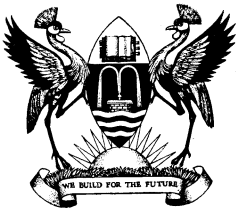

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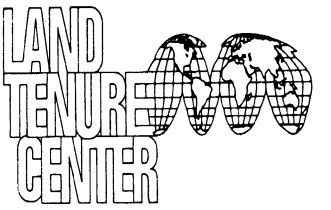

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RURAL AFRICAN LAND MARKETS AND ACCESS TO AGRICULTURAL LAND: THE CENTRAL REGION OF UGANDA

by

Elizabeth S. Troutt

ACCESS TO LAND AND OTHER NATURAL RESOURCES IN UGANDA: RESEARCH AND POLICY DEVELOPMENT PROJECT

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ABSTRACT

RURAL AFRICAN LAND MARKETS AND ACCESS TO AGRICULTURAL LAND: THE CENTRAL REGION OF UGANDA

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Under the Supervision of Professor Richard L. Barrows
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This research analyses hypotheses about individualization of land rights, the emergence of rural land markets, and the effects of land market operation on households' access to agricultural land in rural Uganda as population density and commercial opportunities in agriculture increase. Hypotheses derived from neo-classical economic theory have been advanced to advocate national policies of formal individualization of land rights in several African countries. However, prior to this research, they remained largely untested empirically.

This dissertation develops a three-stage model of rural African land market evolution using concepts from neo-classical and institutional economic theories. Population density, commercialization of agriculture, and land tenure rules are hypothesized to be instrumental variables affecting individualization of land rights and the emergence and operation of land markets. Hypotheses about the emergence of rural land markets and their effects on households' access to land, fragmentation, subdivision, ownership concentration, landlessness, commercial farming, and agricultural investment are tested using cross-sectional data collected through a household sample survey conducted in central Uganda.

The results of the research suggest that customary land tenure in central Uganda has evolved over time to become highly individualized. Land market activity appears to be positively correlated with population density up to some threshold level of population density, beyond which activity decreases. Concentration of land ownership appears to be no greater in areas with more active land markets than those with less active land markets, and not much land market-derived landlessness was found in the survey. Land markets appear to provide an important means of access to land for female-headed and commercial agricultural households.

Policy implications of the research include: (1) customary African tenure systems may evolve over time in response to changes in relative prices of agricultural inputs so that formal legislation is probably not necessary for the emergence of land markets; (2) governments can formally individualize land tenure to protect individual rights and promote land markets, but without accompanying policies to facilitate farm productivity, land market operation is not sufficient for agricultural growth.

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Richard L. Barrows

1. INTRODUCTION

1.1 INTELLECTUAL BASIS: A CONTRIBUTION TO THE LITERATURE ON AFRICAN LAND MARKETS

The economics and development literatures on land use and distribution demonstrate clear agreement among researchers that land markets and other mechanisms which transfer land rights are critical, though certainly not the sole, determinants of agricultural productivity, economic growth, and income distribution. Institutions are sets of rules that define the rights of individuals with respect to each other in their use of property. Land tenure institutions include rules that define: access to land through inheritance and kinship; permissible land use; rights held by the individual or household versus the corporate group or state; and, exchange rights and permissible transfers of land. Land tenure rules therefore influence the operation of a land market, which in turn is a critical determinant of who obtains or holds land rights, how land is used, the level of investment in agriculture, the degree of ownership concentration, the creation or exacerbation of landlessness, and the extent of subdivision and fragmentation of holdings. Since these variables strongly influence agricultural productivity and the distribution of income, the land market is an important determinant of agricultural land distribution and use and the rate of growth in the agricultural sector and thus the economy overall.

Individualization of land rights and functioning land markets have been promoted as preconditions to agricultural development on several grounds (Allan 1969; Johnson 1972; Newbery 1975; Ault and Rutman 1979; Eswaran and Kotwal 1986; Feder and Noronha 1987; Feder and Onchan 1987; Feder et al. 1988; Barrows and Roth 1990). First, individualized tenure is said to offer the land holder clearly defined land rights, which minimizes the cost of ascertaining rights when making decisions about land use and transfer. Second, individualization of rights is supposed to lead to increased agricultural productivity as, through the workings of a well-developed land market, the most productive users bid land away from land holders whose uses are less valuable. Individualization of tenure is also assumed to encourage the greatest fixed-place investment in agriculture since it allows the most freedom to contract, minimizes farmers' costs of converting fixed-place assets into other asset forms, and increases land tenure security. Increased tenure security increases farmers' likelihood of realizing future returns on their investments, either increasing expected net returns or decreasing the implicit discount rate used in investment decisions. In addition, increased tenure security decreases the cost of credit because of both higher collateral value and improved credit worthiness, thereby increasing agricultural investment from the supply side. To the degree that soil conservation requires investments, individualized tenure may also prevent land degradation. Many economists use neo-classical economic theory to argue that a system of private individualized land rights leads to the most efficient distribution and use of land because it offers land holders the greatest breadth, clarity, and certainty of tenure.

Some economists conclude that traditional African land tenure systems allocate resources inefficiently among users and require reform to bring about more individualized rights in land (Dorner 1972; World Bank 1974; Harrison 1987). These economists see as the source of

inefficiency the varying degrees of commonality of rights characteristic of many indigenous African tenure systems. They assert that under a communal rights system, individual rights may not be comprehensive or clear enough to promote the land market they view as integral to achieving an efficient distribution of land. They also assert that under traditional tenure systems, all costs and benefits do not accrue to the decision maker so that private and social costs and benefits diverge.

In addition, they argue that traditional systems too often grant individuals access to land only through inheritance or kingroup membership. Because access to land in traditional African tenure systems is typically determined by birth, gender, common residence, kinship, and social status, transactions in land will be limited to certain individuals or types of individuals, and the emergence of market transactions, in which access to land would be influenced by demand and supply forces, is encumbered. The absence of a land market is said to result in an efficiency loss which increases with the land's scarcity value, and therefore traditional tenure systems require formal individualization to create an atmosphere in which land markets can emerge and function to allow the most productive users to acquire land rights, and ultimately to maximize agricultural growth in developing African economies.

Other economists (Ault and Rutman 1979; Cohen 1980; Boserup 1981; Noronha 1985; Bruce 1988; Shipton 1989; Migot-Adholla et al. 1991) have argued that traditional African tenure systems are dynamic institutions that can adapt efficiently to changes in relative factor scarcities. Although in indigenous African systems individuals' land rights traditionally derive from and are generally subordinate to group rights, customary systems may permit increasingly individualized land rights to emerge in the face of changing relative scarcities of land and labor. For example, Ault and Rutman (1979) view customary African land tenure systems as "sets of individual rights that [have] yet to be defined or exercised" (p. 18), and argue that individualized land rights will emerge when it becomes economically worthwhile for individuals to claim them. In these cases, traditional restrictions on the exercise of individual rights in land may remain in customary law but will be unenforced. By such reasoning, land markets will neither have any impetus to emerge nor be economically beneficial to individuals or national economies until economic conditions influencing their evolution become such that the benefits of more exclusive land rights and the ability to exchange them through market transactions outweigh the costs of continued operation of traditional rules, and the need for forced individualization through formal legislation is eliminated.

The theorized link between individualized rights and agricultural growth in the pure neo-classical model relies on the land market, which links individualization[1] and growth through two mechanisms. The first mechanism is the formation of the land market. Fully individualized tenure is presumed to promote the emergence of land markets to a greater degree than other systems because it offers individuals the most comprehensive, clear, and secure bundle of rights in land. Paramount in this bundle is the right to sell, although accompanying rights, including a

[1] "Individualisation" refers to the possession of land rights by an individual person or household as opposed to the corporate group. This dissertation deals with allocations of land among households; it does not address allocations of land among various individuals within households.

variety of economically important use rights, are also important. Once there is economic value to land use and legal empowerment to transfer parcels, land markets can emerge as some individuals recognize the value of acquiring rights to additional land.

The second market mechanism linking individualization and growth is the role the land market plays as a channel through which those who can extract the highest productivity from land ownership and use can outbid less productive users to acquire access. In this way, the land market is said to lead to an efficient distribution of land among uses and users and thus to maximize social welfare and agricultural growth. Through these two sub-links, economists argue that individualization of land rights is a necessary condition for economic development.

Researchers consider the land market, with both its powers and its limitations, to be instrumental in an array of related processes and issues. Feder and Onchan (1987) argue that, in Thailand, individualization is closely linked to capital formation and land improvements in agriculture. The land market may be important in allowing the transfer of land to productive users. Richards et al. (1973) point to the existence of a market as critical in granting commercial farmers in Uganda access to land. Furthermore, Fortt (1973), West (1972), and Mukwaya (1953) claim the land market was responsible for breaking up the large estates originally allocated by the British to individuals in central Uganda. Commercial farmers may not be the only types of individuals who gain access to land through markets. Land markets, which by definition are blind to the personal characteristics of participants, may provide an important means of acquiring land rights for individuals such as women and ethnic or kingroup outsiders, whose access to land was limited under traditional tenure rules.

Land markets may also be responsible for some less desirable consequences in the pattern of landholding. They may lead to subdivision of parcels below an economic level (Fortt 1973) and excessive fragmentation of holdings. These two effects might be logical by-products of the break-up of holdings as a greater number and variety of individuals gain access to land through markets. Land markets may also contribute to increased concentration of land ownership. In Kenya and Botswana, it appears that increased concentration of land ownership was a direct result of individualization. Berry (1988), however, contends that land markets do not always lead to concentrated ownership in Africa, but that concentration occurs through a variety of processes, including not only through the operation of land markets but also through appropriation by colonial and post-colonial governments and through the exercise of customary rights. And Bruce (1988) maintains that information is as yet insufficient to judge whether a land market or state land administration is generally more likely to increase land concentration in Africa. The functioning of land markets may also be associated with increased landlessness, as the social and economic safety nets inherent in the traditional system are eroded to make way for a degree of individualization sufficient for land markets to emerge.

Thus, the land market will influence progress toward economic development through its effects on land use and its ability (or lack of) to overcome the dangers of excessive fragmentation and subdivision of land parcels and concentration of land ownership. The land tenure system is a significant factor in the structure and operation of the land market, registered individualization of rights being touted as the tenure form most favorable to the emergence of land markets. In light of this, several African countries, among them Botswana, Ghana, Kenya, Somalia, and

Zimbabwe already have laws establishing some form of individualized land tenure. Others, such as Swaziland, Uganda, Zambia, and Tanzania, are considering large scale land tenure reform, based on the theoretical premise that individualized land tenure is a precondition to agricultural development. Otsuka et al. (1992) point out that recently a major concern in Africa has been the development of property rights in land consistent with optimum production, investment, and resource conservation incentives. In designing projects and distributing scarce funds, development organizations, including the United States Agency for International Development and the World Bank, have advocated freehold tenure with registered land titles and the more general establishment of individual rights through land demarcation and survey (Barrows and Roth 1990).

Yet the theorized individualization-land market-economic growth links have hardly been examined empirically, and there is a virtual absence "of careful studies of the operation of both informal and formal land markets in Africa" (Bruce 1988; p. 43). Given the paucity of research, the danger is that land policy in Africa will be based on theoretical hypotheses that remain largely ungrounded in empirical evidence.

1.2 APPLIED RELEVANCE: LAND POLICY REFORM IN UGANDA

Uganda offers a compelling context in which to study, in general, access to land for agriculture and, in particular, the operation of land markets as they influence access to agricultural land under varying socio-economic conditions. With estimated per capita income of US $140 (World Bank 1993) and a ranking as one of the world's 15 poorest nations (World Bank 1992), Uganda struggles to improve the economic position of its citizens. Given the country's lack of a social security system and recent history of political unrest, access to land in Uganda is critically important to people's welfare. Furthermore, in an economy as heavily dependent on agriculture as Uganda's, access to land for farming is of central concern. Agricultural output is produced almost entirely by approximately 2.5 million smallholders. The World Bank (1993) estimates that 80% of them have less than five acres of land. Access to high potential farmland for the mass of the population is crucial, and the distribution of land is a major issue. What West wrote in 1971 remains true:

> The economy of Buganda[2] is still very heavily dependent on agriculture and forestry so that the land is and must for the foreseeable future remain the primary source of wealth. As the land tenure system provides the indispensable link between the people and the land, the nature and peculiarities of this system must continue to exert considerable influence on the development of both the economy and society. The study of this land tenure system, with its merits and defects and its evolution from a customary towards a statutory form, still constitutes therefore a necessary field for research. As an illustration of the process of transition from a communal to an individualized form of tenure the

[2] Buganda, the pre-colonial tribal kingdom of the Baganda people, corresponds almost exactly to what is now the central region of Uganda. At the time of West's writing, the area was still known as Buganda and enjoyed a federal status unique among the former tribal kingdoms within the colonial protectorate and subsequently independent nation.

> situation in Buganda retains a continent-wide relevance at the present time. (p. 1)

The central region of Uganda hosts a mix of land tenures unique within both Uganda and Africa. In 1900, approximately half the land area of the region was placed under a unique tenure form akin to freehold, while the other half was left under the customary system. As a result, a highly individualized tenure form known as mailo[3] has existed alongside the traditional system for nearly 100 years. Over time, socio-economic conditions, such as population density and immigration by outside ethnic groups, changed, more in some areas than in others, and each of the tenure forms adjusted to these changes. Land markets have functioned in much of the region for at least 70 years.

Two characteristics of this mix are of immediate interest in analyzing land tenure policy in Uganda and throughout sub-Saharan Africa. First, the central region is one of the few areas in Africa where land markets have existed for so long and, consequently, where individuals' economic decision making, especially with respect to the acquisition and use of land, has been established in conjunction with markets. Second, the customary tenure system in the central region has evolved during the last century, showing signs of increased individualization even to the point of market exchanges of customary land. Today, the central region offers a suitable arena in which to study land markets both under legislated individualization and a more evolved sort of approximate individualization. In addition, study of land markets in central Uganda may be valuable in informing a national land law reform currently under way.

Uganda's national land law reform process is directly associated with the centrality of agriculture to the economy and the influence which land tenure exerts on access to agricultural land. The impetus motivating the reform process stems from a desire to re-examine and rebuild institutions whose roles were undermined during the political upheaval that characterized much of the last two decades.

In 1975, Idi Amin promulgated the Land Reform Decree (LRD) which, de jure, is still in effect. The LRD made all land in Uganda the property of the state, and permitted individuals to obtain long-term leases to land. In the central region, where mailo land had existed since 1900, this represented a dramatic change in de jure tenure. People who had been land owners became, technically, leaseholders. However, the LRD was hardly implemented, its main result therefore being to create confusion in land relations which had formerly been clearly defined. This history will be recounted in detail in chapter 2; the important point here is that the LRD is still technically the law governing land in Uganda even though recent research in the central region indicates that it has had little effect on individuals' land-related decision making beyond clouding their perception of what is permissible.

Under the leadership of Yoweri Museveni, who became president of Uganda in early 1986, a large degree of stability has been restored, and there has been progress toward re-establishing governmental institutions and forces to provide for continued order and increased economic development. Because of the centrality of agriculture to Uganda's economy, land tenure policy

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[3] Mailo land is described in detail in chapter 2.

was cited early as a factor which, if not wisely designed, could restrict economic development. The 1975 LRD, in its unimplemented state, was viewed as an extraneous law which should either be enforced or abolished. Thus, the land policy debate began.

Interest in national land law reform grew quickly, and several goals for the land tenure system emerged, including: creating, from a now geographically diverse set of land tenure systems, a more uniform tenure system throughout the country; making possible the taxation of land in order to increase government revenue; developing the ability to control the direction of land tenure evolution; promoting access to rural land to allow for the growth of commercial agriculture; and, protecting individual rights and freedoms (MISR/LTC 1989; Technical Committee 1990; Agricultural Policy Committee 1987). In addition, there was a need to align de jure law and de facto practices, which created the options of: enforcing the LRD to bring practice in line with law; abolishing the LRD and implementing a new law which formalized current practice; or, implementing a new law which changed current practice. Research and policy discussions during the late 1980's resulted in the drafting of the *Tenure and Control of Land Bill*, which is presently under review by Uganda's National Executive Committee. As set out by the Bill, the 1975 LRD would be abolished, and land throughout Uganda, with the possible exception of urban property, would be placed under individual freehold tenure.

In the central region, these changes would be little more than a legalization of the system which continued to function even after passage of the LRD. Mailo land would be converted to freehold, but since mailo land has always been akin to freehold, this change would not significantly alter the structure of mailo owners' land rights,[4] and the land markets that emerged in the central region at least 70 years ago continued to operate even after the LRD was passed. However, in other areas of Uganda, it is less clear what effect such legislation might have on households' access to land. Land markets would logically be expected to develop, if they have not already. Trends in the central region, therefore, may be predictive of how formally individualized land tenure and land markets will influence household access to rural land elsewhere in the country and even elsewhere on the African continent. It is therefore important and desirable to investigate the implications of land market operation for households' access to land for commercial as well as subsistence farming in the central Ugandan setting.

1.3 About This Research

In order for a theory to add to knowledge, it must, rather than remain a totally abstract exercise, be tested against observation. Based on the outcomes of empirical inquiries designed to assess the strength of theorized relationships, elements of a theory can be sifted, filtered, modified, and enriched so that, through an iterative process, the theory may come to more truly explain the world it seeks and serves to illuminate. This is the essence, spirit, and goal of the scientific method.

The essential elements of the economic theory of African land tenure have been well-developed for some time (Johnson 1972). This body of theory hypothesizes clear and logical, though

[4] The change would impact tenants on mailo land in a more complex way, as will be discussed in chapter 2.

rather broad, relationships between land rights systems and land markets and their contribution to economic growth through their effects on individuals' access to and use of agricultural land. Specifically, neo-classical economic theory has been used to develop a line of argument asserting that individualized land tenure is necessary to achieve economic efficiency and to maximize social welfare. This is presumed to occur through the exchange and use incentives inherent in the increased clarity, certainty, and security of individualized land rights. Under individualized land tenure, land can be transferred to the most productive users through the operation of a well-developed land market, and tenure security is sufficient to induce the greatest volume and value of agricultural investments on land. However, while they have served as the basis of national policies advocating formal individualization of land tenure (i.e., freehold tenure) in several African countries, because there have been at most only a few quantitative studies of designed to test them, these theoretical relationships have remained largely ungrounded in empirical evidence that either supports or refutes them.

This research serves as an initial applied exploration of the process of individualization of land rights, the emergence of land markets, and the effects of land market operation on households' access to agricultural land (and consequential land distribution and use outcomes) in rural Africa. As such, this research is will neither to explicitly expand the theoretical frontier of land economics, nor provide a definitive or final statement about the validity of the neo-classical theory for land tenure and land market operation in rural Africa. Rather, it is intended as a first attempt to operationalise and test the strength of theorized relationships between land rights, land markets, and individuals' access to land in an African setting.

To this end, specific "hypotheses," which at this point in the grounding of theory in empirical evidence might more fittingly be considered "propositions," are framed in the context of an hypothesized "story" of rural African land market evolution (in chapter 3). Cross-sectional data gathered through a household sample survey in rural central Uganda are then used to test these propositions (Chapter 5) in the sense of discerning relationships and patterns which are portrayed by the hypotheses or propositions. Where empirical relationships are found to vary as hypothesized, attempts are made to use theory to develop a deterministic explanatory line of reasoning connecting theoretical concepts. Where hypothesized relationships are challenged by the empirical analysis, attempts are made to begin to further develop and enrich the theory itself in its application to African land tenure.

1.4 FORMAT OF THE DISSERTATION

Five chapters follow. Chapter 2 reviews central Uganda's land tenure history. Chapter 3 develops a model of the evolution of rural African land markets and presents hypotheses about land markets and their effects on land distribution and use. Chapter 4 describes the survey design for this research. Chapter 5 presents the results of data analyses. And chapter 6 discusses conclusions based on this research.

2. LAND TENURE IN UGANDA'S CENTRAL REGION

2.1 INTRODUCTION

Uganda is a landlocked country situated astride the equator in eastern Africa and bordered by Kenya to the east, Sudan to the north, Zaire to the west, and Rwanda, Tanzania, and Lake Victoria to the south. (A map of Uganda appears in Appendix A.) The climate and soils of Uganda are very well-suited for agriculture, and about 78% of the land area is potentially agriculturally productive. Indeed, Uganda's economic well-being is inextricably bound up with agriculture, both as a means of subsistence for the predominantly rural population and as a contributor to the export economy. Approximately 90% of Ugandans reside in rural areas and engage wholly or predominantly in agriculture (Government of Uganda 1991; World Bank 1993). Agriculture contributes substantially to gross domestic product. During 1988-89, the agricultural sector accounted for 67% of GDP (Lateef 1991) and generated about 90% of export earnings (World Bank 1993). Traditionally, coffee and cotton were the major cash crops. In the mid-1960's, coffee contributed approximately half of all export earnings, and cotton contributed one-quarter. Today, coffee is by far the dominant export crop. In 1988, coffee exports contributed nearly 97% of the total value of exports (Ochieng 1991), and as such, coffee is clearly Uganda's leading source of foreign exchange. As the basis for agricultural production, therefore, land is the country's primary source of wealth. Since agriculture represents such a potential force for poverty reduction in the country, access to land for agriculture may be a crucial determinant of Uganda's economic development. In addition, land represents a refuge, which is important in a country so recently emerged from 20 years of armed conflicts and lacking a social security system.

Uganda's political structure is organized in a hierarchy of elected bodies called resistance councils (RC's), with the national parliament called the National Resistance Council. The village is the lowest RC level and is called the RC-1 area. Each village elects nine of its residents to serve as its RC-1 members. While laws are passed at the national level, there is a great deal of executive and judicial government conducted at the district, sub-county, and village levels. For rural people, the village and sub-county levels are particularly important, for it is at those levels that people can participate in local decision making and seek assistance in settling disputes and handling other problems.

Uganda is divided into seven regions. Although they are not important for political administration, the regions are significant in that they correspond roughly to the areas occupied by the larger pre-colonial tribal kingdoms. In the past, the regions were named according to the tribe whose kingdom was there. Currently, they are named for their geographical location within Uganda. This research was conducted in what is now known as the central region. Formerly called Buganda, the central region was the pre-colonial kingdom of the Baganda.

2.2 UGANDA'S CENTRAL REGION

The central region lies along about 200 miles of the northern and western shores of Lake Victoria and extends inland an average 80 miles. The land area of the central region is about 17,295 square miles, most of which lies at an average elevation of about 4,000 feet. The

region's climate is broadly of the tropical savanna type, with average annual rainfall between 35 and 45 inches. Rainfall is well-distributed throughout the year, exhibiting two peaks separated by two short dry periods. Geologically, the central region is an eroded plateau, with the typical landscape consisting of a multitude of small hills. Most hills are about a mile in diameter with their tops lying about 500 feet above the valleys, which are sometimes filled with papyrus swamp or forest. Soil types lie in bands along the hillsides. In many places, the best soil is a wide band of fertile red clay along the middle of the hillside. These sections, when cleared, are excellent for growing bananas (the staple crop), robusta coffee, cotton, and a variety of other crops.

2.2.1 GOVERNMENT, DOMESTIC LIFE, AND AGRICULTURE

> The Ganda culture and particularly the Ganda political institutions were...so sophisticated that they were essentially adaptable to European modes. Thus, the history of Buganda over the past hundred years is the history of a people modifying their own institutions, and digesting those of the Europeans, to form an amalgam very different from what existed in the past, but yet organically continuous with it. (Southwold 1965, p. 85)

The indigenous Gandan political system was notable for its very high degree of centralization, and especially for the great authority and power attributed to the king. The king was the supreme authority in the tribe, and all other authority derived from him. The king's power stemmed from the fact that he appointed all his subordinates and coordinated a complicated system of political leaders. Chiefs were appointed by him and held office only as long as they remained in his favor. Succession to every headship of a clan or clan segment, while not reliant on appointment by the king, was subject to his confirmation. In return, the king was always dependent on the chiefs and clan and lineage leaders for assistance and information.

Another noteworthy characteristic of Buganda's traditional political structure was its competitive nature. Only the posts of king and clan heads were hereditary. Otherwise, men competed for their first office and for promotion to successive chieftainships. This feature of the traditional political system may have played a key role in establishing the attitudinal framework which embraced competitive access to land and may explain, at least in part, why land markets emerged so rapidly following the introduction of freehold-like tenure in 1900.

For the purposes of government, the kingdom was divided into counties, each of which was governed by a county chief appointed by the king. Each county chief had under him a number of sub-county chiefs who governed specific sections of the county. Below these, there were one or more further levels of chiefs, the lowest being the village chief. Each was responsible to the chief immediately above him in the hierarchy, just as the area of his jurisdiction was a segment of the area governed by the more senior chief. Duties of the chiefs included maintaining law and order, carrying out various public works, assisting in tax collection, and leading men to war. The king had another category of officers called the *batongole*. A *mutongole* was someone who supplied the king with goods or services, receiving land in return. Because land holding and political authority were inseparable, the *mutongole* governed the people who lived on his estate and thus acted as a minor chief.

The heads of clans and sub-clans also held estates, mostly of the size of a single village, attached to their offices. Among other things, the clans were responsible for arranging matters of inheritances of movable property for their members. Today the clans in a few areas retain this duty. However, even during traditional times, the clans in Buganda were not the strong localized corporate units they were in other parts of Uganda and Africa, and ties of personal allegiance to a chief accounted for more than ties of clanship or territoriality. In Buganda, the individual sought his own advantage by changing his allegiance from village to village, from chief to chief (West 1964).

An important characteristic of all offices was the land estate granted to the officer. When a man entered office, he became the authority over the land in his jurisdiction. Since these estates were attached to political offices, continued control over them was contingent on retaining office.

The British protectorate was proclaimed in 1894, and relations between Buganda and the British were formalized under the Uganda Agreement of 1900. The Uganda Agreement recognized Buganda as one of the four provinces of the protectorate, and the king as the native ruler of Buganda on the condition that he obeyed the instructions of the British governor of the protectorate. In most matters concerning Africans in Buganda, the king retained full authority and responsibility, and he continued to appoint and dismiss all chiefs, subject to the governor's approval. During this time, Buganda continued to be administered by the hierarchy of chiefs, although the chieftainships became salaried and resembled a civil service.

From 1900 until independence in 1962, Buganda possessed a special constitutional status to govern itself within the British Protectorate Government. At Ugandan independence, Buganda was given federal status within the country, thereby granting Buganda a decisive voice in the affairs of the central government of Uganda and a continuation of the quasi-autonomy it had enjoyed under British rule. Civil servant-type chiefs continued to govern at the county, sub-county, and parish levels of administration. With the adoption of the 1967 Republican Constitution of Uganda, however, the Kingdom of Buganda ceased to exist. Administrative districts were created for national representation, although chiefs continued to govern locally.

In 1986, Yoweri Museveni became Uganda's president and introduced the current system of resistance councils (RC's). In the central region, the RC system was placed over the existing system of governing chiefs. Resistance councils preside at the same levels as chiefs. The system of chiefs also remains at all levels, functioning alongside and in conjunction with the RC system. While the RC's are today the officially recognized channel of government decision making and action, the chiefs still carry some importance and influence in local affairs, particularly cultural and social, and the two systems appear to view each other with an easy spirit of acceptance and co-operation.

The domestic unit, the household, is generally a group of related people who normally live, eat, and function productively and consumptively together. Actual household composition depends on the stage of development of the family. Households most often consist of a bachelor, a married couple, or a married couple with unmarried children. Married sons and daughters typically function independently of, and therefore constitute separate households from, their

parents. It is also common for a household to consist of a divorced or widowed man or woman and his or her children. Some households also contain one or more relatives of the household head, most often a mother or sister. Today, with the scourge of the AIDS epidemic, a household may also be comprised of grandparents and their grandchildren. The household provides the most prevalent source of labor.

Most rural households in the central region are small-scale cultivators, producing on their plots the bulk of their food requirements as well as cash crops. The staple food is the banana (or plantain), which is cut unripe and eaten steamed and kneaded to form a starchy mass somewhat like mashed potatoes. Other varieties of banana are grown for beermaking, and to provide snacks. Parts of the banana plant other than the fruit are used to provide a variety of useful objects. The typical household has a significant portion of its land devoted to a banana plantation. Other food crops include sweet potatoes, yams, peanuts, cowpeas, beans, tomatoes, and other vegetables and fruits. These may be cultivated alone or under some form of inter-cropping, and may be grown for household consumption only or on a somewhat larger scale for sale in a local market or to a middleman who will sell them in some main town or city.

Cash crops were introduced early in the British protectorate. Cotton was introduced as a cash crop in 1904 and spread rapidly, although it is not commonly found in the central region at present. Robusta coffee was indigenous and grown in small quantities by the Baganda. With the rise in world coffee prices, it spread widely as a cash crop, especially after World War II. Now it is, in financial terms, the leading cash crop. Widely grown throughout the central region, coffee is Uganda's leading foreign exchange earner.

The central region contains some of the richest agricultural land in East Africa (Mukwaya 1953; Richards et al. 1973). In 1972, the Central Region had approximately 28% of Uganda's population but contributed 50% of the country's gross domestic product (West 1972).

2.3 Land Tenure History of Uganda's Central Region[5]

While traditional African land tenure systems vary widely, they do share some general characteristics. Prior to colonialism, populations were sparse, and land in most areas of Africa was in surplus. Economic activity was organized according to kin groups which were central to the social order, and the production, distribution, and consumption of goods were based largely on appropriate kinship ties and behavior. Land was usually viewed as the property of some authority group. While individuals in many African cultures had some individual rights in land, it was usually the group who ultimately claimed ownership or stewardship. Individuals and sub-groups acquired land rights through membership in the group. When individuals gained land rights, the group tended to be the authority on the nature, breadth, and duration of those rights. Under indigenous African land tenure systems, therefore, individuals' rights and duties depended on their status in the kin group or larger community, with rights being endowed through grant rather than through negotiated exchange (Barrows and Roth 1989).

[5] The history of central region land tenure is recounted in detail by Mukwaya (1953), West (1964, 1972), Richards et al. (1973), MISR/LTC (1989), and Kisamba-Mugerwa (1991).

Significant changes have occurred during the last century, with implications for indigenous land tenure systems and individuals' access to land for agriculture. Three broad types of change are increased population densities, increased agricultural markets, and formal land laws. All three have had significant effects on traditional land tenure systems. West observed in 1975 that throughout Africa, new political, economic, demographic, and technological forces were leading to increased individualization of property rights in land and the consequent weakening of the customary systems in which kinship and lineage groups were the main units of control.

First, population densities have increased considerably since the years preceding colonialism. In many areas, increased population pressure on the land has brought or will soon introduce the problem of sub-economic division of parcels, and in some places customary land tenure systems have evolved in response. Second, infrastructural developments and the introduction of cash cropping have created commercial opportunities in agriculture in many areas. Like increased population pressure, these opportunities also prompted changes in some traditional tenure systems as land increasingly became seen as the basis of commercial production.

Third, colonial and post-independence national land laws have been passed in many African countries. These have sometimes disparaged and sometimes reinforced indigenous tenure systems; sometimes they have also created ambiguities in the overall rules structure governing access to land. Today, most African countries have one of two types of national land law. One type allows individuals to own land, while the other vests ultimate ownership of land in the state and allows individuals to lease it on a long-term basis. Both types promote formalized individual land tenure.

The evolution of land tenure in Uganda's central region to its current form embodies all three of these types of change. It divides logically into three periods: (1) the period before 1900; (2) the period from 1900 to 1975; and, (3) the period since 1975.

2.3.1 LAND RIGHTS BEFORE 1900

Prior to 1900, Buganda exhibited the general conditions of many traditional African land tenure systems. Population was fairly sparse, there was no commercial agricultural orientation or land market, and individuals gained land rights by virtue of their membership in a particular group. In traditional Buganda, every individual had a right to occupy and use some area of land. This right derived primarily from one of two sources. The nature of the rights gained was basically the same under the two arrangements.

First, if the individual resided in a village occupied and controlled by a particular clan, sub-clan, or lineage, he gained land rights through his membership in that kinship group. Each clan, sub-clan, and lineage had inalienably attached to it an estate which was believed to derive from an original grant by a king earlier in Buganda's history. The estates of most clans were scattered throughout the kingdom. They were held and managed by the kingroup leadership rather than collectively by the whole kingroup. Individuals were granted use rights to land on the basis of their group membership; their bundle of rights did not include any transfer or subdivision rights.

Second, if an individual resided in a village presided over by a politically appointed chief, he gained land rights because of his position as a subject of that chief. The king and chiefs held rights to estates in their official capacity as political leaders. Each political office had attached to it a number of estates reflective of the level of the office. Each county and sub-county chief had several estates located within his locale, while the king had the greatest number of estates scattered throughout Buganda. While a given chief was viewed as the "owner" of the estates of his office, he technically possessed only usufructuary rights and some other rights to allocate sections of his estates temporarily to sub-chiefs, deputies, and political clients. Such rights ended when the office holder left that particular office due to death, promotion, or demotion, at which time the estate passed to his successor in office rather than to his personal heirs. A chief granted use and occupation rights in land to individuals based on their position as his political clients.

Thus, the village was a group of people linked by ties of political allegiance. It was not a group of people tied irrevocably to a piece of land by serf-like ties, nor was it necessarily a localized kin group. It was the duty of the chief or kingroup leader to grant each household a plot of land, as he was politically responsible for, and had political authority over, the people living in his jurisdiction. Individuals' land rights included those of undisturbed occupation, grazing, water collection, and tree use and firewood collection, all on the condition of correct social and political behavior. A household was generally secure in its tenure as long as it occupied and cultivated the land. Normally, if a family ceased to cultivate a parcel, it reverted to common availability for distribution to other households. In return for political services, the individual accorded his chief (or clan head) tribute in the forms of military service, occasional free labor, and food crops, beer, and respect. These payments were not rent. Just as the authority held the estate by virtue of his office, so the villager held his plot by virtue of his status as a member of the kingroup or as a political client. The villager was free to leave the group and join another if he so desired.

2.3.2 LAND TENURE FROM 1900 TO 1975

The years from 1884 to 1900 were turbulent. Four different kings came to power, and three civil wars and a series of minor disturbances occurred. Following their respective arrivals in 1887 and 1888, Roman Catholic and Protestant missionaries vied with each other and the Muslims (who had arrived earlier) for followers. All of these caused large-scale migrations of chiefs and their followers and upset Buganda's traditional land tenure system and settlement patterns.

It was into this atmosphere that the Uganda Agreement of 1900 was introduced. The Agreement addressed many aspects of political administration; only three of its articles dealt with land tenure. However, it had far-reaching and permanent effects on traditional Bugandan land tenure, for it introduced formalized individual ownership rights over roughly half the land area of Buganda. Sir Harry Johnston, the author of the Agreement, believed that he was simply formalizing and preserving traditional rights and privileges in land (Mukwaya 1953; Southwold 1965; West 1972), but the rights conferred under the Agreement represented a fundamental shift from the traditional system. As West (1972) puts it,

> Johnston's settlement sent Buganda headlong along the road towards the individualization of property rights. The swing away from the traditional group interests came earlier, more precipitously and less spontaneously than would otherwise have been the case. (p. 27)

2.3.2.1 Initial allocation of mailo land

Of the total 17,295 square miles of land in Buganda, more than 8,000 square miles were allocated to private individuals, to be held in a form of freehold known as mailo (local language for "mile") tenure because allocations were made in fractions or multiples of square miles. Land not placed under the mailo system became Crown land for use by the Protectorate. The allottees, in addition to the king, his family, and big chiefs, who received substantial allocations totaling about 1,000 square miles, were chiefs and other people who had held estates under the traditional system. In all, about 4,000 individuals received a total of between 8,000 and 9,000 square miles of land. Each individual received estates in a private capacity, and ownership was not dependent on continued political office.[6]

Each initial allottee received a provisional certificate for a specified acreage of land. Certificate holders then chose the land they wanted, and the remaining area was designated Crown land. The effect of this method of distribution was the placement of the most desirable land in the hands of individuals, with the generally less fertile areas becoming Crown land. West (1972) observes that wherever average annual rainfall falls below 30 inches there is a marked thinning out of mailo holdings, and that virtually all of the land in the central region most suitable for agriculture is held as private mailo.

The distribution of mailo land in Buganda necessitated a cadastral survey unparalleled in Africa at that time (West 1972). In allocating the estates, it was impossible to co-ordinate property boundaries with physical characteristics of the land, thus necessitating that the survey include not just the recording of boundaries but also the marking of boundaries to surround pre-established acreages. At the time the Agreement was signed, no facilities for such tasks existed. Thus, the surveying and titling processes were behind from the inception of the mailo system. It would take more than 30 years to complete the initial survey, by which time the original allocations were long out of date due to transfers and divisions of land through inheritance, gift, and sale.

Further complicating the whole process was the fact that the initial allocation was based on elementary arithmetic, resting on an assumption that exactly 8,000 square miles of land would be distributed to 1,000 individuals. Because the actual number of allottees exceeded the planned 1,000, the originally intended sizes of the allocations had to be reduced to

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[6] In addition, some land was allocated to chiefly offices and could not be sold or bequeathed but rather passed to the chief's successor in office. Such official mailo land neither comprised a significant part of the total area placed under the mailo system nor represented a significant departure from the traditional system. Official mailo land no longer exists, having been converted to public land during the late 1960's.

accommodate them all. Not everyone received an equal area of land since area received varied with the recipients' status; higher ranking chiefs received claims to larger areas of land.

Because the surveying process was nowhere near beginning, individuals received claims in the form of "paper allocations" which were necessarily based on guesswork. As surveying proceeded, it became clear that the paper allocations seldom bore any direct relation to the actual land parcels that came to be physically demarcated, in terms of either size or exact location. Regardless, these paper allocations gave "rise to the curious concept of negotiable property rights in notional areas of land; 'paper acres' as they came to be called" (West 1972, p. 20).

2.3.2.2 Access to land by non-allottees

Individuals who did not receive mailo land had other arrangements through which they could gain access to land. One arrangement available to non-owners was the *bupangisa* tenancy, which was a short-term arrangement including a range of contracts, the most common of which permitted a tenant to cultivate a crop on an owner's land for a single season. This type of arrangement was most often entered into by a mailo owner with non-Bagandans who migrated to Buganda on a seasonal basis.

Another arrangement was the tenancy on a mailo owner's land. The mailo tenancy permitted an individual long-term use of land in exchange for an annual rent. At the time of the original mailo allocations, individuals who were not allottees already resided on most of the mailo estates. They generally remained there, becoming mailo tenants. In some places, occupants resided on some of the Crown land in a continuation of the customary tenure system. These people were allowed to occupy Crown land in the traditional manner.

2.3.2.3 Developments following the introduction of mailo tenure

Several developments occurred in the decades spanning the introduction of the mailo system and the de jure abolition of the system in 1975. Broadly, these included: the enactment of clarifying legislation as land relations grew tense or confused, the development of land markets, and a substantial change in the distribution of mailo land from that established by the original allocation. These developments were inextricably related to each other, so the discussion of them will not proceed in a way that corresponds exactly with the three categories enumerated. All of these developments and their effects are observable in Uganda's central region today.

a. Land not placed under the mailo system

Under the 1900 Agreement, land which was not placed under the mailo system was considered the British government's share of the land area of Buganda. Originally, it had been hoped to use these lands to establish large, European-owned plantations, but there was little Crown land suitable for such use since the more fertile land had become mailo. Under the 1903 Crown Lands Ordinance, occupation and use of Crown land by customary tenants became regulated by a system of Temporary Occupation Licenses. In theory, for an annual fee, an applicant could receive rights to occupy and cultivate up to five acres of Crown land. In practice, however, the licensee typically paid an unauthorized sum to the sub-county chief who would

effectively "sell" him a plot of land. The Ordinance was rarely enforced, and thus these customary tenants "were left free to assume private rights in the land of a form generally equivalent to absolute ownership" (West 1972, p. 95). Customary tenants who had "bought" their land in this manner even sold their plots to others (Fortt 1973). Customary tenure received fairly comprehensive statutory protection under the Public Lands Ordinance of 1962, which repealed the Crown Lands Ordinance and vested the former Crown lands in the Buganda Land Board. This act made it lawful for anyone to occupy by customary tenure any rural lands not already alienated.

b. Freehold tenure in the central region

Under the Crown Lands Ordinance of 1903, individuals and groups could purchase freehold title to Crown land. All freehold land was subject to forfeiture for failure to occupy or develop it. This provision was intended to allow non-Africans, who could not acquire mailo land, to establish and develop cash crop plantations, but while some sugar cane, coffee, rubber, and tea plantations were established, freeholds were purchased primarily by religious missions, and the total area of freehold land remained small.

Aside from the mild threat of forfeiture inherent in the freeholds, the legal distinctions between mailo and freehold tenures were few. The main difference was in ownership of mineral, water, and transfer rights. Rights to minerals and water on freehold land were held by the government, while they vested in the owner of mailo land. Freehold owners faced no restrictions on the disposal of their interest, whereas mailo owners could dispose of their interest only to other Africans. In addition, the rights of mailo owners would come to be greatly influenced by the 1928 Busulu and Envujjo Law (discussed below), while freehold land remained outside the application of that law. Today there is only a nominal difference between mailo and freehold interests. At only 1.5% of the central region's area, the total area of the freeholds scattered around the region is relatively minor, and, with most of it owned by religious institutions, the distinction between freehold and mailo land is largely unnecessary.

c. The relationship between mailo owners and mailo tenants

The realization that the mailo system represented a substantial departure from the traditional system prompted passage of the Land Law of 1908, whose purpose was to define land owners' rights and duties. This law gave mailo owners the full rights of ownership, including the right to transfer land to any other African through sale, gift, or will, but preserved others' traditional joint use rights of water sources and roads.

Neither the 1900 Uganda Agreement nor the 1908 Land Law addressed the relationship between mailo owners and the tenants who occupied areas of their land. At first this new scheme of land relations was exercised according to the old system. Since many of the original mailo owners tended to be the same individuals who were or would have become chiefs under the old system, it was easy for the tenants to view them in the traditional manner.

