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
LANDL	YCL	CL	COMPENS	WITNES	TRADN	CUSTOMC
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
MAGC	RELIGN	COWSO	COWSS	COWSY	GOATO	GOATS
0	0	5	2	4000	0	0
0	0	0	0	0	0	0
0	0	2	2	2000	3	0
0	0	0	0	0	0	0
GOATY	SHPO	SHPS	SHPY	PIGSO	PIGSS	PIGSY
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
CHICO	CHICS	CHICY	MAIZEO	MAIZEOA	MAIZEH	MAIZEHA
5	0	0	1	1.00	0	.00
0	0	0	0	.00	0	.00
0	0	0	1	2.00	0	.00
10	0	0	1	.10	0	.00
MAIZES	MAIZEL	POTSO	POTSOA	POTSH	POTSHA	POTSS
0	0	1	1.00	0	.00	0
0	0	1	.10	0	.00	3000
0	0	0	.00	0	.00	0
0	0	1	.10	0	.00	0
POTSL	BEANSO	BEANSOA	BEANSH	BEANSHA	BEANSS	BEANSL
0	0	.00	0	.00	0	0
1	1	.10	0	.00	4000	1
0	0	.00	0	.00	0	0
0	0	.00	0	.00	0	0
VEGO	VEGOA	VEGH	VEGHA	VEGS	VEGL	SUNFLO
0	.00	0	.00	0	0	0
1	.50	0	.00	1050	1	0
0	.00	0	.00	0	0	0
0	.00	0	.00	0	0	0

SUNFLOA	SWTPOTO	SWTPOTOA	FALLOWO	FALLOWA	FALLOW	NOPERM
.00	0	.00	1	1.00	0	0
.00	0	.00	0	.00	0	0
.00	0	.00	1	1.00	0	0
.00	0	.00	1	1.00	0	0
NOTEN	INADEQ	RISK	TIMEMONY	THFTDAMG	CONFLICT	FERT
0	0	1	0	0	0	1
0	0	0	0	0	0	1
0	0	0	0	-1	0	1
1	0	0	0	0	0	1
FERTC	CHEM	CHEMC	SEED	SEEDC	CONTCR	CONTCR
140	0	0	0	0	1	100
1105	1	250	1	5100	1	-1
360	0	0	0	0	1	1000
130	0	0	0	0	0	0
EQUIPM	EQUIPC	LAB	LABC	MOTOR	TRACTR	PLOUGH
0	0	0	0	0	0	0
0	0	1	4800	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
PLNTR	MILL	FRIDGE	RADIO	TV	IRIG	LIME
0	0	1	1	1	0	0
0	0	0	0	0	1	1
0	0	0	0	0	0	0
0	0	1	1	1	0	0
FENCE	SIL0	ACOM	ACOMY	EQUIP	EQUIPY	BAKE
1	0	0	0	0	0	0
1	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
BAKEY	BUILDE	BUILDY	HAWK	HAWKY	REPAIR	REPAIRY
0	0	0	0	0	0	0
0	0	0	1	8050	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
ART	ARTY	HERB	HERBY	DOA	MNTH	SEASN
1	0	0	0	0	0	0
0	0	0	0	1	1	4
0	0	0	0	1	0	0
0	0	0	0	0	0	0
TRAIN	INFO	SOURCE	DOAGOOD	COMIT	MEANS	INTEG
0	0	0	1	0	0	0
1	1	2	1	0	0	0
1	1	2	1	0	0	0
0	0	0	2	0	0	0

NOKNOW	OPPOSE	HEALTH	DEATHS	AGE1	AGE2	CAUSE1
0	0	0	1	42	0	4
0	0	1	0	0	0	0
0	0	1	0	0	0	0
0	0	1	0	0	0	0

CAUSE2
0
0
0
0

***Appendix B Note:** Cleaned data entered from the first four questionnaires make up this appendix. This is because the total data set would result in an appendix length of more than 100 pages.

