FOOD SECURITY RESEARCH PROJECT

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Disclaimer: This paper reflects conditions up to late 2006 and will be updated and finalized to reflect events and local dialogue that have taken place since then.

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The views expressed in this document are exclusively those of the authors.

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EXECUTIVE SUMMARY

Problem Statement: Research from many developing areas has demonstrated that relatively egalitarian land distribution patterns have tended to generate higher rates of economic growth than highly concentrated ones. The basic reason for this is that broad-based agricultural growth tends to generate second-round expenditures in support of local non-tradable goods and services in rural areas and towns. These multiplier effects tend to be much weaker when the source of agricultural growth is concentrated in relatively few hands. Thus the rate of growth is likely to be affected by the distribution of assets in the agricultural sector, particularly land.

The swelling numbers of Africans living in poverty has increasingly focused the attention of governments, international donors, and researchers to make their development strategies more pro-poor. Strategic plans for poverty reduction have been prepared since 1998 by at least 20 African governments, including Zambia, with support from the World Bank. Curiously, however, almost none of them seriously address the role of land allocation in influencing patterns of agricultural growth and hence the potential for poverty reduction. A relatively passive concern for land issues might appear reasonable in light of the relatively low rural population densities in much of Africa, suggesting that access to land is not a major constraint on agricultural growth or poverty. For example, Zambia's smallholder farming areas contain less than 15 persons per square kilometer. And with the exception of several areas in the west and extreme south of the country, the country is arguably well-suited to agricultural production and receives moderate to high amounts of rainfall.

It might be considered unlikely, therefore, that inadequate access to land would be one of the major causes of rural poverty in Zambia. However, evidence presented in this paper shows that economically viable arable land is not in great abundance in Zambia after considering the current situation with respect to access to road infrastructure and access to services and markets. In fact, access to land is already a major problem for large segments of the rural population in Zambia. Moreover, depending of future land allocation policy, access to good quality land with a market potential may become increasingly beyond the reach of many small-scale farm households, making it more difficult to achieve a smallholder-led, pro-poor agricultural development trajectory.

Zambia has a total surface area of about 752,614 square kilometers, of which 47% (353,729 km^2 or 35,351,708 hectares) is arable land, 30% National Parks and Game Management Areas (225,784 km^2), while hills and swamps take up 12% (90,313 km^2). Forests cover 12% of the land while urban development only takes up 2%. Only about 14% of the arable land is presently cultivated (Chizyuka et al. 2006). However, much of the remaining 86% of arable land is remote, and could support only a subsistence-oriented agricultural production system unless accompanied by substantial public investment in roads and public services to support the development of communities.

Objectives: The objectives of this paper are fourfold: First, we examine the prevailing farm size distribution within Zambia's smallholder farm sector, and how this farm size structure affects the potential for broad-based agricultural growth and rural poverty in Zambia. The paper seeks to explain why there is such a strong correlation within the smallholder farming sector between landholding size and total household incomes, given that off-farm activities make up an important share of total income among rural households in Zambia. Second, the paper explores the apparent paradox of why such a large percentage of

rural households have less than one hectare of land and perceive that additional land is not available to them despite the fact that most of the country's land remains uncultivated. Third, we examine the factors associated with the large variations in landholding size within Zambia's smallholder farm sector by estimating econometric models of household landholding plus rented land, and of households' perceptions of the availability of additional land in their area. These findings hold important implications for government policy and investments under its Poverty Reduction Strategy Program, which relates to the paper's fourth objective of identifying concrete proposals for improving access to land, as well as for improving productivity in the use of existing land, among the most land-constrained smallholder households, which, we argue, will expand the number of small farmers in Zambia who could directly benefit from agricultural growth processes.

Data: The household survey data used in this analysis is drawn from Post Harvest Surveys (PHS), conducted annually by the Central Statistical Office (CSO). The PHS is the still the most comprehensive and statistically valid source of information for the small- and medium-scale farm sector in Zambia (Zulu et al. 2000). In addition, we draw from the 1999/2000 Supplementary Survey (SS) to the Post Harvest Survey, also conducted by CSO. The SS involved revisiting the same rural households that were interviewed in the 1999/00 PHS with a set of supplementary questions which are not normally asked in the regular post harvest surveys. These questions pertained to access to land, information on non-farm income and household socio-demographic characteristics. The SS was conducted in May 2001.

The PHS/SS is based on a sample frame of about 8,000 small- and medium-scale farm households, defined as those cultivating areas between 0 to 20 hectares. Large-scale farmers are not included in this survey. Households were included in the sample only if they were found through initial screening questions to cultivate crops or raise livestock. Because the PHS is an agricultural household survey, by definition, the sample contains no landless households. However, initial village listings to prepare the sample frames for these surveys enumerated all households in these villages. These listings were made available, and the percentage of households who engaged in neither crop nor animal production on their own land was found to be low, less than 4%. Landlessness is somewhat higher in areas closer to towns, where a higher proportion of households are engaged in exclusively off-farm activities.

Main Findings: The study highlights five main findings from analysis of nationally-representative household survey data.

1. Zambia faces the apparent paradox of having roughly a quarter of its rural population facing near-landlessness and perceptions of no additional land available to them despite the existence of substantial underutilization of arable land.

2. Moreover, within a given district or village, there are very wide intra-village differences in farm size within the small-scale sector. Within a given district, the top 25% of households tend to have 8 to 10 times more land than the bottom 25% of households. While mean farm size (including rented land) is 3.05 hectares, about one-third of all households have access to one hectare or less. The bottom 25% of households have a mean farm size of 0.61 hectares, while the top 25% control a mean of 8.85 hectares.

3. These statistics show that there is great variation in farm sizes within the small- and medium-scale farm sector in Zambia. The importance of these findings depends on the degree to which land allocation patterns reflect differences in households' ability to use land

productively. For example, if households with small farm sizes are able to compensate by moving into viable non-farm activities so as to provide land-poor households with adequate alternative income sources, then disparities in land ownership should not necessarily be a policy problem. However, the findings in this paper indicate that there is a strong relationship between landholding size and household per capita income, especially for households owning less than 1.25 hectares of land (which applies to roughly 45% of the smallholder population in Zambia).