Mailo owners therefore "governed" tenants according to traditional customs, and tenants accorded them the traditional types of dues and services expected in return. These included both economic remuneration (originally in the form of a month of labor services (called *busulu*) rendered on the landowner's crops) and the tribute (*envujjo*) or respect traditionally paid to a

chief or other leader. This tribute, which included such things as generally treating one's landlord with politeness and respect, tipping one's hat at him when passing by his house, pushing his bike up hills for him, and bringing him a small share of one's farm produce, played a central role in formalizing and solidifying the tenant-owner relationship on mailo land. By staying on good terms with his landlord, a tenant was more assured of retaining undisturbed occupation of his tenancy and of being able to rely on the mailo owner for assistance in times of, especially financial, strife. Because of the economic return from having tenants, it was beneficial for a mailo owner to attract tenant households onto his otherwise idle land, and a mailo owner maximized his economic and non-economic returns by filling his vacant land with tenants who paid him rent and respect. This system contributed to the high prestige that was associated with mailo ownership.

In 1902, tenants began paying a fixed rent to their landlords in place of the traditional *busulu* payment of one month of labor. This enabled tenants to work for themselves full-time. Most tenants cultivated cotton whose introduction as a cash crop in 1904 greatly increased the income-generating potential of land. Tenants' incomes rose rapidly as a result of their cotton cultivation.

Marked increases in the price of cotton during World War I created an opportunity for mailo owners to extract larger payments from their tenants, and consequently a need to define in more detail and regulate the relationship between owners and tenants. Observing that tenants were earning increased incomes from increased cotton prices, mailo owners began to collect payments based on the area of tenants' cotton cultivation in addition to the annual rental payments. Landlords' incomes soon increased substantially from the increased payments they charged their numerous tenants, and the distribution of owners' and tenants' incomes became noticeably skewed, with owners being the wealthier of the two groups. The tenants' only option in lieu of these payments was to face eviction, a right the mailo owners possessed at the time. Predictably, there was increasing protest from mailo tenants, and the Protectorate government decided it was necessary to protect tenants from exploitation, and, more generally, to clarify the relationship between mailo owners and tenants, both of which were accomplished through enactment of the 1928 Busulu and Envujjo Law. This law guaranteed tenants undisturbed and perpetual possession of their mailo tenancies, including the right to bequeath them.

Very importantly, under the Busulu and Envujjo Law, mailo owners lost the right to evict tenants in most cases. In the few circumstances in which an owner could evict a tenant, he could not do so unless the case had been tried in court. Normally, rights to the holding reverted to the mailo owner only if the tenant surrendered it or left it unused for at least four months. Mukwaya (1953) examined more than 300 court cases between about 1947 and 1952 with the purpose of ascertaining the extent to which tenants' rights were respected in the courts, and found that the courts went beyond the provisions of the Busulu and Envujjo Law in protecting tenants from eviction. As long as tenants remained on the land, continued to cultivate the holding, and fulfilled their obligations to the landlord, courts almost never permitted mailo owners to evict them.

The Busulu and Envujjo Law also controlled the rent that mailo owners could charge their tenants. The law limited ground rents to ten shillings per year and commodity rents to four shillings per acre for up to three acres of cash crops grown plus two shillings per brew of beer. In 1928, this fixed rent was a reasonable sum for both parties. Over time, however, it became financially negligible due to inflation but continued to be paid despite its financial triviality because its payment was very important in formalizing and maintaining the relationship between mailo owner and tenant.

The Busulu and Envujjo Law thus gave mailo tenants a great deal of tenure security at relatively low cost to them. In effect, if not in strict legal terms, it became the tenant rather than the landlord who "owned" the (tenanted) land.

d. Emergence of land markets in the central region

The original 4,000 mailo estates were steadily broken up beginning almost immediately following the introduction of the mailo system. This process occurred through inheritances, gifts, and sales. Sometimes gifts of land were made to relatives during the owner's lifetime, but inheritances and sales accounted for most of the subdivisions (Mukwaya 1953; West 1972).

Since the Baganda had few traditional rules for the inheritance of land because most estates had not been personal property but rather had been attached to political offices, they adapted their rules for the inheritance of moveable property to inheritances of mailo land. Where there were several sons, one (usually the oldest) became the principal heir and received just less than half the estate. The remaining sons and possibly daughters split the remainder of the estate. As the original mailo owners died, their estates were divided among their heirs.

As late as 1953, the clan retained a significant role in land ownership control in that heirs to mailo land were subject to approval by the lineage and clan heads (Mukwaya 1953). However, the clans' influence in land matters declined in general with the introduction of the mailo system, mainly because of refusal by both the protectorate government and the king's council to recognize the clans' practice of customary land rights (West 1972). West (1972) found that important changes in inheritance procedures occurred in Buganda during the 1900's. Although it had not traditionally been customary for women to inherit land, he found that increasing numbers of women did. Looking at successions that occurred between 1950 and 1964, West discovered that 42% of heirs were women and that their numbers had risen during that period. Although women tended to inherit smaller portions of land than men, their holdings amounted to almost 30% of the total. It had also become more common (though not widespread) for these women to bequeath their portions to their own children. Whereas, in the past, deceased women's inherited land usually reverted to the clan, in the mid-1900's women became more likely to see that their children inherited their holdings, even though their children's clanship derives from their father rather than from her.

The sale of mailo land also became common. There is some evidence that the idea of land as a saleable asset, accompanied by some tentative land market activity, had developed in Buganda prior to 1900. Arab traders who arrived in Buganda about 1840 or 1850 may have introduced these concepts. There is some evidence that the king of Buganda sold land as payment for ivory during the 1890's. However, such attitudes were limited to a minute segment of the

population. The mailo system encouraged more individuals to view their land as not only a source of rental income, but also an immediate source of capital through the sale of part or all of it. Thus, under the mailo system, while land continued to be viewed as an asset conveying social and political prestige, it also came to be widely perceived as an economic asset. These views, combined with people's cash incomes from the production and sale of commercial crops, encouraged the emergence of rural land markets in Buganda.

Most mailo allottees viewed their endowment not as a productive enterprise, but as a form of dormant wealth, and the protectorate government encouraged them to sell parts of their holdings to exploit this characteristic. Individuals who understood the meaning and value of the rights embodied in mailo interests were able to acquire land quite easily from those who did not, and a market in mailo land developed quickly upon the completion of the original allocations in 1905. During this time, many people who were not original recipients of mailo land acquired their first mailo estate through purchase, and some of the original allottees enlarged their holdings in this manner.

At first, mailo land could be sold to both Africans and non-Africans, but the king's council, wary of the alienation of "Bagandan land" to non-Baganda, protested, refusing, after 1916, to sanction any further sales of mailo land to non-Africans. Regardless of this, the rural market in mailo land among Africans continued to expand annually:

> In 1915 some 469 transfers *inter vivos* were recorded; in 1918 it was reported that hundreds of small estates, varying from 10 to 100 acres or more, were changing hands; by 1920 it was estimated that 2,269 resultant subdivisions were awaiting survey. (West 1972, p. 136)

After this early burst of market activity, the volume of mailo land transactions fluctuated with economic conditions. Precise records of sales were only kept after 1959 (and not for very long after that due to the declining economic and political conditions of the late 1960's), so there are not many data to illustrate fluctuations in rural land market activity. The figures that are available indicate 4,654 transfers of mailo land in 1960, 1,287 in 1962, and 1,069 in 1965. West (1972) suggests that, after a second flurry of activity in the late 1950's, this gradual decrease in market activity was due to rising land prices, uncertainty about future commodity prices, increased desire to hold land for the future, and increasing political disenchantment.

In the 1920's, during the period of rising world cotton prices and increasing rental charges by mailo owners, mailo tenants began to purchase the residual mailo ownership interest in their holdings. They did this for two main reasons. First, and primarily before 1928, they bought the ownership interest to escape having to pay rents. Second, they desired the social prestige and the ability to enter politics conveyed by land ownership. For several decades, political positions were open only to land owners. Although they no longer needed to escape exorbitant rents after passage of the Busulu and Envujjo Law, and despite the fact that there were no real economic gains to land ownership over tenancy, tenants still sought the value of ownership for its own sake. Richards et al. (1973) and West (1972) suggest that it was the goal of earning money with which to purchase their own ownership interest rather than to invest in agricultural

production which was many tenants' principal motivation for working. Thus, despite their seeming economic irrationality, mailo tenant "buy outs" fuelled a second type of land market.

The perpetuity of tenure that mailo tenants received under the Busulu and Envujjo Law caused mailo owners to charge substantially increased prices for the initial granting of a tenancy on their land, as they rightly identified the granting of a tenancy as an effective loss of their land. Prospective tenants' desire to avoid these costs led to the introduction (or at least proliferation) of another type of land market transaction: the sale of the mailo tenancy. This type of transaction was officially illegal, the sale of a tenancy having been prohibited under the Busulu and Envujjo Law. Thus, at first, these exchanges took place clandestinely. A tenant might sell his plot to another tenant, explaining to the mailo owner that he was temporarily leaving the tenancy in the new man's hands but that new tenancy papers should be drawn up in the new name for the time being. There would be no formal record of the sale, but the new papers would show the tenancy in the name of the new holder. Similarly, part of the tenancy might be sold off and the landlord persuaded to acquiesce in the deal through an offer of part of the selling price. Over time, the effective rule as practiced, which differed from the de jure rule contained in the Busulu and Envujjo Law, permitted sale of a tenancy subject to the mailo owner's approval of the intended buyer and permission to transfer. As this de facto rule relaxed further, the importance of introducing the incoming tenant to the mailo owner for approval remained. Once introduced, the practice of selling mailo tenancies spread widely and increased in frequency. Today, the rural land market probably shows its greatest degree of activity in this type of transaction.

Over the years, the rental payment that land owners could charge their tenants, which was fixed under the Busulu and Envujjo Law, decreased in real value. Additionally, owners possessed progressively less vacant (non-tenanted) mailo land. Thus, the market in mailo land shrank considerably. This was due to a lack of supply of vacant mailo land and a lack of demand by non-tenants for tenanted mailo land because of its decreased economic value. A mailo owner's only means of realizing any gain from tenanted land was through sale to the occupying tenant. These conditions persist, although, at present, difficult economic conditions in Uganda have made it nearly impossible for tenants to purchase the residual ownership interest.

Two major effects of rural land markets were a redistribution of land ownership and a huge increase in the number of land owners. As the land market emerged, the large original mailo estates were broken up, and the number of land owners increased. Inheritances and gifts were responsible for this, but the land market also played a large role. Mukwaya (1953) described sale as the primary factor responsible for the increase in the number of land owners. In his sample from two central region sub-counties, 57.8% of land owners had purchased their land. As a result of divisions through inheritance, gift, and sale, there may have been as many as 200,000 owners of mailo land by 1974 (Bibangambah 1981).[7]

[7] Mukwaya (1953) estimates 45,000 to 55,000 owners by 1953; Southwold (1965) estimates 50,000 to 100,000 by 1965; West (1972) estimates 112,000 by 1972; and Bibangambah (1981) estimates the number of mailo owners approached 200,000 by 1974.

In addition to simply helping increase the number of land owners, the land market allowed people not related to the original mailo allottees to become owners. Many of these were ambitious tenants who were able to save to purchase mailo land rather than a tenancy as increases in the prices paid for cash crops strengthened their economic position.

Additionally, the emergence of rural land markets may have contributed to or reinforced the gradual fading of the idea that the primary or only value of land ownership derived from the social prestige and political benefits it traditionally bestowed. The development of the land market corresponded to people's increased awareness of land as an economically productive asset, and the land market served as a channel through which to earn a monetary return for idle land that may otherwise have been retained unused by its owner for its social or political value. Under increasing land prices, it became increasingly costly for people to hold unused land when they could sell it. Relative to this potential, the value of social prestige paled, although it is clear today that the political and social importance of land remains.

In addition, there is a market in customary tenancies. While they are technically illegal, sales of customary tenancies nevertheless take place.

2.3.3 LAND TENURE SINCE 1975

In 1975, Idi Amin promulgated the Land Reform Decree (LRD), which abolished individual ownership of land and vested ownership of all land in the government of Uganda. Land titles were to be converted by their former owners to 99-year leaseholds from the state. Further, the LRD repealed the 1928 Busulu and Envujjo Law, exposing tenants to eviction by their landlords provided the landlord demonstrated an intent to develop or improve that land and paid the tenant compensation. The LRD also addressed public lands, which remained the property of the state. Customary tenants on public land, who had behaved largely according to an evolved form of traditional rules, are now technically tenants at sufferance and can be evicted by the state with six months notice.

Clearly, the LRD embodied tremendous legal changes in the tenure systems which had functioned in the central region. De jure, land owners' perpetuity of tenure ended, being replaced by 99-year leaseholds. Mailo tenants were exposed to the possibility of eviction,[8] and customary tenants were similarly placed at risk of expulsion from the land they occupied.

However, the LRD remains largely unimplemented, although it has affected all parties' perceptions of their standing in land relative to others. Mailo tenants now feel more secure in their tenancies, not because they think the LRD directly strengthened their position, but because they believe it weakened that of mailo owners. Thus, they feel that their position

[8] Nsibambi (1981) cites the LRD as prompting an "unprecedented scale of eviction of the tenants" (p. 295) and a consequential "souring of the relationship between [owner] and tenant in Buganda" (p. 295), and states that, at the time of his writing, the Uganda Lands Commission was receiving at least two cases per week involving tenant evictions. It is suspected that this rate has slowed considerably since then, especially in rural areas.

relative to the mailo owners was strengthened. Mailo owners share this perception. They feel that their rights were weakened under the LRD, despite the de jure right they gained to evict tenants. Customary tenants worry that they are more vulnerable now than they were prior to the LRD. In addition, the years since enactment of the LRD have been dominated by political and economic hardship on such a scale as to distract everyone, private individuals and administrators alike, from questions of keeping land tenure practices in line with current law and enforcing the LRD. This has led to considerable uncertainty and confusion about land rights.

Thus, the overall effect of the LRD has been to cloud people's expectations about land dealings by introducing a great deal of uncertainty and confusion about the rights and exposures of individuals in various tenure positions. Largely, people have reacted by continuing to interact with respect to land as they did prior to the LRD. A 1987 study by the Agricultural Secretariat of the Bank of Uganda concluded that the Land Reform Decree remains unimplemented in the rural areas and that, despite the formal abolition of the Busulu and Envujjo Law, mailo tenants remain on the mailo estates, perhaps even paying some sort of fees to land owners.

Presently, the government of Uganda is again in the process of changing its land tenure law. Changes are desired to institute as uniform a tenure system as possible throughout the nation, to provide for the efficient evolution of land tenure institutions, to ensure that the land tenure system will stimulate (or, at minimum, not inhibit) agricultural development, and to protect individuals' rights in land. In 1988, Makerere Institute for Social Research of Uganda and the Land Tenure Center of the University of Wisconsin-Madison collaborated on land tenure research in the central region with the mission of informing this land tenure policy initiative, and identified access to land by various groups via land markets and other transfer mechanisms as a key area for further research before informed changes in tenure policy could be instituted.

In May, 1989, participants at a land tenure workshop in Uganda embraced recommendations that a freehold tenure system be instituted throughout Uganda, and appointed a technical committee to investigate the probable grass roots reaction and to draft appropriate legislation. The technical committee (*Report of the Technical Committee* October, 1990) produced the Tenure and Control of Land Bill, which proposes the repeal the LRD and the introduction of freehold land ownership throughout Uganda. The bill is now making its way through the government review process.

2.4 LAND TENURES CURRENTLY EXERCISED IN THE CENTRAL REGION

At present in the central region, considering the possibilities for holding land under both old and current rules, land may be held under many tenure forms. With the LRD layered on top of all the pre-existing land tenure legislation, land rights are less clear than ever. Thus, for two reasons, the following discussion of individuals' rights and duties in land in the central region will be framed primarily in the context of the laws existing prior to the LRD. First, there is evidence that rural residents have continued largely to interact with each other in their land dealings according to the laws and socially accepted practices that pre-dated the LRD. Many rural residents have not even heard of the LRD. Those who have are generally confused as to the exact changes it imposed and have continued to interact in the old ways with respect to

land. Second, if the Tenure and Control of Land Bill, is passed, it will repeal the Land Reform Decree, thus making land tenure policy adjustments to the land tenure systems which preceded it. The following description of the "current" land tenure categories will address mailo owners, mailo tenants, and customary tenants, and will effectively ignore the LRD, although in some cases the (unimplemented) changes contained within the LRD will be reviewed.

2.4.1 MAILO OWNERSHIP

It is necessary to consider both mailo owners' tenanted and non-tenanted land. Prior to the enactment of the LRD, mailo ownership was essentially a freehold interest, with all land rights, including mineral, water, and transfer rights, vesting in the private individual owner, who had or could obtain a land title. These lands were inheritable and could be sold or given away by the owner. Mailo owners also had rights to pledge and mortgage their land in seeking credit. Traditionally, the only restriction on mailo owners' rights was a prohibition on sales to non-Africans.

Occupation of the land by tenants altered the owner's bundle of rights, especially after passage of the 1928 Busulu and Envujjo Law. Under that law, the mailo owner lost most use rights on land occupied by tenants, although he retained rights to minerals and some hardwood trees located on tenancies. Historically, the mailo owner had the right to collect rent and tribute from any tenants on his land. However, the rents were fixed in 1928 (rendering them of trivial monetary value today) and were done away with entirely under the LRD. The LRD gave owners the right to evict tenants, a right they had previously been denied and which they can rarely exercise in practice.

Owners possess de jure rights to pledge or mortgage their tenanted land but are typically unable to exercise these rights because neither formal nor informal lending institutions will accept tenanted land as collateral due to the probable inability to free the land of tenants upon an owner's loan default. The mailo owner also retains all exchange rights in his tenanted land and can therefore bequeath, give away, or sell it, although there is little or no demand for tenanted mailo land for the same reason that lending institutions refuse to accept it as collateral.

Theoretically, mailo land no longer exists, having been abolished by the LRD. Under the LRD, ownership of the land vests in the government from whom former owners may obtain leases. Under the leases, an individual does not have rights to mineral and water located on his land, but may transfer the leasehold to another individual. In practice, former mailo owners in the rural areas still consider themselves owners despite the LRD.

2.4.2 MAILO TENANCY

A tenancy on mailo land encompasses the rights of use, some rights of exclusion, and some rights of exchange. An individual has a permanent right to use his tenancy in almost any way he desires. One exception is that tenants do not have the de jure right to construct houses from permanent materials, although they often do anyway. Mailo tenants have rights to exclude others from some uses of their tenancies. They may generally prevent others from growing

crops there. However, they generally may not exclude others from using footpaths or engaging in other traditional joint use activities. Exclusion rights are not stated in formal laws, vary widely, and do not extend against mailo owners in all cases. Tenants have the right to exclude owners from cropping on their tenancies, but they must permit owners to harvest hardwood trees and extract sand, gravel, or minerals from them. Even in cases in which tenants have exclusion rights over their landlords, their current and historical exercise of them is questionable because of the potential threat this may pose to the traditionally important tenant-owner relationship.

Mailo tenants have limited exchange rights. They have the right to bequeath their tenancy to any heir(s) of their choosing. The rights to lend or rent out the tenancy are unclear. Technically, they may not sell their tenancy to a new owner, although in practice tenancies are frequently sold.

Until the LRD was passed, mailo tenants were secure in the permanence of these rights, especially after the 1928 Busulu and Envujjo Law made it illegal for owners to evict them. The LRD technically exposed mailo tenants to a much greater possibility of eviction although in the rural areas mailo tenants interpret it as having strengthened their position on land.

2.4.3 CUSTOMARY TENANCY

Following the introduction of the mailo tenure system, individuals residing on the remaining Crown (later public) land in the central region were allowed to remain there on a sort of ad hoc basis. They had few explicitly stated legal rights, although they were permitted to use the land in almost any way they wished without interference. The 1903 Crown Lands Ordinance made it possible for an individual to obtain the rights to occupy and cultivate five or fewer acres of Crown land in return for payment of an annual fee. As has been described, individuals rarely obtained access to Crown land in this manner. They instead paid a local chief and received virtual ownership of land. Such practices continue at present, although the frequency of allocations from chiefs has declined markedly as most land has been settled. In many places, sales of already established customary tenancies to new tenants are common.

Under the LRD, customary tenants technically reside at sufferance on public land and can be evicted by the state with six months notice.

2.5 LAND MARKETS IN THE CENTRAL REGION TODAY: EVIDENCE FROM A RAPID APPRAISAL

An interdisciplinary research team conducted a rapid rural appraisal (RRA) about access to land in selected sub-counties of the central region during early 1991 (see Troutt et al. 1993). Researchers visited sub-counties indicated by district officials as representative of their district in terms of demographics and agricultural activity. The RRA provides the most current information about land tenure and land markets in the central region.

Respondents at most sites reported that the typical household's landholdings are comprised of one to three parcels. According to RRA respondents' estimates, parcels are generally small, ranging from two to 15 acres, with the majority being two to three acres in size and averaging not more than five acres. The traditional attitude toward inheritance is that all sons can

rightfully expect to inherit some of their father's land. Indeed, inheritance remains an important means of access to land for both men and women. Most men inherit at least a token amount of their father's land, although they might find it necessary to secure access to additional land through other means. To a lesser extent, women also inherit land, although less often and in smaller shares than men. Respondents at all sites in the RRA ranked inheritance as a primary means of gaining access to land. If present inheritance patterns continue, the parcels received by future generations will be even smaller.

It appears that in some areas people are altering inheritance rules or practices to guard against further subdivision. In one of the sub-counties included in the RRA, for instance, a clause for joint ownership by heirs of inherited land may be inserted in a will in order to guard against further subdivision. The fact that in some areas only a single heir to the father's land is named so that the land is not subdivided may also reflect an evolution in inheritance customs designed to alleviate the subdivision problem. The market has a potentially important role to play in such an evolution. If only one son inherits land, children who do not inherit any land must have an alternate means by which to acquire land.

Information gathered in the RRA suggests that landlessness is not a problem in villages in central Uganda at this time. Although when first asked about landlessness, respondents at almost all sites indicated that there are many landless people, further questioning revealed that most people have access to some land through some means (borrowing, for instance). However, the youngest generation, along with the very poor, who subsist on small holdings, may be considered effectively or imminently landless. Although there is not as yet a large landless class in the rural areas of central Uganda, the possibility of widespread landlessness is not a condition to ignore. First, given current trends, the next generation may face severe problems. Second, the possibility that a landless class exists in the urban centers (which the RRA could have failed to detect) cannot be overlooked.

It is difficult to be certain of the level of land market activity in the central region. People at most RRA sites noted the presence of a functioning land market in their area, although numerous respondents reported an absence of sales of tenure forms other than mailo tenancies. Additionally, at almost all RRA sites, purchase was listed ahead of borrowing and renting in importance in providing access to land, and even ahead of inheritance at about one-third of the sites. However, respondents at most sites had difficulty estimating the actual number of transactions during the previous year.

Buyers and sellers usually locate each other through an informal network of friends or other contacts. Sometimes a seller asks chiefs or RC officials to publicize the land for sale, or posts a public or roadside notice advertising the sale. Alternatively, publicity by sellers might be very secretive and selective, purposely excluding certain parties, such as neighbors, in favor of outside buyers who may pay a higher price. In some places, sellers advertise through very close friends so that only other close friends learn of the sale.

Respondents at all sites reported that land prices are highly influenced by buyers' and sellers' bargaining skills and pressures (cash need or desire for land, for example). Those factors aside, according to RRA respondents, the main factors that influence land prices are tenure, fertility,

developments (most importantly coffee and banana plantations), access to roads, trading centers, or produce markets, parcel size, and availability of water. To finalize a sale, the buyer and seller sign a written agreement in the presence of RC officials, chiefs, friends, neighbors, and the mailo owner, if applicable. Payment is likely to be made prior to this meeting, and the selling price is not usually revealed to those gathered. In mailo land sales, the buyer and seller may go to the Lands Office to transfer the title, but this is usually not done because it is expensive and time consuming, and most titles are long out of date anyway.

2.5.1 CLOSING

In the next chapter, concepts from neo-classical and institutional economic theories applied to land tenure will be used to develop a conceptual model of the evolution of rural land markets in sub-Saharan Africa. Both Uganda's land tenure history and current land market trends will be seen to fit into various stages of the evolutionary process developed.

3. RURAL AFRICAN LAND MARKETS: THEORY AND HYPOTHESES

3.1 RELEVANT CONCEPTS FROM NEO-CLASSICAL AND INSTITUTIONAL ECONOMICS

A land market is a specific institution which defines the process and general terms of negotiated exchanges of land rights, and is both an instrument at the core of individuals' calculus of constrained choice and a manifestation of the broader institutional setting. Land markets, by facilitating bargained land transactions, affect individuals' access to land. In addition, because markets exist within a broad institutional arena which permits or encourages their formation, the land market may be influenced by the broader institutional environment and economic conditions characterizing the area in which it functions. These two statements are, very generally, the respective views of markets taken by neo-classical and institutional economic theories, both of which attempt to explain connections between observed economic conditions and the processes that bring them about.

Neo-classical economic theory focuses primarily on the calculus of choice within the opportunity set. Institutional economic theory concentrates on the role institutions play in shaping the choice sets within which individuals and firms must act. These respective emphases are not contradictory but do lead to different perspectives on land markets. Neo-classical theory centers on conditions for efficiency in a system in which markets are paramount and assumed. Institutional economics is concerned with the process by which the market assumed by neo-classical theory comes into being, alternative forms allocative mechanisms may take, and how economic outcomes relate to these considerations. Concepts from both bodies of theory are useful in a study of land markets in a rural African setting characterized by formally individualized as well as customary tenures and geographically varying levels of land market activity.

3.1.1 NEO-CLASSICAL ECONOMIC THEORY APPLIED TO LAND TENURE

While a precise definition of "neo-classical economics" is elusive, it is possible to identify the assumptions on which the theory typically rests. Neo-classical economic theory assumes that all agents rationally maximize their objective function according to exogenously determined and "well-behaved" preferences or production functions. Chronic information problems are assumed absent, such that agents are able to act with complete and accurate knowledge of economic conditions and even foresight. Neo-classical theory assumes the existence of some set of rules that clearly define rights in property. It is these rights that are exchanged in markets. Additionally, neo-classical economic theory makes assumptions about the exogeneity of certain aspects of the economic system by regarding technology and preferences as fixed and given outside the system. Furthermore, neo-classical economics assumes voluntary exchange of goods between agents of equal legal standing.

The focus is then on the achievement of a unique economically efficient equilibrium in the allocation of scarce resources among competing uses. In the pure neo-classical model, the agent's optimization problem under perfectly competitive markets yields optimality conditions for achieving this efficiency. These include statements about prices, demands for goods and/or

factor inputs, marginal rates of substitution, marginal rates of technical substitution, and marginal utilities of income.

An individual firm will be operating efficiently when the value of the marginal product of each input is equated with its rental price, while an individual household will be efficiently consuming at that point at which the marginal rate of substitution between two goods equals the ratio of their relative prices. Deviation from these equalities is generally explained through the identification or suggestion of "market failures" in the form of violations of any of the theory's underlying assumptions. For instance, information may not be perfect as assumed, and the resulting transaction cost of gathering information may be said to drive a wedge between the value of an input's marginal product and its price.

The neo-classical market is generally defined as a group of agents in touch with one another for the purpose of exchange. Specific definitions include: "a region in which buyers and sellers are in such frequent intercourse with each other that the prices of the same goods tend to equality easily and quickly" (Cournot 1897); "any body of persons who are in intimate business relations and carry on extensive transactions in any commodity" (Jevons 1871); and, "an area over which buyers and sellers negotiate the exchange of a well-defined commodity" (Lipsey 1983, p. 69). Neo-classical economic theory does not address the influence of customary, legal, political, and other social arrangements on the market (Hodgson 1988).

Fundamentally, there are three necessary conditions for optimal resource allocation and maximization of social welfare. First, for an optimal allocation of commodities among consumers, the marginal rate of substitution between any two commodities must be the same for any two consumers. This condition implies that commodities should be distributed in such a way that consumers are on their contract curve, since the contract curve is composed of points where the marginal rates of substitution are equal for the consumers. Second, an optimal allocation of inputs among producers occurs when the marginal rate of technical substitution between any two inputs is the same for any pair of producers. If this condition does not hold, it is possible to increase total production by reallocating inputs among producers. Third, for the optimal allocation of inputs among producers and the optimal allocation of commodities among consumers, the marginal rate of substitution between any two commodities must equal the marginal rate of product transformation between those two commodities for any producer. One of the most important findings of neo-classical microeconomic theory is that, as long as private costs and benefits do not differ from social costs and benefits, a perfectly competitive economy satisfies these three conditions for optimal resource allocation and maximization of social welfare.

Applied to land tenure, the pure neo-classical model is one of individual land users maximizing profit from land use under perfectly competitive markets to determine the quantity of land they will demand at what price. At the neo-classical optimum, the value of the marginal product of land in its most productive use equals the rental price of an additional unit of land ($MVP_{land} = P_{land}$). This statement is used to derive individual demand functions for land. Perfectly free transfers of land ownership are assumed to occur between agents of equal legal standing through smoothly operating land markets. The resulting allocation of land reflects the outcomes of market interactions.

The result of sellers' and buyers' interactions depends on their respective reservation prices and limit prices for land. Limit or bid price is the maximum price a buyer will pay for a unit of land. Limit price is a function of interrelated factors, including the buyer's expected income from using the land, his expectation of how land prices will behave in the future, his initial wealth position and access to credit, the available alternatives to the land purchase, and non-pecuniary aspects of land ownership. Another factor influencing a buyer's limit price may be the cost of confirming ownership rights. This cost decreases a buyer's limit price (Johnson 1972; Barrows and Roth 1990). The determinants of an owner's reservation price are largely the same as those of limit price, but "the various motivations for land purchase would reappear as inducements to retain ownership; the alternatives to land purchase would reappear as alternatives to retaining ownership" (Currie 1981, p. 120). Interaction between owners and prospective buyers in the process of bidding and re-bidding, with zero transaction costs[9] and homogeneous[10] ownership units, determines the set of final contracts, the selling price, the quantity of land transferred, and the resulting distribution of land ownership.

The neo-classical economic theory of land tenure and land distribution relies on clear and individualized land tenure, which "is typically defined as demarcation and registration of freehold tenure" (Barrows and Roth 1989, p. 1). Johnson (1972) derives three criteria which a land tenure system must meet in order to facilitate wealth maximization and economic efficiency. First, property rights must be clearly defined, must be allocated to specific owners,[11] and must possess legal and tenure security.[12] Second, to prevent divergences between private

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[9] The simplest model is that in which transaction costs equal zero. The model can be modified to include transaction costs, however. Different types of transaction costs may enter. One example is the cost of implementing final contracts. Such costs would decrease limit prices and increase reservation prices, thereby decreasing the number of transactions. Sellers would receive an effectively lower price, and buyers would pay an effectively higher price, although the full impact on the price actually paid from buyer to seller would be indeterminate. Another type of transaction cost that could enter is that of establishing contacts and making preliminary negotiations. The implication of these costs is that like units of land may not command the same price, since the transaction costs to some parties could discourage from entering the market the number of participants needed to bid to a competitive price, with the result that some transactions may occur which would not take place if such costs were equal to zero.

[10] Currie (1981) relaxes the homogeneity assumption by allowing separate sub-markets for different categories of land quality or other physical characteristics.

[11] An "owner" may be an individual, a household, or some other clearly defined group such as a corporation.

[12] Tenure security is a land holder's perception of his probability of retaining the land rights he currently possesses. Tenure insecurity results from a perceived likelihood of losing land rights through the arbitrary use of power by those in a position to eject the land holder or otherwise interfere with his rights. As the terms "security" and "insecurity" are used throughout this

and social costs and benefits, all costs and benefits must be internalized in order to bring the realm of decision making in line with the realm of resource control. Third, it must be possible for individuals to enter into contracts freely and with confidence that the contracts will be enforced by an efficient legal system. This essentially asserts that an individualized land tenure system is a necessary precondition for the achievement of economic efficiency and the maximization of social welfare.

Neo-classical economic theory suggests several hypotheses about economic behavior with respect to individualized tenure. First, the landholder's increased certainty and clarity of tenure under a system of individualized land rights decreases his likelihood of having to enter disputes over access, and decreases the economic costs to him of demonstrating his rights when he does enter disputes. Second, individualized land tenure facilitates the emergence of land markets. Without the comprehensive and secure bundle of rights characteristic of individualized tenure, individuals will lack incentives to transact in land.

Third, land markets will permit the most productive users to bid land away from individuals whose uses are less valuable. This can lead to an efficient distribution of land ownership and increased agricultural productivity. Since the transaction costs of ascertaining and enforcing ownership decrease the value of a prospective bidder's marginal value product and therefore his bid price, under a tenure system in which land rights are less than fully individualized, "the more productive user becomes unable to acquire land at the point where the marginal value to him (inclusive of transaction costs) is above the marginal value product of the current owner. From society's view, the more productive user is prevented from obtaining the land, resulting in an inefficient allocation of resources" (Barrows and Roth 1989, p. 2).

Fourth, neo-classical theory predicts that individualization of land rights encourages the greatest volume and value of fixed-place investment in agriculture. Transaction costs decrease the value of agricultural investments. Since transaction costs are supposed to be minimized under individualized land tenure, the value of fixed-place agricultural investments is maximized. Also, the great degree of tenure security arising from individualization increases farmers' likelihood of realizing future returns on their investments, thereby inducing the greatest amount of fixed-place investment. High transaction costs associated with other tenure forms are said to decrease the value of fixed-place investment because uncertainty and insecurity of land tenure increase the investor's risk of being unable to reap future returns from investment. Such risk increases the discount rate applied to benefits earned in later years, thus decreasing the net return to investment and investment volume (Barrows and Roth 1989).

Thus, according to neo-classical theory, with individualized tenure, markets can allocate land efficiently to maximize agricultural productivity and growth. Agents' equal legal standing and their ability to freely enter and exit markets are central to this outcome.

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dissertation, tenure insecurity is not a function of the likelihood of loss of land rights through the economic forces of supply and demand.

3.1.2 INSTITUTIONAL ECONOMIC THEORY OF LAND TENURE

Institutional economic theory analyses economic performance as it is influenced by systems of rights, duties, liberties, and exposures, and attempts to predict the performance effects of changes in these systems. Whereas neo-classical theory considers institutional arrangements to be exogenous to the system under analysis, institutional economic theory considers institutional structures and changes to be central parameters in the determination of behavioral outcomes. Economic performance is seen in part as a function of the many cumulative rights governing the variety of human interdependencies and interactions.

As collective rules specifying what individual and group behavior is permissible, institutions create both static and dynamic sets of mutual expectations (Bromley 1989). The two sets of static correlates are right and duty, and privilege and no right. A right is defined as an expectation or assurance that others will behave in a certain way relative to the right-holder. Others have a correlated duty to behave in the specified way. A privilege means that the privilege-holder is free to behave in a certain way with respect to others. The correlate of privilege is no right. Those without privilege have no right (no recourse) if the privilege-holder acts in a certain way. The right-duty and privilege-no right correlates determine who imposes or bears costs and who reaps benefits.

The two sets of dynamic correlates are power and liability, and immunity and no power. An agent with power may act to create a new legal relation affecting other agents. Those without power are in a position of liability, meaning that they are subject to any new legal relations created by the agent with power. One agent's power implies another's liability. If an agent has immunity, then he is not subject to another's attempt to create a new legal relation. The correlate of immunity is no power. If an agent has immunity, then another has no power, meaning that he may not create a new legal relation affecting the agent with immunity.

One agent's right provides him with the freedom to act, within the boundary defined by his right, without seeking the consent of other parties. Other agents are correspondingly exposed, through duty, to the costs to them of the right-holder's action or to the costs of securing the right-holder's agreement not to act. Costs influence the choice set in which an individual makes economic decisions. Sets of property rights determine the incidence of benefits and costs, which in turn defines individuals' opportunity sets for controlling, using, and transferring rights. In defining individuals' and groups' opportunity sets, institutions are central to choices and behavior, and therefore to the results of economic decision making.

Within the prevailing institutional structure, individuals engage in commodity transactions guided by those of their preferences which can be exercised within their choice sets. Preferences guide these commodity transactions, but an individual may have to make a choice that is of less than highest preference if his most preferred choice lies outside the bounds placed on his opportunity set by prevailing institutions.

Preferences lying outside the limits of individuals' choice sets underlie the process of institutional change. Bromley (1989) describes the process in detail. Briefly, when the existing institutional structure, by constraining individuals' choice sets, clearly limits their ability to transact to take advantage of new economic circumstances (such as new preferences, new

scarcities, changed income or wealth distributions, or new technical possibilities), individuals may begin to challenge the institutional structure with the goal of altering it to permit them to take advantage of the new but unattainable opportunity. Ultimately, their struggles may bring about institutional transactions, which are actions carried out to change prevailing institutional structures. Institutional transactions yield new arrangements under which individuals' sets of rights, duties, privileges, and no rights differ from those under the old arrangements, and under which individuals' choice sets are changed.

In this way, an economic condition, such as a new technical possibility, can create demand for a new institution which will create an economic arena suited to the exploitation of the opportunity. The resultant institutional framework creates a new economic environment in which the structure of property relations has been altered to put some set of individuals in a position to take advantage of the economic opportunity which created the demand for the institutional change. The economic results from the evolved institutional arena will clearly contrast with those that would have resulted under the former institutional framework (Bromley 1989).

In the terms of institutional economic theory, a market is "a set of social institutions in which a large number of commodity exchanges of a specific type regularly take place, and to some extent are facilitated and structured by those institutions...Markets, in short, are organized and institutionalized exchange" (Hodgson 1988, p. 174). The market includes institutional mechanisms to structure, organize, and legitimate contractual agreements and exchanges of property rights. Thus, more generally, a market is "a process whereby control over future income streams is transferred among participants" (Bromley 1989, p. 48). A market does not simply materialize but results from facilitating institutional transactions and peripheral supporting institutional arrangements (Hodgson 1988; Bromley 1989), and thus is seen as not only a medium for the expression of individualistic decision making but as a combination of individual and collective expression.

The economics literature has identified four general types of property regimes: open access or non-property, common or communal property, private property, and state property. The rights of property imply the assent or sanction of a sovereign power vested with both the authority and the ability to protect the exclusive rights of its subjects. This sovereign power may take many forms, including the family, the clan, the tribe, and the state. Property regimes differ in their assignment of rights and duties to individuals and groups.

Under a non-property regime, the benefit stream accruing from a resource can be claimed by anyone because no group of authorized users is specified. Individuals have both privilege and no right in the management and control of the resource. In a common property arrangement, there is a group of resource managers or owners. Group members have both rights and duties in the use, management, and maintenance of the resource. They also have a right to exclude individuals who are not members of the group from gaining access to the resource. Non-members have a corresponding duty to honor such exclusion. A private property regime bestows on individuals the right to use the resource within the bounds set by society. The individual has a corresponding duty not to use the resource in socially unacceptable ways. Other individuals are assigned a duty to accept any socially acceptable use the owner chooses

to engage in, and have a right to expect the owner to adhere to the rule of social acceptability in his resource use. Lastly, under a state property regime, state agencies are given the right to manage the resource through means such as establishing rules of access. State property imposes on individuals an accompanying duty to abide by the rules defined by the controlling agency.

In the institutionalist context, land is viewed as a set of property rights to an income or benefit stream. Land tenure regimes determine what bundles of rights various individuals hold to a given parcel, and therefore to the income streams accruing from their use of it. Different tenure forms are different property regimes and thus imply different right-duty, privilege-no right, power-liability, and immunity-no power correlates for various individuals. Land tenure transformations change the incidence of property correlates, which changes various individuals' abilities to impose costs on others and to reap benefits in their use of land, and therefore change the incidence of benefits and costs. The result may be changes in access for various parties, with accompanying implications for land and income distributions.

In studying land allocation from an institutionalist perspective, it is important to identify not simply to whom land belongs, but who has what specific rights in a given parcel, particularly the rights of land allocation, use, disposal, and reversion, which play themselves out in land use and land transaction decisions. In particular, who has the right of transfer is important because restrictions on transfers may have consequences for land market formation and the distribution and use of land.

In the institutional analysis, legislated changes in land tenure institutions may modify the various individuals' access to land and the resulting distribution of land and income but may not demonstrate neo-classical theory's predicted impact on efficiency measures (Barrows and Roth 1989). Even when a traditional land tenure system becomes more individualized, the economic outcomes may differ from those predicted by neo-classical theory. Under a given land tenure system, different individuals may possess different bundles of rights. Some individuals may be better able than others to take advantage of institutional or technological changes. Positional advantage may come from an expanded bundle of rights relative to that of other individuals or from status in the community such as a chieftainship. Such individuals may capture gains from change and acquire land rights. Thus, even under formal individualization of tenure and the development of land markets, the distribution of land and economic results may differ markedly from those predicted by neo-classical theory if the positionally advantaged individuals are not the most productive users.

In addition, "social" or "cultural" institutions influence the operation of the land tenure system. For example, rules may mandate that all adult members of the society be allowed to use at least enough land for subsistence or that all male offspring are entitled to inherit a portion of their father's land. Additionally or alternatively, rules may prohibit the alienation of certain types or areas of land (burial lands, for example) to certain types of individuals or in general.

Such institutions define the subset of socially permissible options open to individuals in their use and transaction of land, within the potential set defined by the tenure regime alone. To the extent that they restrict the possible land transactions in which individuals may engage, such

peripheral institutions affect the distribution of land and the corresponding land use patterns and income distribution that result. The flexibility of these institutions in response to changing social and economic conditions, opportunities, and pressures will influence the effects of a given property regime, with implications for individuals' access to land and the distribution of land rights and income.

3.2 A THEORY OF RURAL AFRICAN LAND MARKETS

A synthesis of neo-classical and institutional economic principles provides the most cogent theory of land markets in rural parts of sub-Saharan Africa. The following sections present a three-stage evolutionary process for rural African land markets, drawing on the concepts discussed.

3.2.1 STAGE ONE: NO LAND MARKET

Initially, both population density (PD) and commercial opportunities in agriculture (COA) are low. These conditions prevailed in much of pre-colonial sub-Saharan Africa and still characterize some regions. Land is in surplus, and, due to sparse population, labor is the constraining input to agriculture. Due to low PD and the virtual absence of agricultural markets, there is little or no concept of land as a negotiable asset, land is not priced, and land markets do not exist. Rather, access to land is governed by traditional land tenure institutions in which kinship ties typically play a large role, and land rights are allocated through grants from an authority based on the recipient's status within the group. Rules of access are constructed to guarantee each scarce unit of labor access to a sufficient area of land and to ensure that each household earns at least some minimum level of income.