APPENDIX C: VARIABLE DEFINITIONS*

Variable Name	Definition
LIMA	= 1 if LIMA, 0 if control group
ID	= House number
AREA	= 1 if Mhlungweni, 2 if Duduza
ENUM	= 1 if Vilakazi, 2 if Mthalande, 3 if Khumalo, 4 if Sibeko
 <u>Section 1</u>	
HHLD	= Number of household members
MALES	= Number of males
CHILD	= Number of children (<19 years)
ADULTM	= Number of adult males (19-60 years)
ADULTF	= Number of adult females (19-60 years)
ELDER	= Number of elders (>60 years)
HEADSEX	= Gender of family head
HEADAGE	= Age of head
HEADEDU	= 4 if head is uneducated, 1 if primary school, 2 if high school, 3 if tertiary
WE	= Number of household members wage employed
F	= Number of farmers
SE	= Number of self-employed
H	= Number of housekeepers
P	= Number of pensioners
D	= Number of disabled
U	= Number of unemployed
S	= Number of scholars
I	= Number of infants
V	= Number of vagrants
WAGE	= Wage income (R/month)
REMIT	= Income remitted (R/month)
WELFARE	= Disability, child support or pension (R/month)
NOEDU	= Number of uneducated adults in household
PRIMARY	= Number of primary school adults
HIGH	= Number of high school adults
TERTIARY	= Number of tertiary level adults
 <u>Section 2</u>	
BUILD	= 3 if not allowed to build structures, 1 if with consent from local authority and 2 if without approval from local authority
TREES	= plant trees (code similar to BUILD)
FENCES	= erect fences to exclude others (code similar to BUILD)
BEQUEATH	= bequeath (code similar to BUILD)
LEASEOUT	= lease out (code similar to BUILD)
SELL	= sell (code similar to BUILD)

STRAY	=	1 if livestock stayed into cropland after it was planted last season, 0 otherwise
DAMAGE	=	1 if crops were damaged by the livestock, 0 otherwise
AUTHITY	=	1 if redress was sought from local authority, 0 otherwise
COMPEN	=	1 if awarded compensation for damage, 0 otherwise
OWNER	=	1 if livestock owner paid compensation for damage, 0 otherwise
RULES	=	1 if there are rules limiting number of livestock people may graze on communal land, 0 otherwise
PENAL	=	1 if penalties are applied to people who exceed the livestock limit, 0 otherwise

Section 3

CONTRACT	=	1 if anyone in household is hiring cropland in or leasing cropland out this season (including lending or borrowing contracts), 0 otherwise
CONTRN	=	Number of contracts
{		
LESSOR1	=	1 if lessor, 2 if lessee
HEAD1	=	1 if head, 2 if other
GENDER1	=	1 if male, 2 if female
LIMA1	=	1 if LIMA, 2 if DOA, 3 if yourselves
AREA1	=	Area rented
FRML1	=	1 if written, 2 if verbal
TERM1	=	1 if long, 2 if short
PAYMT1	=	3 if cash, 2 if crop, 1 if favour, 4 if no
PARTY1	=	2 if family, 1 if friend, 4 if stranger
}		

Note: The above section enclosed by parentheses refers to the details of the first contract. The details of a second contract are captured using the same variable names followed by '2' as in 'LESSOR 2', 'HEAD 2' and so on.

CONSENTW	=	1 if wife agreed to lease land out, 2 if respondent does not know and 3 if wife did not agree
CONSENTA	=	1 if household members agreed to lease land out, 2 if respondent does not know and 3 if members did not agree
OBJECT	=	1 if husband or son objected, 2 if someone else objected
{		
FULLCASH1	=	1 if cash was paid in full before planting, 0 otherwise
AMT1	=	Full cash rental for season (R)
SHFIX1	=	1 if crop share is a fixed proportion of yield, 0 otherwise
PERCENT1	=	the crop share (%)
SHFIXC1	=	1 if crop share is a fixed amount of the crop, 0 otherwise
UNITS1	=	quantity in kg
}		

Note: The above section enclosed by parentheses refers to the details of the first contract. The details of a second contract are captured using the same variable names followed by '2' as in 'FULLCASH 2', 'AMT 2' and so on.

{		
IDLE1	=	1 if cropland left idle by lessor, 0 otherwise

UNDR1 = 1 if cropland under-utilised by lessor, 0 otherwise
 GRAZE1 = 1 if veld used for grazing, 0 otherwise
 }

Note: The above section enclosed by parentheses refers to the details of the first contract. The details of a second contract are captured using the same variable names followed by '2' as in 'IDLE 2', 'UNDR 2' and so on.