4. There are alternative explanations, none mutually exclusive, for the observed variation in farm size. Some of these are related to talent and effort, colonial policies, inevitable differences in the up-take of new technology, social capital and kinship relationships, and time of settlement in the area. All of these factors are tested empirically in econometric models of household farm size. Results indicate that each of these explanations has some explanatory power and contributes to the explained variation in landholding size. Landholding size is positively related to variables signifying productive farming potential and wealth, which is most likely correlated with initiative and effort. However, we also find that blood/kinship relations between the male and female head-of-household's family and the local chief at time of the family's settlement are positively and significantly associated with current landholding size. These emerging findings lead us to speculate that there may be important institutional and governance factors operating within local systems for allocating land that may be accounting for at least some of the unexplained variation in per capita landholding size within the smallholder farm sector.

5. In many rural areas, unallocated land appears to be unavailable, particularly in areas close to urban areas and district towns, and along major highways. The econometric analysis in this paper reinforces the view that over time the rural population has tended to cluster in areas where access to markets and services are best, leading to a highly nucleated pattern of settlement. At the same time, there appear to be large amounts of unallocated land in the more remote parts of the country, but the economic value of this land is limited because of the lack of access to markets and services. Thus, in densely settled areas where population growth and sub-divisions have created land constraints, rural poverty has become closely associated with inadequate access to land. It is for this reason that current discussions and outcomes with regard to land use and land allocation policy in Zambia are likely to influence future rates of rural poverty and the number of rural Zambians who are able to contribute to the country's agricultural growth.

Policy Implications: Improving access to land among the most land-constrained smallholder households would be a seemingly effective way to reduce poverty. For small farms, a very small incremental addition to land access is associated with a large relative rise in income. Yet improving land access for smallholders is fraught with difficulties: even in land abundant countries, it is questionable whether much unclaimed land is available in settled areas to distribute, expropriating land reform is politically difficult, expensive, and subject to rent-seeking, and market-assisted or community-based approaches have met with very little success to date.

Perceptions of inadequate state land to undertake agricultural development efforts, as reflected in various government documents, highlights two important points for future land policy discussions. First, pressures will mount over the coming years to induce chiefs to release control over part of their land, so that it can be converted into state land which can be allocated to investors to be developed. It is likely that that statutory control of land will progressively replace customary rights, with the state increasingly taking control of land

allocation away from the chiefs. With urbanization, increasing intra-regional migration, and relocation, and states' desires to control resources for both development and patronage activities, many African states appear to be succeeding in slowly wresting control of resources from traditional authorities (Herbst 2000).

The second point highlighted by recent government land documents is the apparent view that state development can take place only on state-controlled land. The rationale for moving land from customary tenure arrangements to state-allocated and privatize-able land is to facilitate state investment in agricultural development. Little consideration appears to have been given to the possibility of state investment in public goods and services to raise the economic value of land in the customary tenure areas and promote agricultural investments by smallholder farmers within these areas. It is possible that this reflects the assumption that the state is in a better position to allocate land in an equitable and pro-poor manner than traditional authorities. However, recent developments in Zambia suggest that this is a highly questionable assumption. In the end, the ability to pursue a land policy that allows for equitable and pro-poor agricultural productivity and income growth will require the commitment of both state and traditional leaders to principles of equity and access to land for the millions of smallholder farmers in Zambia.

There is a perception within government circles that the state is seen as more neutral and a faster delivery channel which can put more land to productive use. However, the transfer of land from the chiefs to the state may also accelerate the allocation of land to large commercial interests, which could leave less land available for allocation to small-scale farm households. While a great deal of land in Zambia remains unutilized, the amount of utilizable land available is much less, after considering the sparse network of infrastructure and other types of service provision in rural areas which determine how much unutilized land is actually utilizable. This brings to the fore the need to distinguish between the total stock of unutilized land in Zambia and the stock of land that could feasibly and productively be utilized given available settlements, roads, health facilities and markets. In other words, much land in Zambia remains unutilized because it cannot feasibly support commercially-oriented farming systems due to its current remoteness, distance from markets, and lack of basic services to make it hospitable for migration and settlement.

Basic public investments to encourage the productive utilization of currently under-utilized areas with good agro-ecological potential also has a potential in Zambia to redress the current land constraints faced by many of its impoverished and isolated rural smallholder households. The basic investments include feeder roads linked to trunk highways, health care facilities, schools, electrification, and tax incentives for agribusiness investment. A policy environment conducive to business development can also attract new capital into newly settled areas with good agricultural potential. This public goods approach to poverty alleviation is an option to consider as an alternative to the farm block concept, in which land would be allocated in large tracts to commercial business entrepreneurs, but with uncertain effects on the poverty-related land constraints being faced by 25% or more of Zambia's rural population.

A second and complementary step would involve enlisting the support of paramount and local chiefs to contribute to national poverty reduction goals through the allocation of unutilized land to new small and medium-scale farmers. Incentives could be provided by the state to chiefs to assist in the allocation of unutilized land under their control in 5-10 hectare lots to smallholder households. It is likely that land lots of this size would discourage wealthy individuals and mainly attract poor and currently land-constrained families. However, acquiring land of this size would almost certainly enable currently land constrained

households to increase their income from farming, add to agricultural growth, and contribute to national poverty reduction objectives.

These findings reinforce the idea that where access to land is highly concentrated and where a sizable part of the rural population lack sufficient land to earn a livelihood as in Zambia, then special measures will be necessary to tackle the problem of persistent poverty. This is almost certain to be a long term undertaking, but avoiding the issue will only prolong the problem.

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ACRONYMS

ASIP II	Agricultural Sector Investment Program Successor Program
CSO	Central Statistical Office
FAO	Food and Agricultural Organization
FSRP	Food Security Research Project
GMAs	Game Management Areas
MACO	Ministry of Agriculture and Cooperatives'
MOL	Ministry of Lands
MSU	Michigan State University
OLS	ordinary least squares
PHS	Post Harvest Surveys
SEAs	Standard Enumeration Areas
SS	Supplementary Survey
USAID	United States Agency for International Development
ZNFU	Zambia National Farmers' Union

1. INTRODUCTION

Poverty reduction and agricultural development are two of the most important and obvious challenges facing Sub-Saharan Africa. The World Bank estimates that 45% of African households in 2000 were living below the poverty line (World Bank 2000). In Zambia, rural poverty is estimated to exceed 74%, according to the 2003 Living Conditions and Monitoring Survey, while urban poverty is estimated at 52% (CSO 2003).