Individuals' access to land depends on the rules functioning in a specific area but will likely depend on kinship and gender. Individuals from outside the relevant group will have limited or no access to land. Women may not have access to land independently of men; when they do, it may be less than men's. However, within the group of preferred individuals who receive land rights, access is equal, since it is based on need and/or ability to cultivate. The implication of this is that access to land does not vary with individuals' wealth standing or entrepreneurial predisposition, and because all member households tend to be guaranteed access to at least a minimal area of land, there is little or no landlessness. Thus, there may be equal access by all households in an area if they are all male-headed and members of the governing group, or there may be a sort of bimodal land distribution in which member households have equal access and non-members have no access.

The distribution of rights and duties in land may be fully allocated to some authority group such as the clan, or may be divided in some way between the group and its individual members. For example, an individual may possess use rights in land with other individuals having a correlated duty to respect those rights while the group holds management rights over the same land with individuals having correlated duty to abide by management decisions made by the group or authority. Traditional institutions satisfy community members such that they are not compelled to seek more individualized rights in land than exist under the prevailing traditional tenure system.

All areas of Uganda's central region are beyond this stage in the evolutionary path of rural land markets. Due to its suitability for agriculture, the region has long been relatively densely populated, so for some time there has been increased competition for a fixed area of land. In addition, the tenure changes introduced under the 1900 Uganda Agreement as well as the early introduction of cash crops to the area transformed prevailing conditions from those required to sustain this stage of the land market in which land has no value and individuals perceive no benefits from more individualized rights.

3.2.2 TRANSITION TO STAGE TWO

Some fundamental change prompts people to value and seek more individualized land rights. This could be population growth, increased commercial opportunities in agriculture, directed land reform introducing individualized tenure, or some combination of these. As a result, access to land takes on increased value to individuals, and it becomes economically beneficial for individuals not only to preserve their traditional land rights but also to expand them. Individuals might manipulate traditional tenure regimes and other institutions to gain or hold advantages over others and may seek to engage in institutional transactions to bring about new social and land tenure rules which favor more individualized claims to land. Institutional transactions will be possible if traditional rules yield to them. Under certain conditions, relatively low PD for example, new rules may not threaten traditional kin group or community claims, making gradual changes in the rules agreeable to traditional authorities. The most important customary rules, such as a prohibition on the alienation of clan burial lands, may be preserved while individual interests emerge. Remaining customary rules, which may be fading, are certainly non-binding in the sense that they do not restrict individuals' decision making. Binding customs are the ones challenged. Thus, PD and COA propel individualization of traditional land tenure institutions. In this second stage of rural land market evolution, land market activity is theorized to be positively correlated with PD and COA, and land markets bring changes in households' access to land and corresponding use and investment outcomes.

3.2.3 STAGE TWO: ACTIVE LAND MARKETS

Increases in PD, COA, and competition for land typically bring the following sorts of changes: (1) more freedom for individuals from others' rights of administration or joint use rights (greater exclusivity); (2) increased perception of land as a saleable good; (3) more land transactions conducted by individuals; (4) more people, or kinds of people engaging in land transactions (Shipton 1989). These changes represent transformations in the land tenure system and consequently in people's access to land, and translate into a series of specific hypotheses about land rights, land markets, and access to land. Discussion of the hypotheses provides the best description of this second stage.

Hypothesis 1: Land rights become more individualized as PD and COA increase.

As population pressure and agricultural market activity increase, land takes on increasing value. As the value of land increases, the benefits to individuals of individual rights in land increase, giving individuals increased incentives to claim greater individual rights in land. In the absence of formally legislated individualization of tenure, increased PD and COA will likely induce individuals and groups to conduct institutional transactions to bring about new rules under which individuals gain expanded bundles of land rights, including freedom from the

authority's rights of administration and the joint use rights which typically characterize traditional African tenure systems.

The merits of individualized land rights advanced by advocates of the pure neo-classical model have been discussed. These merits are often presented as the basis of arguments supporting policies to formally institute individualized, registered land ownership.

Alternatively, indigenous African land tenure institutions may well possess the flexibility to evolve independently in a manner consistent with the conditions of economic efficiency, eliminating the need for formal legislation (Ault and Rutman 1979; Cohen 1980; Boserup 1981; Noronha 1985; Bruce 1988; Shipton 1989; Migot-Adholla et al. 1991). Traditional tenure systems are not fixed with respect to time or to internal or external economic forces. Rather, they are capable of change in response to new economic circumstances. Shipton (1989) acknowledges the close relationship of population density, cash cropping, and individualization of land rights, noting that each of the three appears to contribute to the others.

Migot-Adholla et al. (1991) view indigenous land tenure systems as dynamic in nature and argue "that there is a spontaneous individualization of land rights over time, whereby farm households acquire a broader and more powerful set of transfer and exclusion rights over their land as population pressure and agricultural commercialization proceed" (p. 155). Using data on land rights systems in Ghana, Kenya, and Rwanda, they found that traditional land tenure systems in rain-fed cropping areas evolved autonomously from communal rights toward more individualized rights in response to increased population pressure and cash opportunity in agriculture. Thus, increasing PD and COA may lead to an increased definition and assertion of individual rights in traditional African land tenure systems and an increase in the number of land transactions (Berry 1973; Ault and Rutman 1979; Bruce 1988; Shipton 1989). As PD increases, individual and group rights in land may be clarified, land boundaries may be introduced, sharpened, or changed in character, individuals may increasingly enlist state assistance in protecting their land rights, and chiefs', headmen's, or other local administrators' control over land may begin to disintegrate (Shipton 1989). There may also be an increase in the incidence of disputes involving land, and new or increased tensions may prompt evolution in the customary system.

On the other hand, the response of indigenous land tenure systems to increased PD and COA could be to assert themselves with new vigor. This could be through "an increased emphasis on the exclusiveness of the clan, village or other land-holding group and an intensification of opposition to any form of alienation to outsiders" (Brock 1969, p. 23). The kinship group may gain a renewed or strengthened role in distributing land rights and defining permissible transactions in those rights.

In an African culture, formally legislated individualization of land rights may be neither necessary nor sufficient to bring about economically efficient outcomes in the definition and distribution of property rights in land. It is not necessary if the indigenous system exhibits a tendency to evolve in an efficient manner, while it is insufficient if the indigenous system over which the new law is applied is so inflexible that it will act to limit, obstruct, or confuse the

rights structure attempted under the new law. Hunter (1986) describes cases from Nigeria and Lesotho in which the most common source for acquiring land rights (purchase in Nigeria, inheritance in Lesotho) listed by respondents was not legally recognized, illustrating that the indigenous system is in some cases strong enough to develop or not develop as it will, regardless of what occurs de jure.

Hypothesis 2: Individualization of land rights increases individuals' land tenure security.

According to neo-classical economic theory, individualized land rights increase a land holder's clarity and certainty of tenure, and increased clarity and certainty of tenure increase his tenure security in terms of increasing the likelihood of his maintaining access to that land in the future. (Recall (see footnote 4) that tenure insecurity derives from a perceived likelihood of loss of rights through the arbitrary use of power rather than through land market forces.) This is because as the individual attains either a greater number of the rights or more of the "higher" rights in the bundle of use, exclusion, and management rights over a given parcel, he gains greater control over the parcel relative to other members of the community, including traditional authorities. The individual's increased control and strength of position in using and managing the parcel decreases the likelihood that challenges to his tenure will succeed in altering his access to it.

Hypothesis 3: Land markets emerge and become more active as PD and COA increase.

Increased PD and COA increase land values, which prompts land rights to become more individualized. Individuals increasingly view land as a productive asset of monetary worth. As land rights become more individualized, individuals may eventually acquire transfer rights to their parcels, including the right to sell, which is necessary for the emergence of land markets.

Higher land values also increase the opportunity cost of holding idle land. Meanwhile, there may be individuals who can farm more land than they are able to acquire through traditional channels. Individuals incur a cost of holding land which they lack the inputs to cultivate and are thus induced to release that land for sale through the market. Increased COA induces individuals with sufficient resources to cultivate more land than they possess to search for additional land. Thus, both market supply and market demand for land will increase under conditions of increased land values. Over time, more individualistic bargained transactions in land rights may arise as an addition to the traditional granting of rights in land, and a land market may emerge when the private benefits from exchange outweigh the transaction costs of transfer (Barrows and Roth 1989). It is expected that land market activity will increase along with increases in PD and COA. An increase in sales does not necessarily eliminate other means of acquiring land rights, such as gift, inheritance, borrowing, renting, and grant from the kingroup authority, although the relative incidence of the various types of transactions may change as the land market emerges and becomes more active. As land becomes scarcer, grant allocations may disappear as land allocations that were traditionally based on status relationships come to be made through bargained transactions under the new pressures and incentives facing individuals.

Brock (1969) asserts that the development of a land market does not rely on registration and individual title, citing examples of evolved customary tenure systems in Uganda and Tanzania in which could be found varying degrees of land market activity. West (1972) writes that

before 1900, the customary land tenure system in Buganda, under which the various levels of chiefs held rights of administration over land, were evolving to permit more individualized land rights. Individual hereditary rights had appeared, and some market transactions of land had occurred. West also suggests that without the introduction of the mailo tenure system, individual property rights would have increased on their own with the introduction of cash cropping. When such an evolution is slow, it may be because of the magnitude of transaction costs resulting from uncertainty in the economy that results as the rules and customs defining land tenure evolve.

Hypothesis 4: Individuals' land tenure security is greater in the presence of active land markets.

The actual direction of causation between increased land market activity and increased tenure security is unclear. First, it could be that the increased tenure security resulting from the individualization of rights that results in response to increased PD and COA reduces transaction costs and thereby facilitates land market transactions. In order for land to be transferred through a market, the bundle of rights must be secure in the sense that the parcel holder perceives that there is a low probability that he will lose his land rights through positionally advantaged individuals' arbitrary use of power (not through the land market as an economic mechanism). With low tenure security, the costs prospective buyers expect to incur in surviving challenges to their tenure on purchased parcels may be high, decreasing their bid prices, possibly to the point that they fall below reservation prices, thus freezing the land market. Alternatively, individualization of land rights gives individuals the right to sell their parcels, thereby facilitating the emergence of land markets. It could be that the functioning of land markets makes people feel more secure on their parcels. In fact, it is possible that the causality runs in both directions. Whatever the dominant direction of causality, it is expected that land market activity and land tenure security are positively correlated.

Hypothesis 5: Land market activity increases the degree of fragmentation of land holdings.

The land market may be responsible for excessive fragmentation of land holdings (Lawrance 1963; Fortt 1973; Cohen 1980; Feder 1988). Land market transactions can fragment land holdings as households purchase land parcels that are not contiguous with other parcels they acquire. However, fragmentation of holdings can also occur under customary tenure systems, for example where farmers are granted or bequeathed land in different places. Many times, holdings are deliberately fragmented among different ecological zones in order to reduce risk in agricultural production. It is not clear whether the land market will bring a greater degree of fragmentation than traditional allocation practices, particularly inheritance.

Lawrance (1963) suggests that an owner's unlimited freedom to transfer land under the mailo system will facilitate fragmentation of holdings, as people purchase parcels of land wherever they become available. Hougham (1973) found that about 60% of the estates in his Buganda sample were comprised of more than one parcel and that purchase of parcels was the source of fragmentation in a large number of those cases. Mukwaya (1953) also cites sales as a major agent of fragmentation of mailo estates. In his sample of two central region sub-counties, he found that 57.8% of landowners had acquired their land through purchase, and that individuals bought land wherever it was available without regard to its proximity to their other holdings. However, Mukwaya noted that in the original allocation of the mailo lands in Buganda, it was

rare for an allottee to receive contiguous estates; estates were usually comprised of more than one discontiguous parcel of land, so that fragmentation of holdings existed from the inception of the mailo system.

Alternatively, land markets might be viewed as a channel through which households may acquired additional land that is adjacent to their other holdings. If households sold their parcels and purchased adjacent parcels, then the land market would contribute to consolidation of holdings. According to West (1972), of market transactions and inheritance, the land market is the only one which could achieve consolidation of holdings, thereby counteracting the danger of extreme fragmentation. Thus, that land markets increase fragmentation is one alternate hypothesis to the null hypothesis that they do not; that they increase consolidation (decrease fragmentation) is a second alternate hypothesis.

Hypothesis 6: Land market activity increases subdivision of land parcels.

The land market may be an agent of sub-economic subdivision of land parcels (Lawrance 1963; Fortt 1973; Cohen 1980; Feder 1988). Subdivision occurs through the operation of the land market if individuals sell sub-sections of their parcels. Individuals may sell only part of a parcel in order to generate needed cash (either to invest in cultivation of the remainder of the parcel or to pay for some other expense) or, because of the opportunity cost of holding idle land, to liquidate property they are not able to cultivate. Sub-economic subdivision may occur especially as individuals offer through distress sales only the minimum area of land necessary to generate needed cash. Of the various allocative channels, the land market is the only one which permits individuals to convert landed property to cash. It is not, however, the only one through which subdivision of parcels may occur. Subdivision can be increased through the continuation of traditional practices in which all children or all sons inherit land. Areas with more active land markets are also expected to be those with higher PD's, where greater subdivision of land holdings could come about through the practice of traditional inheritance customs under very populous conditions.

Nevertheless, many authors (Mukwaya 1953; West 1972; Fortt 1973; Khiddu-Makubuya 1981) claim the land market is responsible for breaking up the large estates originally allocated in central Uganda. Between 1900 and 1974, the number of mailo owners increased substantially from the original 3,700 allottees. Although much of this increase occurred through inheritances, land market activity was also largely responsible.

Hypothesis 7: Land market activity increases concentration of land ownership.

Market systems can lead to an unequal distribution of resources, concentrating ownership of assets in the hands of a relative few. Increased individualization of land rights and land markets may play a role in increasing concentration of land ownership. If land is saleable, wealthy individuals can acquire as much land as they can afford, regardless of whether they plan to cultivate it. This would be desirable if it is commercially oriented producers who acquire additional land through the market. Because of land's income-generating potential, concentration of land ownership can lead to skewed distributions of wealth and income and/or other social inequalities.

In Kenya and Botswana, increased concentration of land ownership appears to have been a direct result of individualization (Bruce 1988). However, Berry (1988) contends that land markets do not always lead to concentrated land ownership in Africa, but that concentration occurs through a variety of processes, including not only the operation of land markets but also appropriation of land by colonial and post-colonial governments and the exercise of customary rights. Bruce (1988) add that, as yet, information is insufficient to judge whether a land market or state land administration is more likely to increase land concentration in Africa (Bruce 1988).

Hypothesis 8: Land market activity leads to increased landlessness or imminent landlessness.

Conditions that promote land markets may decrease access to land by poorer households and may create a greater incidence of landlessness or imminent landlessness than the traditional land tenure system with its absence of land markets. This may be the result of several driving factors. First, increased PD, which is hypothesized to be one of the major factors influencing land market activity, implies decreased land for all households since increased population on a fixed land area implies smaller average holdings. As PD reaches very high levels, parcels may become extremely subdivided. Ownership of land may become concentrated in the hands of some households, while other households may have access to less than the minimum area of land required for subsistence, and still others may lose access to land altogether. Since PD is also hypothesized to affect land markets, it may be that land markets and landlessness are joint effects of increased PD, and landlessness may be viewed as a sort of by-product of land markets and concentration of land ownership.

Second, the functioning of the land market itself may decrease access to land by poor households. Land prices may be high in areas with active land markets because land markets are expected to be more active under conditions which increase land values. Financial inability to purchase land, on top of their already subdivided holdings due to high PD, may leave poor households effectively landless. In addition, high land values and the presence of the land market provide a means of converting landed property to much-needed cash, and households with immediate cash needs may approach landlessness through successive distress sales as they progressively sell sections of their holdings to pay school fees, taxes, bride prices, and the like.

Third, the emergence of land markets is likely part of a broad loosening of traditional restrictions on individual land rights. Relative to traditional land tenure structures, systems which allow land markets may be impersonal. This could have a deleterious effect on subsistence households if it means the erosion of the traditional guarantee of access to some minimum area of land to all member households. Households that are not equipped to succeed in the market system may, in the decline or disappearance of the traditional guarantee of access to at least a minimal area of land, end up landless.

Lastly, landlessness could result from the response of traditional land allocation practices to conditions of increasing PD and subdivision. If, in response to these conditions, the individuals who grant land rights change their practices, then some individuals may not receive access to land. For example, traditionally, a father bequeathed land to each of his sons. However, if he observes that dividing his holding among his sons would subdivide it below an economic level,

then he may bequeath it to only one of his sons, leaving the others landless unless they gain access to land through another channel.

Hypothesis 9: Land markets improve access to land by traditionally excluded individuals such as women and ethnic minorities.

Market institutions are by nature impersonal. In economic theory, a perfectly competitive market transaction is an arms-length negotiation which is blind to the personal characteristics of the buyer and seller. Competition and ability-to-pay typically govern participation in market transactions, and transactions occur as long as mutually agreeable prices can be negotiated, irrespective of the gender, ethnicity, age, appearance, or other personal traits of the buyer and seller. The presence of land markets, with the trait-blind avenue they offer to land acquisition, might improve access to land by groups whose access to land is limited under more traditional systems, especially inheritance or kinship-based claims. In central Uganda as well as throughout rural Africa, women and ethnic minorities are two groups whose access to land has generally been limited under traditional tenure systems. Their access is hypothesized to improve through the operation of the more trait-neutral land market.

Hypothesis 10: Land market activity increases access to land by commercial farmers.

Access to land by commercial producers may increase through land markets because of commercial farmers' ability to outbid other buyers. Commercial farmers have higher marginal value products of land than other users. Since a buyer's bid price is a function of marginal value product, commercial farmers, as long as they have adequate cash or access to credit, will be able to outbid less productive users to acquire access to land through bargained exchange. Since land markets do not limit the area of land an individual of land may acquire (provided he is willing and able to pay for it), while traditional tenure systems typically do, commercially oriented individuals are hypothesized to be able to gain access to more land through land markets than they would have been granted under customary tenure rules.

The effect of land markets on commercial agriculture in central Uganda is indeterminate. In 1961, the World Bank mission to Uganda asserted that the mailo system was responsible for allowing the emergence of a land market which discouraged the use of valuable land for subsistence purposes and encouraged its use for increased investment in commercial agriculture, particularly the production of coffee. Thus, the mission claimed, the formal individualization of land rights under the mailo system was responsible for the relatively advanced economic standing achieved by the central region. Khiddu-Makubuya (1981) points out that numerous other factors, such as the introduction of cash crops, the region's central location in the country, the availability of cheap immigrant labor, and the region's class structure, may also have led to the central region's economic growth, and that it is therefore overly simplistic to explain the economic advance solely through the introduction of mailo land.

Mukwaya (1953), in reviewing the typical reasons why buyers in his sample purchased mailo land, found that the main reason for purchase was "to get the social and political advantages associated with landowning" (p. 36), rather than to develop the land for farming, and that "the magic usually attributed to ownership of land [had] not worked very effectively" (p. 37). Hougham (1973) found that theories that land purchases will be closely associated with the

expansion of commercial agricultural production did not hold in central Uganda. People often purchased land without any intention of developing it for agriculture. However, Hougham notes that two-thirds of the "big farmers" in his study had made a sudden (not gradual) jump to large-scale farming and, to do so, had acquired their land through the market. As Richards (1973) puts it:

> The mailo system itself...did not result in the commercial use of land by its owners for a period of some 40 to 50 years, though there were a few exceptions. Traditional attitudes to land ownership as a source of political power and prestige continued and during the first half of the century mailo land was important to its owners as providing rents from peasant tenants and also capital, through the sale and mortgage of portions of estates...
>
> Nevertheless the mailo system, by introducing the rights of land purchase so early in the century as compared with the rest of East Africa...certainly facilitated the purchase and development of the big coffee farms of the fifties which attracted Ganda traders, business men and others into commercial farming. (p. 297)

Fortt (1973) echoes this idea, stating that many early mailo owners simply were not aware of ownership's commercial potential, and concluding that the land market was critical in granting commercial farmers in Uganda access to land, but that this response was not at all immediate and that the individualization of land tenure was not the only factor in the process.

Hypothesis 11: Land market activity increases the incidence of fixed-place agricultural investment and yield-enhancing agricultural practices.

According to neo-classical theory, the emergence of land markets encourages the greatest investment in agriculture and the greatest practice of productivity-increasing agricultural techniques. Different determinants explain the hypothesized link between individualized land rights and land markets and these two outcomes.

The increased tenure security associated with individualized land rights explains the hypothesized increase in fixed-place agricultural investments. Many agricultural investments are costly to make and deliver benefits that accrue over time. A rational producer will not choose to make them if he is not assured of retaining access to the land long enough to reap their benefits. Because rational buyers would not be willing to purchase land on which tenure security is low, land rights that are sufficiently individualized to foster the formation of a land market are probably exclusive, comprehensive, and, most importantly, secure enough to assure holders continued access to their land such that they can reap the future benefits of investments they make on the land. Alternatively, institutional economic theory allows for the causation to flow in the opposite direction. It may be that individuals, in trying to assert or claim increasingly individualized rights in land, make agricultural investments as a means of increasing their security of tenure. This may happen in transitional areas where the rules are in various stages of change and individuals consequently feel least secure in their holdings. In this case, fixed-place agricultural investment is prompted by tenure insecurity.

The hypothesized link between land markets and productivity-enhancing agricultural practices is explained by the bidding process prospective buyers engage in to purchase land. In a competitive market, the highest bidder will acquire land. Since bid price is a function of the user's marginal value product of land, the highest bidder will be the individual who expects the greatest return from land use. Individuals who expect to farm the land the most productively will have the highest value of marginal product of land and will thus gain access to land through the market.

The land market may indeed be important in allowing the transfer of land to productive users who will develop it for agriculture. Feder and Onchan (1987) argue that in Thailand, individualization is closely linked to capital formation and agricultural land improvements. On the other hand, in a study of Ghana, Kenya, and Rwanda, Migot-Adholla et al. (1991) found only a weak relationship, if any, between individualized property rights in land and agricultural yields. West (1972) cites an absence of an investment orientation in mailo owners in central Uganda, asserting that the titled land ownership introduced under the mailo system was not in itself sufficient to induce owners to make fixed-place agricultural investments. He also points out that mailo tenancies provided individuals with sufficient tenure security to induce them to plant coffee, a high-cost, slow-maturing, and long-lasting crop. Richards (1973) also recognizes the absence of agricultural investment occurring in Buganda immediately after the institution of the mailo tenure system. She maintains that such was the case because under the traditional political system, land was not a unit of economic exploitation but rather of political exploitation and that this attitude toward land holding persisted even after the mailo tenure system was introduced.

3.2.4 TRANSITION TO STAGE THREE

As population pressures rise through the second stage of the land market's evolution, increasing demands and prices may gradually induce farmers to sell their idle holdings until they retain the minimum area of land they require or land they are for some reason unwilling to part with. Under extreme crowding, many households may be left with only the land that contains their home. This land is qualitatively different from other land--its loss means not only loss of a productive resource but also abandonment of social identity as a member of the group or community. In rural Africa, land may be viewed as more than a productive resource, especially where ancestral graves and old family homestead sites are involved. The value of land to the household may be determined not only by its productive potential but also by its social, historical, or ancestral significance to the household.

3.2.5 STAGE THREE: LAND MARKET ACTIVITY DECREASES

Interestingly, the same condition which initially spurs the emergence of land markets and causes their activity to increase may, beyond some point, cause them to diminish. Under extremely high PD, the land market may slow down or cease to operate. Having been stimulated by increasing PD and COA up to a point, after that point it exhibits what Shipton (1989) calls a recurve effect, with land market activity declining or disappearing. Shipton (1989) considers densities in excess of 200 people per square kilometer to be extreme. Hill (1972, 1982) says rising PD and rising prices have reduced the incidence of land sales in Kano,

Nigeria. Le Bris (1979) finds a similarly reduced incidence of land sales in the denser parts of south-eastern Togo. There are two explanations for such a phenomenon.

First, extremely high PD gives land high values. Individuals are likely to retain only land that is in some way fundamentally important to them. This land may have special significance because it contains the homestead or family graves, it was inherited from a special relative, or some other reason. The high value of land coupled with the significance of households' remaining holdings raises land holders' reservation prices so much that the price required to induce them to offer land for sale is greater than prospective buyers' willingness to pay. The result is that no land transactions clear the market.

Second, there might be outright rules prohibiting the sale of land, or certain classes of land, or sales to certain types of people. These may be new rules that community leaders deem necessary in light of extreme population pressure, or old rules which are reasserted (Shipton 1989). Rules may emerge or be enforced in order to protect land that the community (or at least the leadership) has viewed all along as being the group's but has not felt the need to actively protect.

In an area with extreme PD and very low or no land market activity, it may be difficult to determine which of these is the reason for the downturn in land market activity. Whatever the reason, the downturn in land market activity has varying implications for various parties' access to land.

The absence of a robust and growing non-agricultural sector of the economy may contribute to the downturn in rural land markets under extreme PD. In many areas of Africa, rural households' only means of supporting themselves comes from agriculture. The traditional prohibition on land sales in indigenous African land tenure systems served to guarantee each unit of scarce labor access to land on which to produce and to provide security of some minimum amount of "income" for all members of the group. Thus, in the absence of an alternative means of earning income, when settlement density becomes so high that there is a danger that some households may become landless, prohibitions on sales may re-emerge in order to prevent the creation of a large landless group. Or even if agricultural activity has been reduced to merest subsistence through extreme subdivision, land holders' reservation prices may be extremely elevated due to an unwillingness to part with the resource that is the basis of their subsistence. A decline in land market transactions would result.

If a labor market existed to absorb idle or effectively landless agriculturists, however, then land market activity might not exhibit such a decline. If barely subsistence farmers have an alternative form of employment which enables them to maintain or surpass the standard of living they have on their extremely small holdings, then they may choose to sell their holdings. Thus, an extremely densely populated area reasonably close to a center of active or expanding non-agricultural enterprise might not experience a decline in land market activity.

3.3 SUMMARY

In summary, concepts from neo-classical and institutional economic theories have been used to formulate a three-stage evolutionary path for rural African land markets. In each stage,

different conditions and forces influence land transactions, with varying implications for households' access to land for agriculture.

The first stage of the hypothesized path is characterized by low population density and limited or no commercial agricultural opportunities. Labor is scarce, and land is in surplus. Traditional land tenure systems, in which membership in the relevant group is important, govern individuals' access to land. Land rights are granted to individuals by some authority based on their status as group members. There are no land markets.

Increases in settlement densities and markets for farm output prompt people to value more individualized rights. Over time, land rights become increasingly individualized, ultimately to the point that individuals achieve the right to sell their parcels, and land markets emerge. This is stage two of the hypothesized evolutionary path, in which land markets become more active as population density and commercialization of agriculture continue to increase. The operation of land markets can have effects on land distribution and use, as land market activity may contribute to fragmentation of holdings, subdivision of parcels, concentration of ownership, and changes in access by female-headed households, commercial farmers, and ethnic minorities.

Beyond some extremely high level of population density, the land market may exhibit a significant decrease in activity or may cease to operate (stage three). Parcels may be so subdivided and holdings so small on average, that individuals become unwilling to sell what land they retain. In the absence of land markets, households' access to land may be considerably reduced. Stage three may rely on the absence of a robust non-agricultural sector.

To date, rural African land market evolution and the relationships hypothesized in the three conceptualized stages have not been empirically studied. This research attempts to examine the theory developed and to test the stated hypotheses using data collected in a household sample survey of central Uganda. Succeeding chapters describe the research design, present results of data analyses, and discuss conclusions which can be drawn from this study.

4. RESEARCH DESIGN

4.1 INTRODUCTION

The purpose of this research is to examine the effects of population density, commercial opportunities in agriculture, and land tenure on rural land markets, and in turn to evaluate the effects of land markets on households' access to land for farming in Uganda's central region. Thus, the unit of evaluation is the rural household, and the broad population of interest is rural households in the central region. In order to control for variations in population density and agricultural commercialization, the survey population was narrowed to households in specific sub-counties in the central region, with survey sub-counties selected on the basis of their levels of these variables. Households were sampled from sub-county populations and interviewed about their socio-economic characteristics and access to land. Lack of sub-county sampling frames necessitated a multi-stage sample design with selection techniques which diverged from simple random sampling at several stages in the design. As will be discussed, this design necessitated a weighting scheme for the computation of sub-county statistics and leads to considerable complexity in the computation and interpretation of descriptive statistics and hypothesis tests.

4.2 SAMPLE DESIGN

Sample households were selected according to a three-stage design. The three stages were: (1) purposive selection of sub-counties from the central region; (2) probability proportional to size (PPS) selection of villages from sub-counties; and, (3) stratified random sampling (StRS) of households from villages.

4.2.1 PURPOSIVE SELECTION OF SUB-COUNTIES

The sub-county was chosen as the area of sampling in this survey for several reasons. First, due to the size of the central region and the lack of any sort of regional sampling frame, some sub-area of the region had to be chosen to control overall survey costs. Second, surveying sub-counties allowed more manageable collection of qualitative data to supplement the survey data. Related to this, selection of the sub-county as the area of research permitted insights gained from a preliminary rapid appraisal of central region sub-counties to be incorporated into both the research design and the interpretation of results. Third, use of sub-counties as sampling areas made it easier to account for variation in the control variables of population density and commercialization of agriculture. Lastly, using the sub-county as the area of sampling allows the results of this survey to be connected with those of a study on land disputes settlement which was funded under the same source as this survey. The sub-county is the lowest administrative level in Uganda at which there are formal judicial structures to handle legal matters including land disputes.

Population density (PD) and commercialization of agriculture (COA) are two factors that may strongly influence rural land markets. In order to test hypotheses about the influence of these variables on land markets and to control for variation in these variables in testing other hypotheses about land markets, four sub-counties were chosen to fill the cells of a two-by-two matrix of high and low levels of PD and COA. The four sub-counties were chosen from the 24

sub-counties included in a preliminary rapid appraisal of central Uganda. The 24 sub-counties included in the rapid appraisal were selected by asking land administrators and agricultural officers in each of the central region's six districts to identify four sub-counties which are agriculturally and demographically representative of the district and which contain a significant area of mailo land.[13] The selection of survey sub-counties from the set of rapid appraisal sub-counties enabled the use of qualitative information collected about them during the appraisal.

Each of the 24 sub-counties from the rapid appraisal was assigned to a cell of the PD-COA matrix based on its actual PD and its conjectured degree of COA. Population densities were calculated from figures supplied by the 1991 Population and Housing Census. Commercialization of agriculture was inferred by observing each sub-county's proximity to main towns and main roads on a map, by reviewing qualitative information from the rapid appraisal about what crops are grown and sold in the area, and by asking knowledgeable Ugandans to classify the sub-counties as more versus less agriculturally commercialized.

Once the 24 sub-counties from the rapid appraisal were classified according to their levels of PD and COA, one sub-county from each cell of the two-by-two matrix was purposively selected for the survey. This selection yielded four survey sub-counties, one each for: (1) high population density and high commercialization of agriculture; (2) high density and low commercialization; (3) low density and high commercialization; and, (4) low density and low commercialization. The four sub-counties selected were: (1) Kibinge (HH)[14] located in Masaka District; (2) Busaana (HL) in Mukono District; (3) Bukuya (LH) in Mubende District; and, (4) Kabulasoke (LL) in Mpigi District. A map of Uganda's central region with these four sub-counties darkened appears in the appendix.

4.2.2 PPS SELECTION OF VILLAGES AND CONSTRUCTION OF HOUSEHOLD SAMPLING FRAMES

This stage of the sample design was necessary because sub-county-level household sampling frames were unavailable. The goal was to obtain a sample of rural households from each of the four sub-counties, but no household frames existed, and cost considerations precluded their construction. However, lists of all of the villages in each sub-county were available from the 1991 Population and Housing Census, and were used to select villages in the sub-counties. Sampling frames for selected villages, from which households would be sampled, were then constructed at much lower cost.

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[13] The rapid appraisal served mainly to gather information about patterns of mailo ownership and tenancy. Hence the requirement that rapid appraisal sub-counties contain substantial areas of mailo land. As will be seen later, selection of survey sub-counties from the set of appraisal sub-counties resulted in a relatively low incidence of customary tenure in the sample.

[14] The abbreviations (HH), (HL), (LL), and (LH) denote, respectively, high density and high commercialisation, high density and low commercialisation, low density and low commercialisation, and low density and high commercialisation.

Lists of villages were obtained for each of the four sub-counties. Each list recorded all of the villages in the sub-county, gave the number of households the Census had enumerated in each village, and classified each village as rural or urban. Villages classified as urban by the Census were dropped from the lists in order to produce sub-county populations of assuredly rural households.[15] Since the remaining rural villages contained varying numbers of households, PPS sampling was used to select four villages in each of the four sub-counties. This preserved equal selection probabilities for individual households in the sub-counties.

4.2.3 STRATIFIED RANDOM SAMPLING OF HOUSEHOLDS

The second stage of the sample design yielded four villages in each of the four sub-counties, for a total of 16 villages. Sampling frames were constructed by visiting each household in these villages and listing the head's name and gender and the tenure types of all land held by the household. Most household heads were available because it was the end of the dry season and people were waiting to start new cultivation with the imminent arrival of the rainy season. If the household head was not available, another household member, a neighbor, or a village leader gave the best information possible. This listing produced household sampling frames containing information about households' land tenure.

Because land tenure and land rights are central to this research, a sample containing all of the land tenure forms in the central region was desired. To assure this, the village sampling frames were stratified on the basis of households' land tenure status. Each household was assigned to one of the following five land tenure strata.

1. Owners: households owning mailo or freehold land or leasehold of any tenure;
2. Mailo tenants (MT): households holding tenancies on mailo land;
3. Customary tenants (CT): households holding tenancies on public land;
4. Mixed tenure (MIX): households holding more than one of the first three tenures listed; and,
5. No permanent tenure (NoPT): households lacking any of the first three tenures listed; most of these households rent or borrow land.

Households in the first three strata, with the exception of parcels they borrow or rent, possess land of only one tenure. Households in the fourth stratum hold land under more than one permanent tenure. Households in the fifth stratum have in common a perceived lack of long-term security of access in that they hold no permanent-tenure land. When asked, they say that they are landless. In fact, while they do not hold any permanent-tenure land, they have access to land through a relative, an employer, or a formal borrowing or rental arrangement. Their distinguishing characteristics are that they do not hold any permanent-tenure land and that they are uncertain about the duration of their present situation.

Once the village populations were stratified, ten households were randomly sampled from each land tenure stratum in each village, implying a maximum sample of 50 households (10 households from each of the five strata) per village. If a stratum in a given village contained

[15] Three of the 53 villages in Busaana (HL) and of one of the 47 villages in Kibinge (HH) were dropped.

fewer than 10 households, all of the households in that stratum were selected, implying a census for that stratum in that village. The distribution of sample households across tenure strata and sub-counties is given in table 4.1.

Table 4.1: Distribution of sample households, by sub-county, village, and land tenure stratum; * implies that a census of households was taken in the stratum.

Sub-county	Village	Number of Households					
		Own	MT	CT	MIX	NoPT	Total
Kibinge (HH)	Kabaale	6*	15	--	10*	2*	33
	Kalunduka	--	11	--	3*	6*	20
	Katolelwa	8*	13	--	11	9*	41
	Kisojjo B	3*	17	--	10*	4*	34
Total		17	56	--	34	21	128
Busaana (HL)	Busunsuli	--	--	15	3*	6*	24
	Bukungulu	--	--	14	--	6*	20
	Nanyuki	4*	--	11	4*	10	29
	Kiw. Cntrl.	10	9	8*	11*	11*	49
Total		14	9	48	18	33	122
Kabulasoke (LL)	Bulwadda W.	10	10	6*	11*	8*	45
	Nkandwa	7*	10	--	3*	4*	24
	Kakinga	3*	10	--	2*	5*	20
	Kisozi A	2*	11	--	2*	7*	22
Total		22	41	6	18	24	111
Bukuya (LH)	Kisalizzi	3*	13	--	2*	6*	24
	Kimbejja	8*	10	4*	7*	8*	37
	Kijwa	10*	10	--	3*	11	34
	Kyetume	4*	12	--	7*	4*	27
Total		25	45	4	19	29	122

There are two significant features about the figures in table 4.1. First, a large number of customary tenant households was sampled in only Busaana (HL). This resulted from the selection of sub-counties from those included in the rapid appraisal. Sub-counties for the appraisal were selected partly because they contain significant areas of mailo land. Kibinge, Kabulasoke, and Bukuya are comprised primarily of mailo land, leaving only small areas as public land. Busaana, however, was not cleared of tsetse until the 1950's. Because of

Busaana's tsetse infestation, not much of its area was placed under the mailo system, leaving a much greater part of its area as public land occupied by customary tenants. Thus, only in Busaana was a large number of customary tenant households sampled.

Second, a census of owner, mixed, and no-permanent-tenure households was taken in many of the villages. In addition, cases where there are more than 10 sampled households in a stratum in a given village indicate that households' tenure status as determined during the interview differed from the tenure status assigned during construction of the sampling frames. The degree of such misassignment error is unknown but thought to be low.

4.3 DATA COLLECTION: SURVEY QUESTIONNAIRES

Sampled households were interviewed between April and June of 1992. The respondent was usually the household head, but when the head was unavailable even after repeated returns to the homestead, another individual (usually a household member) acted as respondent. Of 483 respondents, 32 (approximately 6%) were not household heads.

Two questionnaires were used in the survey. First, an overall household questionnaire was administered to all households in the sample regardless of their land tenure. Questions in the household questionnaire related to general information, including socio-economic characteristics of the household, perceptions about access to land in general, and the household's agricultural practices. The final section of the household questionnaire inventoried the household's land holdings, listing all parcels held by all members of the household and identifying their tenure (including rented and borrowed parcels). Second, a parcel questionnaire was administered for each parcel listed in the household's land holdings inventory. The type of information gathered about each tenure was consistent except for characteristics unique to a particular type of tenure. For example, questions specific to mailo ownership, such as whether the land is titled, were not asked for tenancies. Thus, there was one overall household questionnaire for every household in the sample and a parcel questionnaire for each of the parcels held by each household in the sample.

Copies of the survey questionnaires and a detailed explanation of survey procedures can be found in Appendix C.

4.4 IMPLICATIONS FOR DATA ANALYSIS

The main types of quantitative methods to be used in hypothesis testing are regression analysis and comparisons of various sub-groups in the sample. While the multi-stage sample design does not affect regression methodology, it does dictate the computation of means and standard errors. This turns out to be rather complicated given the combination of second-stage PPS sampling with third-stage stratified random sampling (StRS) and the use of Statistical Analysis System (SAS). The following sections discuss the computation of sub-county means and standard errors.

4.4.1 COMPUTATION OF WEIGHTED MEANS AND VARIANCES IN SAS

The stratification of the sampling frames gave households in different strata different probabilities of selection into the sample. Weighted statistics must be calculated to account for

this. A variety of built-in procedures in SAS compute weighted means and variances, where the weight used is supplied by the analyst as a column of the dataset. The weighted means formula in SAS is

$$ave_w = \Sigma_i w_i x_i / \Sigma_i w_i, \quad (4.1)$$

where "w" signifies a non-negative weight for each observation (i) in the dataset, "x_i" is an individual observation, and "ave_w" denotes the weighted mean. Each observation may have a unique value of the weight variable, or some observations may have the same value. The denominator of equation 4.1, which is the sum of the observations of the weight variable, normalizes the weighted mean for cases in which the weights do not sum to one across all observations. To use this SAS formula, there is a need to derive mean and variance formulas which are functions of a household-level weight applied to individual observations of a specific variable such as income or land holdings size.

4.4.2 DERIVATION OF SUB-COUNTY MEANS

Many statistics and sample survey references provide discussions about the computation of means when either StRS or PPS sampling is used. However, a prolonged search failed to find any discussion of multi-stage designs combining these two methods. Consultation with local sample survey and statistics experts likewise produced no references for this sample design (Carter 1993; Johnson 1993; Sweet 1993; Winsborough 1993). Thus, the formula for sub-county means is derived by proceeding through the sample design stage by stage and applying the conventional computation for the sampling method used at each.

The lowest level of the sample design is the land tenure stratum within each village, for which an individual stratum mean can be computed. The next level of the sample design is the village, for which the individual stratum means must be combined to form a village mean. The highest level in the sample design is the sub-county which is the main level for which the mean is needed. Means for the villages in the sub-county must be combined to compute the desired sub-county mean. This process will be specified in equations culminating in a general formula for a sub-county mean which reflects the sample design.

Because households were selected from land tenure strata using simple random sampling, the stratum mean in a given village is the simple average of the households sampled from that stratum. The simple average is equal to the sum of the observations divided by the number of observations; that is,

$$ave_t = \Sigma_i x_{ti} / n_t, \quad (4.2)$$

where "x_{ti}" signifies an individual observation within a tenure stratum, "n_t" gives the number of sample observations in the stratum, and "ave_t" is a stratum mean within a village.

Because the village frames were stratified before households were sampled, each village mean is a weighted average of the stratum means, with the weights being the proportion of the village population in each stratum. That is,

$$\begin{aligned} ave_v &= \Sigma_t (N_t/N_v) * ave_t \\ &= (1/N_v) * \Sigma_t N_t * ave_t, \end{aligned} \quad (4.3)$$

where "N_v" gives the total number of households in a village, "N_t" is the total number of households in a stratum (within a village), and "ave_v" is a village mean. This computation yields the village mean of all tenures in the village. (The village mean of a particular tenure stratum is the simple average of the stratum observations, which is given by equation 4.2.)

Use of PPS sampling to select villages within a sub-county maintained equal selection probabilities for the households in the sub-county (until the introduction of StRS, which has been accounted for by the weight in equation 4.3). Therefore, the sub-county mean is given by the simple average of the means of the villages in the sub-county, which is

$$ave_S = (1/4)*\Sigma_v ave_v, \tag{4.4}$$

where "ave_S" denotes a sub-county mean.