HIGHRY = 1 if higher yields expected than lessor's previous yields, 0 otherwise
 INCR = the increase (for example, a response of 2 would indicate that expected yields were twice as much as previous yields)
 LAST2 = 1 if anyone in the household hired in or leased out cropland in either of the last two seasons, 0 otherwise

{
 LESSORL1 = 1 if lessor, 2 if lessee
 HEADL1 = 1 if head, 2 if other
 GENDERL1 = 1 if male, 2 if female
 LIMAL1 = 1 if LIMA, 2 if DOA, 3 if yourselves
 AREAL1 = Area rented
 FRMLL1 = 1 if written, 2 if verbal
 TERML1 = 1 if long, 2 if short
 PAYMTL1 = 3 if cash, 2 if crop, 1 if favour, 4 if no
 PARTYL1 = 2 if family, 1 if friend, 4 if stranger
 }

Note: The above section enclosed by parentheses refers to the details of the first contract. The details of a second contract are captured using the same variable names followed by '2' as in 'LESSORL 2', 'HEADL 2' and so on.

FEED = 1 if to feed extended family, 0 otherwise
 INCOME = 1 if to increase farm income, 0 otherwise
 LOSSP = 1 if loss of pension earnings through death, 0 otherwise
 LOSSW = 1 if loss of wage earnings through death or illness, 0 otherwise
 PROVEMP = 1 if to provide employment, 0 otherwise
 LOSSI = 1 if loss of labour through illness or death, 0 otherwise
 LOSSE = 1 if loss of labour through wage employment, 0 otherwise
 LOSSO = 1 if loss of labour through old age, 0 otherwise
 CASH = 1 if insufficient cash to buy seed or fertilizer, 0 otherwise
 RENT = 1 if earn more from rental income than from farming, 0 otherwise
 THEFT = 1 if fear of theft of crops or fence, 0 otherwise
 FARMR = 1 if to help Farmers' Association, 0 otherwise
 USE = 1 if to keep cropland used, 0 otherwise
 DIST = 1 if cropland too far from home, 0 otherwise
 RENEW = 1 if any rental contracts negotiated in 2001/2 not renewed, 0 otherwise
 DISP = 1 if contract terminated due to dispute, 0 otherwise
 DEATH = 1 if contract terminated due to death or illness, 0 otherwise
 NEW = 1 if contract terminated due to finding a better tenant or lessor, 0 otherwise

Section 4

DISPT	=	1 if dispute in past 2 seasons, 0 otherwise
REASN	=	1 if reason for dispute was possession of land by lessee, 0 otherwise
AMEND	=	1 if contractual terms amended, 0 otherwise
LANDL	=	1 if lost land without compensation, 0 otherwise
YCL	=	1 if lost income/crop without compensation, 0 otherwise
CL	=	1 if lost crop, 0 otherwise
COMPENS	=	1 if received compensation for losses, 0 otherwise
WITNES	=	1 if parties consulted to resolve the dispute were people who witnessed the contract, 0 otherwise
TRADN	=	1 if parties consulted were the traditional authority, 0 otherwise
CUSTOMC	=	1 if customary court was consulted, 0 otherwise
MAGC	=	1 if magistrate's court was consulted, 0 otherwise
RELIGN	=	1 if religious leader was consulted, 0 otherwise

Section 5

COWSO	=	number of cattle owned
COWSS	=	number of cattle sold
COWSY	=	income in Rands from cattle sales

Note: for the following list of livestock (enclosed in parentheses), the suffixes 'O', 'S' and 'Y' are used to denote 'owned', 'sold' and 'income from sales' respectively as in COWS above.

{		
GOAT	=	goats
SHP	=	sheep
PIGS	=	pigs
CHIC	=	chickens
}		
MAIZEO	=	1 if maize planted on own land this season, 0 otherwise
MAIZEOA	=	approximate area of maize planted on own land
MAIZEH	=	1 if maize planted on hired land this season, 0 otherwise
MAIZHA	=	approximate area of maize planted on own land
MAIZES	=	income from maize sales last season
MAIZEL	=	1 if maize sold to local customers, 0 otherwise

Note: For the following list of crops (enclosed in parentheses), the suffixes are O=planted on own land, OA=area of own land, H=planted on hired land, HA= area of hired land, S=sales income and L=sales to local consumers as with 'MAIZE' above:

{		
POTS	=	potatoes
BEANS	=	beans
VEG	=	vegetables
SUNFL	=	sunflower
SWTPOT	=	sweet potatoes
}		
FALLOW	=	1 if land left fallow, 0 otherwise
FALLOWA	=	fallow area
FALLOW	=	1 if resting the land, 0 otherwise
NOPERM	=	1 if renting not permitted, 0 otherwise