In countries where the majority of the population is engaged in agriculture, poverty reduction and agricultural growth are clearly linked. This has been well understood ever since the pioneering work of Johnston and Mellor (1961), who showed that rapid economic development in most of Asia during the 20th century started with food crop productivity growth for the millions of small farms in these countries.

The swelling numbers of Africans living in poverty has increasingly focused the attention of governments, international donors, and researchers to make their development strategies more pro-poor. Strategic plans for poverty reduction have been prepared since 1998 by at least 20 African governments, including Zambia, with support from the World Bank. Curiously, however, almost none of them seriously address the role of land allocation in influencing patterns of agricultural growth and hence the potential for poverty reduction.[1] More recently, due to the increasingly recognized importance of land to Africa's development, AU/NEPAD, ECA and ADB under the leadership of the AU Commission has agreed to work jointly to develop a land policy framework and guidelines (AU/ECA/ADB 2006). Prior to these more recent efforts to develop an African land policy initiative, a more passive concern for land issues might appear reasonable in light of the relatively low rural population densities in much of Africa, suggesting that access to land is not a major constraint on agricultural growth or poverty. For example, Zambia's smallholder farming areas contain less than 15 persons per square kilometer. And with the exception of several areas in the west and extreme south of the country, the country is arguably well-suited to agricultural production and receives moderate to high amounts of rainfall.

It might be considered unlikely, therefore, that inadequate access to land would be one of the major causes of rural poverty in Zambia. Rather, the challenge might be cast as how to put idle and unutilized land in the hands of people who have the capacity to make productive use of it. Indeed, this stance is reflected in the current design of Zambia's Poverty Reduction Strategy Program (Republic of Zambia 2001). A salient feature of the draft Program is the promotion of 1,000 hectare farm blocks to be sold to qualified local businessmen to develop commercialized agricultural businesses. Through employment generation and productive use of land, these farm blocks are envisaged to reduce rural poverty.

However, this paper argues that economically viable arable land is not in great abundance in Zambia after considering the current situation with respect to access to road infrastructure and access to services and markets. In fact, access to land is already a major problem for large segments of the rural population in Zambia. Moreover, depending of future land allocation policy, access to good quality land with a market potential may become

[1] For example, neither of the World Bank's (2000) synthesis chapters on Addressing Poverty and Inequality or Spurring Agriculture and Rural Development, contains any references to the role of constrained access to land or land distribution inequalities in contributing to poverty.

increasingly beyond the reach of many small-scale farm households, making it more difficult to achieve a smallholder-led, pro-poor agricultural development trajectory.

The objectives of this paper are fourfold: First, we examine the prevailing farm size distribution within Zambia's smallholder farm sector, and how this farm size structure affects the potential for broad-based agricultural growth and rural poverty in Zambia. The paper seeks to explain why there is such a strong correlation within the smallholder farming sector between landholding size and total household incomes, given that off-farm activities make up an important share of total income among rural households in Zambia. Second, the paper explores the apparent paradox of why such a large percentage of rural households have less than one hectare of land and perceive that additional land is not available to them despite the fact that most of the country's land remains uncultivated.[2] Third, we examine the factors associated with the large variations in landholding size within Zambia's smallholder farm sector by estimating econometric models of household landholding plus rented land, and of households' perceptions of the availability of additional land in their area. These findings hold important implications for government policy and investments under its Poverty Reduction Strategy Program, which relates to the paper's fourth objective of identifying concrete proposals for improving access to land, as well as for improving productivity in the use of existing land, among the most land-constrained smallholder households, which, we argue, will expand the number of small farmers in Zambia who could directly benefit from agricultural growth processes.

[2] Food and Agricultural Organization (FAO) statistics indicate that of Zambia's 75 million hectares, roughly 35 million hectares are suitable for agricultural production. Of this 35 million hectares, only 5.2 million (14.9%) hectares were under cultivation between 1995 and 2000 (see www.apps.fao.org). The Zambia National Farmers' Union (ZNFU) estimated that only 6% of the country's arable land was currently under cultivation (Hudson 1994). Chizyuka et al. (2006) estimated in 2006 that about 14% of the arable land was being cultivated.

2. DATA AND METHODS

The household survey data used in this analysis is drawn from Post Harvest Surveys (PHS), conducted annually by the Central Statistical Office (CSO). The PHS is the still the most comprehensive and statistically valid source of information for the small- and medium-scale farm sector in Zambia (Zulu et al. 2000). In addition, we draw from the 1999/2000 Supplementary Survey (SS) to the Post Harvest Survey, also conducted by CSO. The SS involved revisiting the same rural households that were interviewed in the 1999/00 PHS with a set of supplementary questions which are not normally asked in the regular post harvest surveys. These questions pertained to access to land, information on non-farm income and household socio-demographic characteristics. The SS was conducted in May 2001.

The PHS/SS is based on a sample frame of about 8,000 small-scale and medium-scale farm households, defined as those cultivating areas between 0 to 20 hectares. Large-scale farmers are not included in this survey. Households were included in the sample only if they were found through initial screening questions to cultivate crops or raise livestock. Because the PHS is an agricultural household survey, by definition, the sample contains no landless households. However, initial village listings to prepare the sample frames for these surveys enumerated all households in these villages. These listings were made available, and the percentage of households who engaged in neither crop nor animal production on their own land was found to be low, less than 4%. Landlessness is somewhat higher in areas closer to towns, where a higher proportion of households are engaged in exclusively off-farm activities.

Our analysis focuses on landholding size at the household level. Landholding refers to land that is under the household's use rights, so long as it is regularly utilized, including rented land. This generally includes all cropped land, wood lots, fallow land, land under tree crops, gardens and rented land. We measure poverty in terms of income relative to a poverty line. Although income is generally considered less desirable than consumption-based measures of welfare, income is the only welfare indicator that was consistently available across these data sets. Income is nevertheless accepted as a key indicator of household economic activity and welfare. Income also has the advantage of providing insights as to how the composition of household economic activity (e.g., farm vs. non-farm income) varies with household landholding size.