As shown by equation 4.1, it is necessary to derive a weight variable which, when applied in the SAS weighted means formula (equation 4.1), will reflect the computations expressed in equations 4.2, 4.3, and 4.4. Combining these equations to derive weights for use in the SAS weighted means procedure gives:

$$\begin{aligned} ave_S &= (1/4)*\Sigma_v ave_v \\ &= (1/4)*\Sigma_v\{(1/N_v)*\Sigma_t N_t*ave_t\} \\ &= (1/4)*\Sigma_v\{(1/N_v)*[\Sigma_t N_t*(\Sigma_i x_i/n_t)]\}. \end{aligned} \tag{4.5}$$

Moving constants (N_v, N_t, and n_t will be constant across the x_i in a given stratum in a given village) through summations implies that the following weight be applied to each observation for computing the sub-county mean of all tenure strata:

$$w_i = (1/4)*(N_t/N_v)*(1/n_t). \tag{4.6}$$

Equation 4.6 indicates that each observation's weight will be a function of the number of households sampled from the observation's tenure stratum, the total number of households in the observation's tenure stratum, and the total number of households in the village. In the case in which a census of households was taken within a given tenure stratum, $N_t = n_t$ such that these two terms cancel in equation 4.6. If the desired mean is that for a specific stratum at the sub-county level, then equation 4.6 reduces to

$$w_i = (1/4)*(1/n_t). \tag{4.7}$$

Sub-county means for various sub-groups, such as male- and female-headed households, can be derived in a comparable fashion.

Equations 4.2 through 4.5 appeared in the literature discussing sample designs with only one stage. One example of multi-stage sampling with PPS sampling at a first stage was found, but it did not use StRS at the later stage (Scheaffer et al. 1986). However its authors did use the

same substitution approach employed here to derive equations 4.5 and 4.6. Nonetheless, the assumption that formulas for means in a single-stage design apply in a multi-stage framework, with means from lower levels in the design brought into upper-level formulas (as demonstrated above) may be suspect, although neither the literature nor local experts challenge this procedure.

4.4.3 DERIVATION OF SUB-COUNTY STANDARD ERRORS

Estimated standard errors are required for comparisons of means. According to Scheaffer, Mendenhall, and Ott (1986), when PPS sampling is used to select clusters (e.g., villages) of population elements (e.g., households), the variance of the mean is estimated by weighted squared deviations of the cluster means (ave_c) from their average (cave)

$$V(ave_{PPS}) = [1/(n(n-1))]*\Sigma_c[ave_c - cave]^2, \qquad (4.8)$$

where "n" now denotes the number of clusters selected using PPS sampling. In the case currently under consideration in which four villages were selected by PPS sampling in each sub-county, equation 4.8 becomes the estimated variance of the sub-county mean and can be re-written as

$$V(aves) = (1/12)*\Sigma_v[ave_v - aves)^2], \qquad (4.9)$$

where "aves" and "ave_v" are given by equations 4.4 and 4.3, respectively. The estimated standard deviation is the square root of equation 4.9.[16]

Thus, when a sample is selected by first sampling clusters (villages in this survey), the variance of the estimated mean is held to depend only on the deviation of the cluster (village) means from their average (the sub-county mean) and not on the deviation of individual observations from their means. This raises some considerations specific to the points presented thus far.

4.4.4 CAVEATS FOR THE INTERPRETATION OF RESULTS

The notion that, in the case of PPS sampling, variance derives only from deviations of the cluster means from their average raises two concerns: (1) bias of variance estimates; (2) drawing conclusions from SAS output.

First, in PPS sampling, a "random" sample of, say, 100 households is selected through a random selection of clusters of the population. Thus, while the analyst claims that 100 sample households represent a given population, those 100 households were actually chosen in a much smaller number of clusters which is said to represent the population. The small number of clusters relative to the number of sample observations has the effect of significantly reducing the degrees of freedom in the equation estimating variance. It is possible that this may generate variance estimates that are too small, thus biasing significance tests and significantly increasing

[16] By the central limit theorem, standard errors of aveS and avev can be estimated by dividing V(aveS) and V(avev) by the square root of nS and nv, respectively (Ott 1988).

the chances of mistakenly rejecting null hypotheses. As Rice (1988) states, "since one would expect [units within a single cluster] to be relatively homogeneous, [PPS sampling] can be less precise than a simple random sample of the same size" (p. 212). However, the amount of bias in the estimate and therefore the magnitude or frequency of errors in tests are indeterminate (Sweet 1993).

Second, when SAS is used to compute weighted means and variances and to conduct further analyses using those statistics, the built-in weighted variance formula which corresponds to the weighted means expression is

$$s^2_w = \Sigma_i[w_i*(x_i - ave_w)^2]/d, \qquad (4.10)$$

where $d = n-1$
or $d = \Sigma_i w_i$
or $d = n$
or $d = \Sigma_i w_i - 1$,

and "i" denotes the individual observation (as opposed to a cluster statistic), "n" is the number of observations (as opposed to the number of clusters), "w_i" is the observation's value of the weight variable, and "ave_w" is the SAS weighted mean given by equation 4.1. The analyst has only limited power to alter this built-in expression through selection of the denominator in equation 4.10 from the set of four choices. The weight variable must be that used in equation 4.1. Thus, it is impossible to make SAS' weighted variance formula equivalent to equation 4.9. Weighted variance estimates computed by SAS derive from deviations of individual dataset observations from the overall mean rather than from deviations of cluster means from their average. Weighted variances computed by SAS are considerably smaller than those computed from equation 4.10. This result may be due to the particular variables chosen for the comparison. However, since sampling theory suggests that variances computed using equation 4.10 may be too small, SAS' weighted variances, at least some of which are even smaller, ought to be suspect.

This has implications for conducting multiple comparisons of means using SAS or any other method. As the SAS manual notes:

> The multiple comparison tests were developed for [the unweighted] situation, and the statistical behavior of these tests is well-understood. In the less common situation of using a WEIGHT statement, [the SAS procedure] computes weighted means and uses the weighted means in the formulas shown. The statistical behavior here is not well-understood, since the multiple comparison tests were designed for the situation of unweighted means." (pp. 941-2)

It seems that multiple comparison theory has been well developed for the situation of unweighted means but has not been developed for weighted means. Thus, it appears that

statistical theory has not advanced sufficiently to assure validity of the SAS built-in functions or even the application of equation 4.9 to conduct multiple comparisons of sub-county means.

Thus, the multi-stage sample design necessitated for this survey by the absence of sub-county sampling frames and by the need to stratify the population by tenure introduces concerns about the statistical analyses needed to test hypotheses. The problem stems not merely from a concern about SAS but more generally from what appears to be a gray area in statistics theory, and is therefore irreconcilable. Thus, when descriptive statistics are presented, they should be evaluated with skepticism. In the data analyses, conclusions are drawn from regression results rather than from relationships between sub-county means.

4.5 A DESCRIPTION OF THE SAMPLE

Of the 486 households sampled according to the multi-stage design described, three could not be interviewed and were not replaced in the sample (response rate was about 99%). Three other households were later identified as outliers on income or area of landholdings and were dropped from analyses. One had a 1991 income of 2,926,500 Ushs[17] when the other sampled households' incomes ranged fairly continuously from zero to 626,000 Ushs. This was a 10-member household residing in Busaana (HL) on a 4-acre mailo tenancy and owning 250 cattle. The household's primary source of income in 1991 was milk sales, which generated approximately 2.7 million Ushs.

Two other households appeared to be outliers because of the large size of their landholdings. Both reside in Bukuya (LH). The first is an elderly widow who resides on 1,280 acres (2 square miles) of mailo land which belonged to her late husband. At the time of the interview, the deceased's will had not been read, and the respondent did not know how the land would be divided. Her income in 1991 was 7,500 Ushs. The other was a mixed-tenure household headed by a 32-year old man. The household holds three parcels of land which total 646 acres. Two of the parcels are mailo tenancies of three acres each. The third is one square mile of mailo land which the head inherited jointly with his two brothers. It has never been sub-divided between the three, and each brother considers himself to own and have access to the entire block. This household earned approximately 520,000 Ushs during 1991. Without these two households, the land holdings variable ranges from zero to 340 acres.

Table 4.2 presents some descriptive statistics of the households sampled in the four sub-counties. Table 4.2 does not present any unexpected information, as similarities and differences between sub-counties are consistent with expectations. Household size and composition, average age and education level of household heads, and the average numbers of parcels to which households have access tend to be uniform across sub-counties. Expected differences appear in landholdings size and income. As expected, landholdings are smaller in the two more densely populated sub-counties than in the two less densely populated sub-counties. Interestingly, within a fixed level of population density (i.e., considering only the densely settled sub-counties and then only the less densely settled sub-counties), both average income and average landholdings are larger in more commercialized sub-counties than in less

[17] Approximately 1,000 1991 Uganda shillings = 1 U.S. dollar.

commercialized sub-counties. These relationships will be examined and discussed in more detail in the next chapter.

Table 4.2: General description of the sample, by sub-county

Characteristic	Kibinge (HH)	Busaana (HL)	Kabulasoke (LL)	Bukuya (LH)
Number of HH's in final dataset	128	122	111	122
Number of HH's with male heads	90	105	79	102
Number of Bagandan HH's	100	32	76	73
Average HH[18] size	5.9	5.8	5.1	4.5
range (people)	1-21	1-17	1-16	1-20
Average age of HH head	47.2	45.3	45.0	47.2
range (years)	19-90	19-89	17-84	16-110
Head's ave. education (yrs)	4.4	4.1	4.0	3.4
Average parcels[19]/HH	1.9	1.7	1.9	1.6
range (parcels)	0-7	0-3	0-7	0-6
Average acres/HH	5.1	3.2	7.3	10.6
range (acres)	0-166	0-55	0-105	0-340
# HH's owning cattle	9	15	13	8
Ave. HH income (1991 Ushs)	80,974	53,162	51,346	55,269
range: 0 to	505,000	626,000	620,000	450,000
Number of parcels in sample	203	122	133	152
Number of ownership parcels	69	25	40	56
Number of MT parcels	128	23	80	88
Number of CT parcels	6	74	13	8
Number of rented parcels	0	21	0	0
Number of borrowed parcels	31	39	45	33
Average acres/parcel	3.1	2.4	3.3	7.8

[18] "HH" stands for household.

[19] These figures include parcels which households rent and borrow.

5. DATA ANALYSES AND RESULTS

5.1 INTRODUCTION

Land markets would be best examined over time. Ideally, a researcher interested in land market evolution under increases in population density (PD) would study a specific geographic area and examine annual (or periodic) data on the number of parcels acquired through market transactions beginning in a year when settlement was sparse and continuing through a time of much higher settlement density. A comparable analysis could be performed to study relationships between land markets and the degree of commercialization of agriculture (COA). In an area with an accurate land registry, such time series data would be available. As another possibility, a researcher could essentially create a time series analysis by repeating a previous land market study in the same area at several points in time. In a developing country, however, a researcher is unlikely to obtain time series data through either a land registry or repeated studies at a specific location.

In Uganda, the land registry has never been up to date. Market transfers of tenancies were not recorded because tenancies were not registered properties. Most of the records that were kept were destroyed, disheveled, or lost during the two decades of unrest. In addition, though several researchers (Mukwaya 1953; Richards et al. 1973; West 1974; Ault and Rutman 1979) studied central Uganda's land tenure and land markets earlier this century, none of them documented their research sites sufficiently to allow replication of their studies at the same locations. A time series dataset could have been constructed by asking respondents in this survey to report all variables for every year of their households' existence, but this was not attempted due to the extraordinary respondent recall it would have relied on.

Alternatively, a cross-sectional approach was taken, and study sub-counties were chosen in a way that could conceivably proxy for time. Since areas generally become more populated over time, low-PD sub-counties might represent earlier versions of current high-PD sub-counties; that is, over time, low-PD areas might be expected to develop into high-PD areas. The assumptions implicit in this approach are that regional growth occurs along the same path and at the same pace in all areas regardless of their topography, ethnic mix, or other characteristics, and that technology is constant across areas. Any interpretation of the results presented in this chapter must be tempered by the knowledge that, in reality, these assumptions do not necessarily hold.

Chapter three presented eleven hypotheses about rural African land markets and their effects on households' access to land. The hypotheses (and the section of this chapter in which they are discussed) are:

1. Land rights become more individualized as PD or COA increases. (sec. 5.2)

2. Individualization of land rights increases individuals' land tenure security. (sec. 5.3)

3. Land markets emerge and become more active as PD or COA increases. (sec. 5.4)

4. Individuals' land tenure security is greater in the presence of active land markets. (sec. 5.5)

5. Land market activity increases the degree of fragmentation of land holdings. (sec. 5.6)

6. Land market activity increases subdivision of land parcels. (sec. 5.7)

7. Land market activity increases concentration of land ownership. (sec. 5.8)

8. Land market activity is associated with landlessness or imminent landlessness. (sec. 5.9)

9. Land markets improve access to land by traditionally excluded individuals such as women and ethnic minorities. (sec. 5.10)

10. Land market activity increases access to land by commercial farmers. (sec. 5.11)

11. Land market activity increases the incidence of fixed-place agricultural investment and yield-enhancing agricultural practices. (sec. 5.12)

These hypotheses divide logically into two categories. The first category (hypotheses 1 through 3) contains hypotheses about the process of individualization of land rights and the emergence of land markets. The second category (hypotheses 4 through 11) consists of hypotheses about the effects of land market operation. However, each of these hypotheses will be discussed in a separate section of this chapter.

Very briefly, the main themes of the results are: First, and not surprisingly given Uganda's land tenure history, all forms of land tenure in the central region appear to be highly individualized and secure, although individualization does appear to be related to land tenure, PD, and COA. Second, some results support the theory that land market activity is positively correlated with PD up to some threshold level of PD, beyond which activity decreases, and that land market activity increases with increased COA. Third, fragmentation of holdings and parcel size appear to be influenced by the land market, although it is unclear whether they have reached levels that would impede agricultural activity or restrict household income to below-subsistence levels. Fourth, concentration of land ownership is no greater in areas with more active land markets than those with less active land markets, and not much land market-derived landlessness was found in this survey. Fifth, land markets may provide an important means of access to land for female-headed households, non-Baganda, and commercial farmers. Finally, in the central region, neither tenure nor land market activity was found to exert a prominent influence on the incidence of fixed-place agricultural investments or productivity-increasing farming practices. Much more can be said about these points, and each will be discussed in greater detail in the sections which follow.

5.2 PD, COA, AND INDIVIDUALIZATION OF LAND RIGHTS

"Individualization of land rights" is a broad and complex concept, especially in an area, such as central Uganda, with several forms of tenure. In this research, "individualization" means the assertion of rights, or certain critical rights typically associated with freehold tenure, over an

area of land by an individual person or household. Fully individualized land rights would be equivalent to freehold tenure in which individuals possess most or all use rights, exchange rights, and bequest options to the land, with possible constraints on the exercise of these rights exerted only through government regulation such as zoning. Economic theory suggests that, as PD or COA increases, it becomes economically beneficial for individuals to claim increasingly individualized rights over particular areas of land.

The process of individualisation will be gradual rather than instantaneous. There may be lengthy periods of transition during which various land rights are added to or dropped from individuals' bundles, relationships between individuals with respect to land are changing, and some parcels, individuals, or types of parcels or individuals are favored over others. That is, the degree of individualization may vary among individual land holders and perhaps among types of parcels, and these variations may themselves shift over time. This transition period may be quite lengthy, but as PD and COA increase over time, land rights will generally become more individualized.

Based on this premise, at any point in time, sub-counties with high PD and/or high COA should exhibit greater individualization of land rights than those with lower PD or COA, although numerous other factors might influence the cross-sectional relationship between individualization, PD, and COA. The trend toward increased individualization can be expected to occur on all tenures.

5.2.1 LAND RIGHTS

During interviews, survey respondents were presented with a list of land rights that included use rights, transfer rights, and exclusion rights. (A list of the specific rights respondents were asked about is provided in appendix D, and a list of variable names and definitions used throughout the chapter is given in appendix E.) Respondents were asked whether they legally possessed each right on each of the parcels they control. Mailo and customary tenants were then asked whether anyone's (such as a mailo owner, a chief, or some other authority figure) permission is required for them to exercise each of the rights they said they have. Mailo owners with tenanted land were asked whether they could in fact exercise each right they indicated they have on land occupied by tenants. Unfortunately, through an oversight, mailo owners were not asked about their rights over their non-tenanted land. Thus, individualization is assessed by analyzing rights on mailo and customary tenancies.

Individualization could in theory be measured by the incidence of "yes" responses or the incidence of "no" responses for each right. However, because respondents were first asked about each right and then about whether permission is necessary for the rights they said they have, the counts given for "yes, with permission" and "no" may not be accurate, since respondents did not know that they would be asked whether they need permission to exercise each right they claimed. Therefore, on the first reading of the rights list, the respondent may have replied "no" for a right that he can exercise only with permission. In such cases, that right would not have been repeated on the second reading of the list because it would have been coded "no" in the first reading. Thus, the "yes, with permission" responses may be undercounted and the "no" responses may be over-counted. However, the (outright) "yes" responses should be reliable counts. Therefore, the individualization analyses are conducted

from the "yes" responses, by creating, for each right on mailo and customary tenancies, a binary variable coded one if the response to the right was an outright "yes" and zero if it was not.

Frequency counts of responses for rights on mailo and customary tenancy parcels are given in tables F.1 and F.2 in appendix F. There was extremely low (or no) variation in responses for several rights. For example, respondents on both customary and mailo tenancies overwhelmingly report that they possess fencing (FENCEPERM) and wood gathering (WOOD) rights on their parcels. Other examples can be seen through inspection of tables F.1 and F.2 in appendix F. Due to this low variation in the responses for several of the tenancy rights, only a subset of rights on customary and mailo tenancies is used to analyze individualization.

5.2.2 INDIVIDUALIZATION

Individualization of land rights is hypothesized to be greater under conditions of greater PD or COA. Thus, all else constant, based on PD, land rights in Kibinge (HH) should be the most individualized, followed by Busaana (HL), Kabulasoke (LL), and Bukuya (LH), in that order. Based on COA, land rights should be more individualized in Kibinge than in Busaana, and more individualized in Bukuya than in Kabulasoke.

Rights for which the responses (as shown in tables F.1 and F.2 in appendix F) had little or no variation are not analyzed. Dropping rights whose responses have no variation left in the analysis rights which might be thought of as being "higher" in a bundle of rights. These include: rights to plant and cut trees (PLANTTREES, CUTTREES); rights to bury the deceased (BURY); the commercial rights of digging sand, clay, and gravel to sell (DIGSALE) and making bricks to sell (BRICKSALE); the transfer rights to give away (GIVE), rent out (RENT), pledge, and sell the parcel; and, rights to exclude others from using footpaths (OTHNOPATH) and collecting fire wood (OTHNOWOOD) and water (OTHNOWATER). For mailo tenancies, this included the additional rights to exclude the mailo owner from grazing his livestock (MONOGRAZE), using paths (MONOPATH), cutting trees (MONOTREE), and collecting wood (MONOWOOD) and water (MONOWATER). The proportions of customary and mailo tenancies on which the holder has each right appear in tables 5.1 and 5.2, respectively.

Table 5.1: Weighted proportion of customary tenancies for which holder responded (outright) "yes" for the right indicated, by sub-county. The number of customary tenancies sampled was: 6 in Kibinge, 74 in Busaana, 13 in Kabulasoke, and 8 in Bukuya

Right	Proportion of parcels on which the holder has the right			
	Kibinge (HH)	Busaana (HL)	Kabulasoke (LL)	Bukuya (LH)
PLANTTREES	100	93.1	61.5	77.6
CUTTREES	100	56.8	54.5	51.6
BURY	38.3	84.5	100	100
BRICKSALE	100	87.9	69.2	77.6
DIGSALE	100	84.2	69.2	64.6
GIVE	100	87.3	92.3	64.6
RENT	100	91.6	92.3	90.6
SELL	100	91.4	92.3	64.6
PLEDGE	70.6	91.4	53.8	87.0
OTHNOPATH	38.3	53.2	30.8	22.4
OTHNOWOOD	100	97.8	69.2	73.9
OTHNOWATER	38.3	39.4	0.0	0.0

The figures for customary tenancies in tables F.1 (appendix F) and 5.1 suggest that customary tenure in the central region today is highly individualized. The frequency counts for the rights responses listed in table F.1 (appendix F) indicate that there is consistently little or no variation in many rights on customary tenancies. Particularly, almost all customary tenants sampled have the use rights to dig sand or gravel (DIGHOME) and make bricks (BRICKHOME) for home use, erect permanent structures (BLDPERM) or fences (FENCEPERM), bury the deceased (BURY), hunt, and gather firewood (WOOD). Furthermore, customary tenants also possess the transfer rights to bequeath (BEQ), lend, rent, sell, or give the parcel to another individual, and they can exclude others from grazing livestock (OTHNOGRAZE) and cutting trees (CUTTREES) on the parcel--rights which were thus dropped from analyses. There is greater variation in responses about tree rights (PLANTTREES, CUTTREES), engaging in commercial activities (DIGSALE, BRICKSALE), and excluding others from using footpaths (OTHNOPATH), and collecting firewood (OTHNOWOOD) and water (OTHNOWATER) from the parcel--rights which were analyzed.

Of the subset included in table 5.1, most use and transfer rights may be exercised on a majority of parcels sampled (greater than 50% of parcels, except in the case of the right to bury in Kibinge). This suggests that customary tenancies are highly individualized, especially since most customary tenants have the rights to plant and cut trees, and to sell, give away, or rent out the parcel--rights which often distinguish freehold tenure from customary African tenures. Of the exclusion rights examined, customary tenants appear to have the right to prevent others from gathering wood on their parcels but not to prevent others from using paths or collecting water on their parcels. Footpaths, firewood, and water were often communal (or sometimes

open access) resources in traditional African systems, so the fact that at least one of these is breaking down is significant. That it is the right to exclude others from collecting wood on the parcel may be associated with customary tenants' possession of the rights to plant and cut trees on their parcels.

It appears that "customary" tenure in central Uganda is today characterized by a very comprehensive and fairly exclusive bundle of rights approaching that of freehold tenure. Background anthropological and land tenure literature indicates that while customary tenure in the central region has not been widely communal since the earliest descriptions, it was not always this highly individualized. What is observed at present is an evolved form of customary tenure which is similar to mailo ownership. The increased individualization in customary tenure could be, as theory predicts, a response to increases in PD and COA that have occurred throughout the area. Alternatively, perhaps customary tenants, upon recognizing the benefits to mailo owners of comprehensive land rights, began to claim more individualized rights for themselves.

Table 5.2: Weighted proportion of mailo tenancies for which the holder responded (outright) "yes" for the right indicated, by sub-county. The number of mailo tenancies sampled was: 128 in Kibinge, 23 in Busaana, 80 in Kabulasoke, and 88 in Bukuya.

Right	Weighted proportion parcels with the right			
	Kibinge (HH)	Busaana (HL)	Kabulasoke (LL)	Bukuya (LH)
PLANTTREES	79.5	52.1	56.2	80.5
CUTTREES	64.6	37.1	41.7	49.4
BURY	87.2	96.4	72.3	85.1
BRICKSALE	57.9	52.8	54.9	58.6
DIGSALE	44.3	51.9	48.3	46.1
GIVE	54.5	42.1	71.2	57.8
RENT	55.2	74.5	77.5	71.8
SELL	26.2	41.2	53.2	55.2
PLEDGE	41.9	48.3	54.8	66.0
MONOGRAZE	67.4	51.0	40.7	38.1
MONOPATH	35.8	14.3	12.2	11.3
MONOTREE	37.3	27.4	18.6	27.6
MONOWOOD	47.8	42.1	16.8	15.3
MONOWATER	17.7	1.9	5.6	1.5
OTHNOPATH	59.0	37.8	35.8	38.0
OTHNOWOOD	90.7	98.3	73.3	57.6
OTHNOWATER	32.6	1.0	10.9	4.6

Mailo tenancy is the most prevalent tenure in central Uganda. While certain rights, such as the right to continued occupancy and use over multiple generations, were bestowed by legislation, other rights were granted selectively by the mailo owner. The quality of the relationship between the mailo owner and the mailo tenant was traditionally fundamental in defining a mailo tenant's land rights. Traditionally, the better the relationship between the owner and tenant, the better the tenant's chances of having more comprehensive land rights. In particular, rights to build permanent structures (a brick and concrete house akin to those built by mailo owners historically being the most important), to sell the tenancy, and to cut trees were granted at the mailo owner's discretion. Thus, mailo tenants, in seeking to gain more individualized land rights in response to increased land values from increased PD or COA, may face cultural constraints on such expansion. Both the mailo owner and the mailo tenant may react to higher land values by attempting to expand their rights relative to each other on the tenanted area. It is not clear which party would succeed.

It may be that the figures in table 5.2 reflect this ambiguity. If the outcome were straightforward, then tenants would possess rights on a greater proportion of mailo tenancies

in Kibinge (HH) than in the other sub-counties. However, this is not the case. If the sub-county proportions are ranked for each right, it quickly becomes evident that the ranking changes through the use and transfer rights. For example, the highest proportion of mailo tenants in Kabulasoke (LL) can rent out their tenancy while the highest proportion in Kibinge (HH) can cut trees and the highest proportion in Busaana (HL) can bury the deceased on their tenancies.

Interestingly, of the economically important rights (those that generate returns or cash flow--to make bricks for sale (BRICKSALE), dig clay or gravel for sale (DIGSALE), and rent, sell, and pledge the tenancy), the lowest proportion of mailo tenants who can exercise these, except making bricks for sale, is in Kibinge (HH). The sub-county rankings for the rights to sell and to offer the tenancy as collateral for credit (PLEDGE) are exactly the reverse of the PD ranking of the sub-counties. This challenges the expectation provided by economic theory unless it can be explained by mailo owners' seeking to gain more individualized rights over their tenanted land for commercial-oriented purposes by limiting tenants' rights.

The opposite appears to be true for exclusion rights on mailo tenancies. It is in Kibinge (HH) that the greatest proportion of mailo tenants possess all of the rights except that to exclude others from collecting firewood on the tenancy (OTHNOWOOD). This holds for tenants' rights to exclude even the mailo owner from various uses (MONO...). Perhaps it is exclusion rights which tenants can succeed in claiming when seeking more individualized land rights. However, with the exception of the right to exclude others from collecting firewood on the tenancy (OTHNOWOOD), the exclusion rights can be exercised on fewer than half the tenancies in most sub-counties.

From the figures in tables 5.1 and 5.2, it appears that, overall, the degree of individualization on mailo and customary tenancies increases with higher levels of PD, but the exact relationship is not clear, and the influence of COA on individualization is not at all evident. This is probably due in part to variation in additional determinants of individualization.

5.2.3 INDIVIDUALIZATION: REGRESSION ANALYSES

A way to assess the influence of PD and COA on the individualization of land rights more directly is regression analysis. This technique can isolate the effects of PD and COA by controlling for variation in other factors (such as the household head's gender or ethnicity, or size or the parcel or length of time the parcel has been held, for example) which may also influence whether a parcel holder possesses a given right. Since the dependent variable (possession of the right) is binary, logistic regression models are run for each right using two subsets of the sampled parcels. The first subset contains both mailo and customary tenancy parcels, while the second contains mailo tenancy parcels only. A parcel holder's possession of a given land right should depend on characteristics of the sub-county (PD, COA), the parcel (tenure (PMT), time held (YRSHAD), and whether purchased (PBUY)), and the holder (gender (HGENDER) and ethnicity (HHBAG)). These characteristics were included in the models as exogenous variables, although it is really the effects of PD and COA on the possession of each right that are of interest here.

Regression results are displayed in tables 5.3 and 5.4.

Tables 5.3 and 5.4, presenting logit regression results for models of rights on customary and mailo tenancies, reveals that few of the exogenous variables are statistically significant at either the 5% or the 10% level in increasing the probability that a holder possesses the right on his parcel. Surprisingly, the coefficient estimated for whether the parcel was purchased (PBUY) is negative in the models for the economically important rights to dig clay or gravel for sale (DIGSALE), to sell the parcel, and to pledge the parcel for credit, suggesting that it is less likely for holders of purchased parcels to possess those rights. The length of time the owner has held the parcel (YRSHAD) is also a statistically significant determinant of a number of rights, and, as expected, is negative when it is significant. If the degree of individualization of land rights has been increasing over time, and if the bundle of rights attached to a parcel of land undergoes the greatest change or adjustment at times of transfer, then holders who acquired their parcels more recently might be expected to possess more individualized bundles of rights over those parcels. Gender (HGENDER) and ethnicity (HHBAG) of the household head are not statistically significant in many of the models, but when they are, being male or Bagandan tends to increase a holder's chances of possessing a given right on his parcel. Men and Baganda were traditionally favored relative to women and non-Baganda, respectively, in gaining access to land in Uganda's central region, so this result might have been expected.

The tenure of the parcel (PMT) is a statistically significant determinant for all of the use and transfer rights examined except the right to bury the deceased on the parcel. The positive sign of the coefficient estimated for the dummy variable indicating mailo tenancy (PMT) (table 5.3) implies that mailo tenants are more likely than customary tenants to possess these rights. This is somewhat surprising. The proportions of customary tenancy parcels with various rights (table 5.1) suggest that customary tenure in the central region is highly individualized, but controlling for other factors that might affect the rights a parcel holder has, the regression results (table 5.3) indicate that mailo tenancies are more individualized than customary tenancies despite the presence of the traditionally constraining role of the mailo landlord.

The hypothesis of interest is really that increasing PD or COA will increase individualization of land rights. For the set of customary and mailo tenancies (table 5.3), PD is statistically significant in explaining whether a parcel holder has pledge, sale, and exclusion (OTHNO...) rights. Higher PD tends to increase the holder's rights to sell or pledge his parcel, and to decrease his rights to exclude others from using footpaths and collecting firewood and water. Increased COA tends to decrease the likelihood that a mailo or customary tenant possesses the rights to plant trees, cut trees, and bury the deceased on the parcel.

Table 5.3: Parameter estimates and (standard errors) for logit regression models of the holder's possession of land rights by mailo and customary tenants[20]

Right (1=yes)	Int.	PD	COA	PBUY	YRSHAD	HGENDER	HHBAG	PMT
PLANTTREES	-2.812* (.902)	-.001 (.001)	-1.019* (.354)	-.386 (.293)	-.020** (.012)	-.060 (.265)	.274 (.306)	1.455* (.419)
CUTTREES	-1.530* (.749)	-.0004 (.001)	-.880* (.312)	-.139 (.252)	-.002 (.009)	-.137 (.323)	-.364 (.264)	.651* (.329)
BURY	-2.126* (.915)	.0001 (.001)	-.802* (.386)	-.377 (.308)	-.031* (.013)	.975* (.479)	.696* (.336)	.439 (.403)
BRICKSALE	-2.929* (.799)	.0001 (.001)	-.446 (.324)	.038 (.263)	-.001 (.010)	.080 (.343)	.267 (.278)	1.738* (.389)
DIGSALE	-1.204 (.739)**	.0001 (.001)	.109 (.313)	-.398 (.262)	-.006 (.009)	-.145 (.339)	.036 (.273)	1.471* (.350)
GIVE	-2.307* (.819)	.001 (.001)	.414 (.329)	-.624* (.277)	-.013 (.010)	.160 (.358)	.420 (.288)	1.707* (.436)
RENT	-3.840* (.964)	.001 (.001)	.180 (.357)	-.229 (.289)	-.005 (.011)	-.254 (.362)	.809* (.316)	2.277* (.566)
SELL	-2.335* (.833)	.003* (.001)	.391 (.330)	-.958* (.285)	-.020* (.011)	-.106 (.368)	.014 (.293)	2.530* (.449)
PLEDGE	-1.521* (.791)	.002* (.001)	-.047 (.335)	-.540* (.278)	-.022* (.011)	-.699* (.362)	.879* (.289)	2.200* (.427)
OTHNOPATH	1.885* (.721)	-.002* (.001)	.308 (.305)	.010 (.242)	-.017** (.009)	-.041 (.314)	.068 (.258)	-.312 (.313)
OTHNOWOOD	-.042 (.904)	-.005* (.001)	.790* (.369)	.081 (.345)	-.005 (.013)	-.269 (.428)	-.136 (.348)	.672 (.499)
OTHNOWATER	2.682* (1.013)	-.006* (.002)	-.549 (.502)	-.422 (.317)	-.023* (.011)	.105 (.434)	.645** (.365)	.603 (.445)

[20] In this and all subsequent tables, * and ** signify statistical significance at the five and ten percent levels, respectively.

Table 5.4: Parameter estimates and (standard errors) for logit regression models of the holder's possession of land rights on mailo tenancies

Right (1=yes)	Parameter estimates & standard errors						
	Int.	PD	COA	PBUY	YRSHAD	HGENDER	HHBAG
PLANTTREES	1.780* (.803)	.0004 (.001)	-1.261* (.384)	-.434 (.326)	-.017 (.013)	.229 (.417)	-.023 (.337)
CUTTREES	-.395 (.726)	.0003 (.001)	-.818* (.356)	-.106 (.307)	-.016 (.012)	-.526 (.387)	-.709* (.321)
BURY	-1.670* (.882)	-.001 (.002)	-.767** (.411)	-.582 (.365)	-.031* (.016)	1.145* (.578)	.495 (.387)
BRICKSALE	-.944 (.681)	.0008 (.001)	-.427 (.345)	.249 (.290)	-.004 (.011)	-.072 (.374)	.252 (.307)
DIGSALE	.628 (.680)	.001 (.001)	.110 (.344)	-.181 (.298)	-.012 (.011)	-.322 (.386)	-.090 (.310)
GIVE	-.570 (.691)	.0009 (.001)	.480 (.356)	-.644* (.298)	-.014 (.011)	.005 (.378)	.582** (.315)
RENT	-1.312** (.751)	.001 (.001)	.296 (.372)	-.173 (.301)	-.008 (.011)	-.385 (.376)	.828* (.332)
SELL	.162 (.699)	.004* (.001)	.256 (.350)	-.896* (.310)	-.032* (.011)	-.169 (.401)	.005 (.317)
PLEDGE	.855 (.714)	.003* (.001)	-.263 (.359)	-.619* (.305)	-.027* (.012)	-.960* (.418)	.800* (.319)
OTHNOPATH	1.815* (.707)	-.001 (.001)	.018 (.345)	-.132 (.289)	-.025* (.011)	-.374 (.370)	.109 (.307)
OTHNOWOOD	.604 (.779)	-.004* (.001)	.840* (.407)	.301 (.369)	-.007 (.015)	-.307 (.461)	-.374 (.373)
OTHNOWATER	3.202* (1.024)	-.005* (.002)	-.849 (.618)	-.649 (.408)	-.031* (.014)	-.043 (.533)	.614 (.440)
MONOGRAZE	.547 (.686)	-.003* (.001)	-.198 (.349)	-.249 (.293)	-.010 (.011)	.480 (.379)	.162 (.309)
MONOPATH	2.665* (.950)	-.004* (.002)	-.071 (.505)	.365 (.381)	-.004 (.013)	-.255 (.498)	.645** (.393)
MONOTREE	2.327* (.859)	-.002* (.001)	-.360 (.417)	-.209 (.330)	-.006 (.012)	-.314 (.444)	.596** (.347)
MONOWOOD	2.716* (.838)	-.005* (.001)	.075 (.420)	-.180 (.319)	-.012 (.011)	-.139 (.409)	.229 (.342)
MONOWATER	4.151* (1.524)	-.006* (.003)	-.719 (.923)	.228 (.560)	-.029** (.017)	.449 (.635)	1.008** (.548)

The results for the same models run on the set of mailo tenancies alone (table 5.4), with the parcel tenure variable (PMT) omitted, are similar to those run on mailo and customary tenancies together (table 5.3). If a mailo tenant acquired his parcel through purchase (PBUY), then his chances of having rights to give the parcel away, to pledge the parcel to obtain credit, and to sell the parcel decrease. The longer a mailo tenant has held his parcel (YRSHAD), the less likely he is to possess the rights to bury the deceased on the parcel, sell the parcel, pledge the parcel for credit, exclude others (OTHNO...) from using paths or collecting water on the parcel, and exclude the mailo owner from collecting water there. If the household head is male, he will be more likely to have the right to bury the deceased on the parcel and less likely to have the right to pledge the parcel for credit.

The household head's ethnicity (HHBAG) is statistically significant in determining the presence of several rights on mailo tenancies. While Baganda are less likely to have the right to cut trees on their parcels, they are more likely to have the rights to give the parcel away, to rent the tenancy, to pledge the tenancy for credit, and, not surprisingly, to prevent the mailo owner from using footpaths, gaining access to trees, and collecting water on the tenancy. Mailo land was originally unique to Baganda, and mailo owners were traditionally Baganda who attracted tenants as political patrons. This resulted from the original allocations' having been made to Bagandan elites, and mailo land's having become associated with the Baganda. Their tribal kinsman would have been primary targets to become patrons, and the relationship between a Bagandan owner and tenant may differ from that in which the tenant is not Bagandan, especially considering that in recent years the king has encouraged Baganda to keep mailo land in the tribe rather than alienate it to other ethnicities.

Higher PD increases a mailo tenant's chances of having the rights to sell or pledge his parcel. These are economically crucial rights typically associated with freehold tenure, so this result supports the hypothesis that mailo tenancies become more individualized as PD increases, ceteris paribus. Contrary to this, the regression results for mailo tenant rights (table 5.4) imply that higher PD significantly decreases a mailo tenant's chances of possessing all of the exclusion rights analyzed (except that of excluding others from using footpaths on the parcel). This result suggests that, in some ways, mailo tenancies become less individualized under greater population pressure. It may be that higher PD induces mailo owners and others to claim traditionally more common-property types of rights.

High COA significantly decreases the likelihood that a mailo tenant will possess rights to plant and cut trees and to bury the deceased on his parcel, and increases his chances of being able to exclude others from collecting wood on the parcel. The first of these effects (decreased rights to plant and cut trees) is an unexpected result since theory predicts that increased COA will broaden individuals' rights, especially those that are economically important. As with some of the rights under increased PD, tenants' decreased tree rights under higher COA may signify mailo owners' traditional claims to trees even on land occupied by tenants.

5.2.4 INDIVIDUALIZATION: SUMMARY

In summary, from both the regression models and the proportions of parcels on which holders possess rights, it appears that PD and COA influence individualization of land rights. The proportions of tenancies on which parcel holders possess selected rights (tables 5.1 and 5.2)

suggest that rights on customary tenancies become more individualized as PD increases, and that some rights on mailo tenancies become more individualized while others do not. Regression results (tables 5.3 and 5.4) indicate that, when mailo and customary tenancies are analyzed together, increased PD increases parcel holders' likelihood of having rights to sell and pledge their tenancies and decreases their likelihood of having exclusion rights, and that increased COA decreases their rights to plant and cut trees and to bury the dead on their parcels. Regression results for mailo tenants alone indicate similar effects of PD and COA, with the additions that increased PD decreases mailo tenants' likelihood of being able to exclude mailo owners from using the parcel, and that increased COA increases their ability to exclude others from gathering firewood on the tenancy.

The interpretation of these results is difficult. The suggestion that, in most cases, increased COA decreases rights contradicts the hypothesis advanced, and may indicate various authorities' (the mailo owner in the case of mailo tenancies, a local authority for customary tenancies) attempts to limit the expansion of individuals' rights as land use becomes more potentially valuable. That increased PD appears to decrease parcel holders' ability to exclude others from traditionally communal use rights suggests that communities react to increased population pressure by reverting to some joint uses of land. This may be a prudent response under conditions in which average holdings are shrinking. Mailo tenants appear to become less able to exclude mailo owners from their parcels as land values rise. It appears that, as PD increases, mailo owners increasingly claim rights of access to mailo tenancies, suggesting that mailo owners are in a strong position to limit tenants' rights when there is an economic benefit to doing so.

However, the likelihood that a tenant will have the right to sell the parcel increases as PD increases. This is true for both customary and mailo tenants. This is crucial, and strongly supports the hypothesis that land rights become more individualized under conditions of increasing PD. The right to sell is one of the paramount rights in freehold tenure. It is also essential for the emergence of land markets.

5.3 Individualization and Tenure Security

Economic theory suggests that increased individualization of land rights increases tenure security by clarifying claims to land and making land rights more exclusive. In this dissertation, "tenure security" is used to mean that a parcel holder perceives a zero probability of a successful challenge to his continued possession of rights to the parcel through any sort of manipulation or arbitrary use of power or the instruments of the state; "security" and "insecurity" of tenure do not refer to a parcel holder's likelihood of "losing" his parcel through the operations of supply and demand forces, such as are inherent in land market operation. In the previous section, land rights in central Uganda appeared to be highly individualized overall. Therefore, correspondingly high levels of tenure security throughout the region are expected, with PD, COA, and land tenure still hypothesized to influence differences.

Survey respondents were asked whether they were not at all, slightly, moderately, highly, or extremely worried about losing access to each of their permanent-tenure parcels. Holders of 102 of the 610 permanent-tenure parcels in the sample said they felt some degree of insecurity. A five-value security variable could have been constructed for analysis, but there were too few

parcels with each degree of insecurity to permit separate analyses for the different levels of insecurity. The small numbers of observations with some of the degrees of insecurity (see table F.3 in appendix F) created an estimation problem. Therefore, a binary variable (SECURE) was coded zero if the respondent perceived any degree of insecurity on the parcel and one if the respondent perceived his tenure to be completely secure.

Table 5.5 displays the proportions of permanent-tenure parcels in each sub-county on which holders perceive their tenure to be fully secure, and table 5.6 presents the proportions by tenure for each sub-county.

Table 5.5: Weighted proportion of permanent-tenure parcels with no perceived tenure insecurity, by sub-county

	Kibinge (HH)	Busaana (HL)	Kabula. (LL)	Bukuya (LH)
Number of permanent-tenure parcels	203	122	133	152
Prop'n of parcels w/ no insecurity	87.6	88.9	78.0	79.2

In general, holders of most parcels in the sample perceive their tenure to be completely secure. Mailo owners are overwhelmingly secure in their tenure, which is probably because mailo land is essentially freehold tenure. Extremely high proportions of mailo tenancies have perceived security of tenure in Kibinge (HH), Kabulasoke (LL), and Bukuya (LH), sub-counties whose areas are predominantly mailo land, most of which is tenanted. However, in Busaana (HL), where mailo land is scarcer than in the other sub-counties, less than 60% of mailo tenants perceived no tenure insecurity. Not surprisingly, Busaana is the sub-county in which the vast majority of customary tenants perceive their tenure to be fully secure. In the other three sub-counties, respondents are more concerned about retaining access to their customary tenancies, although the number of observations (12) is small.