NOTEN	=	1 if did not know tenants, 0 otherwise
INADEQ	=	1 if not enough rental, 0 otherwise
RISK	=	1 if contract risk, 0 otherwise
TIMEMONY	=	1 if insufficient time or money, 0 otherwise
THFTDAMG	=	1 if fear of theft or cattle damage, 0 otherwise
CONFLICT	=	1 if conflict between family members, 0 otherwise
FERT	=	1 if fertilizer used this season, 0 otherwise
FERTC	=	cost of fertilizer
CHEM	=	1 if chemicals used this season, 0 otherwise
CHEMC	=	cost of chemicals
SEED	=	1 if seeds used this season, 0 otherwise
SEEDC	=	cost of seeds
CONTCTR	=	1 if contractor used this season, 0 otherwise
CONTCTRC	=	cost of contractor
EQUIP	=	1 if equipment used this season, 0 otherwise
EQUIPC	=	cost of equipment
LAB	=	1 if labour used this season, 0 otherwise
LABC	=	cost of labour

Section 6

MOTOR	=	number of motor vehicles
TRACTR	=	number of tractors
PLOUGH	=	number of ploughs
PLNTR	=	number of planters
MILL	=	number of mills
FRIDGE	=	number of fridges
RADIO	=	number of radios
TV	=	number of TVs

Section 7

IRIG	=	1 if irrigation was an improvement financed by household, 0 otherwise
LIME	=	1 if lime was financed, 0 otherwise
FENCE	=	1 if fence was financed, 0 otherwise
SILO	=	1 if silo was financed, 0 otherwise

Section 8

ACOM	=	1 if accommodation was hired out, 0 otherwise
ACOMY	=	1 if income from accommodation, 0 otherwise

Note: For the following list of non-farm enterprises (enclosed in parentheses), the suffix Y means income from the activity as in 'ACOM' above

{		
EQUIP	=	1 if contractor services or equipment were hired out, 0 otherwise
BAKE	=	1 if meals were baked, brewed or sold, 0 otherwise
BUILD	=	1 if houses were built or repaired, 0 otherwise
HAWK	=	1 if hawking or shopkeeping was done, 0 otherwise
REPAIR	=	1 if cars or houses were repaired and maintained, 0 otherwise

ART	=	1 if furniture or handcrafts were made, 0 otherwise
HERB	=	1 if herbalist, 0 otherwise
}		
<u>Section 9</u>		
DOA	=	1 if name of DOA Extension Officer is known, 0 otherwise
MNTH	=	number of times contacted in month
SEASN	=	number of times contacted in season
TRAIN	=	1 if a household member has attended an agricultural training course during the past three years, 0 otherwise
INFO	=	1 if able to get farming information when needed, 0 otherwise
SOURCE	=	1 if source of information is LIMA, 2 if DOA, 3 if neighbours and 4 if shops
DOAGOOD	=	1 if felt that DOA could do the job as well as LIMA, 3 if felt that DOA could not do the job as well and 2 if they do not know
COMIT	=	1 if reason is not committed to helping farmers, 0 otherwise
MEANS	=	1 if they do not have the means to visit, 0 otherwise
INTEG	=	1 if they lack integrity, 0 otherwise
NOKNOW	=	1 if they do not know what must be done, 0 otherwise
OPPOSE	=	1 if they are opposed to the idea, 0 otherwise
<u>Section 10</u>		
HEALTH	=	1 if head is in good health, 0 otherwise
DEATHS	=	1 if there were deaths, 0 otherwise
AGE1	=	age in years of 1 st deceased
AGE2	=	age in years of 2 nd deceased
CAUSE1	=	4 if cause of death of 1 st deceased was natural, 1 if illness, 2 if accident and 3 if Tuberculosis
CAUSE2	=	4 if cause of death of 2 nd deceased was natural, 1 if illness, 2 if accident and 3 if Tuberculosis

* Appendix C Note: As might be evident, the sections correspond to the sections in the questionnaire; the variable names follow the same order as the related questions in the questionnaire. It might be noticed that some pieces of information, obtained from the questionnaires, have not been assigned variable names or definitions; and were not included in the data set in Appendix B. This is generally because those questions involved irrelevant responses or involved very few responses in the affirmative. Further, some new variable names and definitions might be noticed; these are generally based on common and/or important responses to open-ended questions.