3. GROWTH, POVERTY REDUCTION AND ACCESS TO LAND: A CONCEPTUAL FRAMEWORK

The model of structural transformation has demonstrated that in countries where 70-80% of the rural population derive the bulk of their income from agriculture, poverty reduction typically depends on agricultural productivity growth.[3] But clearly growth alone is not sufficient for poverty reduction; the distribution of assets makes a difference. Johnston and Kilby (1975), Mellor (1976), and more recently Quan and Koo (1985) and Deninger and Squire (1998) have demonstrated that relatively egalitarian land distribution patterns have tended to generate higher rates of economic growth than highly concentrated ones. The basic reason for this is that broad-based agricultural growth tends to generate second-round expenditures in support of local non-tradable goods and services in rural areas and towns. These multiplier effects tend to be much weaker when the source of agricultural growth is concentrated in relatively few hands. Thus the rate of growth is likely to be affected by the distribution of assets in the agricultural sector, particularly land.

However, evidence is emerging that not only does the initial distribution of assets affect the rate of economic growth, but it also affects the poverty-reducing effects of the growth that does occur. For example, Ravallion and Datt (2002) found that the initial percentage of landless households significantly affected the elasticity of poverty to non-farm output in India. In a sample of 69 countries (Gugerty and Timmer 1999) found that, in countries with an initial "good" distribution of assets, both agricultural and non-agricultural growth benefited the poorest households slightly more in percentage terms. In countries with a "bad" distribution of assets, however, economic growth was skewed toward wealthier households, causing the gap between rich and poor to widen. It is especially noteworthy that in this latter group of countries, agricultural growth was associated with greater increases in inequality than was non-agricultural growth. This reverses what has been considered the more typical pattern, wherein agricultural growth is seen to contribute more to poverty reduction than growth outside the agricultural sector. These findings reinforce the idea that where access to land is highly concentrated and where a sizable part of the rural population lack sufficient land to earn a livelihood, then special measures may be necessary to tackle the problem of persistent poverty (Ravallion 1997).

3.1. Relationship between Landholding Size and Income: An Initial Bivariate View

The previous section highlights research findings that the initial distribution of assets (such as land) affects both the rate of economic growth and the poverty-reducing effects of the growth that is achieved. The importance of these findings for rural growth and poverty alleviation strategies in Zambia depends in part on the degree to which land allocation patterns influence household income and poverty. If non-farm activities are able to compensate for small landholdings and provide land-poor households with adequate alternative income sources, then disparities in land ownership should not necessarily be a policy problem. Considering the fact that 48% of Zambia's population is urbanized and that a substantial portion of rural households earn part of their income from non-farm sources, one might expect the relationship between land size and income to be weak. To examine these issues, we reproduce simple bivariate graphs from Jayne et al. (2003) relating household per capita

[3] The genesis of this literature is the pioneering work of Johnston and Mellor (1961); Johnston and Kilby (1975); and Mellor (1976). See also Lipton (1977); Haggblade, Hammer and Hazel (1991); Delgado et al (1994); and Datt and Ravallion (1998).

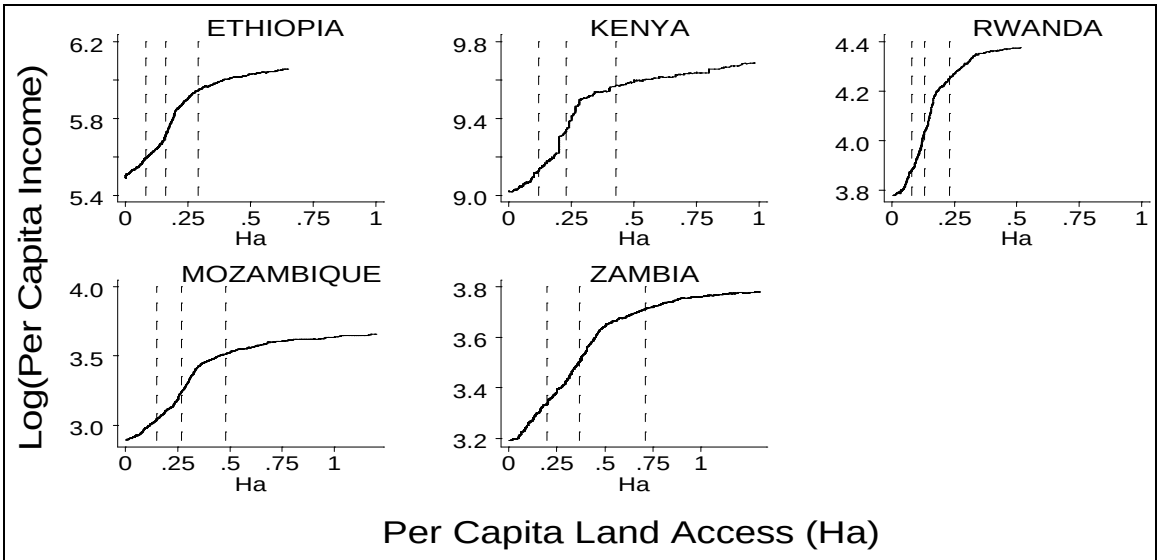
landholding size to household per capita income, including non-farm income and crop income from rented land, for the smallholder farm sector in Zambia, Ethiopia, Kenya, Rwanda, and Mozambique (Figure 1). The three dashed vertical lines show the 25th, 50th, and 75th percentiles of sampled households along the x-axis. For example, 25% of the sample households in Kenya have between zero and approximately 0.10 hectares per capita, while the top quartile owns on average 1.1 hectares per capita.

In each country, we find a positive association between household per capita land holdings and per capita income (the sum of crop, livestock, and off-farm income). The association between household income and land is especially steep among households whose land size is below the median level in each country (the middle dotted line in Figure 1). Because the vertical axis showing per capita income is in log form, we can read differences in numbers as percent changes. For instance, the line for Kenya starts at the log of per capita income at 9.2 and has a kink at 9.6. The difference between these two points is 0.4, which indicates a 40% increase in per capita income when household per capita land size increases from zero to 0.25 hectares.

The same change in landholding size (from zero to 0.25 hectares) increases per capita income by more than 40% in Rwanda, just less than 40% in Mozambique, and about 30 percent in Ethiopia. In all four countries, the association between land and income becomes weaker somewhere within the third land size quartile, and nearly disappears in the fourth quartile.