Table 5.6: Weighted proportion of permanent-tenure parcels with no perceived tenure insecurity; by sub-county and tenure

Sub-county and tenure	# parcels	# w/ full security	% w/ full security
Kibinge - mailo land	69	61	88.9
- mailo tenancy	128	115	88.5
-customary tenancy	6	2	29.4
Busaana - mailo land	25	24	95.4
- mailo tenancy	23	15	56.7
- customary tenancy	74	70	95.3
Kabulasoke - mailo land	40	35	89.1
- mailo tenancy	80	55	76.7
- customary tenancy	13	9	69.2
Bukuya - mailo land	56	48	85.9
- mailo tenancy	88	68	78.7
- customary tenancy	8	4	52.1

Some customary tenants gave detailed reasons for their insecurity. Four of the nine respondents who explained why they feel insecure referred to the distance of the parcel from their homestead, and, of those, two said they have planted banana plantations on the parcels to try to maintain their rights to them. The other five attributed their insecurity to being tenants on "government land" rather than being tenants on mailo land or being "land owners." Three of these five respondents expressed worry about government's ability to repossess the land or evict them at any time.

Perceived tenure security may be associated with ethnicity. Baganda comprise a clear majority of the central region's population, although numerous other ethnicities, drawn by relatively favorable agricultural conditions and employment opportunities, also reside there in increasing numbers. Membership in an ethnic minority may cause an individual to feel concerned about his tenure, especially as increases in PD and COA make access to land more competitive and valuable. Table 5.7 presents proportions of parcels with complete perceived tenure security, by sub-county, tenure, and household ethnicity.

Table 5.7: Weighted proportion of permanent-tenure parcels with no perceived tenure insecurity; by sub-county, tenure, and ethnicity

Sub-county and tenure	# parcels held by:		% parcels w/ no insecurity	
	Non-baganda	Baganda	Non-baganda	Baganda
Kibinge (HH)	25	178	80.4	91.7
Busaana (HL)	83	39	88.9	79.5
Kabulasoke (LL)	35	98	71.8	79.8
Bukuya (LH)	52	100	80.7	85.2
Kib. - owners	2	67	100	88.6
- mailo tenants	23	105	79.9	93.3
- cust. tenants	0	6	--	30.3
Bus. - owners	7	18	100	94.8
- mailo tenants	16	7	56.5	55.2
- cust. tenants	60	14	96.0	93.0
Kab. - owners	3	37	56.7	92.3
- mailo tenants	31	49	71.6	78.4
- cust. tenants	1	12	100	65.1
Buk. - owners	4	52	100	83.3
- mailo tenants	44	44	80.8	86.0
- cust. tenants	4	4	41.4	61.4

As seen in table 5.5, most parcel holders perceive their tenure to be secure. However, ethnicity may indeed affect perceived tenure security. Judging from the figures in the top part of table 5.7, Bagandan land holders perceive their tenure to be secure on a greater proportion of parcels than non-Baganda in Kibinge, Kabulasoke, and Bukuya, while a greater proportion of non-Baganda in Busaana perceive their tenure to be fully secure. This suggests that membership in a local majority (where the distinction in Baganda versus non-Baganda rather than specific non-Bagandan ethnicities) is more important than immigrant status in affecting a land holder's perceived level of tenure security. This same trend applies even when the figures in table 5.7 are disaggregated by tenure as well as by ethnicity, especially if proportions computed from very low numbers of observations are discounted.

To examine the influence of individualization on perceived tenure security while controlling for other factors that may influence security, a logistic model was run regressing the binary SECURE variable on several variables thought to affect security. The hypothesis is that tenure security increases as land rights become more individualized, but that tenure security is a function of personal, parcel, and sub-county characteristics. Therefore, the explanatory variables included in the model were: PD, COA, whether the parcel was acquired through purchase (PBUY), how long the parcel has been held by the respondent (YRSHAD), the

household head's gender (HGENDER) and ethnicity (HHBAG), whether the parcel is a mailo tenancy (PMT), and whether selected rights apply on the parcel. This model was run on the set of sampled customary and mailo tenancies, results are given in table 5.8.

Table 5.8: Parameter estimates (b-hat) and standard errors for logit regression models for mailo and customary tenants' perceived tenure security; dependent variable is SECURE

Exogenous variables	b-hat	std error
Intercept	-1.261	(1.002)
PD	-.003 **	(.422)
COA	-.110	(.364)
PBUY	-.208	(.014)
YRSHAD	-.007	(.589)
HGENDER	1.295 *	(.380)
HHBAG	.445	(.469)
PMT	-.121	(.555)
CUTTREES	-.120	(.494)
PLANTTREES	-1.114 *	(.537)
DIGSALE	-.237	(.591)
BRICKSALE	.967 **	(.540)
GIVE	-.361	(.514)
RENT	-.325	(.544)
SELL	.680	(.435)
PLEDGE	-.721 **	(.378)
OTHNOPATH	.780 *	(.542)
OTHNOWATER	-.418	(.544)

Not many of the explanatory variables in the model are statistically significant in affecting whether the holder of a customary or mailo tenancy perceives his tenure to be secure. Higher PD decreases perceived tenure security, probably because of the increased competition for land under greater population pressure. Male-headed households tend to perceive themselves to be more secure in their tenure, probably due to the traditionally greater access to land they have enjoyed relative to females. *Ceteris paribus*, "individualization" does influence perceived tenure security in the sense that the coefficients estimated for four of the rights included in the model are statistically significant. Interpretation of the results is difficult, however, since the coefficients on PLANTTREES and PLEDGE are negative while those on BRICKSALE and OTHNOPATH are positive.

All in all, the results do not lend much support to the hypothesis that greater individualization of land rights conveys greater tenure security to landholders. This could be because neo-classical theory applied by some economists does not hold in a rural African setting such as central Uganda or because the empirical model failed to assess the relationships it was designed to capture. First, it is possible that, in areas where traditional rights systems have often awarded land rights to the group ahead of the individual and in which individuals have always been virtually guaranteed at least use rights in some land, the process of individualization represents a threatening breakdown of the traditional system in the minds of individuals who then perceive themselves as more vulnerable to losing access to land under the evolved system. Second, the measurement of perceived tenure security through a binary variable is admittedly weak. Measurement of individuals' perception about their probability of retaining specific use, transfer, and exclusion rights or use of a multi-valued measure of tenure security rather than a binary definition may have been a sounder approach.

5.4 PD, COA, AND LAND MARKETS

Economic theory argues that more active land markets will be found in areas with greater PD or COA. Shipton (1987) theorizes that this relationship may hold only until population pressure on land reaches extreme levels. If PD (or COA) and market activity data (e.g., the percent of parcels transferred through the land market per time period) were available for all locales in Uganda's central region or for a single locale continuously over time, the data could be charted to generate a curve depicting variation in land market activity with respect to PD (or COA). The slope of the curve should be positive but decreasing as PD (or COA) increases, and may downturn beyond some high level of PD.

Neither comprehensive data about PD, COA, and land market activity for all localities in Uganda's central region nor time series data for a single locality with which to examine the relationship between socio-economic conditions and land markets was available. Instead, four sub-counties with different characteristics of PD and COA were chosen to represent four different points on the theorized curve, and information about land market participation was collected from a sample of households in each sub-county.

Based on theory, certain predictions can be made as to how land market activity should vary across the four sub-counties. First, the ranking of the sub-counties based on their levels of land market activity might correspond to their PD ranking since increased PD is hypothesized to increase land markets. Thus, it could be that the most land market activity would be observed in Kibinge (HH), followed by Busaana (HL), Kabulasoke (LL), and Bukuya (LH), in that order. Second, since Kibinge's PD far exceeds Shipton's proposed threshold of 200 people per square kilometer, it might be that market activity there is lower than in some or all of the other sub-counties. This might also be true in Busaana where PD is also greater than Shipton's proposed threshold.

Third, within a level of "high" or "low" PD, the sub-county with higher COA is expected to have more active land markets than that with lower COA. By this reasoning, land market activity in Kibinge (HH) should be greater than in Busaana (HL), and greater in Bukuya (LH) than in Kabulasoke (LL). Alternatively, it could be that within a level of COA, the sub-county with the higher PD will have more land market activity than the sub-county with lower PD.

Thus, an alternative expectation is that land markets may be more active in Kibinge (HH) than in Bukuya (LH), and in Busaana (HL) than in Kabulasoke (LL).

5.4.1 LAND MARKETS: MEASURES OF LAND MARKET ACTIVITY

Using the information gathered in the survey, several measures of land market activity are possible, including: (1) the proportion of households who have purchased some land; (2) the proportion of parcels acquired through the land market; and, (3) the proportion of its holdings each household acquired through purchase, in terms of *acres*.

All three measures are based on cross-sectional data and share the limitation that they consider only households' current holdings. It is possible that a household may previously have held land which it purchased. Another limitation is that the data collected register market activity through purchases only and not through total sales in the area. If it was known that all market transactions involved only local buyers and sellers, then the number of purchases would in fact measure the total number of market transactions. However, if sales to non-resident buyers occur, then counting only purchases by (local) respondents would underestimate the total number of market transfers. In central Uganda, purchases by local buyers probably closely approximate the total number of transfers because it is not very common for a buyer to purchase land located very far from his homestead. Despite their potential weaknesses, the proposed measures are probably reasonable indicators of market activity.

The measures of land market activity are:

1. Whether a household has purchased land (HHBUY): A binary variable coded one if a household purchased any of its current land holdings and zero if it did not. The sub-county average of HHBUY estimates the proportion of households in the sub-county who have participated in the land market. Under this measure, land market participation by households who have purchased only one parcel is considered equivalent to participation by households who have purchased more than one parcel.

2. Whether a parcel was acquired through purchase (PBUY): A binary variable coded one if the parcel was purchased and zero if it was not. The sub-county mean of PBUY estimates the proportion of parcels which were acquired through the land market. Since households may hold more than one parcel, a given household may be represented more than once with this measure, and PBUY could equal one for some of that household's parcels and zero for others.

3. The proportion of its acres the household purchased (%ACBUY): A continuous variable valued at the percent of its current acres the household purchased. The sub-county mean of %ACBUY gives another estimate of market participation by households in the sub-county.

These three measures will be analyzed and the analyses will be compared to see if they return consistent or contradictory results.

5.4.2 LAND MARKETS: MARKET ACTIVITY RESULTS

Clearly, numerous factors in addition to PD and COA may influence land market participation. These include tenure (PMT, PCT), parcel size (PSIZE), holdings size (HHACRES), and household ethnicity (HHBAG), income (HHINCOME), education (HEADEDU), lifecycle stage of the household (HEADAGE), and gender (HGENDER) of the household head. To assess the effects of PD and COA on land market activity while controlling for variation in these additional factors, the market activity measures were regressed on all of these variables. The influence of these other factors is of interest in hypotheses that will be evaluated in later sections of this chapter. In this section, only the results relating to the effects of PD and COA on rural land markets will be discussed. Logistic regression was used for models with binary measures of land market activity (PBUY and HHBUY), while linear OLS regression was used for the model with the continuous measure (%ACBUY).

Regression results for the PBUY, HHBUY, and %ACBUY models are presented in tables 5.9, 5.10, and 5.11, respectively. Minor specification changes of the models in tables 5.9 through 5.11, such as the substitution of the number of acres inherited by the household for the percent of holdings inherited (%ACINHER), do not cause changes in the magnitude, the sign, or the statistical significance of any of the estimated coefficients. Nor does the magnitude, sign, or statistical significance of any of the estimated coefficients change substantially when the models are run by sub-county (with PD, PD^2, and COA dropped) instead of for all the sub-counties together.

Table 5.9: Logistic regression results for PBUY model; permanent-tenure parcels only

Explanatory variables	b-hat	se
Intercept	.729	1.447
PD	.037 *	.017
PD^2	-.0001 *	.00004
COA	1.957 *	.591
YRSHAD	.034 *	.009
PMT	-.332	.285
PCT	-1.353 *	.371
PSIZE	.011	.013
HHAGINC (x 1,000)	.003 **	.002
HHNONAGINC (x 1,000)	.0003	.001
HHPARCELS	-.323 *	.093
HEADAGE	-.044 *	.008
HGENDER	-.799 *	.310
HEADEDU	-.001	.039
HHBAG	.281	.256

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Intercept	.729	1.447
PD	.037 *	.017
PD^2	-.0001 *	.00004
COA	1.957 *	.591
YRSHAD	.034 *	.009
PMT	-.332	.285
PCT	-1.353 *	.371
PSIZE	.011	.013
HHAGINC (x 1,000)	.003 **	.002
HHNONAGINC (x 1,000)	.0003	.001
HHPARCELS	-.323 *	.093
HEADAGE	-.044 *	.008
HGENDER	-.799 *	.310
HEADEDU	-.001	.039
HHBAG	.281	.256

Table 5.10: Logistic regression results for HHBUY model run on (1) all households in the dataset and (2) households in strata 1-4 only

HHBUY models	All HH's		Stratum 1-4 HH's	
Explanatory variables	b-hat	se	b-hat	se
Intercept	1.483	1.499	-.725	1.870
PD	.027 **	.017	.024	.021
PD^2	-.00007 *	.00004	-.00007	.00005
COA	1.557 *	.666	1.624 *	.802
HHACRES	-.010 *	.004	-.013 *	.004
%ACINHER	.024 *	.004	.040 *	.005
HHAGINC (x 1,000)	-.003	.002	-.0003	.002
HHNONAGINC (x 1,000)	-.002	.002	-.003	.002
HEADAGE	-.035 *	.007	-.007	.009
HGENDER	-.930 *	.347	-1.134 *	.406
HEADEDU	-.120 *	.044	-.081	.054
HHBAG	.055	.291	-.278	.351

Table 5.11: OLS regression results for %ACBUY model run on (1) all households in the dataset and (2) households in strata 1-4 only

%ABUY models	All HH's		Stratum 1-4 HH's	
Explanatory variables	b-hat	se	b-hat	se
Intercept	10.821	17.266	39.692 *	19.348
PD	-.228	.197	-.156	.217
PD^2	.0006	.0005	.0005	.0005
COA	-16.695 *	7.292	-16.650 *	7.988
%ACINHER	-.289 *	.034	-.499 *	.038
HHACRES	.004	.053	.027	.053
HHAGINC (x 1,000)	.007	.024	-.027	.024
HHNONAGINC (x 1,000)	.016	.021	.017	.021
HEADAGE	.520 *	.083	.221 *	.096
HGENDER	10.435 *	3.713	11.127 *	4.127
HEADEDU	1.039 *	.522	.386	.585
HHBAG	.603	3.289	4.832	3.634

The results for the PBUY and HHBUY models (tables 5.9 and 5.10) are similar. In these two models, the coefficients on PD, PD^2, and COA are statistically significant and are, respectively, positive, negative, and positive. This suggests two things about the effects of PD and COA on land market activity. First, the positive coefficient on COA suggests that, as agricultural marketing opportunities develop in an area, parcels of land are more likely to be acquired through purchase, and households are more likely to participate in the land market. That is, rural land markets develop in response to increased opportunities to market farm output, probably as individuals seek to expand their area of cultivation in order to benefit from the increased opportunities. This idea will be reinforced by results in section 5.10 which suggest that: a) households who have purchased land have higher incomes and larger land areas, and b) households with higher agricultural incomes have larger land holdings.

Second, the signs of the estimated coefficients on PD and PD^2 support the theorized concave curve for land market activity with respect to PD. The positive coefficient estimated for PD implies that land market activity increases as PD increases, while the negative coefficient on PD^2 implies that it does so at a decreasing rate as PD increases. It could well be that the land market declines significantly or even shuts down all together when PD reaches some extreme level.

The reason for such a decline in land markets cannot be discerned from the data collected in this survey. It could be that under conditions of extreme PD the value of land to its current holders is so high that their reservation prices for selling are greater than any buyer's willingness-to-pay such that no sales occur. Alternatively, it could be that extreme population pressure in an African setting prompts a reassertion of traditional prohibitions on land sales so that no transactions occur because they are no longer permitted. Respondents in the

preliminary rapid appraisal suggested that clan elders in some parts of Kibinge (HH) had recently disallowed land sales, particularly to non-clan members. A third possibility is a combination of these two explanations. It is not possible in this study to determine the underlying explanation for a decline in land market activity. Nevertheless, the regression results presented in tables 5.9 and 5.10 clearly support the notion that such a decline occurs.

In an area with a developed non-agricultural sector, a downturn in land market activity might not be observed, even under extreme population pressure. Traditional prohibitions on land sales prevented landlessness and guaranteed a minimum amount of income for group members. A resurfacing of such prohibitions may represent an attempt by group authorities to guard against households' becoming landless. High reservation prices of land holders' and the consequent dampening of the land market achieves essentially the same thing. However, in an area where a sufficiently developed non-agricultural sector exists to absorb landless individuals and guarantee them at least subsistence earnings, then holders' reservation prices might not reach such high levels and there might not be a perceived need to bar sales. As a result, land market activity may remain stable rather than declining.

The results for the %ACBUY model (table 5.11) challenge those for the PBUY and HHBUY models. The signs on the PD, PD^2, and COA variables in the %ACBUY model are the opposites of those in the PBUY and HHBUY models. While the coefficients estimated for PD and PD^2 do not test significantly different from zero, those on COA do, and their negativity suggests that land market activity, as measured by %ACBUY, decreases as agricultural markets broaden.

This conclusion is suspect, however, and there are two possible explanations for its contradiction of the PBUY and HHBUY model results. First, perhaps improved agricultural marketing opportunities do prompt an increase in land market participation by households (as suggested by the results for the PBUY and HHBUY models), but as land markets become more developed, participating households acquire a smaller proportion of their land through them (as suggested by the results for the %ACBUY model). Since high PD implies, by definition, more households (especially in this study, in which Kibinge and Busaana have extreme PD's), the land market in high-PD sub-counties could be more active and pervasive, but each household could participate for a smaller percentage of its total holdings. Second, it could be that the binary measure of land market participation (PBUY or HHBUY) is superior to the continuous measure (%ACBUY).

Table 5.12 presents the average values of the different measures of land market activity for each of the sub-counties.

Table 5.12: Weighted averages of land market activity measures, by sub-county

Measure of land market activity	Kibinge (HH)	Busaana (HL)	Kabulasoke (LL)	Bukuya (LH)
Mean of PBUY[21]	28.3	42.7	34.7	20.2
Mean of HHBUY[22]	25.0	46.5	37.2	17.0
Mean of %ACBUY[2]	17.7	37.3	28.0	14.1

The different measures of land market activity shown in table 5.12 return consistent results. Under all three measures, the ranking (from highest to lowest) of sub-counties on their average value of the land market measure is: Busaana (HL), Kabulasoke (LL), Kibinge (HH), Bukuya (LH). This result supports the hypothesis that PD is an important determinant of land market activity and that land market activity declines under conditions of extreme PD.

These results agree with those from the regressions of PBUY and HHBUY on the set of exogenous variables in suggesting that the four sub-counties are in different stages of land market evolution. Busaana (HL) and Kabulasoke (LL), ranked respectively first and second in terms of land market activity, appear to be in the middle of stage two in which market activity is positively correlated with PD. Kibinge (HH), an extremely densely settled area, may be in the third stage of land market activity in which the activity of the land market declines. Bukuya (LH), which has quite low PD for central Uganda, may be in very early stage two along with Busaana and Kabulasoke, in late stage one, or in transition from stage one to stage two. If Kibinge (HH) is assigned to the third stage of land market evolution, then the remaining sub-counties' land market activity ranking corresponds with their PD ranking, illustrating stage two behavior.

Information gathered in the rapid rural appraisal (RRA) that preceded this survey gives some suggestion that, under extreme PD, land markets might not be very active. Respondents at RRA sites in Kibinge (HH) indicated that a land market functioned in their area but estimated that five to 20 parcels had been sold during the previous year, despite the very high number of parcels in Kibinge due to the many households (high PD) there. At sites in Busaana (HL), respondents estimated that 70 to 100 parcels (mostly customary tenancies) had been sold during the past year. Respondents in Kabulasoke (LL) did not estimate the number of land market transactions but said that there were "many incidents of buying and selling." In Bukuya, respondents recalled five to ten land market transfers during the previous year. While they fail to provide precise estimates, RRA respondents' statements do lend support to the relative

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[21] Computed from sampled permanent-tenure parcels.

[22] By definition, households in stratum five, who hold no permanent-tenure land of their own, have not bought any of their current holdings. Therefore, it might make sense to omit them from the computation of the percent of sub-county households who have purchased land. When this figure is calculated for households in only the other four strata, the sub-county ranking does not change.

levels of the land market activity measures presented above and to the regression results for the PBUY and HHBUY models.

5.4.3 LAND MARKETS: THE INFLUENCE OF LAND TENURE

This study also examines the effect of land tenure on rural land markets. Economic theory predicts that, due to the increased clarity, exclusivity, and defensibility of its rights, freehold land is more likely than other tenures to be transferred through a land market. Thus, in central Uganda, mailo land should be bought and sold more commonly than mailo and customary tenancies.

Information gathered in the rapid rural appraisal (RRA) leads to a different expectation. In the RRA, respondents usually stated that most land market transfers were of mailo tenancies. These assertions contradict two historical facts. First, as Mukwaya (1953) and West (1964) document, market transactions of mailo land played a major role (along with inheritance) in subdividing the large blocks of mailo land that were originally allocated. The land market was particularly important at the time mailo land was transferred from one generation to the next, as heirs often sold part of the land they inherited to raise capital to finance other ventures such as petty trade, transportation, or education. Second, under the 1928 Busulu and Envujjo Law, mailo tenants were explicitly denied the right to sell their tenancy to new tenants, although for at least five decades sales of mailo tenancies have in fact occurred (typically only with the mailo owner's consent). Nevertheless, RRA respondents maintain that most land market activity is in mailo tenancies.

Respondents in the RRA said that the lesser market in mailo land is due to the relative scarcity of non-tenanted mailo land. District land officers throughout the central region estimated that at least 80% of mailo land is occupied by tenants, who are an encumbrance on the land. Despite the de jure weakening of tenants' position under the 1975 Land Reform Decree, tenants and owners alike perceive tenants' occupancy to be permanent and highly secure. Furthermore, tenants no longer pay any form of rent.[23] Tenanted mailo land no longer has any use or income-earning potential for its owner. Therefore, there is little or no market demand for it. Compounding this may be another trend. It is widely recognized that non-tenanted mailo land is of great value. Responses in RRA interviews as well as informal comments by survey respondents indicated that current owners of tenant-free mailo land are inclined to retain it, a desire which may further dampen the mailo land market.

Thus, there are two competing expectations. The first is that the greatest market will be in mailo land because it offers the clearest and most individualized rights. The second is that most market activity will be transfers of tenancies because there are so many more mailo tenancies than mailo land or customary parcels in Uganda's central region and because most mailo land is encumbered by tenants.

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[23] Tenants ceased their traditional busulu payments following the passage of the Land Reform Decree in 1975. However, there appears to be a resurgence of busulu payments by both mailo and customary tenants in Kabulasoke (LL), where 31 of 81 mailo tenants paid an average 950 Ushs. and eight of 13 customary tenants paid an average 1,438 Ushs in 1991.

The results in table 5.9 for the logistic regression of PBUY on the explanatory variables suggests that tenure is indeed an important determinant of land market activity. The coefficients estimated for the dummy variables indicating whether a parcel is a mailo tenancy (PMT) or a customary tenancy (PCT) are both negative. Since the omitted tenure category is mailo ownership, this implies that mailo and customary tenancies are both less likely than mailo land parcels to be purchased. However, because the coefficient on the mailo tenancy dummy is not statistically significant, it is only possible to conclude that there is greater market activity in mailo land than in customary tenancies, a result which supports the theory that mailo land will be transacted more commonly because of the freehold nature of its bundle of rights.

Table 5.13 presents the numbers and proportions of parcels which were purchased by their current holder, by tenure for each sub-county.

Table 5.13: Number and weighted proportion of permanent-tenure parcels which were purchased by their current holder, by sub-county and tenure

Sub-county and tenure	Total parcels	# Purchased	% Purchased
Kibinge - mailo land	69	11	18.5
- mailo tenancy	128	36	25.3
- customary tenancy	6	4	58.8
Busaana - mailo land	25	2	9.3
- mailo tenancy	23	5	22.8
- customary tenancy	74	37	54.8
Kabulasoke - mailo land	40	10	26.9
- mailo tenancy	80	32	39.2
- customary tenancy	13	2	15.4
Bukuya - mailo land	56	10	18.7
- mailo tenancy	88	17	16.8
- customary tenancy	8	1	13.0

It is difficult to draw conclusions from the figures in table 5.13. There is no clear ranking of the tenures on the basis of either the number or proportion of each which was acquired through purchase. For example, in Kibinge and Busaana, a greater proportion of customary parcels than mailo parcels or mailo tenancies was purchased, while in Kabulasoke and Bukuya, a lower proportion of customary tenancies than the other two tenures was purchased. However, in Kibinge only four customary tenancies were purchased as opposed to 11 and 36 for mailo land and mailo tenancies, respectively. Looking at the overall frequencies with which parcels in the sample were purchased likewise fails to present a clear result. Without weighting to reflect the sample design, mailo land parcels comprise 31% (190 of 610) of the permanent-tenure parcels sampled, mailo tenancies comprise 52% (319 of 610), and customary tenancies comprise 17% (101 of 610). However, mailo parcels account for only 20% of purchased parcels (33 of 167),

while mailo and customary tenancies account for 54% (90 of 167) and 26% (44 of 167), respectively. Thus, from this approach, it appears that: (a) based solely on frequencies, mailo tenancies are by far the most commonly market-transacted properties; and, (b) based on the percent of the sample they comprise relative to the percent of purchased parcels they account for, customary tenancies are more commonly sold and mailo land parcels are least commonly sold.

However, there are numerous factors in addition to tenure which influence whether a parcel will be purchased. These include both parcel characteristics, such as parcel size and how long ago the parcel was acquired, and household characteristics, such as income and education. The lack of clear patterns in table 5.13 and the awareness of additional factors which determine the way an individual acquires land suggest that the regression results shed more light on the importance of tenure on land market activity.

5.4.4 LAND MARKETS: SUMMARY

There are two main results about land markets, PD, COA, and tenure. First, the results support the hypothesis that land market activity increases with PD and COA, and that activity decreases when PD reaches some extremely high level. The re-curve effect is attributed to the absence of a well-developed non-agricultural sector of the economy that could absorb landless laborers.

Second, regression results suggest that, of the tenures in central Uganda, mailo land is most likely to be purchased, although the coefficient estimated for mailo tenancy tenure (PMT) is not statistically significant. Judging just from the incidence of occurrence, mailo tenancy appears to be the most market transacted tenure form. Of the 167 purchased parcels in the sample, 90 of them are mailo tenancies. However, this finding may simply be a result of the prevalence of mailo tenancy in central Uganda and fails to account for other factors that influence purchase.

5.5 LAND MARKETS AND PERCEIVED TENURE SECURITY

Several considerations contribute to the theory that individuals' tenure security will be greater in the presence of more active land markets. First, land markets emerge when land rights become sufficiently individualized to facilitate their operation. Since individualized rights offer greater tenure security to individual holders, the presence of land markets and increased tenure security should be positively correlated. Second, a bundle of rights which includes the right to sell might also include increased exclusion rights. Therefore in an area with an active land market, where a significant proportion of parcels is transferred through the market, the holders of a greater proportion of parcels have the ability to exclude others from the parcel and, therefore, may be reasonably assured of their ability to continue to claim rights to the parcel. Third, there could be a carry-over effect from purchased parcels whose holders feel very secure in their tenure relative to holders of non-purchased parcels. That is, the presence of functioning land markets may increase the prevailing level of tenure security for buyers and non-buyers alike.

If increased land market activity raises individuals' tenure security, then parcel holders in sub-counties with more active land markets (Busaana and Kabulasoke) should feel more secure in

their tenure than individuals in sub-counties with less land market activity (Kibinge and Bukuya). The figures contained in table 5.5 (section 5.3) show, foremost, that the holders of over three-quarters of permanent-tenure parcels in all four sub-counties perceive no tenure insecurity on their parcels. However, the figures in table 5.5 do not clearly suggest any relationship between tenure security and land market activity at the sub-county level.

Another way to examine whether the land market increases land tenure security could be to look at the proportion of purchased versus non-purchased parcels on which respondents said they feel secure. These proportions are given in table 5.14.

Table 5.14: Weighted proportion of permanent-tenure parcels with no perceived tenure insecurity, by sub-county, tenure, and whether the parcel was acquired through purchase

Sub-county & tenure	Non-purchased parcels		Purchased parcels	
	Number	% w/ security	Number	% w/ security
Kibinge (HH)	152	85.8	51	92.8
Busaana (HL)	78	83.6	44	95.0
Kabulasoke (LL)	89	73.9	44	75.0
Bukuya (LH)	124	79.9	28	75.6
Kibinge - mailo land	58	87.8	11	93.7
- mailo tenancy	92	85.9	36	96.3
- customary tenancy	2	50.0	4	15.0
Busaana - mailo land	23	94.9	2	100.0
- mailo tenancy	18	47.8	5	86.9
- customary tenancy	37	94.8	37	95.7
Kabulasoke - mailo land	30	88.2	10	91.6
- mailo tenancy	48	71.9	32	73.2
- customary tenancy	11	63.6	2	100.0
Bukuya - mailo land	46	82.7	10	100.0
- mailo tenancy	71	80.4	17	70.5
- customary tenancy	7	44.9	1	100.0

The figures in table 5.14 reinforce the idea that tenure security is high in general, but do suggest that respondents are more apt to perceive their tenure to be secure on parcels they acquire through purchase than on parcels they acquire through other means. In Kibinge, Busaana, and Kabulasoke, respondents feel secure on a greater proportion of purchased parcels than non-purchased parcels. This is also true in ten out of 12 cases when parcels are disaggregated by tenure. Thus, the sub-county/tenure averages support the hypothesis that land markets are associated with increased tenure security.

However, the regression results for tenure security (table 5.8, section 5.3) suggest that purchase does not have a statistically significant effect on security (the coefficient estimated for PMT is not statistically significant). Since regression controls for the effects of other factors which might also affect tenure security, the conclusion must be that the proportions in table 5.14 do not present as clear-cut a relationship as might appear. There are two possible explanations for this. On one hand, other characteristics of purchased parcels or their holders, such as income or wealth position, might lead buyers to feel more secure than holders of non-purchased parcels. These other effects, which are controlled for in the regression analysis of tenure security, make it appear that the tenure of purchased parcels is more secure because they were purchased when in fact the increased security comes from parcel or buyer characteristics which are correlated with the parcel's having been purchased. On the other hand, the binary measure of tenure security used in the regression analyses may not be a good measure. Respondents could quite possibly feel secure about retaining some rights over their parcels and insecure about retaining others, a situation not captured in the approach taken in this survey.

The conclusion here is that land market activity in central Uganda does not have much impact on parcel holders' perceived tenure security. This may be primarily because there is such a high prevailing level of tenure security overall.

5.6 LAND MARKETS AND FRAGMENTATION OF LAND HOLDINGS

In this study, "fragmentation" refers to the number of discontiguous parcels held by a household. The more discontiguous parcels a household controls, the more fragmented its holdings. Fragmentation is not necessarily bad, as it is often an effective way of spreading agricultural risk, by using parcels in different ecological niches. However, extreme fragmentation can have negative effects on agriculture. If a household's parcels are extremely distant from each other, the travel cost associated with cultivating those farthest from the homestead may be sufficiently high to induce the household to leave them idle, leading to decreased agricultural output. Economic theory predicts that the presence of a land market will contribute to increased fragmentation of households' land holdings.

Table 5.15 shows the average number of parcels which households hold and the average size of parcels in the sample, by sub-county.

Table 5.15: Weighted average number of parcels per household and weighted average size of parcels, by sub-county

	Kibinge (HH)	Busaana (HL)	Kabula. (LL)	Bukuya (LH)
Parcels/HH	1.9	1.7	1.9	1.6
Perm.-tenure parcels/HH	1.6	1.1	1.3	1.3
Acres/parcel (all parcels)	3.1	2.4	3.3	7.8
Acres/parcel (perm.-tenures)	2.8	2.0	4.1	6.9

According to the figures in table 5.15, fragmentation does not vary in direct relation to PD, COA, or level of land market activity, as the average number of parcels per household is fairly similar across the four sub-counties. This is most evidenced by Kibinge's (HH) having the most parcels per household but among the least active land markets. However, even though land markets are not currently very active in Kibinge, they must have been when Kibinge's land market was in stage two. Thus, the "snapshot" of many parcels per household captured by this cross-sectional analysis may reflect the effect of past land market activity.

The results of OLS regressions of households' number of land parcels on a set of sub-county and household characteristics are shown in table 5.16. In the first model in the table, the dependent variable is the total number of parcels a household holds (HHTOTPARCELS), including parcels it borrows and rents. The dependent variable in the second model is the number of permanent-tenure parcels a household possesses (HHPERMPARCELS).

Table 5.16: OLS regression results for HHTOTPARCELS (model 1) and HHPERMPARCELS (model 2)

Exogenous variables	Model 1		Model 2	
	b-hat	se	b-hat	se
Intercept	1.572 *	.184	.055	.181
PD	.0004	.0003	.0003	.0003
COA	.063	.083	.254 *	.082
HHACRES	.007 *	.002	.007	.002
HHAGINC (x 1,000)	.003 *	.001	.004 *	.001
HHNONAGINC (x 1,000)	.002 *	.001	.001 *	.001
HHBUY	.766 *	.095	.980 *	.094
HGENDER	-.071	.107	.019	.105
HHBAG	.021	.089	.235 *	.088
HEADAGE	-.007 *	.002	.004	.002
HEADEDU	.013	.015	.037 *	.015

Results for the regressions are very similar, especially with respect to the effects of land market participation on fragmentation. The results indicate that participation in the land market is highly influential in explaining the total number of parcels and the number of permanent-tenure parcels a household has. In addition, the second model, in which the household's number of permanent-tenure parcels is the dependent variable, the coefficient estimated for COA is statistically significant and positive, suggesting that households respond to increased commercial opportunities in agriculture by adding to their permanent land holdings (a result which will be reinforced in section 5.10). Together, these results suggest that when agricultural marketing opportunities increase, households turn to the land market to add to their holdings in order to expand their area of cultivation. Virtually by definition, this behavior increases the fragmentation of households' holdings due to the low probability that parcels available for sale will be contiguous with parcels the household already holds.

5.7 Land Markets and Subdivision of Land Parcels

"Subdivision" is the dividing of a parcel into more than one smaller parts at the time of its transfer to a new holder. The smaller parcels are, the more subdivided they are said to be. Subdivision can occur if only part of the original parcel is transferred, or if different parts of the parcel are transferred to different recipients. Subdivision can be beneficial in that it may make access to land possible to a greater number of individuals. Extreme subdivision, however, can affect households negatively. Extreme subdivision may mean that parcels, on average, are not of sufficient size to support a household which relies on agriculture for subsistence. Application of economic theory leads to the hypothesis that land market activity will contribute to increased subdivision.

Comparing the average acres per parcel figures for Kibinge (HH) and Busaana (HL) in table 5.15 suggests that land market activity may have some correlation with greater subdivision of parcels. Average parcel size in Busaana is less than that in Kibinge, even though Kibinge is by far the more densely populated of the two sub-counties. It is Busaana which appears to have more land market activity (section 5.4). Average parcel size is smaller in Kabulasoke (LL) than in Bukuya (LH), but it is difficult to know whether that results from Kabulasoke's denser population or more active land market.

Another indication of whether the land market increases subdivision of parcels may be given by looking at variation in average parcel size for parcels acquired through purchase versus parcels acquired through some other means. These calculations are given in table 5.17.

Table 5.17: Number and weighted average size of permanent-tenure parcels; by sub-county, tenure and whether the parcel was purchased

Sub-county and tenure	Average parcel size (acres)			
	Not purchased		Purchased	
	#	Ave. size	#	Ave. size
Kibinge (HH)	152	3.4	51	2.2
Busaana (HL)	78	3.0	44	1.8
Kabulasoke (LL)	89	3.7	44	2.7
Bukuya (LH)	124	7.9	28	7.0
Kibinge - mailo land	58	10.3	11	4.5
- mailo tenancy	92	2.3	36	1.9
- customary tenancy	2	6.5	4	5.5
Busaana - mailo land	23	9.4	2	13.0
- mailo tenancy	18	1.7	5	1.2
- customary tenancy	37	2.4	37	1.7
Kabulasoke - mailo land	30	10.2	10	9.4
- mailo tenancy	48	2.7	32	2.1
- customary tenancy	11	1.3	2	0.8
Bukuya - mailo land	46	35.2	10	15.9
- mailo tenancy	71	3.5	17	5.4
- customary tenancy	7	6.2	1	2.0

The figures in table 5.17 suggest a striking effect: that parcels acquired through the land market are, on average, smaller than those acquired through other channels. This is true in all four sub-counties when all three permanent tenures are evaluated together (top part of table 5.17), and also true in all but two cases when the three tenures are evaluated separately (lower

part of table 5.17). In some instances, the difference in average size between parcels acquired through the market and parcels acquired in other ways is small, but in some it is quite pronounced.

This seeming role of the land market in transferring smaller parcels than other mechanisms may be tied to households' propensity to sell small sections of their holdings when they experience an immediate need for cash. Households experiencing a cash-shortage may sell the minimum area of land necessary to raise the required funds. Responses given in the RRA support this idea. At most sites, RRA respondents said that the main reason for someone to sell part of his holding is an immediate need for cash, such as for children's school fees or hospital fees. Of course there are other reasons, such as a desire to relocate to another geographic location, for which households might sell their full holding.

Table 5.18 shows regression results for models in which the dependent variable is parcel size in acres (PSIZE). The specifications differ only in terms of the explanatory variables included to control for how long ago each parcel was acquired by its current holder. The first specification contains binary variables for the decade of acquisition (acquisition during the 1990's is the omitted category) (P19_'s), while the second uses a single continuous variable equal to the number of years the current holder has held the parcel (YRSHAD).

Table 5.18: OLS regression results for models of PSIZE; permanent-tenure parcels only

Exogenous variables	Specification 1		Specification 2	
	b-hat	se	b-hat	se
Intercept	12.109 *	4.546	12.080 *	4.050
PD	-.032 *	.006	-.034 *	.006
COA	5.250 *	1.793	5.422 *	1.793
YRSHAD	--	--	.131	.068
P1920'S	5.469	19.004	--	--
P1930'S	-.536	6.171	--	--
P1940'S	12.625 *	4.592	--	--
P1950'S	2.699	3.915	--	--
P1960'S	5.341	3.644	--	--
P1970'S	.297	3.302	--	--
P1980'S	2.071	3.003	--	--
PBUY	-2.002	1.829	-1.597	1.835
PMT	-12.100 *	1.905	-11.901 *	1.911
PCT	-8.663 *	2.712	-8.212 *	2.716
HGENDER	-.225	2.128	-.242	2.130
HEADAGE	.039	.057	.027	.058
HHBAG	-1.491	1.880	-.909	1.880
HHAGINC (x 1,000)	.048 *	.010	.046 *	.010
HHNONAGINC (x 1,000)	-.004	1.611	-.003	.010

The coefficients estimated for the variables indicating how long a parcel has been held by its current owner show that over time, as would be expected, parcel size has tended to decrease, all else equal. This makes perfect sense in light of increasing populations on a fixed land area across the central region. However, only parcels acquired during the 1940's were (statistically) significantly larger than those being acquired during the 1990's. The positive coefficient estimated for the number of years the parcel has been held (YRSHAD) in the second specification suggests the same conclusion--the longer a parcel has been held, the bigger it is--although it is not statistically significant.

The main coefficient of interest to the hypothesis that land markets increase subdivision of parcels is that estimated for whether the parcel was purchased (PBUY). This coefficient is not statistically significant in either of the specifications shown in table 5.18, which suggests acceptance of the null hypothesis that land markets do not influence subdivision in central Uganda. Thus, while the figures in table 5.17 seem to suggest that purchased parcels are more subdivided than non-purchased parcels, this idea does not hold up when other factors that may

also affect parcel size are controlled for. It may be that non-market transfers, such as inheritance, reduce parcel size just as much as land sales. Without knowing the minimum area of land an average-sized household in Uganda's central region requires to sustain itself and the total number of parcels held by a particular household, it is not possible to determine whether parcels in central Uganda are "excessively" subdivided.

5.8 LAND MARKETS AND CONCENTRATION OF LAND OWNERSHIP

Land markets are hypothesized to increase concentration of land ownership, an effect that is viewed almost universally as highly undesirable because it makes the distribution of land less equitable. If land markets do contribute to more concentrated land ownership, then they can be said to reduce access to land for at least some individuals. In a rural area in which virtually all households rely on agriculture to support themselves, the need for all households to have access to a reasonable area of land for farming is implicit.

One measure of distributional inequality is the Gini coefficient, the graphical counterpart of which, for evaluating income distribution, is the Lorenz curve. When the variable of interest, household land holdings in this case, is sorted from lowest to highest, the Gini coefficient can be calculated as:

$$G = 1 + (1/H) - (2/H^2 a_{ave})[a_1 + 2a_2 + \ldots + Ha_H],$$

where "H" is the population size and "a" is household land holdings (in acres) ordered so that $a_1 >= a_2 >= a_3 \ldots >= a_H$ (Boadway and Bruce 1984). The Gini coefficient calculated by this formula measures the area between the 45-degree diagonal and the Lorenz curve, and should be bounded by zero and asymptotically one.

In this analysis, higher Gini coefficients mean more concentrated land holdings. Since Busaana (HL) appears to have the most active land market and Bukuya (LH) the least active, Busaana might be expected to have the highest Gini coefficient and Bukuya the lowest. In fact, as the figures in table 5.19 show, the reverse is true.

Table 5.19: Weighted[24] and unweighted Gini coefficients, by sub-county; rankings are from highest (1) to lowest (4)

	Kibinge (HH)	Busaana (HL)	Kabulasoke (LL)	Bukuya (LH)
Weighted Gini	1.004	1.003	1.005	1.006
Ranking	3	4	2	1
Unweighted Gini	.697	.581	.657	.748
Ranking	2	4	3	1

Busaana, the sub-county with the most land market activity, has the lowest Gini coefficient, signifying the least concentrated (or most equitably distributed) land holdings of the four sub-counties. Bukuya, with the least active land market, has among the highest Gini coefficients.