Figure 3.1.8

		Owner 2	
		Do nothing	Add 1 cow
Owner 1	Do nothing	\$100, \$100	\$95, \$104.5
	Add 1 cow	\$104.5, \$95	\$99, \$99

The above prisoner's dilemma matrix shows that each grazier, acting in self interest, would want to add a cow thus contributing to degradation of the pastoral land, resulting in a reduction in the total payoff enjoyed from the land. The total payoff reduces from \$200 in the initial situation, to \$199.5 in the case where one grazier adds a cow, to \$198 in the case where both graziers add a cow each. The bottom right-hand corner, then, demonstrates the non-cooperative situation, and one can see that, even with repeated games, the society could settle at the inefficient equilibrium of the non-cooperative convention. It is important to note that it is the cooperative solution that maximises benefits to individual users in the long run.

As it was discussed in Section 2.15, it is the possibility of punishment by the other player that keeps a player from deviating from the cooperative solution. However, in the case of KwaZulu-Natal, where the owners may be (a) absent from the region, (b) short term-oriented, or (c) unaware of the long run implications of pastoral degradation, there is possibly no concept of punishment. Further, in this case, it seems inappropriate to extend the concept of punishment in a two-person society as with a prisoner's dilemma to a society with several graziers, many of whom may not know each other. However, keeping in mind that punishment in the prisoner's dilemma game takes the form of non-cooperation, it could be theorised that the graziers have chosen S2, the policing strategy, as their eternal strategy, based on deviation by other player(s) in some period(s) in the past.

price dispersion. The price dispersion, not accounted for by product heterogeneity, is attributed to imperfect information (Challen, 2000:103).

Challen (2000:106) concludes that “thinness” of the market results in inefficient pricing of the resource and high transaction costs:

The extent of price dispersion and the transaction costs associated with imperfect information decreased between 1994 and 1995 in association with an increase in the frequency of transactions.

Challen (2000:106) further recommends that government agencies collect and publish trade prices in providing market information to potential participants.

Section 2.13 explains the concept of dynamic institutional analysis, which takes account of the costs of transition from one institutional structure to another that are incurred in institutional reform. Thus dynamic transaction costs can be understood to be the costs of transition. Challen (2000:147) says that changes made so far, in the context of the Australian water resources, have been incremental and that this could be due to the high transition costs associated with a large institutional change. An interesting and important dimension of dynamic transaction costs illustrated by Challen (2000) refers to inter-temporal costs arising from the potential future costs of reversing institutional change made in the present time, if and when the change is found to be unfavourable.

Section 4.2.1 indicates that the new institutions currently being undertaken towards privatisation and market re-allocation could prove to be cost-ineffective and otherwise unfavourable to government objectives. In case of attempting to reverse the institutional change in the future, the government would face opposition from private irrigators and would have to carry the costs of compensation to the irrigators for attenuation of their rights (Challen, 2000:153). Section 2.6 explains the concept of non-attenuated rights.

Challen (2000:147) makes the important point that an attenuation of rights would be more costly than institutional change in the direction of nonattenuation:

For example, institutional change was achieved quickly and with relative ease in creating common property rights for group irrigation schemes and introducing market institutions for re-allocation of water entitlements. Both of these changes involved a transfer of property rights down the

hierarchy from colonial/state governments. On the other hand institutional change proved difficult, with attenuation of riparian rights... at the turn of the century, and in the creation of institutions for interstate common property rights. Both of these changes involved a transfer of property rights up the institutional hierarchy, in the first case from private individuals to state governments and in the second case from state governments to an interstate common property organisation.

The fact that a gradual/incremental approach has been taken so far is to be commended. This could be partly because policy makers have realised that strengthening private property rights could only lead to less government control in the future over the use of water in environmental management.

It is evident that water resource use has a large number of interested parties; with regard to environmental concerns, these would include the general public living in the region. Referring to Section 3.1.2, this aspect of many interested parties, together with uncertainty of future “states of nature”, could be argued to make water a resource that is more suited to administrative rather than market re-allocation.

Further, with regard to a possible need for reversal of institutional reform in the future on knowing the “state of nature” better, a gradual approach would be recommended. However, Challen’s notion of quasi-option value offers a significant perspective on the possible need for institutional reversal.

4.2.3 The concept of quasi-option value

Challen (2000:155) specifies a model where “decisions on institutional change are made with the objective of maximising welfare according to a welfare function that is defined as the benefits from water use minus the costs of environmental management and any compensation costs associated with institutional” reversal. It must be noted that strong property rights (in the model) increase the benefits from water use, simply because trading in the market can be expected to re-allocate water to its best possible use. The costs of environmental management and the possibility of reversal compensation costs would increase with an adverse state of nature. Information of the state of nature is likely