These bivariate findings are supported by district and community fixed-effect econometric models showing that in each of these countries, after controlling for household assets, education levels, family size, education, and other socio-demographic characteristics, land holding size is strongly associated with household income for landholdings under 1.25 hectares. For households possessing over 1.25 hectares, the relationship between income and landholding size becomes weaker (see Jayne et al. 2003 for cross-country evidence). However, according to the nationally-representative Post Harvest Surveys (99/00 and later years), approximately 45% of all farm households in Zambia's small- and medium-scale sector control less than 1.25 hectares, even after including rented land. One-quarter of Zambia's smallholder farms are smaller than 0.61 hectares (again including rented land). Because households' off-farm income tends to be strongly correlated with landholding size, these land constrained households are generally among the poorest in the country (Zulu et al. 2000; Jayne et al. 2003). Also, based on nationally-representative data in Zambia, it was found that there are very large variations in landholding size per person within the smallholder sector. For example, after ranking all small- and medium-scale farm households nationwide by landholding size, the top 25% of households control roughly 8 times more land per capita than the bottom 25% (Jayne et al. 2003). Most of the variation in landholding size per capita is a within-village phenomenon, not a between-village one. On top of the concentrated distribution of land within the smallholder farm sector is the major inequality in land allocation between the large-scale and the smallholder farm sectors.

Figure 1. Log of Per Capita Income by Per Capita Landholding Size



Note: The vertical lines are drawn at 25th, 50th, and 75th percentiles of per capita land owned for each country. The top 5 percent of observations are excluded from the graphs because lines are sensitive to a few extreme cases.

3.2. Land Allocation Patterns in Zambia

Zambia has a total surface area of about 752,614 square kilometers, of which 47% (353,729 km^2 or 35,351,708 hectares) is arable land, 30% National Parks and Game Management Areas (225,784 km^2), while hills and swamps take up 12% (90,313 km^2). Forests cover 12% of the land while urban development only takes up 2%. However, only about 14% of the arable land is presently cultivated (Chizyuka et al. 2006). However, much of the remaining 86% of arable land is remote, and could only support a subsistence-oriented agricultural production system unless accompanied by substantial public investment in roads and public services to support the development of communities. We will return to this point in Section 9.

Land in Zambia is vested in the President who holds it in trust for the people of Zambia. Land in Zambia is administered under various classifications; state land, reserve land and customary Land. State land is mostly titled land and covers farming and urban areas to the extent of 4,500 square kilometers only or 6% of the country (see Figure 2). During the colonial period, state land was declared as Crown land, which could be bought and sold, while that reserved for indigenous Africans was under customary rules of tenure.

Figure 2. Map of Zambia Showing State Land (Darkened) and Customary Land

Source: van Loenen 1999.

Substantial amounts of land along the line of rail in the area known to have valuable minerals that also happened to be well situated for farming was Crown land and reserved for European settlers. Africans of this area were forced to move to areas reserved for indigenous Africans.

Approximately 94% of the country is officially designated as Customary Area. It is occupied by 73 tribes, headed by 240 chiefs, 8 senior chiefs and 4 paramount chiefs (Chileshe 2005). Usually, tenure under customary lands does not allow for exclusive rights in land. No single person can claim to own land as the whole land belongs to the community. Land is deemed as belonging to members of the community for their own use (Republic of Zambia 1995).

However, as stated by Metcalfe (2005), the fact that 94% of Zambia's land is in the customary system must be heavily qualified.

> "Although it is sometimes stated that 94% of Zambia falls under customary tenure from that proportion must be deducted the 8% of the country designated as national parks and further 8% designated as forest reserves. From the remaining 76% must be deducted 2% for urban areas and 12% as unspecified areas (e.g., state farms, property, military, research stations, etc.). Finally, from the remaining 64% the Game Management Areas (GMAs) that make up 22% of Zambia's land area must be considered" (Metcalfe 2005, p. 7).

These figures put into context the generally held notion that 80% of arable land in Zambia remains uncultivated, and that 94% of its land is under customary tenure, implying that it

is available for smallholder agricultural development. According to Chizyuka et al. (2006), land falling under customary administration is 62% of the country territory or 46,500 square kilometers, but this includes mountainous areas, marshes and swamps, areas that are permanently flooded, infested with tsetse flies, and/or too remote to have a commercial potential.[4] Therefore, in reality, a much smaller amount of commercially viable arable land is available for future generations of Zambian smallholders than one might initially think based on the commonly cited figure that 94% of Zambia's land is under customary tenure and that the vast majority of this remains uncultivated.

3.3. Distribution of Land Holdings among Small-holder Farmers in Zambia

Having established the relationship between landholding size and household income in Section 3.1, we now move to the distribution of land holdings among smallholder farmers in Zambia. Tables 1 and 2 summarize the distribution of land according by landholding size quartile for each province, according to the CSO's Supplemental Post-Harvest Survey. The quartiles are established by ranking small and medium scale producers by the amount of land under the household's use (owned plus rented land), and subsequently dividing the sample thus obtained into four equal groups. The reported numbers show how the amount of land under households' use rights (hereafter land access) varies across provinces and among land access quartiles within each province (Zulu et al. 2000).

Mean landholding size (hereafter including land rented by the household but not included land leased out to others) is roughly three hectares in the smallholder sector. There are large regional differences. Western, Northwestern and Lusaka provinces have the smallest mean household land access; households in these provinces have access to less than two hectares on average. Northern Province has the largest average farm sizes, at 6.5 hectares. However, the bottom 50% of households in Northern Province have no more land than in any other province (1.5 hectares or less). The large mean farm sizes in Northern Province are because of a small percentage of relatively large farms in the top quartile.

Table 1 shows that there are large variations in landholding size per household *within* each province. In Central, Eastern and Southern provinces, the traditional maize belt provinces, the 25% of households with the most land have 4 to 6 times more land than the bottom 25% of farmers. The dispersion of landholding sizes are even larger within Copperbelt and Northern Provinces, where the top 25% of households have 7 times more land than the bottom 25% of households. While one might expect these disparities to greatly decline when computing farm sizes in per capita terms, this is not the case. Table 2 reports mean landholding size per capita for each quartile by province, for the two years of the Supplemental PHS survey, 1999/00 and 2002/03. The bottom 25% of farmers in every province have between 0.1 and 0.2 hectares per person, while the top 25% having between 0.81 and 1.93 hectares per person. In every province, the top 25% of small and medium scale farmers have at least six times more land per capita than the bottom 25% of farmers. It is reiterated that these findings do not include the large-scale commercial farming sector. If large-scale farmers were included, the skewness of land access would obviously be even greater (Zulu et al. 2000).