This result suggests that, contrary to the hypothesis, land holdings in central Uganda may be more evenly distributed in the presence of more active land markets. As has been cited, the land tenure history of the central region indicates that the land market played a substantial role not only in breaking up the original mailo estates but also in permitting access to mailo land by individuals not related to the original (elite) allottees. However, the Gini coefficients in all four sub-counties are fairly large, indicating that land in all four is far from perfectly evenly distributed.

5.9 LAND MARKETS AND LANDLESSNESS

A further hypothesis is that land markets lead to increased landlessness. In this study, with its focus on the effects of land markets on access to land, there is an interest not just in landlessness but in landlessness resulting from land market activity. If landlessness is defined as having access to no land whatsoever (not even a plot on which to erect a house), then no "landlessness" was encountered in the sites in this survey. This is by construction. All members of the communities surveyed belonged to a household, and, by definition, all households have access to at least enough land on which to reside, even if that land does not belong to them. It is possible that the research design could have missed an entire class of people who have departed from the areas to live, for example in Kampala, because they could not get access to any land at all in the village.

Alternatively, households who reside in the village but who hold no permanent-tenure land parcels could be deemed landless. In fact, 107 such households were sampled in the survey.

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[24] Calculation of the Gini coefficient is based in part on average landholdings. The sample design for this research requires a weighted computation of sample statistics. The "weighted" Gini coefficients in the table are calculated using weighted average landholdings for a_{ave} in the formula. However, since the weighted Gini coefficients exceed one when, by definition, they should fall between zero and one, "unweighted" Gini coefficients were also computed using the simple average of land holdings for a_{ave}.

The data about these households can be examined for signs of land market-derived "landlessness."

The 107 landless households in the sample (comprising the fifth stratum in the sample design described in chapter four) are of four main types. The first ("type A") are sons or daughters whose households are independent from their parents' but reside and, in some cases, cultivate on part of their parents' (usually their father's) land. The second ("type B") are similar to type A, but rather than being offspring, they are relatives on (part of) another relative's parcel. The third ("type C") are caretakers and/or laborers on someone else's parcel. If they are caretakers, then the holder of the parcel is absent and feels it necessary to have an occupant on the parcel in order to assure his continued access to the parcel and, sometimes, to protect or maintain perennial crops on the parcel. Caretakers may also be laborers. Type C households who are only hired laborers and have no caretaking responsibilities generally reside in a small (often sub-standard) house on the parcel but only occasionally cultivate their own separate crops. Their job is to work on crops that belong to the parcel holder. A fourth category ("type D") are households whose only access to land comes from formal rental or borrowing arrangements which are independent of any familial ties.

Type A households are distinct from type B households because the two types' likelihood of inheriting part of the parcel on which they reside may differ substantially. Type D households differ from types A and B in that their access to the land they occupy and use is independent of family relationships. Type C households are distinct from types A, B, and D in that they provide a service, whether or not they are paid, in return for their access to land.

Because of the small number of observations in this landless subset of the sample, a weighting scheme is not used to calculate descriptive statistics. Therefore, figures presented in tables in this section do not provide unbiased sub-county estimates, but may still reflect relative relationships and trends in the data. Table 5.20 shows the frequency of the 105 sampled "landless" households who were interviewed, by sub-county and type of household, and selected sub-county-level descriptive sample statistics for them. Two sampled landless households were unable to be interviewed and were not replaced in the sample.

Table 5.20: Frequencies and selected sub-county descriptive statistics of sampled landless households; by sub-county; unweighted computations

Frequencies and unweighted Descriptive statistics	Kibinge (HH)	Busaana (HL)	Kabulasoke (LL)	Bukuya (LH)
Number of landless households	21	33	24	29
Type A households	6	19	9	5
Type B households	2	1	6	10
Type C households	5	5	4	6
Type D households	8	8	6	8
Average age of HH head (yrs.)	42.1	34.4	37.8	43.5
Percent of HH's with male head	42.9	90.9	58.3	79.3
Percent of bagandan HH's	61.9	15.2	54.2	51.7
Average acres/HH	0.5	0.8	6.0[25]	1.9
Average income/HH	43,527	42,845	35,693	41,997
Average HHAGINC	12,000	25,718	16,295	8,583
Average HHNONAGINC	31,527	17,227	19,398	33,414
Percent of HH's who work off-farm	52.4	27.3	27.3	31.0

Interestingly, as shown in table 5.20, the greatest number of landless households was sampled in Busaana, the sub-county thought to have the most active land market. In addition to being most numerous in the Busaana sample, landless households sampled there are also the youngest on average and the most predominantly male-headed. (The fact that only 15.2% of landless households in Busaana are Bagandan would seem to suggest that landlessness is highly linked to ethnicity if it were not the case that non-Bagandan comprise a majority of Busaana's population.) However, a relatively large number of landless households was also sampled in Bukuya, the sub-county with the least land market activity and the sparsest population, although landless households there are the oldest and have the greatest non-agricultural income on average.

Landlessness overall in the central region may not be the result of increased land markets, despite observation of the highest incidence of landlessness in Busaana. In this study, it is important to distinguish between market-derived landlessness and landlessness resulting from social or cultural practices. Informal discussions with respondents indicate that many landless female-headed households are divorced or widowed and have neither inherited any land from their parents nor retained any rights to the land they gained access to through their late or

[25] Two outlying borrowed parcels, equal to 102 and 105 acres, are included in the calculation of this figure. When these two parcels are omitted from the calculation, the average acreage per landless household in Kabulasoke equals 1.3 acres.

former husbands. These women very often turn to a parent or other relative to host them on their land. Such women are landless not as the result of land markets but of the exercise of traditional land tenure rules which have historically offered women less access to land through inheritance and which render women few or no rights to the property of their husbands.

Similarly, type C households (caretakers and laborers) may also constitute a form of landlessness that stems more from the exercise of traditional practices than from land market forces. Comments made by caretakers and landless laborers suggested that most were men who came from Zaire, Rwanda, or Burundi upon hearing that they could earn money by working for a land holder in central Uganda. They told of leaving wives and young children with the plan of returning home to invest their earnings after a few years. However, as laborers or caretakers, they have earned far too little to provide for themselves let alone to save any money, and have had to remain in Uganda. Thus, these individuals appear to be landless more as a result of the attraction of the central region's relative prosperity and of low wages than of the operation of land markets.

The above discussion suggests examination of the sample of landless households by type. Combining the sub-county frequencies, the total numbers of type A, type B, type C, and type D households in the sample are, respectively, 39, 19, 20, and 29. Most landless households are sons or daughters on their parents' land. There are also many households who formally borrow or rent land as their only means of access. Table 5.21 presents simple descriptive statistics for the four types of landless households sampled.

Table 5.21: Simple statistics for sampled landless households; by type; unweighted computations

Statistic	Type A	Type B	Type C	Type D
Number of HH's	39	19	20	29
Average age of HH head	28.4	46.8	48.3	42.5
Average acres/HH	1.0	1.0	0.5	5.7[26]
Percent of HH's with male head	76.9	47.4	85.0	69.0
Percent of bagandan HH's	41.0	84.2	20.0	34.5
Percent HH's who work off-farm	25.6	10.5	37.4	48.1
Average income/HH	41,249	33,586	40,956	46,533
Average HHAGINC	22,797	14,711	10,733	12,038
Average HHNONAGINC	18,451	18,875	30,222	34,494

[26] Calculation includes two outlying borrowed parcels of 102 and 105 acres. If these two parcels are omitted from the calculation, then the average type D household has access to 2.0 acres.

There are some interesting patterns in the figures in table 5.21. First, type A households are, on average, much younger than the other types, and a very high proportion of them have male heads. Type A households may be predominantly young men who have not yet acquired any of their own land through inheritance or other means. Indeed, 30 of the 39 type A households in the sample are headed by males whose average age is 24.7 years, while the average age of the nine female heads is 41 years. Male type A heads have had their households on their parents' land for an average of 6.4 years, or roughly since they became independent, on average, at approximately age 18. Although, 25.6% of type A households overall have members who work off-farm, a member of 30% of male-headed type A households works off-farm, while only 11% of female-headed type A households have a member who works off-farm. There is a similar gender-related disparity in average household income; with an average income of 50,237 Ushs., male-headed type A households earned, on average, more than four times as much as female-headed type A households in 1991.

Taken together, these figures suggest that the land-acquisition profile of a type A household depends of the gender of its head. Female-headed type A households are likely older women who do not appear to have any hopes of inheriting (eight of the nine said they did not expect to inherit any land) and do not appear to be working to earn the money with which to purchase land.

On the other hand, male-headed type A households probably have yet to acquire an initial parcel of their own but plan to at some point in the future. A significant proportion of them appear to be working off-farm, presumably with the goal of earning enough money to purchase a parcel, although they can also look forward to inheriting some land. Of the 30 male-headed type A households, 19 said they expect to inherit some land from their parents. For the other 11, and even for the 19 who expect to inherit, the land market may provide a crucial means of access to permanent-tenure land, either as an alternative or a precursor to inheritance. For these households, the land market, rather than leading to landlessness, may offer access to land.

In table 5.21, type B households appear to be different from type A households, but, when inspected by gender, they display some trends similar to those of type A households. Overall, a higher proportion of type B households than of other types are headed by women (10 female heads, nine males) and a lower proportion of type B households have someone earning income off-farm. Type B households also have lower average incomes than the other types. However, male heads of type B households average only 34.7 years of age (compared to 57.8 years for female heads of type B households), and have had their household on their relative's land for only 3.8 years, compared to the average 10 years their female counterparts have been on their relative's land. In addition, 22% of male-headed type B households have a member working off-farm, and their average 1991 income was 48,117 Ushs, or nearly three times that of female-headed type B households, none of whom had a member who worked off-farm. Thus, male-headed type B households are probably similar to, although older than and lacking the primacy of the parent-son relational bond of, their type A counterparts, while female-headed type A and type B households are probably also similar to each other.

There are two striking observations about type C households. First, 85% (17 of 20) of those sampled are headed by males. Second, 80% of them are not Baganda. These two figures support the idea stated earlier that type C households are landless due more to traditional cultural practices than to the functioning of land markets.

The figures in table 5.21 suggest that type D households may be working hard to acquire land. They are not distinct in terms of the average age of their head or the proportion headed by males or Baganda. Where they differ from the other three types of landless households is in the relatively high proportion who have a member earning income from working off the farm and their corresponding relatively high average total and non-agricultural incomes. It appears that type D households, who presently lack access to land through family ties, become rather entrepreneurial. They have negotiated formal borrowing and/or rental arrangements, and a high number of them work off-farm. The land market may supply an important means by which these households could gain access to land.

Thus, although economic theory suggests that land market operation can bring about increased landlessness as land becomes concentrated in the hands of fewer holders, there is no evidence of this effect in the data collected in this survey. On the contrary, it appears that many of the landless households in the sample stand to benefit from the existence of the land market, *if* they can raise the cash resources necessary to bid successfully for land. The land market may provide their initial or only means of acquiring permanent-tenure land of their own. This is perhaps most strongly supported by the fact that of the 105 landless households interviewed, only 14 ever held any permanent-tenure parcels of their own. Of these, only six "lost" their land through the market, and the parcels of three of those were sold by someone without the actual holder's knowledge or consent. Of the other three sales, one was a distress sale (needed medicine), and one was the sale of the household's entire holding to emigrate from the area. The third sold three parcels, one to raise court fees and the other two to settle disputes over them.

Of course, as noted previously, it is possible that there have been incidents of households leaving the village after being rendered landless through participation in the land market. The survey methodology of this research did not allow such households to be captured in the sample.

5.10 LAND MARKETS AND ACCESS TO LAND BY WOMEN AND NON-BAGANDA

In many traditional African land tenure systems, certain groups or types of individuals were guaranteed access to at least some minimum area of land while other groups were denied, or had more limited, access to land. Examples of the former might be male members of a particular group (defined by kinship or some other criterion) who have attained a prescribed age.

In central Uganda, three groups historically had limited access to land. The first is women, particularly unmarried women who head their own household. Although the Baganda do have a tradition of bequeathing land to daughters, frequency and size of daughters' inheritance is substantially less than sons'. In the RRA, respondents at many sites stated that daughters inherited only when all sons fell out of parental favor or when they had no brothers. In the

absence of a land market, an unmarried, divorced, or widowed woman would be forced to rely on her parents' hospitality for access to land, and the access she gained would most likely be in the form of occupancy rather than possession. However, the presence of a land market should offer female-headed households (and other households) a channel through which to acquire land of their own, provided of course that they can obtain the revenue necessary to make a purchase.

Since intra-household data about specific household members' land holdings were not gathered in this survey, female-headed households' rather than women's access to land will be examined. About 20% (107 of 486) of the households in the survey are headed by women, which is a significant number. However, access to land by female members of the remaining 379 male-headed households will not be examined, although it is a very important issue given that women comprise at least half of the population and agricultural labor force and given the wide documentation that access to land and other resources in rural sub-Saharan African households is rarely pooled among household members (Guyer 1986; Fapohunda 1988; Palmer 1988; Saul 1989; Whitehead 1990; Smith 1994).

A second group traditionally excluded from gaining access to land in the central region are non-Baganda. The Baganda are noted to have been historically imperialistic (West 1974; Southwold 1965), often seeking to conquer neighboring kingdoms and annex their territories to their own. In addition, they were a prosperous kingdom in which non-Bagandan individuals served as servants and were not given land to use for themselves. The creation of the mailo lands in 1900 reinforced this attitude toward land. Mailo land was viewed as Bagandan land because it was originally allocated primarily to Bagandan elites. Even today, the king of the Baganda discourages tribe members from alienating mailo land to non-bagandans (*The New Vision*, April 18, 1991). Yet the central region has been rather ethnically mixed for several decades, and, as this survey demonstrates, non-Baganda clearly have access to land, including mailo land. However, non-Baganda may not have gained access to land in the absence of an ethnicity-blind land market. At some point, a non-Bagandan individual became the first to gain access to land of his own in the central region, and he probably did not inherit his land.

A third group which may have limited access to land in traditional African tenure systems is young men who have not reached the specified minimum age necessary to receive land rights. This is another group which could benefit from the presence of land markets. However, they will not be analyzed here because of the inherent life-cycle sorts of acquisition relationships which would be better assessed using time series data.

Tables 5.22, 5.23, and 5.24 present regression results for "access to land" regression models. "Access to land," a dependent variable, is measured by the total acreage of all the parcels to which a household has access (HHACRES), including rented and borrowed parcels. A rural household's access to land (HHACRES) is thought to be highly dependent on household income, which may in turn be determined by the land area to which the household has access. In the lifecycle of the rural Ugandan household, there is likely an initial endowment of land through bequest. In the absence of such an endowment--an increasingly common occurrence for young heads due to increasing populations in the central region--a household must initially work to raise money to purchase the initial parcel. Following the initial acquisition, whether it

occurs through purchase or inheritance, the parcel can be used to cultivate crops for both household consumption and sale. Some of the income earned from the sale of crops may be used to acquire more land to expand both cultivation area and holdings available to pass to children as the household matures. Thus, household income and land holdings are probably highly interrelated.

In light of this, income (which may depend in part on access to land for commercial farming) and access to land (which, over time, may depend in part on income) are modelled as a system of simultaneous linear equations solved using a two-stage least squares approach. Of course, household income (HHINCOME) also depends on factors in addition to its land holdings, and a household's access to land (HHACRES) depends on factors in addition to its income. Among the explanatory variables included in the equations are various characteristics of the household head (ethnicity (HHBAG), age (HEADAGE), gender (HGENDER), and level of education (HEADEDU)), characteristics of the sub-county (PD and COA), and characteristics of the household (its size (HHSIZE), whether it has purchased land (HHBUY), number of acres inherited (ACINHER), whether any members have off-farm jobs (WORKOFF), and variables reflecting land borrowing and renting (HHBORR, HHACBORR, HHRENT, HHACRENT)).

Table 5.22 contains estimated coefficients and standard errors for two specifications of the land holdings equation, and table 5.23 presents estimated coefficients and standard errors for the corresponding specifications of the income equation. Table 5.24 contains results for versions of the income equation in which the dependent variable is agricultural income (specification 2b) or non-agricultural income (specification 2c) rather than total income (as in table 5.24). Specifications for the income equations in tables 5.23 and 5.24 correspond to the second specification of the land holdings equation presented in table 5.22.

Table 5.22: Regression results for two specifications of the landholdings equation; specifications correspond to like-numbered specifications of the income equation presented in tables 5.23 and 5.24

Dep. var. = HHACRES	Specification 1		Specification 2	
Exogenous variables	b-hat	se	b-hat	se
Intercept	1.175	3.477	-2.238	2.956
PD	-.018 *	.006	-.014 *	.005
COA	2.178	1.467	2.646 *	1.322
ACINH	.831 *	.027	.833 *	.024
HHBORR	-.650	1.623	--	--
HHACBORR	--	--	.936 *	.094
HHRENT	.823	3.329	--	--
HHACRENT	--	--	1.766	2.180
HHAGINC (x 1,000)	.050 *	.012	.049 *	.011
HHNONAGINC (x 1,000)	-.003	.011	-.001	.010
HHBUY	5.685 *	1.669	5.184 *	1.509
HEADAGE	.046	.044	.077	.039
HGENDER	-.473	1.887	-.479	1.705
HEADEDU	.118	.264	.068	.239
HHBAG	.325	1.618	1.625	1.440

Table 5.23: Regression results for specifications of the income equation; dependent variable is 1991 household income in Uganda shillings; specifications correspond to like-numbered specifications of the landholdings equation presented in table 5.22

Dep. var. = HHINCOME	Specification 1		Specification 2a	
Exogenous variables	b-hat	se	b-hat	se
Intercept	-43.549 *	18.273	-39.272 *	17.011
PD	.048	.031	.044	.030
COA	2.933	7.850	4.017	7.729
CATTLE	5.099 *	1.499	8.424 *	1.794
HHCROPACRES	2.414 *	.593	2.262 *	.587
WORKOFF	58.094 *	8.989	56.747 *	8.835
HHSIZE	4.895 *	1.169	4.701 *	1.156
HGENDER	25.111 *	9.836	25.611 *	9.701
HEADAGE	.136	.236	.063	.231
HEADEDU	2.308	1.415	2.222	1.400
HHBAG	19.411 *	8.471	8.319 *	8.212
HHBORR	-5.326	8.584	--	--
HHACBORR	--	--	-2.148 *	.656
HHRENT	26.681	17.475	--	--
HHACRENT	--	--	20.420	12.505
HHBUY	11.736	8.816	14.015	8.716

Table 5.24: Regression results for specifications of the income equation; dependent variables are household's 1991 agricultural income (specification 2b) and non-agricultural income (specification 2c) in Ushs; specifications correspond to specification 2 of the landholdings equation presented in table 5.22

Exogenous variables	Spec. 2b: HHAGINC		Spec. 2c: HHNONAGINC	
	b-hat	se	b-hat	se
Intercept	-26.190 *	11.544	-13.082	13.425
PD	.069 *	.021	-.025	.024
COA	-.222	5.245	4.239	6.100
CATTLE	6.640 *	1.218	1.784	1.416
HHCROPACRES	2.662 *	.399	-.400	.464
WORKOFF	-2.476	5.996	59.223 *	6.973
HHSIZE	3.140 *	.784	1.561	.912
HGENDER	16.702 *	6.584	8.909	7.656
HEADAGE	-.009	.157	.073	.183
HEADEDU	1.582	.950	.640	1.105
HHBAG	14.076 *	5.573	4.243	6.481
HHACBORR	-1.349 *	.445	-.799	.518
HHACRENT	4.295	8.486	16.625	9.869
HHBUY	1.969	5.915	12.047	6.879

Although there are many interesting results in tables 5.22 through 5.24, only those pertaining to land markets, gender, ethnicity, and access to land will be discussed in this section. Other results in the tables will be referred to in sections to which they are more directly relevant.

5.10.1 LAND MARKETS AND ACCESS TO LAND, BY GENDER OF HOUSEHOLD HEAD

Table 5.25 presents selected sub-county descriptive statistics relating to gender, land market participation, and access to land.

Table 5.25: Weighted statistics, by sub-county and gender of household head

Descriptive statistic	Kibinge (HH)	Busaana (HL)	Kabula. (LL)	Bukuya (LH)
# of male heads	90	105	79	102
# of female heads	38	17	32	20
Ave. acres/male-headed HH	5.4	3.3	10.8[27]	12.5
Ave. acres/female-headed HH	3.8	3.2	3.6	4.6
% male-headed HH's who bought land	30.5	45.9	31.0	21.2
% female-headed HH's who bought	32.4	13.2	52.7	22.0
Ave. % holdings bought by male HH's	17.3	36.2	18.0	11.3
Ave. % holdings bought by females	25.0	11.3	51.6	22.0
% male HH's who inherited land	85.1	47.8	53.2	52.1
% female HH's who inherited land	37.8	54.4	36.5	26.7
Ave. % holdings inher'd by males	65.6	33.2	43.2	37.2
Ave. % holdings inher'd by females	26.0	53.9	32.6	26.7
Ave. income/male-headed HH	95,526	52,733	72,563	62,817
Ave. income/female-headed HH	36,777	74,043	12,050	12,565

In all four sub-counties, male-headed households have larger land holdings than female-headed households. In Busaana (HL), the sub-county which appears to have the most active land market, women's holdings most closely approach men's, suggesting that the land market may have an equalizing effect on access. Furthermore, in three of the four sub-counties, a higher proportion of female-headed households than male-headed households purchased land. In those same sub-counties, female-headed households purchased a greater proportion of their holdings than male-headed households, and fewer female- than male-headed households inherited land and inherited a lower proportion of their holdings. Lastly, in those three sub-counties, male-headed households had far greater incomes in 1991 than female-headed households.

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[27] The figure in the table was computed including "landless" households. Two "landless" households in Kabulasoke have rather large (borrowed) holdings of 102 and 105 acres. When these households are excluded from the computation, average acres/male-headed household in Kabulasoke is 5.8.

However, none of these patterns holds in Busaana, where land markets appear to be most active. In addition, a lower proportion of female-headed households have purchased land in Busaana than in the other three sub-counties, and female-headed households in Busaana obtained a lower proportion of their current holdings through the land market than female-headed households in the other study sub-counties. Disaggregating the sample by gender may not portray the real situation accurately because it fails to control for variation in any of the other factors which influence household access to land through markets. For this reason, regression models, isolating the *ceteris paribus* effects of variables of interest must be relied on to draw conclusions.

The coefficient estimated for gender of the household head in the land holdings equation (table 5.22) is not statistically significant, suggesting that, when variations in other determinants of land holdings size are controlled for, gender of the household head is not a significant determinant of the area of land to which a household has access. The coefficients estimated for head's gender in three of the four income equations are positive and statistically significant. The estimated coefficients suggest that, *ceteris paribus*, male-headed households earned approximately 25,000 more shillings of total income and about 16,000 more shillings in income from agricultural sources than female-headed households in 1991.

The land holdings - income model results in table 5.22 show that when variations in other influential factors are controlled for, household land market participation is a statistically important determinant of the size of household holdings. In all specifications o of the land holdings - income model, a household's land purchase tends to increase the area of the household's holdings by five to six acres. This is true for all households, not just women and non-Bagandan. Thus, the land market is an important determinant of household access to land.

Furthermore, the regression results about land market activity presented in tables 5.9 through 5.11 indicate that household head gender plays a statistically significant role in determining household land market participation, although the picture painted by those results appears complex. In the models in which the dependent variable is a binary measure of market activity (PBUY in table 5.9 and HHBUY in table 5.10), the estimated coefficient on gender is negative, suggesting that parcels held by female-headed households are more likely than those belonging to male-headed households to have been purchased and that female-headed households are more likely than male-headed households to have purchased any of their holdings. This implies that, as theory predicts, land markets provide female-headed households an important means of access to land. Thus, policies that promote land markets may help women gain access to land. Given the statistical importance of cropped acreage in increasing household income (see tables 5.23 and 5.24), increased access to land by female-headed households can translate into improved financial well-being for female-headed households, without necessarily implying decreased well-being for male-headed households.

However, in the model in which the dependent variable is the percent of its holdings a household purchased (%ACBUY) (table 5.11), the coefficient estimated for head's gender is positive, which contradicts the results for the PBUY and HHBUY regression models just discussed. It could be consistent with those results if, while female-headed households are more likely to participate in the land market (as suggested by the PBUY and HHBUY results),

male-headed households who have bought land have bought a higher proportion of their holdings than female-headed households who have bought land. The data do not support this conjecture. As shown in table 5.25, female-headed households purchased a greater proportion of their holdings than male-headed households in three of the four sub-counties surveyed. These results support the hypothesis that land markets improve women's access to land, although women in central Uganda still have access to less land, on average, than men.

5.10.2 LAND MARKETS AND ACCESS, BY ETHNICITY OF THE HOUSEHOLD

Table 5.26 displays selected descriptive statistics for Bagandan and non-Bagandan households in each of the four sub-counties.

Table 5.26: Weighted statistics, by sub-county and ethnicity of household head

Descriptive statistic	Kibinge (HH)	Busaana (HL)	Kabula. (LL)	Bukuya (LH)
# of Bagandan HH's	100	32	76	73
# of non-Bagandan HH's	28	90	35	49
Ave. acres/Bagandan HH	5.9	5.1	4.5	11.8
Ave. acres/non-Bagandan HH	2.0	4.2	10.1[28]	6.0
% Bagandan HH's who bought land	26.7	5.4	43.2	15.7
% non-Bagandan HH's who bought	25.4	45.4	25.1	26.4
Ave. % holdings bought by Bag. HH's	13.7	3.0	21.6	6.7
Ave. % bought by non-Bag HH's	18.8	36.3	26.4	20.2
% Bagandan HH's who inherited land	76.7	92.1	57.4	64.5
% non-Bagandan HH's who inherited	71.4	41.8	44.4	29.8
Ave. % holdings inher'd by Bag. HH's	61.7	87.3	45.8	51.8
Ave. % holdings inher'd by non-Bagandan	47.6	28.1	35.2	18.2
Ave. income/Bagandan HH's	96,953	144,845	34,616	68,070
Ave. income/non-Bagandan HH's	53,430	45,469	59,268	38,172

[28] The figure in the table was computed including two "landless" households with rather large (borrowed) holdings of 102 and 105 acres. When these households are excluded from the computation, average acres/non-Bagandan household in Kabulasoke is 4.5.

Comparisons of the figures in table 5.26 substantiate that the land market is an important source of access to land for non-Baganda in the central region where they constitute an ethnic minority despite their increasing populations. Bagandan households' average land holdings and incomes are larger than non-Bagandan's in all sub-counties. However, non-Bagandan households' land holdings are closest to Bangandans' in the sub-county with the most active land market, Busaana (HL), suggesting that a more active land market may help equalize access to land by different ethnicities by providing an ethnically neutral means of acquiring land. Furthermore, non-Bagandan households have purchased a greater proportion of their holdings than Bagandan households, and, correspondingly, inherited a lesser proportion of their holdings. This reinforces the idea that a traditionally excluded pool of people is using the land market to gain much-needed access to land.

However, as mentioned in the gender analysis, the disaggregation of the sample by ethnicity in table 5.26 fails to isolate differences in land access and market participation which stem only from household ethnicity. Other variables may also be tied to ethnicity in bearing out the differences seen in the figures in table 5.26. Regression analysis is necessary to control for these other influences.

The role land markets may play in improving non-Bagandan households' access to land relative to Bagandans' is not clear from the regression results presented in tables 5.9 through 5.11 and 5.22 through 5.24 (land holdings - income models). The coefficient estimated for household ethnicity (HHBAG) is not statistically significant in any of the market or access models. It may be that present generations of non-Baganda and Baganda have equal access to land because non-Baganda made their primary gains in access earlier this century. A time series analysis may be able to examine this.

Only in the income regressions (tables 5.23 and 5.24) are coefficients estimated for household ethnicity statistically significant. Their positive signs imply that, all else constant, Bagandan households' 1991 incomes were approximately 18,000 Ushs higher than non-Bagandans'. Given the importance of agricultural sources of income and the importance of land access to earning agricultural income, this income differential could be a manifestation of slightly differential access to land that the market participation (tables 5.9 through 5.11) and land holdings (table 5.22) models failed to capture.

5.10.3 LAND MARKETS AND ACCESS BY WOMEN AND NON-BAGANDA: SUMMARY

Two results about land markets and access to land by female-headed and non-Bagandan households are noteworthy. First, land market participation (HHBUY) is a significant determinant of household access to land (HHACRES, table 5.22). This is true for all central region households, not just certain kinds of households. Given the positive influence of access to land (HHACRES) on household income (HHINCOME), land markets appear to be important in permitting households to get access to additional land to cultivate to earn higher incomes. In this way, land markets increase household well-being.

Second, the results support the hypothesis that land markets improve women's and non-Bagandans' access to land in central Uganda. Female-headed and non-Bagandan households

appear to purchase land more frequently than male-headed and Bagandan households, respectively. In addition, female-headed and non-Bagandan households purchased a greater proportion of their holdings than did male-headed and Bagandan households. Again, given the strong link between access to land and income, land markets may be instrumental to female-headed and non-Bagandan households' well-being.

5.11 LAND MARKETS AND ACCESS TO LAND BY COMMERCIAL FARMERS

One of the most compelling claims made by advocates of formal individualization of tenure is that land markets will enable commercial farmers to obtain additional land to bring under production, which will contribute, ultimately, to improved agricultural productivity and economic growth in the agricultural sector. In this study, commercial farming by each household is defined by degree. Rather than defining a household as either commercial or non-commercial in its agriculture, each household's level of agricultural commercialization is determined by the amount of income it earned from agricultural sources (during 1991). The higher a household's income from agricultural sources, the more agriculturally commercialized the household is considered to be. Agricultural incomes of households in the sample range from zero to 450,000 Ushs (total income ranges from zero to 626,000 Ushs), although half of the households had 1991 agricultural incomes of 22,200 Ushs or less. The (unweighted) full-sample average agricultural income is 43,977 Ushs. Eighty households had no income from agricultural sources, while 275 (61% of the sample) earned all of their 1991 income from agricultural sources.

The regression results in tables 5.22 through 5.24 (land holdings - income models) show that household land holdings (HHACRES, table 5.22) increase with household agricultural income (HHAGINC), implying that households who are more agriculturally commercialized have access to more land, and that cropped acreage (HHCROPACRES, tables 5.23 and 5.24) is a statistically significant factor in increasing household income from agricultural sources. Additionally, the regression results for the fragmentation (HHPARCELS, HHPERMPARCELS) and subdivision (PSIZE) models in tables 5.16 and 5.18 demonstrate that the level of income from agriculture (HHAGINC) significantly influences both the number and size of the parcels to which a household has access. Lastly, the results in table 5.22 (the land holdings regression) also show, as previously discussed, that households who purchase land have larger holdings. Clearly, access to land must be of central concern in promoting commercial agriculture.

Therefore, the land market may indeed play a crucial role in facilitating the acquisition of additional land by households capable of cultivating greater areas. The regression results in table 5.9 (model for parcel purchase (PBUY)) suggest that parcels held by more commercialized households are more likely to have been acquired by purchase than those held by less commercialized households. This implies that the promotion of rural land markets could be an important component of economic development because the land market appears to help increase agricultural output by allowing commercial farmers to acquire more land to cultivate. In the absence of the land market, commercial households may not be able to acquire additional land, and the potential for increased production might not be realized.

5.12 LAND MARKETS AND THE INCIDENCE OF FIXED-PLACE AGRICULTURAL INVESTMENT AND YIELD-ENHANCING AGRICULTURAL PRACTICES

Application of neo-classical economic theory to land leads to the hypothesis that individualization of land rights and land markets increase the incidence of agricultural investments and agricultural techniques that will enhance yields, although different factors of causation explain these relationships. First, the increased tenure security provided by more individualized land rights assures parcel holders that they will retain access to the parcel long enough to reap future benefits accruing from costly agricultural investments. In addition, the increased tenure security associated with individualized land rights may increase parcel holders' access to credit, thereby enabling them to make improvements on the land. Second, the land market that emerges under more individualized land rights permits the most productive users to acquire land. These lines of reasoning lead to the expectation that, in this research, agricultural investments and productivity-improving agricultural practices will take place on purchased parcels more often than on parcels acquired through other means.

Limited information about a variety of fixed-place investments and agricultural practices was collected in the survey. For each of his parcels, each respondent was asked whether he had made any of the fixed-place investments since acquiring the parcel, or engaged in any of the agricultural techniques during the previous year (1991).

The fixed-place agricultural investments asked about in the survey were: the construction of bunds or ridges to control soil erosion (BUNDS), the planting of grass strips to control erosion (STRIPS), the construction of an access road on or to the parcel (ROAD), and the planting of a tree crop, most commonly coffee, bananas, or eucalyptus (TREECROP). These investments may carry substantial initial costs and deliver benefits which accrue over time. Each respondent indicated whether he had ever made each investment on each of his parcels. Respondents gave a variety of reasons for not having made the investments. Explanations such as the topographical irrelevance of the investment (as with bunds or ridges on flat parcels) and acquisition of the parcel with the investment already in place were considered to make the investment irrelevant for a given parcel. In these cases, the parcel was dropped from the analysis for that investment.

Agricultural techniques inquired about included the use of improved seeds rather than seeds recycled from the previous year's harvest (SEEDS), mulching (MULCH), and the application of chemical herbicides (HERB) and insecticides (INSECT). Respondents indicated whether they had engaged in these activities on their parcels during 1991. As they did for fixed-place investments, respondents gave a variety of reasons why they did not engage in these practices, including not yet holding the parcel in 1991, not cultivating the parcel during 1991, and lacking the money to conduct the technique. If the practice was deemed irrelevant for a particular parcel based on the reason given for not carrying out the practice, then the parcel was dropped from the analysis for that practice.

Agricultural practices and fixed-place investments were measured in a simplistic fashion. Instead of measuring the costs incurred, the exact level of an investment, or the number of times a given practice was carried out, a binary variable for each investment or activity was coded one if the household engaged in the practice during 1991 or had made the investment

since acquiring the parcel, and zero if not. (The frequencies of occurrence for the practices and investments on the permanent-tenure parcels in the sample are shown in table F.4 in appendix F.)

Logistic regression analysis was then used to determine the effects of a set of explanatory variables on the probability that the household engaged in the practice or made the investment. Of course, numerous other sub-county, household, and parcel characteristics may influence agricultural investment decisions. Sub-county characteristics included in the models are population density (PD) and whether the sub-county has relatively highly commercialized agriculture (COA). Household characteristics include: the size of the household (HHSIZE); the amount of income the household earned from agricultural and non-agricultural sources during 1991 (HHAGINC and HHNONAGINC); and, the gender, ethnicity, and education level of the household head (HGENDER, HHBAG, and HEADEDU). Parcel characteristics included in the models are: the length of time the household has held the parcel (YRSHAD); parcel size (PSIZE); whether the parcel's soil is better or worse than other parcels in the area (PSOILBET, PSOILWOR), whether the parcel's topography is slightly hilly (PSLHILL) or a hillside (PHILLSIDE) as opposed to flat; the parcel's distance from the homestead (PDISTANCE); the parcel's tenure (PMO, PMT); and, whether the parcel was purchased (PBUY).

Fixed-place agricultural investments differ from productivity-improving agricultural techniques in the frequency with which they must be conducted. The investments studied in this research tend to be carried out only once (within a certain time horizon), whereas the agricultural techniques asked about are usually undertaken annually or seasonally. Because this difference may affect the results for the two groups, fixed-place investment activities and agricultural practices are discussed in separate sections below.

5.12.1 FIXED-PLACE AGRICULTURAL INVESTMENTS

Regression results for the models for the fixed-place agricultural investments examined are shown in tables 5.27 and 5.28.

Table 5.27: Estimated coefficients and (standard errors) for logit regressions for whether the current holder has constructed bunds or ridges on the parcel and whether the household has planted grass strips on the parcel; permanent-tenure parcels only

Explanatory variables	BUNDS	STRIPS
Intercept	2.690 * (.560)	3.919 * (.779)
PD	-.004 * (.001)	-.003 * (.001)
COA	.573 * (.265)	.348 (.337)
HHSIZE	.020 (.035)	.015 (.041)
HHAGINC (x 1,000)	.0002 (.002)	-.002 (.002)
HHNONAGINC (x 1,000)	-.003 * (.002)	.001 (.002)
HGENDER	-.077 (.306)	-1.057 (.442)
HHBAG	-.150 (.268)	-.733 * (.371)
HEADEDU	-.112 * (.042)	-.106 * (.053)
YRSHAD	-.039 * (.008)	-.036 * (.010)
PSLHILL	-.591 * (.300)	.043 (.387)
PHILLSIDE	-.695 (.416)	-.301 (.526)
PSIZE	-.006 (.007)	-.006 (.007)
PSOILBET	.085 (.264)	.087 (.323)
PSOILWOR	.143 (.288)	.796 * (.392)
PDISTANCE	.015 (.045)	1.024 * (.457)
PMO	-.373 (.391)	-.073 (.493)
PMT	-.546 (.340)	-.476 (.433)
PBUY	-.031 (.249)	-.781 * (.310)

Table 5.28: Logit regression results for whether the current owner has built a road on or to the parcel and for whether the household has planted a tree crop on the parcel; permanent-tenure parcels only

Explanatory variables	ROAD	TREECROP
Intercept	-1.201 (.774)	.031 (.506)
PD	-.001 (.001)	-.001 (.001)
COA	.946 * (.391)	.153 (.262)
HHSIZE	.004 (.048)	-.049 (.033)
HHAGINC (x 1,000)	.0001 (.003)	.001 (.002)
HHNONAGINC (x 1,000)	-.006 * (.003)	-.0002 (.002)
HGENDER	-1.432 * (.434)	-.753 * (.302)
HHBAG	-.590 (.375)	.086 (.259)
HEADEDU	.116 * (.061)	-.010 (.041)
YRSHAD	-.029 * (.014)	-.024 * (.008)
PSLHILL	1.069 (.412)	-.496 * (.247)
PHILLSIDE	-.120 (.706)	.375 (.381)
PSIZE	-.054 (.032)	-.031 (.022)
PSOILBET	-1.336 * (.471)	.237 (.271)
PSOILWOR	-.644 (.403)	.434 (.270)
PDISTANCE	.093 (.066)	.173 * (.074)
PMO	1.233 * (.679)	.518 (.404)
PMT	.784 (.554)	.422 (.344)
PBUY	.741 * (.364)	-.200 (.248)

There are few obvious trends in the results presented in tables 5.27 and 5.28. In general, not many of the estimated coefficients in the fixed-place investment regression models are statistically significant.

The negative coefficient estimated for population density (PD) implies that, when population pressure increases, the likelihood that the parcel holder has constructed bunds or ridges or planted grass strips on the parcel decreases. This counters expectations; it would seem that as settlement density increases, reducing the size of individuals' parcels, parcel holders would be more likely to make improvements on their land in order to intensify their use of the land. Perhaps this result makes sense if people become unwilling to make improvements to a parcel that is below some minimum size. The coefficient estimated for COA suggests that parcel holders are more likely to build bunds, ridges, and roads on their parcels in the presence of increased agricultural markets. This is exactly as expected--increased marketing opportunities should induce people to improve their land for agriculture in order to increase their output for market.

The coefficient estimated for non-agricultural income (HHNONAGINC) is negative when it is significant, implying that increased income from non-agricultural sources decreases the household's likelihood of constructing bunds, ridges, and access roads. This makes sense if households rely less on agriculture and become correspondingly less interested in improving their parcels for farming as they earn more from non-agricultural pursuits.

The coefficient estimated for head gender (HGENDER) is negative when it is statistically significant, suggesting that, all else equal, there is a greater chance that the investments will be in place on parcels held by female-headed households. This is the case for in the grass strips, access road, and tree crop models, and suggests that women, ceteris paribus, are likely to improve their parcels, perhaps to compensate for their limited access to land relative to men.

Household head's schooling (HEADEDU) also appears is a statistically significant determinant of fixed-place investment activity in three of the four models. The coefficient estimated for head's education is negative in the bunds/ridges and grass strips models, and is positive in the access road model. The negative coefficients are puzzling, since it was expected that more highly educated individuals would be more aware of the potential benefits of the investments and, if education increases individuals' income-earning potential, perhaps would be better equipped financially to engage in them.

Of the parcel characteristics included in the models, the number of years the current holder has owned the parcel (YRSHAD) and the binary variables for slightly hilly topography (PSLHILL) and worse than average soil quality (PSOILWOR) are statistically significant determinants of some of the investments examined. The coefficient estimated for YRSHAD is statistically significant and negative in all four of the models. This makes sense if either younger individuals are the ones who have held their parcels for fewer years (the Pearson correlation coefficient for YRSHAD and head's age is .576) or once a holder has held a parcel for a certain length of time without making the investment, he becomes less likely to make it. Slightly hilly topography of a parcel (PSLHILL) is a statistically significant determinant of a parcel holder's likelihood to build bunds or ridges, construct an access road, and plant a tree crop on the parcel. Since the topography category omitted from the models was "flat," it appears that holder's are less likely to build bunds or ridges and to plant tree crops on slightly hilly parcels than on flat parcels, and are more likely to build roads on slightly hilly parcels than on flat parcels. A positive coefficient was estimated for PSOILWOR in the grass strips model. This could imply that households plant grass strips in order to improve the productivity of marginal parcels.

Central to the hypothesis that fixed-place investments increase in the presence of land markets are the binary variables indicating the tenure of the parcel (PMO and PMT) and whether the current holder acquired the parcel through purchase (PBUY). The coefficient estimated for PMT is not statistically significant in any of the models. The coefficient estimated for PMO is statistically significant in only the access road model, where its positive sign implies that parcel holders are more likely to build access roads to mailo land than to customary tenancies (the omitted tenure category).

The regression results for whether the parcel was purchased (PBUY) are puzzling. The coefficient estimated for PBUY is statistically significant in the grass strips and access road models. A parcel's being purchased increases the likelihood that the holder will construct an access road to it, and decreases the likelihood that he will plant grass strips on it. The positive sign in the access road model is consistent with the hypothesis that individualized land rights and land markets increase fixed-place investment. The negative coefficient in the grass strips model is puzzling, however, since it seems to contradict this theory, unless it is the case that

individuals purchase parcels which do not require erosion control measures such as grass strips.