The finding of large intra-zone variations in landholding size continues to hold when the analysis is performed at smaller geographic units. For example, we regressed landholding

[4] i.e., commercial in the sense that a farmer could feasibly produce agricultural commodities for the market given the location and extent of infrastructural development in the area.

size per capita on standard enumeration area dummy variables (the smallest geographic variable available in the PHS data set, which generally contains 1-2 villages). This is equivalent to an ANOVA test measuring the extent of inter-village vs. intra-village variation. The R^2 of this model was 0.269, indicating that only 26.9% of the variation in smallholder land access per capita is between villages; the remaining 73.1% of the variation is *within* villages. There are indeed significant regional differences in landholding size. But despite such regional differences, these findings indicate that the differences in smallholder access to land are not due mainly to differences in population density. The most important sources of variations in household access to land are *within* villages.

Table 1. Landholding Size Per Household in Zambia by Province, 2002/03

Province	Quartile of Landholding Size Per Household				mean
	1st quartile bottom 25%	2nd quartile	3rd quartile	4th quartile	
	hectares per household				
Central	0.60	1.41	2.83	8.44	3.23
Copperbelt	0.59	1.36	2.70	10.23	3.18
Eastern	0.68	1.43	2.77	6.18	2.20
Luapula	0.58	1.52	2.86	7.55	2.61
Lusaka	0.58	1.41	2.67	7.30	1.98
Northern	0.62	1.50	2.91	10.90	6.54
Nwestern	0.63	1.47	2.83	6.24	1.70
Southern	0.60	1.41	2.72	7.90	2.64
Western	0.58	1.41	2.66	6.31	1.75
National	0.61	1.44	2.79	8.85	3.05

Source: Supplementary Survey to the 1999/2000 Post-Harvest Survey, Central Statistical Office
Notes: All numbers are weighted. Figures include rented land.

Table 2. Landholding Size Per capita, by Province, 1999/2000 and 2002/03 Crop Seasons

Province	Quartile of Landholding Size Per capita				mean
	1st quartile bottom 25%	2nd quartile 2nd 25%	3rd quartile 3rd 25%	4th quartile top 25%	
	hectares per capita				
Central	0.11	0.23	0.44	1.14	0.52
	0.11	0.23	0.39	1.04	0.47
Copperbelt	0.10	0.22	0.58	1.93	0.67
	0.11	0.22	0.38	1.01	0.44
Eastern	0.14	0.28	0.49	0.96	0.45
	0.11	0.23	0.38	0.99	0.44
Luapula	0.10	0.28	0.52	1.43	0.54
	0.10	0.23	0.38	1.02	0.40
Lusaka	0.12	0.21	0.41	1.10	0.36
	0.10	0.23	0.40	1.24	0.38
Northern	0.10	0.36	0.58	1.85	0.87
	0.10	0.23	0.39	0.95	0.42
Nwestern	0.10	0.28	0.46	0.85	0.32
	0.11	0.23	0.38	0.81	0.30
Southern	0.10	0.21	0.40	0.89	0.39
	0.10	0.23	0.40	1.04	0.41
Western	0.10	0.25	0.51	1.17	0.37
	0.11	0.23	0.38	0.89	0.37
National Level	0.11	0.27	0.50	1.43	0.58
	0.11	0.23	0.39	0.98	0.41

Source: Supplementary Survey to the 1999/2000 Post-Harvest Survey, Central Statistical Office
Note: All numbers are weighted. Figures include rented land.

3.4. Bivariate Relationships between Landholding Size, Education, and Indicators of Welfare

Table 3 shows the relationship between rural households' landholding size, educational status, and indicators of welfare, using nationally representative household survey data from the 1999/00 Post Harvest Survey, conducted by the Central Statistical Office. The data is described in detail in Section 4. Household attributes are grouped on the left side of the table (first column). The landholding size terciles are obtained by ranking all households in the sample by landholding size (including rented land) from the smallest to the largest and then dividing the group into three equal terciles. We also grouped all households in the sample into three education terciles (low, medium, and high). The education terciles are obtained by ranking the number of years that the household head spent in formal education, from the lowest to the highest, and then dividing the sample into three equal groups. Each land tercile is ranked in the three education tercile (columns 3 to 11).

A number of observations emerge from the bivariate relationships shown in Table 3:

1. There are relatively few cases of households with highly educated members and low landholding size. Conversely there are relatively few cases of households in the low education tercile and the highest landholding size tercile. It is not possible using cross-sectional data to tease out the dynamics – for example, are households with relatively high education able to acquire more land thus allowing them to become relatively affluent, or are households with large landholdings already relatively wealthy, enabling them to better able to educate their members? The dynamics cannot be determined with this cross sectional database, but it is interesting to note that income-poverty is clearly associated with small farm size and low education.

2. Within each landholding size tercile, household income and value of crop sales increases 30-50% between the lowest and highest education tercile.

3. Holding education tercile constant, household income increases as landholding size increases, except for the highest education tercile. Due to well-educated households' advantages in off-farm employment activities, their incomes are not highly correlated with farm size. By contrast, landholding size matters greatly for relatively uneducated households, since their off-farm income earning potential is limited.

4. Not surprisingly, off-farm income is quite small for the lowest education tercile, regardless of landholding size.

5. Female headed households are disproportionately in the bottom education and bottom land terciles.

6. Livestock makes up a very small percentage of household income shares in all categories.

Table 3. Household Attributes by Land Access and Education, 2003/04

Landholding Size Tercile		1 (0 - 1.4 hectares)			2 (1.4 - 2.4 hectares)			3 (> 2.4 hectares)		
Education tercile		1	2	3	1	2	3	1	2	3
	Total	0-6	7-8	9-19	0-6	7-8	9-19	0-6	7-8	9-19
		---------- median value ----------								
No. of observations	6826	966	721	619	752	765	725	602	830	846
Land Access										
Landholding size	3.10	0.70	0.80	0.80	2.00	2.00	2.00	6.90	6.90	8.10
Landholding size	0.60	0.20	0.20	0.20	0.60	0.40	0.40	1.70	1.20	1.30
Demographic										
Household	5.80	4.20	5.30	6.00	4.80	6.10	7.10	5.30	6.60	7.90
Female headed	24.00	40.50	28.80	19.60	26.60	20.70	16.50	23.10	13.60	13.20
Age of household	44.20	44.90	41.00	40.20	45.20	43.20	42.90	49.60	44.40	46.60
Level of	5.20	2.00	5.40	8.80	2.60	5.40	8.20	2.70	5.40	7.90
Assets										
Draft animals	36.04	28.40	22.80	29.50	34.10	36.80	34.80	55.30	39.80	46.00
Income										
Gross value of	183.10	101.10	100.50	144.90	164.10	184.90	200.80	227.60	273.00	299.30
HH per capita	78.70	57.00	58.10	105.50	65.90	69.60	98.50	80.40	86.40	108.40
Crop income share	72.30	74.70	66.30	53.30	81.20	75.40	63.80	84.70	78.80	68.30
Off-farm income	24.60	22.90	31.00	44.20	16.00	21.40	31.80	12.60	17.80	27.50
of which:	3.90	5.90	4.10	3.80	3.30	2.90	3.40	2.50	3.30	4.60
own	11.90	10.80	15.90	16.00	8.60	12.60	11.70	7.30	10.90	13.70
non-	6.40	2.40	5.40	21.80	2.30	3.70	14.70	1.60	2.60	7.80
	2.40	3.80	5.40	2.60	1.70	2.10	1.90	1.20	0.90	1.40
Livestock product	3.10	2.50	2.70	2.50	2.80	3.20	4.40	2.60	3.40	4.20

Source: Post Harvest Survey (PHS) and Supplemental Survey to the PHS, 1999/00, CSO. US$ are computed at 2000 exchange rate.

4. ALTERNATIVE EXPLANATIONS FOR OBSERVED DISPARITIES IN LAND ALLOCATION AMONG SMALL-SCALE FARMERS

There are several competing explanations for the intra-village differentiation in household landholding size among rural households in Zambia. Kajoba (2001) regards peasant differentiation as a positive process indicating rural dynamism and a natural outgrowth of greater agricultural commercialization rather than as an 'exploitative' process. He stresses the importance of differential adoption of new agricultural technology (e.g., use of draft power and equipment, agronomic practices, chemical fertilizer, and improved seeds), contact with European farmers and extension agents, and differences in entrepreneurial ability among small-scale farmers in leading to differentiation in landholding sizes (see also Chipungu 1988). Since innovations are not adopted by every farmer all at once, the resulting differential adoption inevitably translates in some adopters forging ahead of others; such differences could translate into differences in accumulation of land. Kajoba (1988) also emphasizes that rural differentiation was accentuated by government policy during the colonial period that sought to create a nucleus of proficient small-scale farmers who adopted good farming techniques that would then be diffused more widely through the rural communities. Muntemba (1980) contends that the introduction of commercial crop production among the Lenje people of Central Province, “contributed to social differentiation in that a few rich and a large middle class of peasant farmers emerged while many others remained poor" (Muntemba 1989, p. 263). Kajoba (2001) argues that while there is need to take appropriate measures to help those groups which are lagging behind, the observed current differentiation in access to land within the small-scale farming sector is a sign of rural dynamism and provides no rationale for redistributive measures.

Other scholars have emphasized the first settler phenomenon, in which the first migrants into an area enjoy the benefit of relative land abundance and are able to secure use rights over a larger area than is available to more recent migrants, especially if coming from a different ethnic group than that of the original settlers (Govereh 1999).

A third possible explanation, related to the social capital literature, emphasizes the role of kinship and personalized ties in influencing the allocation of resources (e.g., Durlauf and Fafchamps 2004). Land allocation in most areas of Zambia remains under control of the local chiefs, sub-chiefs, and village headmen. Individuals that have close ties with traditional authorities, or whose parents and grandparents have enjoyed such ties, may be hypothesized to have potentially greater access to resources allocated by the local authorities, including land.

There are obvious inter-zone explanations for differences in landholding sizes, such as agro-ecological potential, access to markets, and population density. However, these factors do not tend to vary greatly within communities and hence cannot be considered important sources of the observed within-village differences in landholding size. We seek to identify these intra-village factors empirically in Sections 7 and 8.

5. PERCEPTION OF LAND ACCESS AMONG SMALLHOLDER FARMERS IN ZAMBIA

Despite the clear link between land access and income among small-holders farmers, the issue of land access in Zambia is perplexing because the country is generally thought of as a land abundant country. It is commonly believed that there are no major land constraints in Zambia, because less than 10% of Zambia's land is currently cultivated and population density at the national level is quite low. However, as shown in Section 1, this statistic can greatly overestimate the amount of arable land available for productive use in the country.

This section explores the issue of access to arable land from the perspective of the small-holder farmers themselves. One of the questions asked of households in the 2000 Supplementary Survey (CSO 2001) was "Is there unallocated arable land that is available to households in your village?" Nationwide, 45% of households felt that there was unallocated arable land that was available in their village area. Table 4 presents respondents' answers to this question. Also included in the table is the arable and available land according to a recent study (Mambo 2004) minus already utilized cropped land by province in the year 2000.

The responses in the table initially suggest that many households in Zambia perceive that there is unallocated land available in their villages. This view is particularly strong in the sparsely populated areas of Northwestern and Northern provinces, which incidentally also have the biggest portions of arable and available land, and to a lesser extent in Central Province. Central province is third in terms of available arable land. However, in the major agricultural provinces of Eastern and Southern provinces, less that 40% of respondents reported that unallocated arable land was still available in their areas. These two provinces have, other than Western province, the lowest square kilometers of available and arable land.

One might expect that the "no" responses would be concentrated in the most densely populated provinces, and the yes responses would be concentrated in sparsely populated areas. This is not uniformly the case in Zambia (Table 4). For instance Western Province has the second lowest population density in Zambia but it contained the greatest proportion of respondents indicating that no additional land was available. This is most likely because many parts of Western Province are unsuitable or only marginal suitable to crop cultivation, hence population density underestimates the degree to which population is concentrated in a few productive areas.

Western Province has the lowest area of available and arable land in Zambia. The population density of Central Province is higher than in Luapula and Eastern provinces but a greater proportion of households in Central felt that unallocated land was still available. This could be explained in part by the absolute area that is arable and available since, as mentioned earlier, Central Province is only third to Northwestern and Northern Provinces.