5.12.2 AGRICULTURAL PRACTICES

Tables 5.29 and 5.30 present results for regressions of the agricultural practices.

Table 5.29: Logit regression results for whether the holder mulched or applied chemical herbicide to the parcel during 1991

Explanatory variables	MULCH	HERB
Intercept	2.701 (.536)	6.998 * (1.066)
PD	-.002 * (.001)	-.004 * (.001)
COA	.031 (.253)	.275 (.378)
HHSIZE	-.035 (.031)	-.015 (.042)
HHAGINC (x 1,000)	-.002 (.002)	-.002 (.002)
HHNONAGINC (x 1,000)	.0005 (.001)	.00001 (.002)
HGENDER	.178 (.304)	-1.503 * (.609)
HHBAG	-.209 (.261)	-1.189 * (.503)
HEADEDU	-.071 (.039)	-.023 (.057)
YRSHAD	.004 (.008)	-.014 (.011)
PSLHILL	-.521 * (.250)	-.118 (.361)
PHILLSIDE	-.112 (.408)	-.176 (.550)
PSIZE	.015 (.012)	-.005 (.008)
PSOILBET	-.726 * (.246)	.798 * (.375)
PSOILWOR	.578 (.291)	.431 (.417)
PDISTANCE	.037 (.049)	-.007 (.046)
PMO	-.739 * (.386)	-2.083 * (.686)
PMT	-1.033 * (.349)	-1.032 (.683)
PBUY	.072 (.241)	.164 (.355)

Table 5.30: Logit regression results for whether the holder applied chemical insecticide to or planted improved seeds on the parcel during 1991

Explanatory variables	INSECT	SEEDS
Intercept	6.898 * (1.004)	3.563 * (.626)
PD	-.006 * (.001)	-.003 * (.001)
COA	-.015 (.378)	.127 (.284)
HHSIZE	-.038 (.040)	-.042 (.035)
HHAGINC (x 1,000)	-.006 * (.002)	.004 * (.002)
HHNONAGINC (x 1,000)	-.003 * (.002)	-.003 * (.001)
HGENDER	-.809 (.477)	-.167 (.346)
HHBAG	-1.076 * (.439)	-.084 (.294)
HEADEDU	-.029 (.054)	-.064 (.045)
YRSHAD	-.002 (.010)	.001 (.009)
PSLHILL	-.530 (.349)	-.753 * (.286)
PHILLSIDE	-.549 (.525)	-.018 (.505)
PSIZE	.008 (.011)	.010 (.017)
PSOILBET	.001 (.331)	-.109 (.273)
PSOILWOR	.421 (.402)	1.086 * (.353)
PDISTANCE	-.055 (.043)	.358 (.253)
PMO	-2.030 * (.710)	-.721 (.446)
PMT	-1.870 * (.695)	-1.015 * (.398)
PBUY	.442 (.357)	.008 (.268)

Statistically significant coefficients are as rare in the agricultural practices models as in the investment models. The coefficient estimated for population density (PD) is statistically significant and negative in all four of the agricultural activity models, implying that increasing settlement densities decrease the likelihood that parcel holders will engage in any of the agricultural techniques evaluated. As with the investment models, this is surprising because it is expected that people would want to intensify production as much as possible as parcel size shrinks. The coefficient estimated for COA is not statistically significant in any of the models.

Of the household characteristics included in the models, agricultural (HHAGINC) and non-agricultural income (HHNONAGINC), head gender (HGENDER), and ethnicity (HHBAG) are statistically significant determinants of several of the agricultural practices modeled. The non-agricultural income (HHNONAGINC) coefficient is statistically significant and negative in the insecticide and improved seeds models, implying that increased income from non-agricultural sources decreases the household's likelihood of practicing those techniques. This makes sense if households rely less on agriculture and become correspondingly less interested in improving their farming as they earn more from non-agricultural sources. The coefficient for income from agricultural sources (HHAGINC) is positive in the improved seeds model, as expected, suggesting that as households rely more on agriculture for income, they invest more in becoming more productive. Alternatively, and contrary to expectations, the coefficient for agricultural income is negative in the insecticide model, implying that as they earn more income from agriculture, households become less likely to apply insecticide to their crops.

The coefficients estimated for head gender (HGENDER) and ethnicity (HHBAG) are negative when they are statistically significant, suggesting that, all else equal, there is a greater chance that herbicide will be applied on parcels held by female-headed or non-Bagandan households and that insecticide will more likely be applied on parcels held by non-Baganda. This suggests that female-headed and non-Bagandan households, *ceteris paribus*, are likely to improve their agricultural methods, perhaps to compensate for their limited access to land relative to men and Baganda.

The quality of the parcel's soil is a statistically significant determinant of whether the parcel holder engages in some of the agricultural practices examined. The omitted category was average quality soils, so the results for the agricultural practice regression models indicate the following. Holders of parcels with better-than-average soils (PSOILBET) are less likely to mulch them and more likely to apply herbicide to them. This could be because parcels with better soils do not require mulching but are worth applying herbicide to. Holders of parcels with worse-than-average soils (PSOILWOR) are more likely to mulch and plant improved seeds on them, a result which may suggest that these activities are undertaken in attempts to improve the productivity of otherwise marginal land.

Land tenure appears to influence the incidence of the agricultural techniques modeled. With the exception of the mailo tenancy variable in the herbicide regression model, the coefficients estimated for the tenure variables (PMO, PMT) are statistically significant in all cases. Moreover, the coefficients on the tenure variables are always negative, implying, since the omitted tenure category is customary tenancy, that holders of mailo land and mailo tenancies are less likely than customary tenants to carry out the selected agricultural practices, all else constant. Since no evidence from the rapid appraisal or the survey indicates that customary tenants are higher marginal value product users of land, it could be that customary land is of lower quality for agriculture and therefore requires productivity-enhancing measures to make it more productive. West (1972) documented that the best land for agriculture was placed under the mailo system, so this is a plausible explanation.

The coefficient estimated for the variable indicating whether the holder purchased the parcel (PBUY) is not statistically significant in any of the models, which challenges the hypothesis that land market activity increases the undertaking of yield-enhancing agricultural practices.

5.13 SUMMARY OF RESULTS

This section provides a brief summary of the results, by hypothesis, in the order in which the hypotheses have been addressed thus far. In the next chapter, the results will be further discussed in conjunction with their meaning for theory and policy conclusions.

1. Land rights become more individualized as PD or COA increases.
From regression analyses and informal comparisons of the proportions of parcels on which holders possess specific land rights, it appears that PD and COA influence individualization. The proportions of tenancies on which parcel holders possess selected rights (tables 5.1 and 5.2) suggest that rights on customary tenancies become more individualized as PD increases, and that some rights on mailo tenancies become more individualized while others do not. Results of regression models of specific land rights on the sample of mailo and customary

tenancies (table 5.3) indicate that increased PD increases parcel holders' likelihood of having rights to sell and pledge their tenancies and decreases their likelihood of having exclusion rights, and that increased COA decreases their rights to plant and cut trees and to bury the dead on their parcels. Regression results for mailo tenants alone (table 5.4) indicate similar findings, with the additions that increased PD decreases a mailo tenant's likelihood of being able to exclude the mailo owner from using the parcel, and that increased COA increases the mailo tenant's ability to exclude others from gathering firewood on the tenancy.

2. Individualization of land rights increases individuals' land tenure security.
The survey results neither support nor refute the hypothesis that greater individualization of land rights conveys greater tenure security to landholders. Holders of most of the parcels in the sample perceive no tenure insecurity, and (according to analysis of hypothesis one) all land tenure in central Uganda appears to be quite individualized. However, regression analysis of tenure security as a function of a set of explanatory variables that included possession of various land rights (to proxy for "individualization") did not find a statistically significant relationship between tenure security and individualization. The failure to find a statistically significant relationship between these two variables may have resulted from the measurement of perceived tenure security through a binary variable, which is admittedly weak. Measurement of individuals' perception about their probability of retaining specific use, transfer, and exclusion rights or use of a multi-valued measure of tenure security rather than a binary definition may have been a sounder approach.

3. Land markets emerge and become more active as PD or COA increases.
According to the analyses performed in this research, land markets increase with increasing COA, as hypothesized. Households in sub-counties with higher levels of COA are more likely to have purchased land than households in sub-counties with lower COA. In addition, households who have purchased land hold five to six more acres, on average, than those who have not, and the size of household land holdings increases as household agricultural income increases. Likewise, PD exerts a strong influence on land market activity. It appears that up to some threshold level of PD, land markets become more active as PD increases. However, once PD exceeds some extreme level, land market activity appears to decline.

Furthermore, regression results suggest that, of the land tenure forms in central Uganda, mailo land is most likely to be purchased, although the coefficient estimated for mailo tenancy tenure (PMT) is not statistically significant in the regression model. Judging just from the incidence of occurrence, mailo tenancy appears to be the most frequently purchased tenure form. Of the 167 purchased parcels in the sample, 90 of them are mailo tenancies. However, this finding may simply be a result of the prevalence of mailo tenancy in central Uganda and fails to account for other factors that influence purchase.

4. Individuals' land tenure security is greater in the presence of active land markets.
Results about the relationship between land market activity and land tenure security were not statistically significant. The proportion of holders of purchased parcels who perceive their tenure to be fully secure exceeds that of holders of non-purchased parcels who perceive their tenure to be fully secure. However, differences between these figures were not formally tested to see whether they are in fact significantly different from zero, and in the regression model for

tenure security (table 5.8), the binary variable reflecting whether the parcel was purchased was not found to be statistically significant.

5. Land market activity increases the degree of fragmentation of land holdings.
The survey results indicate that participation in the land market increases the number of land parcels held by a household. In each sub-county, the average number of parcels held by households who have purchased land is greater than the average number of parcels held by households who have not purchased land, although these means were not formally compared. In addition, the household land market participation variable is statistically significant and positive in regression equations modeling the number of parcels a household possesses (table 5.16).

6. Land market activity increases subdivision of land parcels.
Sampled parcels which were purchased by their holders appear to be smaller, on average, than parcels which their holders acquired through other means. However, the coefficient on the dummy variable for parcel purchase in the parcel size regression model (table 5.18) is not statistically significant.

7. Land market activity increases concentration of land ownership.
This result suggests that, contrary to the hypothesis, land holdings in central Uganda may be more evenly distributed in the presence of more active land markets. Gini coefficients calculated to measure inequality of land distributions were highest in the two sub-counties thought to have the least active land markets, suggesting that land is less equitably distributed in the sub-counties with less active land markets than in the sub-counties with more active land markets. However, the Gini coefficients in all four sub-counties are fairly large, indicating that land is not perfectly evenly distributed in any of the sub-counties.

8. Land market activity is associated with landlessness or imminent landlessness.
This survey provides little to no evidence of land market-derived landlessness in central Uganda. This is perhaps most strongly supported by the fact that of the 105 landless households interviewed, only 14 ever held any permanent-tenure parcels of their own. Only six "lost" their land through the market, and the parcels of three of those were sold by someone without the actual holder's knowledge or consent. Thus, it appears that many of the landless households in the sample stand to benefit from the existence of the land market, if they can raise the cash resources necessary to bid successfully for land.

Of course, as noted previously, it is possible that there have been incidents of households leaving the village after being rendered landless through participation in the land market. The survey methodology of this research did not allow such households to be captured in the sample.

9. Land markets improve access to land by traditionally excluded individuals such as women and ethnic minorities.
There are two noteworthy results about land markets and access to land by female-headed and non-Bagandan households. First, land market participation is a statistically significant determinant of household access to land (table 5.22). This is true for all central region

households, not just specific types of households. In this way, land markets increase household well-being. Second, the results support the hypothesis that land markets improve female-headed households' access to land in central Uganda. Female-headed households purchase land more frequently, and purchase a larger proportion of their holdings, than male-headed households. (Access to land by female members of male-headed households could not be assessed because intra-household data were not collected in the survey.) Similar observations were made for non-Bagandan households relative to Bagandan households, but the results were not statistically significant.

10. Land market activity increases access to land by commercial farmers.
Evidence from this survey supports the hypothesis that land market activity increases commercially-oriented farmers' access to land. The results of a regression model for parcel purchase (table 5.9) indicate that parcels held by more commercialized households are more likely to have been purchased than those held by less commercialized households.

11. Land market activity increases the incidence of fixed-place agricultural investment and yield-enhancing agricultural practices.
Analyses of fixed-place agricultural investments provide conflicting results. In regression models of selected fixed-place investment activities (tables 5.27 and 5.28), the coefficient estimated for a dummy variable indicating parcel purchase is statistically significant in the grass strips and access road models. A parcel's being purchased increases the likelihood that the holder will construct an access road to it, and decreases the likelihood that he will plant grass strips on it.

No statistically significant relationship was found between land market activity and yield-enhancing agricultural practices. The coefficient estimated for parcel purchase is not statistically significant in the models for the occurrence of any of the agricultural practices considered (tables 5.29 and 5.30).

Measurement of fixed-place investments and agricultural practices was not very detailed. A simple binary variable indicating whether the investment or practices was conducted was used, and may have failed to capture the hypothesized relationships in the majority of the models.

6. CONCLUSIONS

6.1 INTRODUCTION

For the last quarter-century, economists have debated the role of freehold land tenure in encouraging the emergence of land markets, the role of land markets in achieving economically efficient land allocations and use patterns, and whether traditional African tenure systems might evolve in a manner consistent with the tenets of neo-classical economic theory. Largely as a result of theoretical economic arguments asserting that individualized land tenure and land markets are necessary to maximize growth in the agricultural sector, African governments and international development organizations have espoused formally registered freehold tenure in sub-Saharan African countries. However, little empirical evidence exists either to support or to refute hypothesized relationships between land rights, land markets, access to land, and agricultural production.

In Uganda, debate about a national land policy reform has culminated in the *Tenure and Control of Land Bill* now under review by the National Executive Committee of the National Resistance Council; this bill would introduce freehold tenure throughout Uganda. Mailo land, a form of freehold tenure, has operated on approximately half the land area of Uganda's central region (formerly Buganda) since 1900. The traditional tenure system remained on the other land area of central Uganda and has continued to function alongside the formally individualized mailo system since then, although in an evolving form. Land markets have operated for at least 70 years, during which settlement rates have increased and agricultural marketing opportunities have expanded. Implementation of the proposed legislation throughout Uganda may benefit from information about the effects of land markets on rural households' access to agricultural land in central Uganda.

Thus, central Uganda offers a suitable arena in which to seek evidence to test hypotheses about relationships among land rights, land markets, and land access and use. In addition, there is an immediate need for such information to inform the national land tenure policy decisions currently underway in Uganda. The issues examined in this research range from hypotheses about the influence of population density and agricultural commercialization on the individualization of land rights and the emergence of land markets, to hypotheses about how resultant land markets affect rural households' access to land and the consequent prospects for land distribution, commercialized agriculture, and agricultural investment. Data collected through a household sample survey in central Uganda were used to test these hypotheses. This chapter reviews the results of hypothesis tests with respect to the validity of the theory of the evolution of rural African land markets developed in chapter three. This chapter also considers some methodological limitations of this research, discusses the implications of the results for land policy in Uganda and elsewhere in sub-Saharan Africa, and proposes topics for future research.

6.2 RESULTS OF HYPOTHESIS TESTS AND CONCLUSIONS ABOUT THEORY

A description of rural African land market evolution was developed in chapter three. Concepts from neo-classical and institutional economic theories were synthesized to formulate a three-

stage evolutionary path for rural African land markets. In each stage, different conditions of population density (PD), commercialization of agriculture (COA), and responding land tenure rules influence land transactions and affect rural households' access to land for agriculture.

The first stage of the hypothesized path is characterized by low PD and limited or no COA. Labor is scarce, and land is in surplus. Traditional land tenure systems, in which membership in some group, often kinship based, is important, govern individuals' access to land. Group authorities grant to all eligible group members use rights to some minimum area of land sufficient to support their household, assuring at least subsistence "income" for group members and protecting against landlessness and poverty within the group. Land is not priced, and land markets do not exist.

Over time, as settlement densities increase and markets for farm output develop and expand, the value of access to land increases, and the evolutionary path enters stage two, in which individuals claim increasingly individualized land rights, ultimately to the point that they gain the right to sell their parcels, and land markets emerge and become more active as PD and COA continue to increase. The operation of active land markets affects land distribution and use, as land market activity may contribute to fragmentation of land holdings, subdivision of land parcels, concentration of land ownership, and changes in access to land by female-headed households, commercial farmers, and ethnic minorities.

A third stage in the evolution, in which land markets exhibit a significant decrease in activity or cease to operate altogether, may occur beyond some extremely high level of PD. Under extreme population pressure, land parcels may be so subdivided and holdings so small on average, that individuals become unwilling to sell what land they retain, especially in the absence of a non-agricultural labor market that offers income-earning potential.

To test hypotheses about individualization of land rights, rural land market emergence, and the effects of land markets on households' access to land, a sample of households from central Uganda was interviewed about their socio-economic characteristics and their land tenure, access, and use. A cross-sectional study was conducted because time series data were not available. Households were sampled from specific areas of central Uganda with known PD and conjectured levels of COA in order to control for the effects of these variables as well as to proxy for changes in them which might occur at a single site over time. The data were analyzed to examine relationships hypothesized in chapter three. A detailed discussion of data analyses and results was given in chapter five. What follows is a summary of the outcomes of the hypothesis tests which focuses on what they suggest about the validity of the evolutionary path of rural African land markets and individual hypotheses presented in chapter three.

Economic theory hypothesizes that, as PD and COA increase, the benefits to individuals of land access and use increase, giving individuals increased incentives to claim more individualized land rights. Even if formal individualization of tenure does not occur, individuals and groups may independently conduct institutional transactions to yield new rules under which individuals gain expanded bundles of land rights. Results of analyses of customary and mailo tenants' land rights in central Uganda suggest that, as predicted by economic theory, land rights generally become more individualized as PD increases. However, the results do not

wholly support the hypothesis that land rights in a rural African community become more individualized in a linear and unlimited fashion as PD and COA increase.

First, the results provide limited support for the hypothesis that land rights tend to become more individualized as PD increases from initially low levels. Overall land rights in central Uganda appear to be highly individualized across all tenures. In addition, in central Uganda, increased PD increases the likelihood that parcel holders have the rights to sell and pledge their tenancies. However, increased PD decreases the likelihood that they have rights to exclude others from various uses of their parcels.

The overall high level of individualization in central Uganda no doubt results in part from history. Mailo ownership, for which rights data were not gathered, is fully individualized de jure under the 1900 Uganda Agreement, a regulation which has been reinforced by practice. Mailo tenancy is also formally individualized, having been defined and standardized by 1928 legislation. However, the inception of mailo tenancy occurred through a continuation of the traditional tenure system on areas in which the mailo tenure system had been introduced. As both PD and COA increased (COA particularly through the introduction of cotton as a cash crop), mailo tenants claimed increasingly individualized rights over their tenancies, and the tenure form was not officially legislated until this expansion and mailo owners' attempts to limit it caused considerable tension. Customary tenancies also became increasingly individualized fairly early, despite the fact that this tenure form was not formally defined or individualized until relatively recently. As early as the 1920's, individuals claimed, and even purchased, rights to areas of land that had been left under the customary system. Thus, while all three tenures are clearly products of history, this research demonstrates that, at present, increased PD increases individualization in that it increases the likelihood of tenants' possession of various specific rights.

Second, increased COA decreases the likelihood that mailo and customary tenants possess rights to plant and cut trees on their parcels, which contradicts the hypothesis advanced, and may indicate that various authorities (the mailo owner in the case of mailo tenancies, a local authority for customary tenants) attempt to limit the expansion of individuals' rights, or to expand their own claims, as land use becomes more potentially valuable. Results from this survey also indicate that increased PD appears to decrease parcel holders' ability to exclude others from traditionally communal use rights, suggesting that rural African communities may react to increased population pressure by reverting to, or refusing to relinquish, some joint uses of land, which may be prudent under conditions in which average holdings are shrinking. Both of these are economically rational responses by individuals and groups with positional advantage to changing economic conditions.

Thus, while increased PD and COA appear to prompt a general trend toward more individualized land rights, in an African setting in which some land use has traditionally been communal and in which authority figures have had the power to limit individuals' land rights, the process of individualization may not consist of a strictly linear progression of successive additions of rights to individuals' bundles. Very importantly, it appears that individuals gain the right to sell their parcels as PD increases. Results in this research clearly indicate that increased PD increases the likelihood that a mailo or customary tenant possesses the right to sell his

parcel, a finding supported by history. Over time, although officially prohibited from doing so, mailo tenants began to sell their parcels, at first clandestinely but then increasingly openly. Customary tenants proceeded in basically the same manner, even though they did not even hold a property form that was initially deemed saleable. This is highly significant because the right to sell is essential for the emergence of land markets.

The theory advanced hypothesizes that land markets will not function until increases in PD and COA prompt sufficiently individualized land rights for individuals to gain the right to sell their parcels. Once land markets emerge, land market activity is hypothesized to increase as PD and COA increase, with the possibility of a substantial decline in land market activity under conditions of extreme PD and the absence of a robust non-agricultural sector. The first stage of the hypothesized evolutionary path, in which land markets do not operate, could not be examined in central Uganda because land markets already function throughout the region, probably due to the region's tremendous fertility, its relatively dense settlement patterns, and its land tenure history.

The evolutionary path presented in chapter three hypothesizes that, once land markets emerge, land market activity increases with PD and COA, although it may decline if PD exceeds some threshold level. The results of this research strongly support this hypothesis. Furthermore, the results suggesting the concavity of a curve depicting land market activity versus PD are very important. First, the finding that land market activity will increase as PD increases allows hypothesized outcomes that depend on land market operation. Second, the possibility of a third-stage decline in land market activity under extreme PD suggests that economic theory must be applied with a clear recognition of the setting, in this case rural Africa. Economic theory has been applied by some economists to suggest that land market activity increases as PD or COA increases, without ever declining. However, economic theory allows for the possibility that the land market may decline under extreme PD in rural African settings in the absence of a healthy non-agricultural sector. There are two possible explanations for this, both of which are consistent with the tenets of economic theory when the context is viewed from the perspective of the rural African smallholder.

First, under conditions of extreme settlement pressure, average holdings become very small. The area of land that households retain may be at or below the minimum required to sustain a household. In addition, the land that households retain may hold special meaning to them--it may contain their house or ancestral graves or have some other unique feature. Under these conditions, and in the absence of an absorbent non-agricultural labor market, it is natural that holders' reservation prices for land become very high, perhaps high enough to freeze land market activity, because the opportunity cost of parting with the land could be starvation.

Alternatively, consider the economic purpose of the traditional restriction on land sales in most customary African tenure systems. This ban, accompanied by the granting of use rights to every eligible group member, guaranteed access to land by all (scarce) units of labor in the society and assured at least a minimum "income" to all households or individuals, thereby preventing landlessness and abject poverty. Under extreme PD, with shrinking land holdings and the absence of a healthy non-agricultural sector, the reassertion of traditional prohibitions on land sales may serve the purpose of preventing the creation of a landless class.

According to neo-classical economic theory, individuals' land tenure security is related to both individualized land rights and land market activity. Individualization of land rights is said to increase a land holder's tenure security by increasing the clarity, certainty, and strength of his land rights, thereby decreasing his perception of the probability that his continued possession of those rights will be successfully challenged by anyone positionally advantaged to arbitrarily use or otherwise manipulate instruments of power. The direction of causality between land market activity and tenure security is less clear. A certain degree of tenure security may be necessary for land market transactions to occur, or the operation of land markets may increase individuals' security, or both. Thus, tenure security is hypothesized to be positively correlated with land market activity and to increase as land rights become more individualized.

This research, however, provides little support for either of these hypothesized relationships. Regression models did not find possession of various land rights to be statistically significant determinants of parcel holders' perceived tenure security. In addition, although the proportion of holders of purchased parcels who perceive their tenure to be secure is higher than the proportion of holders of parcels acquired through other means who perceive their tenure to be secure, a regression model did not find purchase to have a statistically significant effect on tenure security. Thus, this research suggests that there is no direct relationship between individuals' perceived tenure security and either individualization of land rights or land market activity.

This finding could be attributed to two factors. First, it could be that tenure security is in fact unrelated to land market activity and individualization. However, this is not an intuitively appealing explanation for the results of the hypothesis tests. Most parcel holders in central Uganda perceive their tenure to be secure, and land tenure in central Uganda is today highly individualized. Additionally, most individuals who purchased their parcels perceive their tenure to be secure while fewer holders of non-purchased parcels feel their tenure is fully secure. Both of these observations suggest that there may be some relationship between tenure security, purchase, and individualization.

A more palatable explanation is that results of the hypothesis tests are attributable to any of various aspects of the research method. As an example, a time series analysis (rather than the cross-sectional approach used in this study) may have revealed the hypothesized relationships. If there is any lag between, for instance, changes in individualization of land rights and changes in perceptions of tenure security, a time series approach may be needed to assess these hypotheses. In addition, the use of a binary variable to measure tenure security is admittedly weak. Measurement of individuals' perceptions of their likelihood of retaining specific rights or use of a multi-valued measure of tenure security may be more sound.

Land market activity is hypothesized to increase fragmentation of land holdings. Market transfers of land can fragment holdings as households purchase parcels that are not contiguous with other land they acquire. Evidence from this survey strongly supports this hypothesis. Analyses of the survey data show that household land market participation increases fragmentation in that it increases the number of discontiguous parcels a household possesses. This is reasonable. Given the high number of parcels in a village, there is a low probability that

a parcel adjacent to a particular household's holdings becomes available for sale. The result is that in purchasing an additional parcel, the household fragments its holdings.

Critics of land markets assert that, in developing countries, this process will lead to excessively fragmented holdings, precluding farmers' ability to take advantage of economies of scale in agriculture as they enlarge their holdings. However, this does not appear to have occurred in central Uganda, although household participation in the land market does appear to increase fragmentation there. In most cases, the average distance between a household's homestead and its parcels is not large enough to prevent the household from cultivating them. In addition, of the land market and inheritance (which can also be an agent of fragmentation), only the land market can counteract fragmentation by offering households a means of consolidating their holdings by acquiring parcels adjacent to their other land. In the presence of land markets, individuals even have the option to sell distant parcels, and the revenue from such sales can be used to purchase land closer to their homestead or other parcels.

Three interrelated effects are also hypothesized to be related to land market activity. One hypothesis is that land market activity will contribute to increased subdivision of land as individuals sell sub-sections of parcels. In this survey, purchased parcels tend to be smaller, on average, than parcels acquired through other means. However, in a regression modeling parcel size, parcel purchase was not found to be a statistically significant determinant of parcel size. Thus, while average parcel size appears to support the hypothesis that purchased parcels are more subdivided than non-purchased parcels, the hypothesis is rejected when other factors that affect parcel size are controlled for. Non-market transfers, such as inheritance, may reduce parcel size just as much as land sales.

A second hypothesis is that land markets increase concentration of land ownership because, if land is saleable, wealthy individuals can acquire as much land as they can afford, regardless of whether they plan to cultivate it. The possible results of ownership concentration include skewed land and income distributions and reduced access to land for at least some households. In a rural area in which virtually all households rely on agriculture for subsistence, the need for all households to have access to a reasonable area of land for farming is unquestionable. In this research, Gini coefficients were calculated to measure the distributional inequality of land in the sample. The result suggests that, contrary to the hypothesis, land holdings in central Uganda may be more evenly distributed in the presence of more active land markets. The land tenure history of the central region indicates that the land market played a substantial role not only in breaking up the original mailo estates but also in permitting access to mailo land by individuals not related to the original recipients. Thus, as long as speculative land purchases are not widespread, rural land markets may, counter to the hypothesis advanced, provide increased access to land, which can lead to more equitable land, and therefore income, distributions.

Lastly, land markets' potential contribution to the creation of a landless class of households has been cited in objection to the operation of uncontrolled land markets in developing countries where the migration of a landless rural class to urban areas in search of work could strain the urban economy. The theory stems from the hypothesis that land markets will concentrate land ownership as poor individuals, especially those with cash-need emergencies, engage in distress sales, gradually selling all of their land and becoming landless. This research, however, found

very little evidence of land market-derived landlessness in the areas surveyed. Of the 105 "landless" households interviewed, only six previously held parcels which they sold, and only eight others previously owned parcels. The balance started out landless and have yet to acquire an initial parcel through any means. Therefore, contrary to the theory advanced, it appears that land markets, rather than causing or contributing to landlessness in central Uganda, may provide landless households a means by which to escape landlessness.

Neo-classical economic theory has also been applied to hypothesize that certain types of individuals whose access to land under traditional African tenure systems was limited or restricted may have increased access in the presence of (through participation in) land markets. This appears to be the case for female-headed households in central Uganda. Data analyses indicate that female-headed households are more likely than male-headed households to purchase land and that female-headed households purchase a larger share of their holdings than do male-headed households. (Access to land by female members of male-headed households was not analyzed because intra-household data were not collected.) While comparable results related to non-Bagandan households in central Uganda were not statistically significant, rapid appraisal interviews and informal conversations with local authorities suggest that the land market is also an important means of access to land for them, particularly in areas where non-Bagandan comprise a local minority (as opposed to some areas in which they are a local majority even though they comprise a region-wide minority).

Additionally, one of the most compelling claims made by advocates of formal individualization of tenure is that land markets will enable commercial farmers to obtain additional land to expand their area of production, which will contribute, ultimately, to increased agricultural output and economic growth in the agricultural sector. The explicit hypothesis in this study is that land market activity increases access to land by commercial farmers. This survey provides evidence that land markets may indeed play a crucial role in facilitating the acquisition of additional land by households capable of expanding their area of cultivation. Regression results indicate that parcels held by more commercialized households are more likely to have been purchased than those held by less commercialized households.

Thus, the findings of this research support the general hypothesis that land markets increase access for certain types of households relative to those households' access through traditional allocative channels. Specifically, these results support the hypothesis that land markets increase female-headed and commercial agricultural households' access to land. This implies that the promotion of rural land markets could not only help traditionally excluded groups of individuals get land (thereby preventing their reliance on an already strained public sector for support), but could also be an important component of economic development because the land market appears to help increase agricultural output by allowing commercial farmers to acquire more land to cultivate.

Finally, application of neo-classical economic theory to land leads to the hypothesis that the emergence of land markets encourages the greatest investment in agriculture and the greatest practice of productivity-increasing agricultural techniques. There is little evidence in this survey that market activity influences the likelihood that parcel holders carry out various fixed-place agricultural investments or engage in various productivity-enhancing agricultural

practices on their parcels. Thus, this study fails to provide evidence on the basis of which to reject or to accept this hypothesis. Failure to discern a statistically significant relationship between land market activity and investment may have resulted from the measurement of "fixed-place investment" and "yield-enhancing agricultural practices" through binary variables reflecting the presence or absence of the activity rather than through measurement of the costs incurred in conducting it, the frequency in which it is practiced, or some other more detailed measure of investment activity. This may be a difficult hypothesis to test in that the concepts are difficult to operationalise, and this area of the theory may be, ultimately, impossible to test empirically.

6.3 METHODOLOGICAL LIMITATIONS OF THIS RESEARCH

The households interviewed in this survey were sampled according to a three-stage design. In the first stage, study sub-counties in central Uganda were purposively selected. This facilitated controlling for variation in PD and COA, allowed the incorporation of qualitative information about the sub-counties from a preliminary rapid appraisal, and reduced the sampling area (a necessity due to a lack of a regional sampling frame). Because household sampling frames were also unavailable at the sub-county level, in the second stage, survey villages were sampled from each of the selected sub-counties by probability proportional to size. Village-level sampling frames were then constructed (at lower cost than would have been incurred at either the regional or sub-county level) by visiting and enumerating each household in each sampled village. These frames were stratified on the basis of households' land tenure. Finally, in the third stage, households were randomly sampled from the land tenure strata in each village, yielding the household sample.

Probably the foremost limitation of this research derives from its cross-sectional design. A time series analysis would have been preferable, as the emergence and activity level of land markets and their influence on households' access to land are clearly processes which develop over time. However, lack of time series data precluded a time series analysis in this research. Alternatively to the cross-sectional analysis conducted, a case study approach could have been used. Case studies would have revealed many details of interest about the households studied, including their pattern of land acquisition throughout their life cycle, but the representative quality of the households studied would have remained unknown.

There are three major concerns about the cross-sectional approach with respect to this research. First, the use of several sites with differing levels of PD and COA to proxy for the evolution of a single site over time assumed that all sites advance similarly with respect to demographic and economic conditions and agents' responses to them in their decision making. This is perhaps an unrealistic assumption. Technology, topography, climate, and proximity to urban centers all vary geographically, thus making every locale at least minimally unique. Furthermore, in African societies, the ethnic mix present, which may influence inter-household relationships with respect to land, may vary substantially across locales.

Second, any cross-sectional analysis portrays household characteristics at only a single point in time. Observed characteristics may be lagged effects of past events. This may be particularly true for land relationships, land markets, and access to land in a rural African setting in which there may be a significant generational (or other time-related) element to land transactions and

acquisition. The implication for this research is the risk of basing conclusions about land market effects, which are the result of *past* land market transactions, on analyses of *current* land market activity.

Third, there may be an argument for considering the hypotheses tested in this research as a simultaneous system. If the hypotheses are written as a system of equations along the lines of, for example,

$$\textbf{Land Market} = f(PD, COA, \ldots) \quad (6.1)$$

$$\textbf{Fragmentation} = f(\ldots \textbf{Land Market}, \ldots) \quad (6.2)$$

and so on, where bold type indicates that a variable is endogenous to the model, it is clear that the endogenous land market variable enters equation 6.2 (and would enter equations for subsequent hypotheses) on the right-hand side, suggesting that the equations should be estimated simultaneously in the cross-sectional analysis.

There are two counter-arguments to this, however. First, with the possible exceptions of land tenure security and subdivision of land parcels, there is thought to be no causal simultaneity between land market activity and other concepts (such as security and subdivision). Thus, the argument for estimating the equations simultaneously does not appear to be upheld at the conceptual level. Second, the relationships embodied in the hypotheses really occur over time. Ideally, they would be tested through a time series analysis, in which current land market activity would be a function of current and past population density and commercialization of agriculture, and current fragmentation (and other effects of land markets) would be a function of past land market activity. In this case, the explanatory variable on the right-hand side of equation 6.2 above would be some lagged value of land market activity, which would not be endogenous to the model.

Another limitation of the research resulted from an omission in questionnaire design, resulting in the failure to collect land rights data from mailo owners of non-tenanted land. This prevented the inclusion of land owners in the analyses of land rights individualization. As a result, neither the degree of individualization of mailo and customary tenancies relative to outright land ownership nor the reaction of individualization of mailo ownership to increases in PD and COA could be assessed empirically.

In addition, the possibility that the survey missed a whole class of truly landless households cannot be disregarded. By definition, all "households" in the communities surveyed have access to at least enough land on which to reside, even if they do not own that land. Landless households who have emigrated from the survey sites had a zero selection probability. Although neither qualitative information gleaned from the survey nor rapid appraisal interviews suggest that such emigration occurs, the possibility that a class of truly landless households exists must be acknowledged.

Statistical concerns arose from the combination of probability proportional to size sampling and stratified random sampling in the survey design. This combination was necessary because

of a lack of sampling frames (not an unusual problem in developing countries) and to ensure that all tenure types were represented in the sample. However, because it did not preserve equal selection probabilities for all households in the survey population, this design necessitated the use of weights in the estimation of population parameters (such as means) and their variances. Searches of the statistics literature and consultations with statisticians raised substantial concerns that the variances calculated would be biased.

Consequently, hypothesis tests were based on regression results rather than on comparisons of group means. However, since, in several cases, informal comparisons of group means suggested relationships that either supported or refuted the hypothesis under scrutiny, complementing regression analyses with formal tests of differences between group means to see whether they generated results consistent with regression results would clearly have added to the strength of the research.

Another empirical concern relates to the operationalisation of concepts central to the subject of land rights, land markets, and their effects on access to land and agricultural productivity. Two examples from this research are "security" and "investment." The statistical insignificance of the results of analyses about these concepts may have resulted more from definitional problems than from indefinite relationships between the variables of interest or of misspecification of models. Both of these concepts were measured through binary variables. Clearly, this is overly simplistic, and better measures are needed. For security, an improved measure could be the household's level of concern about losing particular rights rather than overall access to a parcel. For investment, a superior measure might be the value of labor and materials used in carrying out the investment activity.

Lastly, as with any social science research, the generality of this research must be addressed. The central region of Uganda is unique in several respects. Its fertility for agriculture is above average within Uganda and probably within Africa, and its topography is certainly unique within Uganda. The hierarchical and competitive nature of Buganda's traditional system of government was probably somewhat unique, and may have contributed significantly to Bagandans' almost immediate embrace of the mailo tenure system following its inception. Additionally, the mailo system itself is unique to central Uganda. Finally, the location of the region in Uganda, particularly its proximity to the capital city, probably has led to an above-average prevailing level of education and technology in the region.

However, any research setting is unique. If concern about this prevented research, knowledge might never advance. Additionally, while central Uganda is indeed unique, its distinctive characteristics may not lead to substantial differences between land relations there and those elsewhere in Uganda or sub-Saharan Africa. For example, according to historical accounts, the customary land tenure system of central Uganda shared common features with tenure systems indigenous to other parts of the country and sub-Saharan Africa. In addition, the mailo tenure system which was implemented in central Uganda is unique, but it is a form of freehold tenure, which has been implemented or may be implemented in other African countries. Thus, individuals elsewhere in Africa might reasonably be expected to interact with respect to land similarly to residents of central Uganda.

6.4 POLICY CONCLUSIONS

It is evident from this survey, from the preliminary rapid appraisal, and from informal conversations with numerous individuals ranging from government officials to rural producers that land markets function in central Uganda. It is also evident, particularly from the survey and RRA results, that land market activity varies spatially and affects access to land and outcomes which are influenced by land access. The *Tenure and Control of Land Bill* would institute freehold tenure throughout Uganda, with the possible exception of some urban areas. In central Uganda, mailo land, a form of freehold tenure, has existed and influenced tenure relations since 1900. The traditional system of the region also remains, albeit in what must be a significantly evolved form. Land markets have operated for at least 70 years, although they may have experienced fluctuations in activity level over time. Several of the findings of this survey about land markets and access to land in central Uganda are specifically relevant to Uganda's current policy decisions as well as more generally applicable to issues of land rights, land markets, and land access and use throughout sub-Saharan Africa.

First, while the proposed legislation will certainly encourage the functioning of land markets by establishing a land rights structure that can foster their operation, it is probably not necessary for the emergence of land markets. In fact, some form of market in land rights probably operates on customary land in many areas of Uganda (and sub-Saharan Africa) at present. Respondents in the rapid appraisal at numerous sites outside the central region reported that land sales occur in their locales, many of which do not have freehold tenure. Both freehold and other tenure forms are reportedly transacted. The high number of mailo and customary tenancy sales in the survey demonstrates that neither a freehold bundle of rights (although both of these tenures are highly individualized) nor legal permission to sell is necessary for the transfer of parcels through land markets. Thus, in many cases the goal of fostering land markets can probably be achieved by permitting customary systems to evolve in response to increasing population and/or agricultural commercialization as they occur. This approach would avoid the costs of formulating, implementing, and enforcing formal individualization policy, and would probably bring the emergence of land markets at the point at which their operation is economically efficient. However, given that Uganda also has the goal of creating a uniform tenure system nation-wide within a predictable time period, the need for legislation there is evident.

While it is not possible to know exactly how the variety of customary tenures practiced throughout Uganda and sub-Saharan Africa would respond to formal individualization of land rights, increased PD, and/or increased COA, evidence from this survey indicates that customary tenure in the central region is today an evolved form which is highly individualized compared to its traditional characteristics. The causes of this individualization are not clear. It may have resulted from customary tenants' response to increased land values due to increasing PD or COA, or from their response to the observed benefits of the full bundle of ownership rights, including the right to sell, conferred by mailo tenure. Whatever the cause, since central Uganda's customary tenure system (in its traditional form) shared many characteristics of indigenous African tenure systems in general, customary systems elsewhere in sub-Saharan Africa might reasonably be expected to evolve along a similar (though surely not identical) path and to become generally more individualized when exposed to increasing PD, increasing COA, and/or formal individualization initiatives.

Second, land markets appear to be instrumental in helping various types of households gain access to land. The examples from this survey are the rural "landless" who have yet to acquire an initial parcel of their own, female-headed households whose likelihood of gaining land rights through inheritance is lower than males', and ethnic outsiders. For these groups, and possibly others, land markets may provide crucial access to land, and, importantly, not necessarily to the detriment of other households' access. Thus, governments interested in assisting these groups should encourage the operation of truly competitive land markets in which the personal traits of the bargaining parties are irrelevant in determining access.

An extension of this relates to commercial farmers' access to land and the potential for increasing agricultural output and economic growth. The results of this survey suggest that households who have purchased land have significantly larger holdings than households who have not, and demonstrate that holding size and agricultural income are interrelated, which indicates that land markets make it possible for agricultural producers with a commercial orientation to gain the additional holdings they need to expand their production to commercial levels. While land markets alone will probably not markedly boost commercial agricultural production, their absence may constrain growth of commercial agriculture if commercially oriented producers are unable to expand their holdings through traditional channels of access.

Third, the possible decline in land market activity under extreme PD is very important to national policy, especially in developing countries, where the creation of a large class of landless households could strain the urban economy. If the land market ceases to operate beyond some level of PD, which this survey provides evidence of, some households may be unable to gain access to sufficient areas of land to subsist. Therefore, policy makers need to be watchful of rural households' access to land in extremely densely settled areas.

The absence of a growing non-agricultural sector may be central to the decline in land market activity; if such a sector existed near an extremely settled rural area, the land market might not cease to operate. Thus, successful promotion of non-agricultural enterprises will provide a absorbent non-agricultural labor market in which landless households can earn at least subsistence income, and should induce households with sub-economic-sized parcels to sell their land and enter the non-agricultural labor market. If this were the case, the land market would continue to operate. In addition, governments might implement policies geared toward the prevention of extreme settlement, such as regional or national advertisement of land availability in less populated areas.

Fourth, as land rights become increasingly individualized and especially as land markets emerge and become more active, the need for accurate records of boundaries, ownership, and land transactions will increase. This information will of course facilitate academic research (for example, by permitting time series analyses of land markets), but it will also be at least as useful to policy makers and governments because it can be used to monitor markets, to help enforce a system of land taxation, and to prevent or settle land disputes. However, any record-keeping system will be costly, with the exact cost depending on what activities are undertaken as part of the system. For example, minimal documentation of what land is held by specific individuals will cost less than a comprehensive system of surveying, titling, and registration. In

a developing country, where funds are scarce, there is an opportunity cost of any use of funds. In Uganda, where the AIDS epidemic rages, the opportunity cost of using scarce funds to establish and maintain a system of land records is the foregone benefits that would accrue from directing those funds toward AIDS care and research.

Furthermore, the cost of a land records system must be weighed against the benefits it produces. The benefit of registration accrues to the individual in the form of increased tenure security, increased land value, and perhaps an enhanced ability to transfer or mortgage the property. Any resulting increase in agricultural investment or productivity, or reduction in the incidence of land disputes will generate national-level benefits. The major national-level benefits therefore occur through aggregation of benefits that accrue first at the individual level.

Under a program of systematic comprehensive registration, it is likely that, at least for some parcels considered at the national level, the benefit will be less than the cost. This could occur because the land holder does not wish to expand or intensify his agricultural operation due to age, availability or cost of labor, or other reasons that are economically rational for that individual. Aggregated to the national level, much spending will be targeted at registration of parcels for which there is no immediate benefit. If government had excess reserves of foreign exchange or a large operating budget surplus, the investment in low-benefit registration might be more easily justified than when government's budget is in deficit and the opportunity cost of capital is quite high.

The land market offers a mechanism to achieve almost the same benefits as more systematic registration, but at a potentially lower cost. Registration could proceed only at the time of a land transaction, and only for land owners who specifically request registration. Most likely, land registration would proceed in a spatially scattered manner, although many parcels in an area with high demand might be registered at about the same time, so that pockets of registered land might naturally evolve around the country. People would be prompted to register their land only when the benefits of gaining title outweigh the costs to them. Registration would be more likely to occur on a wider scale in areas where land values and productivity in agriculture are sufficiently high to make it valuable to people to title their land or to seek to buy titled land. Costs to government would be significantly reduced from the high level associated with systematic comprehensive registration, and would be much more in balance with aggregate benefits.

Thus, because of the high costs associated with systematic comprehensive registration or other record system and because of the extreme scarcity of funds facing African governments, some less costly land records system might be more feasible as well as more justified. Documentation of land market transactions as they occur is one possibility. Another possibility (or one possible way of collecting the proposed land market-based records) is the collection and maintenance of records at the local level by local leaders. In Uganda, resistance council officers could document agreeable land boundaries, land holders, and the details of land transfers in their jurisdictions. Another possibly low-cost option is the incorporation of land records documentation into some existing data collection system.

Fifth, land market participation is dependent on an individual's ability to pay to purchase land. The rapid appraisal conducted prior to this survey found that one of the main constraints on land market operation in central Uganda is prospective buyers' lack of cash. Thus, credit programs to assist households to purchase land might help rural land markets function smoothly. Such programs might take the form of an income-conditioned subsidy program with eligibility defined by income in order to prevent concentration of land ownership.

Sixth, and specific to Uganda, it appears that in the traditional relationship between mailo owners and tenants, owners are better positioned than tenants to claim rights or to limit tenants' rights and that tenants have no immunity to owners' increased claims. Given that mailo tenancy is the tenure of the majority of rural residents and agricultural producers in central Uganda, some protection of mailo tenants' rights might be in justified on the grounds that it would ensure that tenants are not discouraged or prevented from farming by a gradual erosion of their rights by mailo owners under conditions of increasing PD or COA.

6.5 FUTURE RESEARCH

Topics for further research derive directly from some of the conclusions about the theory of land market evolution as well as from the methodological limitations of this study.

First, time series studies of land market operation and household access to land in rural Africa are still needed. Many of the relationships examined in this cross-sectional study would probably be better tested through a time series approach because of the large potential for the access and production effects of competitive land allocation to lag behind the emergence and operation of land markets. In particular, future researchers might study the process of individualization and emergence of land markets with respect to changing PD and COA conditions, or the level of land market activity over time relative to various households' access to and use of land over time. Such studies will provide better academic understanding of land market dynamics, which will also be highly useful to future land tenure policy deliberations in sub-Saharan Africa.

Second, further investigation of the third stage of rural African land market evolution in which land market activity substantially declines would also be theoretically interesting as well as critical to informing sound policy. The danger of the creation of a large landless class in a country with a limited non-agricultural sector and no formal welfare system cannot be understated. Thus, it is important to determine the causes of a decline in land market activity or at least the conditions under which a decline may occur. Since the absence of a reasonably nearby non-agricultural sector is thought to be central for a decline in land market activity under extreme population pressure, it would be logical to undertake such a study in an area with very high PD and the presence of a growing non-agricultural sector. Under these conditions, the land market might be expected to remain active rather than to exhibit a substantial decrease in activity.

Third, the findings of this research strongly suggest that land markets increase access to land by female-headed households relative to the access they gain through non-market channels. However, because no intra-household data were collected in this survey, only female-headed households' access to land was examined. It was not possible to examine access to land by

female members of male-headed households. Instead, it was assumed that if male-headed households have access to land, then female members of those households have access to land, which may not be an accurate assumption for households in rural sub-Saharan Africa. Relaxation of this assumption in the form of an intra-household analysis of joint and independent decision making about access to resources and pooling of production inputs and income by adult male and female members of households could be an important topic for future research. If individualization of land rights and land markets contribute to an increased orientation toward cash cropping and if income and access to land and other resources are not pooled among household members, there could be negative repercussions for households' overall well-being.

Fourth, the operationalisation, measurement, and analysis of various concepts such as "security of tenure" and "agricultural investment" need further examination. Economic theory of land tenure presents clear and convincing hypotheses that individualized land rights and land markets will increase tenure security and agricultural investment, but testing these hypotheses has proven difficult. Perhaps several studies focussing specifically on land markets, security, and agricultural investment would be more suitable for examining the hypothesized relationships. Smaller, more focussed surveys would not weary respondents, and could attempt a variety of definitions and measurements as well as gather evidence from a variety of geographic areas.

6.6 CLOSING

This research provides a quantitative examination of how land rights and land markets evolve in rural Africa as population density and commercial agricultural opportunities increase. It has tested empirically hypotheses derived from neo-classical economic theory of land tenure, which, although previously untested, have often been advanced by policy makers as if they were well-grounded in empirical evidence. It has also contributed insights about the interaction of population density, commercialization of agriculture, and land markets that will help to develop a body of theory which better captures the nuance and complexity of actual market behavior. Additionally, it has demonstrated some of the ways in which land markets may affect rural African households' access to agricultural land. However, this research is only one step on the path toward a fuller understanding and a richer theory of the process of individualization of land rights and the operation and effects of rural land markets in sub-Saharan Africa.

APPENDIX A

MAP OF UGANDA

APPENDIX B

MAP OF THE CENTRAL REGION OF UGANDA

Kibinge, Busaana, Kabulasoke, and Bukuya sub-counties are marked with vertical lines.

APPENDIX C

SURVEY PROCEDURES AND QUESTIONNAIRES

Hiring and training of enumerators, preparation of questionnaires, and household interviews were conducted according to the following steps:

1. Four enumerators were hired to conduct household interviews. Two women and two men were selected from a field of recent graduates from Makerere University in Kampala, Uganda. Of the four enumerators, two were Baganda and two were non-Baganda.

2. The initial questionnaire was drafted in English. Questions were checked repeatedly for clarity of meaning and phrasing.

3. As their first assignment, the enumerators were given copies of the English questionnaire and were asked to translate it into Luganda, the local language of central Uganda. The enumerators were on their honor not to consult with anyone in making their translation. This served to check the enumerators' Luganda skills and to generate four independent Luganda versions of the questionnaire.

4. The four enumerators and I then assembled for a period of several days and read through the English questionnaire and their Luganda translations. I read each English question and explained in detail why I was asking it; then the enumerators read their translated version of the question. The four translations often differed quite a bit with respect to word choice and phrasing! When there were differences, we reviewed the meaning of the English question and debated the merits of the various translations (or even new translation ideas) until the enumerators agreed on a single translation of the question. This process continued until we had generated a complete Luganda version of the questionnaire.

5. The Luganda questionnaire was given to a third party to translate back into English. This person had never seen the original English version of the questionnaire. The back-translated English version was then compared with the original English questionnaire. Any differences that arose were handled by reviewing the goal of the original question and repeating step 4 until a Luganda version was arrived at that captured its meaning.

6. Following the translation of the questionnaire, the enumerators and I held a one-week training session in which we reviewed the importance of confidentiality, thoroughness, and consistency of answers. We did many role-play exercises to prepare for such situations as introducing ourselves, explaining our work, and handling resistant respondents.

7. Following enumerator training, the Luganda questionnaire was pre-tested in several villages in Luwero District over about three days. Luwero District is in central Uganda (where the survey was to take place) but was not one of the actual survey sites. Questionnaires were

checked for length of interviews and adequacy of questions and responses. Interviews during the pre-test lasted almost three hours (too long)! In an attempt to remedy this, questionnaires were again modified to eliminate extraneous questions and, otherwise, to "clean up" the questionnaires in terms of adding and deleting response choices where necessary and so on.

8. The final questionnaire that was generated as a result of the translating, back-translating, and field-testing was duplicated in the print shop at Makerere Institute of Social Research at Makerere University in Kampala, Uganda.

9. We embarked on our field tasks in January, 1992. The first challenge was the construction of village sampling frames for the 16 study villages. We visited each village and hired local officials (RC-I officials) to guide each of the enumerators on a door-to-door enumeration of households in the village. Usually we visited the village the night before we planned to conduct this listing exercise in order to inform the RC-I chairman of our goal and to enlist his/her help in hiring three other official guides for the next day's listing. When we returned to the village the following morning, the guides were usually assembled and waiting for us, and most of the village had been alerted about our presence and the fact that we were on a harmless research mission. Generally the guides would also already have decided among themselves what quarter of the village they were responsible for covering so that there would be no duplication or omission of village households on our lists. Each of the guides then accompanied an enumerator through a quarter of the village, and the enumerators listed the name and gender of the household head and all the types of land (tenure forms) held by (all members of) the household. In all 16 study villages, our listing generated a number of households within three of the number of households found by the 1991 Population and Housing Census, which had taken place about a year earlier.

10. The constructed sampling frames were then stratified on the basis of households' land tenure. Households to be interviewed were sampled from the resulting stratified village frames. The land tenure strata and household sampling procedures are described in chapter 4 of this dissertation.

11. Once a sample of households was drawn for each village, interviews began. Interviews took place during approximately March through June, 1992. Logistically, the process of moving from one interview to the next followed that of constructing the sampling frames. Local RC-I officials' assistance was enlisted in order to help re-write the list of sampled households in a logical order (spatially), to help enumerators locate sample households, and to help reassure villagers that we meant no harm. Guides were not, however, permitted to witness interviews. Indeed, few had the time or desire to sit in on interviews; they generally guided an enumerator to a given household, made the necessary introductions, and then went to their cultivation or other work, returning about an hour and a half later to guide the enumerator to the next household. Alternatively, the current respondent simply guided the enumerator to the next respondent, made the introductions, and told the next respondent that he/she had nothing to fear by agreeing to be interviewed. Enumerators distributed small bars of soap to respondents at the conclusion of the interviews. The soap was intended as a token of appreciation and not as an incentive to be interviewed, and enumerators were not permitted to mention the soap to entice resistant respondents.

12. In most of the 16 villages surveyed, the RC-I chairman insisted that we share a special meal with his/her family at the conclusion of the interviewing process. These were fun times of laughter, picture-taking, and spirited exchange. (Pictures were sent to villages about eight months after my return to the United States.)

Copies of the English and Luganda questionnaires follow.

APPENDIX D

LIST OF LAND RIGHTS INCLUDED IN HOUSEHOLD INTERVIEWS

Use rights:

BLDPERM: the right to build permanent structures on the parcel.

BRICKHOME: the right to manufacture bricks on the parcel for home use.

BRICKSALE: the right to manufacture bricks for sale on the parcel.

BURY: the right to bury the deceased on the parcel.

CUTTREES: the right to cut trees that grow on the parcel.

DIGHOME: the right to dig clay, sand, and gravel from the parcel for home use.

DIGSALE: the right to dig clay, sand, and gravel from the parcel to sell.

FENCEPERM: the right to construct permanent fences on or around the parcel.

FIREWOOD: the right to gather firewood on the parcel.

HUNT: the right to hunt on the parcel.

PLANTTREES: the right to plant trees on the parcel.

Transfer rights:

BEQUEATH: the right to bequeath rights to the parcel upon death.

GIVE: the right to give the parcel to another holder.

LEND: the right to lend the parcel to another user.

PLEDGE: the right to pledge the parcel as collateral in seeking credit.

RENT: the right to rent the parcel to another holder.

SELL: the right to sell the parcel to another holder.

Exclusion rights:

MONOGRAZE: the right to exclude the mailo owner from grazing animals on the tenancy.

MONOPATH: the right to exclude the mailo owner from using footpaths on or through the tenancy.

MONOTREES: the right to exclude the mailo owner from cutting or picking from trees growing on the tenancy.

MONOWATER: the right to exclude the mailo owner from collecting water from sources on the tenancy.

MONOWOOD: the right to exclude the mailo owner from gathering firewood from the tenancy.

OTHNOGRAZE: the right to exclude others from grazing animals on the parcel.

OTHNOPATH: the right to exclude others from using footpaths on or through the parcel.

OTHNOTREES: the right to exclude others from cutting or picking from trees located on the parcel.

OTHNOWATER: the right to exclude others from collecting water from sources located on the parcel.

OTHNOWOOD: the right to exclude others from gathering firewood on the parcel.

APPENDIX E

DEFINITIONS OF VARIABLES

ACINHER: continuous variable indicating the total acreage of all inherited parcels currently held by the household.

%ACBUY: continuous variable indicating the total acreage of all purchased parcels currently held by the household as a percent of households total current acreage.

%ACINHER: continuous variable indicating the total acreage of all purchased parcels currently held by the household as a percent of households total current acreage.

BEQUEATH: variable indicating whether the parcel holder has the right to bequeath rights to the parcel upon his death; N=no, Y=yes, YP=with permission.

BLDPERM: binary variable indicating whether the holder of the parcel has the right to build permanent structures on the parcel; 0=no, 1=yes.

BRICKHOME: binary variable indicating whether the holder of the parcel has the right to manufacture bricks on the parcel for home use; 0=no, 1=yes.

BRICKSALE: binary variable indicating whether the holder of the parcel has the right to manufacture bricks for sale on the parcel; 0=no, 1=yes.

BUNDS: binary variable indicating whether the holder of the parcel has constructed bunds or ridges on the parcel to control soil erosion; 0=no, 1=yes.

BURY: binary variable indicating whether the holder of the parcel has the right to bury the deceased on the parcel; 0=no, 1=yes.

CATTLE: continuous variable indicating the number of cattle the household owns.

COA: binary variable indicating whether the sub-county is considered to have high commercialization of agriculture relative to the other survey sub-counties; COA=1 (yes, high COA) for Kibinge and Bukuya, COA=0 (no, low COA) for Busaana and Kabulasoke.

CUTTREES: binary variable indicating whether the parcel holder has the right to cut trees that grow on the parcel; 0=no, 1=yes.

DIGHOME: binary variable indicating whether the parcel holder has the right to dig clay, sand, and gravel from the parcel for home use; 0=no, 1=yes.

DIGSALE: binary variable indicating whether the parcel holder has the right to dig clay, sand, and gravel from the parcel to sell; 0=no, 1=yes.

FENCEPERM: variable indicating whether the parcel holder has the right to construct permanent fences on or around the parcel; N=no, Y=yes, YP=with permission.

FIREWOOD: binary variable indicating whether the parcel holder has the right to gather firewood on the parcel; 0=no, 1=yes.

GIVE: binary variable indicating whether the parcel holder has the right to give the parcel to another holder; 0=no, 1=yes.

HEADAGE: continuous variable indicating the household head's age in years.

HEADEDU: continuous variable indicating the number of years of formal education the household head received.

HERB:binary variable indicating whether the parcel holder applied chemical herbicide to crops on the parcel during 1991; 0=no, 1=yes.

HGENDER: binary variable indicating the gender of the household head; 0=female, 1=male.

HHACBORR: continuous variable indicating the number of acres the household borrows; total of the areas of all parcels the household borrows.

HHACRENT: continuous variable indicating the number of acres the household rents; total of the areas of all parcels the household rents.

HHACRES: continuous variable indicating the total number of acres to which the household currently has access; equal to the sum of the areas of all permanent-tenure and non-permanent-tenure parcels the household held at the time of the survey.

HHAGINC: continuous variable indicating the amount of the household's cash income earned from sales of crops or livestock products; in Uganda shillings.

HHBAG: binary variable indicating whether the household is Bagandan; 0=no, 1=yes.

HHBORR: binary variable indicating whether the household borrows any land; 0=no, 1=yes.

HHBUY: binary variable indicating whether the household acquired any of the parcels it currently holds through purchase; 0=no, 1=yes.

HHCROPACRES: continuous variable indicating the total cropped acreage of all of the household's parcels.

HHINCOME: continuous variable indicating the household's 1991 cash income, in Uganda shillings; questionnaire only asked households for their primary and secondary incomes, but 230 households had income from only one source in 1991, so the two sources asked about are thought to capture most of the income earned by the other households.

HHNONAGINC: continuous variable indicating the amount of the household's cash income earned from sources other than sales of crops or livestock products; in Uganda shillings.

HHPARCELS: continuous variable indicating the total number of parcels the household holds; includes borrowed and rented parcels.

HHPERMPARCELS: continuous variable indicating the number of permanent-tenure parcels the household holds; excludes borrowed and rented parcels.

HHRENT: binary variable indicating whether the household rents any land; 0=no, 1=yes.

HHSIZE: continuous variable indicating the number of people who comprise the household.

HUNT: binary variable indicating whether the parcel holder has the right to hunt on the parcel; 0=no, 1=yes.

INSECT: binary variable indicating whether the parcel holder applied chemical insecticide to crops on the parcel during 1991; 0=no, 1=yes.

LEND: binary variable indicating whether the parcel holder has the right to lend the parcel to another user; 0=no, 1=yes.

MONOGRAZE: binary variable indicating whether a mailo tenant has the right to exclude the mailo owner from grazing animals on the tenancy; 0=no, 1=yes.

MONOPATH: binary variable indicating whether a mailo tenant has the right to exclude the mailo owner from using footpaths on or through the tenancy; 0=no, 1=yes.

MONOTREES: binary variable indicating whether a mailo tenant has the right to exclude the mailo owner from cutting or picking from trees growing on the tenancy; 0=no, 1=yes.

MONOWATER: binary variable indicating whether a mailo tenant has the right to exclude the mailo owner from collecting water from sources on the tenancy; 0=no, 1=yes.

MONOWOOD: binary variable indicating whether a mailo tenant has the right to exclude the mailo owner from gathering firewood from the tenancy; 0=no, 1=yes.

MULCH: binary variable indicating whether the parcel holder mulched the parcel during 1991; 0=no, 1=yes.

OTHNOGRAZE: binary variable indicating whether the parcel holder has the right to exclude others from grazing animals on the parcel; 0=no, 1=yes.

OTHNOPATH: binary variable indicating whether the parcel holder has the right to exclude others from using footpaths on or through the parcel; 0=no, 1=yes.

OTHNOTREES: binary variable indicating whether the parcel holder has the right to exclude others from cutting or picking from trees located on the parcel; 0=no, 1=yes.

OTHNOWATER: binary variable indicating whether the parcel holder has the right to exclude others from collecting water from sources located on the parcel; 0=no, 1=yes.

OTHNOWOOD: binary variable indicating whether the parcel holder has the right to exclude others from gathering firewood on the parcel; 0=no, 1=yes.

P1920'S: binary variable indicating whether the parcel was acquired by its current holder during the 1920's; 0=no, 1=yes.

P1930'S: binary variable indicating whether the parcel was acquired by its current holder during the 1930's; 0=no, 1=yes.

P1940'S: binary variable indicating whether the parcel was acquired by its current holder during the 1940's; 0=no, 1=yes.

P1950'S: binary variable indicating whether the parcel was acquired by its current holder during the 1950's; 0=no, 1=yes.

P1960'S: binary variable indicating whether the parcel was acquired by its current holder during the 1960's; 0=no, 1=yes.

P1970'S: binary variable indicating whether the parcel was acquired by its current holder during the 1970's; 0=no, 1=yes.

P1980'S: binary variable indicating whether the parcel was acquired by its current holder during the 1980's; 0=no, 1=yes.

PBUY: binary variable indicating whether the parcel was purchased by its current holder; 0=no, 1=yes.

%PBUY: continuous variable indicating the number of its currently held parcels the household acquired through purchase as a percentage of the total number of permanent-tenure parcels it holds.

PCT: binary variable indicating whether the tenure of the parcel is customary tenancy; 0=no, 1=yes.

PD: discrete variable indicating the sub-county's population density, in people per square kilometer; PD=361 for Kibinge, PD=274 for Busaana, PD=89 for Kabulasoke, PD=58 for Bukuya.

PD^2: discrete variable equal to PD times PD.

PDISTANCE: the distance of the parcel from the homestead as estimated in miles by the respondent.

PERENCROP: binary variable indicating whether the parcel holder has the right to plant perennial crops on the parcel; 0=no, 1=yes.

PERMFENCE: binary variable indicating whether the parcel holder has the right to erect a fence made of permanent materials on or around the parcel; 0=no, 1=yes.

PHILLSIDE: binary variable indicating whether the parcel is a hillside; 0=no, 1=yes.

PLANTTREES: binary variable indicating whether the parcel holder has the right to plant trees on the parcel; 0=no, 1=yes.

PLEDGE: binary variable indicating whether the parcel holder has the right to pledge the parcel as collateral in seeking credit; 0=no, 1=yes.

PMO: binary variable indicating whether the tenure of the parcel is mailo or freehold ownership or leasehold of any tenure; 0=no, 1=yes.

PMT: binary variable indicating whether the tenure of the parcel is mailo tenancy; 0=no, 1=yes.

PSIZE:continuous variable indicating the size of the parcel, in acres, as estimated by the respondent.

PSLHILL: binary variable indicating whether the parcel's topography is rolling hills, or not flat, not a hillside, and not a swamp; 0=no, 1=yes.

PSOILBET: binary variable indicating whether the quality of the parcel's soil is better than the area's average, as reported by the respondent; 0=no, 1=yes.

PSOILWOR: binary variable indicating whether the quality of the parcel's soil is worse than the area's average, as reported by the respondent; 0=no, 1=yes.

PSWAMP: binary variable indicating whether the parcel contains any swamp areas; 0=no, 1=yes.

RENT: binary variable indicating whether the parcel holder has the right to rent the parcel to another holder; 0=no, 1=yes.

ROAD: binary variable indicating whether the parcel holder has built an access road on, to, or around the parcel; 0=no, 1=yes.

SECURE: binary variable indicating whether the parcel holder perceives his tenure on the parcel to be secure; SECURE=1 if the holder perceives no tenure insecurity on the parcel, SECURE=0 if the holder perceives any degree of tenure insecurity on the parcel.

SEEDS: binary variable indicating whether the parcel holder planted improved seeds on the parcel during 1991; 0=no, 1=yes.

SELL: binary variable indicating whether the parcel holder has the right to sell the parcel to another holder; 0=no, 1=yes.

STRIPS: binary variable indicating whether the parcel holder has planted grass strips on the parcel as a measure of erosion control; 0=no, 1=yes.

TEMPFENCE: binary variable indicating whether the parcel holder has the right to build a fence from temporary materials (such as sticks) on or around the parcel; 0=no, 1=yes.

TREECROP: binary variable indicating whether the parcel holder has planted tree crops on the parcel; 0=no, 1=yes.

WORKOFF: binary variable indicating whether any member of the household earns income from work performed off the household's land; 0=no, 1=yes.

YRSHAD: continuous variable indicating how long the household has held the parcel, in years.

APPENDIX F

SUPPLEMENTAL TABLES

Table F.1: Frequency counts of rights to customary *kibanja* parcels, by sub-county; frequencies of "yes with permission" responses can be calculated from the numbers in the table

Right	Kibinge (HH) n=6		Busaana (HL) n=74		Kabula. (LL) n=13		Bukuya (LH) n=8	
	No	Yes	No	Yes	No	Yes	No	Yes
FENCEPERM	0	6	9	59	3	9	1	7
PLANTTREES	0	6	3	67	4	8	1	6
CUTTREES	0	6	28	39	2	6	1	4
DIGHOME	0	6	1	71	1	10	1	7
DIGSALE	0	6	7	57	3	9	0	5
BLDPERM	0	6	1	70	1	12	1	7
BURY	0	3	0	61	0	13	0	8
HUNT	0	6	0	70	0	13	0	8
FIREWOOD	0	6	1	70	1	12	0	8
BRICKHOME	0	6	1	70	0	12	0	8
BRICKSALE	0	6	6	60	4	9	0	6
BEQUEATH	0	6	3	69	1	12	0	8
LEND	0	6	3	70	1	12	0	7
RENT	0	6	4	67	1	12	0	7
GIVE	0	6	4	64	1	12	2	5
SELL	0	6	4	65	1	12	1	5
OTHNOGRAZE	0	6	0	72	2	11	1	6
OTHNOWATER	3	3	50	23	13	0	8	0
OTHNOPATH	3	3	33	39	9	4	6	2
OTHNOTREES	0	6	0	73	2	11	1	7
OTHNOWOOD	0	6	1	71	4	9	1	6
PLEDGE	1	4	6	65	6	7	1	7

Table F.2: Frequency counts for responses about rights on mailo tenancy parcels, by sub-county; frequencies of "yes with permission" responses can be calculated from the numbers in the table

Right	Kibinge (HH) n=128		Busaana (HL) n=23		Kabula. (LL) n=80		Bukuya (LH) n=88	
	No	Yes	No	Yes	No	Yes	No	Yes
FENCEPERM	17	88	4	17	5	45	9	66
PLANTTREES	11	98	6	14	13	44	15	67
CUTTREES	30	70	9	9	22	35	28	43
DIGHOME	4	92	1	19	5	56	6	72
DIGSALE	35	46	4	13	15	34	33	38
BLDPERM	4	100	3	16	1	68	2	77
BURY	3	104	1	19	4	54	2	73
HUNT	8	96	1	20	0	74	2	81
FIREWOOD	2	108	0	20	0	71	1	86
BRICKHOME	7	102	0	22	2	64	1	77
BRICKSALE	30	68	4	14	9	40	24	50
LEND	6	98	3	15	5	68	10	68
RENT	30	69	2	16	6	58	10	64
GIVE	25	64	4	12	6	58	23	53
SELL	24	36	3	11	8	48	18	52
OTHNOWATER	75	39	19	1	73	6	84	3
OTHNOPATH	46	70	12	9	43	34	55	31
OTHNOTREES	0	105	0	20	0	68	11	73
OTHNOWOOD	4	109	0	21	14	61	34	52
MONOGRAZE	15	81	7	12	35	30	43	35
MONOWATER	87	21	18	2	73	3	85	1
MONOPATH	67	40	15	5	54	10	70	10
MONOTREES	44	43	9	8	39	17	48	23
MONOWOOD	39	58	8	12	48	15	61	15
PLEDGE	31	49	7	10	18	43	14	60

Table F.3: Number of permanent-tenure parcels whose holders expressed various levels of perceived tenure insecurity, by sub-county; borrowed and rented in parcels not included

# parcels with:	Kibinge (HH) 203 parcels	Busaana (HL) 122 parcels	Kabulasoke (LL) 133 parcels	Bukuya (LH) 151 parcels
No insecurity	178	109	99	120
Slight insecurity	6	7	19	4
Moderate insecurity	6	1	7	17
A lot of insecurity	13	5	5	6
Extreme insecurity	0	0	2	4

Table F.4: Number and weighted proportion of parcels on which fixed-place investments have been made by the current holder or the agricultural practice was carried out by the household during 1991; permanent-tenure parcels only; parcels for which measurement of the investment or practice was not relevant are dropped from the analysis for that investment or practice

Investments and agricultural practices	Kibinge (HH)		Busaana (HL)		Kabulasoke (LL)		Bukuya (LH)	
	# w/	% w/	# w/	% w/	# w/	% w/	# w/	% w/
Applied herbicide	170	21.9	104	2.2	111	11.2	125	3.8
Applied insecticide	170	28.2	104	4.0	111	9.7	124	3.6
Mulched	165	48.0	102	16.3	111	42.4	123	26.4
Used improved seeds	165	34.5	102	12.8	111	32.2	123	20.9
Built access road	112	66.1	78	83.2	62	65.3	92	70.2
Built bunds or ridges	153	63.1	90	33.6	110	41.1	124	20.6
Planted grass strips	144	28.7	84	25.6	102	18.6	117	14.9
Planted a tree crop	185	57.4	107	75.6	112	54.2	113	59.7

REFERENCES

Allan, William. 1969. "Land Tenure and Productivity." In *Population and Food Supply*, edited by J. Hutchinson. Cambridge University Press. Cambridge.

Ault, David E. and Gilbert L. Rutman. 1979. "The Development of Individual Rights to Property in Tribal Africa." *Journal of Law and Economics*. 22: 163-82.

Bank of Uganda, Agricultural Secretariat. 1987. *Final Report: Land Tenure and Soil Conservation*. Working Group on Land Tenure and Soil Conservation. Kampala, Uganda.

Barrows, Richard and Michael Roth. 1990. "Land Tenure and Investment in African Agriculture: Theory and Evidence." *The Journal of Modern African Studies*. 28, 2(1990): 265-297.

Berry, Sara. 1988. "Concentration Without Privatization? Some Consequences of Changing Patterns of Rural Land Control in Africa." In *Land and Society in Contemporary Africa*, edited by R.E. Downs and S.P. Reyna. University Press of New England. Hanover.

Bibangambah, Jossy R. 1981. "An Analytical Overview of the Rural Development Problem in Uganda." In *Rural Rehabilitation and Development*, edited by Apolo Nsibambi and James Katorobo. Makerere University. Uganda.

Boserup, Ester. 1981. *Population and Technological Change*. University of Chicago Press. Chicago.

Brock, Beverley. 1969. "Customary Land Tenure, 'Individualization' and Agricultural Development in Uganda." *East African Journal of Rural Development*. 2(2): 1-27.

Bromley, Daniel W. 1989. *Economic Interests & Institutions*. Basil Blackwell, Inc. Oxford.

Bruce, John W. 1988. "A Perspective on Indigenous Land Tenure Systems and Land Concentration." In *Land and Society in Contemporary Africa*, edited by R.E. Downs and S.P. Reyna. University Press of New England. Hanover.

Carlsen, John. 1980. *Economic and Social Transformation in Rural Kenya*. Scandinavian Institute of African Studies. Uppsala, Sweden.

Carter, David. 1993. Madison Academic Computing Center. University of Wisconsin-Madison. Personal communication.

Cohen, John. 1980. "Land Tenure and Rural Development in Africa." In *Agricultural Development in Africa*, edited by R. Bates and M. Lofchie. Praeger. New York.

Commons, John R. 1990. *Institutional Economics: Its Place in Political Economy*. Transaction Publishers. New Brunswick (U.S.A.).

Currie, J. M. 1981 *The Economic Theory of Agricultural Land Tenure*. Cambridge University Press. Cambridge, UK.

Dorner, Peter. 1972. *Land Reform and Economic Development*. Penguin. Harmondsworth, England.

Eswaran, Mukesh and Ashok Kotwal. 1986. "Access to Capital and Agrarian Production Organisation." *The Economic Journal*. 96(June): 482-498.

Fapohunda, Eleanor. 1988. "The Nonpooling Household: A Challenge to Theory." In *A Home Divided: Women and Income in the Third World*, edited by Daisy Dwyer and Judith Bruce. Stanford University Press. Stanford, CA.

Feder, Gershon and Raymond Noronha. 1987. "Land Rights Systems and Agricultural Development in Sub-Saharan Africa." *World Bank Research Observer*. 2(July): 143-169.

Feder, Gershon and Tongroj Onchan. 1987. "Land Ownership Security and Farm Investment in Thailand." *American Journal of Agricultural Economics*. 69: 311-320.

Feder, Gershon, Tongroj Onchan, Yongyuth Chalamwong, and Chira Hongladarom. 1988. *Land Policies and Farm Productivity in Thailand*. Johns Hopkins University Press. Baltimore.

Fortt, Jean M. 1973. "Land Tenure and the Emergence of Large Scale Farming." In *Subsistence to Commercial Farming in Present-Day Buganda: An Economic and Anthropological Survey*, edited by Audrey I. Richards, Ford Sturrock, and Jean M. Fortt. Cambridge University Press. Cambridge, MA.

Government of Uganda. 1991. *Provisional Results of the 1991 Population and Housing Census*. Statistics Department. Ministry of Planning and Economic Development.

Guyer, Jane. 1986. "Intra-Household Processes and Farming Systems Research: Perspectives from Anthropology." In *Understanding Africa's Rural Households and Farming Systems*, edited by Joyce Lewinger Moock. Westview Press. London.

Harrison, Paul. 1987. *The Greening of Africa*. Paladin Grafton Books. London.

Herrick, Allison Butler, *et al.* 1969. *Area Handbook for Uganda*. U.S. Government Printing Office. Washington, D.C.

Hill, Polly. 1972. *Rural Hausa: A Village and a Setting*. Cambridge University Press. Cambridge, MA.

Hill, Polly. 1977. *Population, Prosperity and Poverty: Rural Kano, 1900 and 1970*. Cambridge University Press. Cambridge, MA.

Hill, Polly. 1978. "Food Farming and Migration from Fante Villages." *Africa*. 48(3): 220-229.

Hill, Polly. 1982. *Dry Grain Farming Families: Hausaland (Nigeria) and Karnataka (India) Compared*. Cambridge University Press. Cambridge, MA.

Hodgson, Geoffrey M. 1988. *Economics and Institutions*. Polity Press. Cambridge.

Hougham, D.A. 1973. "The Farms--Origin and Growth." In *Subsistence to Commercial Farming in Present-Day Buganda: An Economic and Anthropological Survey*, edited by Audrey I. Richards, Ford Sturrock, and Jean M. Fortt. Cambridge University Press. Cambridge, MA.

Hunter, John. 1986. "African Land Tenure." *Agricultural Administration*. 23(2): 109-122.

Johnson, Cobe. 1993. Professor emeritus. Department of Agricultural Economics. University of Wisconsin-Madison. Personal communication.

Johnson, Omotunde E.G. 1972. "Economic Analysis: The Legal Framework and Land Tenure Systems." *Journal of Law and Economics*. 15: 259-276.

Khiddu-Makubuya. 1981. "Land Law Reform and Rural Development in Uganda." In *Rural Rehabilitation and Development*, edited by Apolo Nsibambi and James Katorobo. Makerere University. Uganda.

Kisamba-Mugerwa, W. 1991. "Institutional Dimensions of Land Tenure Reform." In *Changing Uganda*, edited by Holger Bernt Hansen and Michael Twaddle. James Currey Ltd. London.

Kish, Leslie. 1965. *Survey Sampling*. Wiley. New York.

Kish, Leslie. 1987. *Statistical Design for Research*. Wiley. New York.

Lateef, K. Sarwar. 1991. "Structural Adjustment in Uganda: the Initial Experience." In *Changing Uganda*, edited by Holger Bernt Hansen and Michael Twaddle. James Currey Ltd. London.

Lawrance, J. C. D. 1963. *Fragmentation of Agricultural Land in Uganda*. Entebbe, Uganda. Government Printer.

Le Bris, Emile. 1979. "Surpression Demographique et Evolution Fonciere: Le Cas du Sud-est du Togo." *Africa Perspectives 1.* (special issue): 107-125.

Mafeje, Archie. 1973. "Agrarian Revolution and the Land Question in Buganda." In *Dualism and Rural Development in East Africa*, edited by Roger Leys. Institute for Development Research. Denmark.

Makerere Institute of Social Research (Makerere University; Uganda) and Land Tenure Center (University of Wisconsin-Madison; U.S.A.). 1989. *Land Tenure and Agricultural Development in Uganda.* Unpublished.

Mansfield, Edwin. 1985. *Micro-Economics: Theory and Applications.* W.W. Norton & Company. New York.

Migot-Adholla, Shem, Peter Hazell, Benoit Blarel, and Frank Place. 1991. "Indigenous Land Rights Systems in Sub-Saharan Africa: A Constraint on Productivity?" *The World Bank Economic Review.* 1: 155-175.

Mukwaya, A. B. 1953. *Land Tenure in Buganda: Present Day Tendencies.* Eagle Press. Nairobi.

Newbery, D. M. G. 1975. "Tenurial Obstacles to Innovation." *Journal of Development Studies.* July, 1975: 263-277.

Noronha, Raymond. 1985. *A Review of the Literature on Land Tenure Systems in Sub-Saharan Africa.* Report ARU 43. World Bank Agriculture and Rural Development Department. Washington, D.C.

Nsibambi, Apolo. 1981. "From Symbiosis to Antagonism: The Case of the Relationship between the Landlord and the Tenant in the Rural Development of Uganda." In *Rural Rehabilitation and Development*, edited by Apolo Nsibambi and James Katorobo. Makerere University. Uganda.

Ochieng, E.O. 1991. "Economic Adjustment Programmes in Uganda 1985-89." In *Changing Uganda*, edited by Holger Bernt Hansen and Michael Twaddle. James Currey Ltd. London.

Otsuka, Keijiro, Hiroyuki Chuma, and Yujiro Hayami. 1992. "Land and Labor Contracts in Agrarian Economies: Theories and Facts." *Journal of Economic Literature.* 30(December): 1965-2018.

Ott, Lyman. 1988. *An Introduction to Statistical Methods and Data Analysis.* Boston. PWS-Kent Publishing Company.

Palmer, Ingrid. 1988. "Gender Issues in Structural Adjustment of Sub-Saharan Agriculture and Some Demographic Implications." World Employment Programme Research Working Paper. Geneva: ILO.

Paterson, Douglas B. 1980. "Coping with Land Scarcity: The Pattern of Household Adaptations in One Luhya Community." IDS Working Paper 360. Institute for Development Studies, University of Nairobi. Nairobi.

Paterson, Douglas B. 1984. "Kinship, Land and Community: The Moral Foundations of the Abaluhya of East Bunyore (Kenya)." Ph.D. dissertation, University of Washington. University Microfilms International. Ann Arbor.

The Report of the Technical Committee on the Recommendations Relating to Land Tenure Reform Policy. October, 1990. Prepared for the Agricultural Secretariat, Bank of Uganda. Unpublished.

Rice, John A. 1988. *Mathematical Statistics and Data Analysis*. Wadsworth and Brooks/Cole Advanced Books and Software. Pacific Grove, CA.

Richards, A.I. 1973. "The Traditional Administrative Structure and the Agricultural Development of Buganda." In *Subsistence to Commercial Farming in Present-Day Buganda: An Economic and Anthropological Survey*, edited by Audrey I. Richards, Ford Sturrock, and Jean M. Fortt. Cambridge University Press. Cambridge, MA.

Richards, Audrey I., Ford Sturrock, and Jean M. Fortt, eds. 1973. *Subsistence to Commercial Farming in Present-Day Buganda: An Economic and Anthropological Survey*. Cambridge University Press. Cambridge, MA.

Samuels, Warren J. and A. Allan Schmid, eds. 1982. *Law and Economics: An Institutional Perspective*. Kluwer-Nijhof Publishing. Boston.

Saul, Mahir. 1989. "Separateness and Relation: Autonomous Income and Negotiation Among Rural Bobo Women." In *The Household Economy: Reconsidering the Domestic Mode of Production*, edited by Richard Wilk. Westview Press. London.

SAS Institute Inc. *SAS/STAT User's Guide*, version 6, vol. 2. Cary, NC.

Scheaffer, Richard L., William Mendenhall, and Lyman Ott. 1986. *Elementary Survey Sampling*. Duxbury Press. Boston.

Schmid, A. Allan. 1978. *Property, Power, and Public Choice: An Inquiry into Law and Economics*. Praeger Special Studies. New York.

Shipton, Parker. June 15, 1989. *How Private Property Emerges in Africa: Directed and Undirected Land Tenure Reforms in Densely Settled Areas South of the Sahara*

(draft). A report to the Bureau of Program and Policy Coordination, U.S. Agency for International Development.

Smith, Lisa C. 1994. "Structural Adjustment and Welfare in Rural Africa: The Role of Resource Control in Households." Staff Paper Series No. 368. Department of Agricultural Economics. University of Wisconsin-Madison.

Southwold, Martin. 1965. "The Ganda of Uganda." In *Peoples of Africa*, edited by James L. Gibbs, Jr. Holt, Rinehart and Winston, Inc.

Sweet, James. 1993. Department of Sociology. University of Wisconsin-Madison. Personal communication.

Troutt, Elizabeth, Mark Marquardt, W. Kisamba-Mugerwa, and Richard Barrows. 1993. *The Dynamics of the Land Market and the Issue of Compensation in Uganda.* A report prepared by Makerere Institute of Social Research (Makerere University) for the Agricultural Secretariat in the Bank of Uganda. Kampala, Uganda.

Varian, Hal R. 1984. *Microeconomic Analysis.* W.W. Norton & Company. New York.

West, H. W. 1964. *The Mailo System in Buganda: A Preliminary Case Study in African Land Tenure.* Government Printer. Entebbe, Uganda.

West, Henry W. 1972. *Land Policy in Buganda.* The University Press. Cambridge.

West, H. W. 1971. *The Transformation of Land Tenure in Buganda Since 1896.* African Social Research Documents vol. 2. African Studies Centre, University of Cambridge. Great Britain.

Whitehead, Ann. 1990. "Rural Women and Food Production in Sub-Saharan Africa." In *The Political Economy of Hunger (Vol. 1): Entitlement and Well-Being.* Clarenden Press. Oxford.

Winsborough, Halliman. 1993. Department of Sociology. University of Wisconsin-Madison. Personal communication.

World Bank. 1974. *Land Reform.* World Bank Development Series. Washington, D.C.

World Bank. 1992. *World Tables 1992.* Johns Hopkins University Press. Baltimore.

World Bank. 1993. *Uganda: Agriculture.* Washington, D.C.

World Bank. 1993. *Uganda: Growing Out of Poverty.* Washington, D.C.