One might expect a greater uniformity of opinion to emerge when examining perceptions of available land at the village level. Remote areas of a province with poor access to markets and basic services may have an abundance of unallocated arable land, while areas near main roads and towns may be densely settled and hence have little available unallocated land. When the previous question is analyzed at the level of Standard Enumeration Areas (SEAs), which generally contain between one and three villages), we still find significant differences of opinion as to whether unallocated land is available. In 67 of the 394 SEAs in the CSOs 1999/00 Supplemental Survey, at least 70% of the households within those SEAs responded that unallocated land was available in their village. In 126 SEAS, 70% or more of the

households responded that land was not available. Hence, there was at least 70% consensus in 193 (48.9%) of the 394 SEAs about the availability or non-availability of unallocated arable land. If we use a more strict standard for consensus as 80% or more of the respondents answering in the same way, then in only 34% of the SEAs was there a consensus as to whether unallocated arable land was available (Table 5). This means that within localized communities, there appears to be a lack of consensus as to whether unallocated arable land is available – these perceptions are household-specific. What explains these discrepancies of perception?

Table 4. Perceptions of Availability of Arable Land in Zambia and Population Density, By Province

Province	Is there unallocated arable land?		Arable & available	Arable and available minus already cultivated land (kms^2) (i.e., unutilized)	Population density[a]
	% Responding Yes	% Responding No			
Central	57.9	42.1	65,800	64,679	27
Copperbelt	39.2	60.8	23,172	22,720	146
Eastern	32.6	67.4	6,769	3,935	25
Luapula	38.6	61.4	28,120	27,031	16
Lusaka	40.0	60.0	11,756	11,587	776
Northern	68.3	31.7	102,751	149,543	13
Northwestern	96.0	4.0	151,992	102,203	5
Southern	33.6	66.4	6,321	4,493	36
Western	23.3	76.7	1,877	879	7
Zambia	45	55	398,560	387,022	14

Source: Supplementary Survey to the 1999/2000 Post Harvest Survey, Central Statistical Office, Lusaka, Zambia.
Note: [a]Population densities are computed from the PHS data and therefore apply to smallholder farming areas. They do not count large-scale farming areas.

Table 5. Perceptions on Availability of Arable Land in Zambia, By Standard Enumeration Areas within Provinces

Province	Is there unallocated arable land around this village?	
	% of SEAs in which at least 80% of respondents replied YES	% of SEAs in which at least 80% of respondents replied NO
Central	5.0	7.5
Copperbelt	8.3	25.0
Eastern	9.7	27.7
Luapula	0	15.2
Lusaka	0	23.1
Northern	32.5	5.0
Northwestern	78.6	0
Southern	6.1	24.5
Western	2.4	38.1
Zambia	16.0	18.0

Source: Supplementary Survey to the 1999/2000 Post Harvest Survey, CSO, Lusaka, Zambia.

6. DETERMINANTS OF HOUSEHOLDS' PERCEPTIONS OF ACCESS TO UNALLOCATED LAND

To understand the factors influencing households' views about their access to additional land in their area, we specified a district fixed-effects probit model. Probit models are relevant for determining factors associated with binary variables where there are two alternative outcomes. In our case, the outcome is the household respondent's view of whether or not there is unallocated land available in the village. In Section 7, our dependent variables are actual household landholding size and landholding sizes per person. We regress these variable on the set of household assets, socio-demographic characteristics, settlement characteristics, and variables for which information is available at district level, such as population density and agro-ecological conditions. The list of variables and salient descriptive statistics are presented in Table 6. We briefly discuss these variables below.

6.1. Variables Used in the Regressions

6.1.1. Household Assets

Information from the PHS and SS surveys was available on whether the household owned particular kinds of assets and home-building material that is believed to signify wealth; this information was formulated into categorical variables because information on the value of these assets was not collected. The value of owned livestock plus draft equipment (ploughs, harrows, ox-carts) was available, and the value of these productive assets was aggregated into one variable. These assets tend not to change quickly over time and can be regarded as largely fixed in the short run. Over the longer run, assets and landholding size are likely to move together endogenously.

6.1.2. Socio-Demographic Characteristics

We constructed variables indicating the numbers of household members falling into particular age/sex categories. These variables contain more information and more precisely characterize the composition of the household than variables such as family size or adult equivalents. Variables were also specified for the age of the head of household to control for family life-cycle effects. For example, a young married couple just starting out may not be expected to have as much land, other factors held constant, as a more mature family with more members and where the household head is in his/her prime economically productive years. Household landholding size may again decline for an older couple, as they may cede some of their land to their adult children. We entered the age of the household head with a quadratic term because of our *a priori* reasons to expect a non-linear relationship, but its inclusion did not reject an F-test in any of the models, hence this term was dropped from the final reported results. Variables are also constructed for female-headed households, households where the male head is not living on the farm, and the number of years in which the household's family has been living in the area. A significant portion of Zambia's rural population is composed of immigrants having settled in the area over the past several generations from other locations in the country or from neighboring countries.

Table 6. Variables Used in the Regression Models

	Units	mean value (% responding yes if categorical variable)	standard deviation
Dependent variables			
Landholding size per hh[a]	Hectares	3.59	6.83
Landholding size per capita[a]	Hectares per cap	0.69	2.05
Perception that land is available for allocation (1=yes)	categorical	45.0%	n.a
Household Assets:			
HH owns bicycle motorbike or canoe (1=yes)	categorical	49.1%	n.a.
HH owns radio or tv	categorical	37.2%	n.a.
HH owns car pickup or van	categorical	1.2%	n.a.
HH owns grinding mill, pump or well	categorical	3.5%	n.a.
HH has asbestos or iron sheets	categorical	12.1%	n.a.
livestock assets plus traction equipment	Kwacha	571,282	1,846,255
Socio-Demographic Characteristics:			
Children under age 5	number per hh	0.92	0.95
Children aged 5 to 11	number per hh	1.84	1.67
Boys aged 12 to 16	number per hh	0.37	0.68
Girls aged 12 to 16	number per hh	0.38	0.69
Male adults aged 17 to 59	number per hh	1.12	0.96
Female adults aged 17 to 59	number per hh	1.16	0.86
Males 60 yrs and above	number per hh	1.54	1.23
Females 60 yrs and above	number per hh	1.63	1.17
Age of the household head	Years	44.97	14.79
HH head related to headman (1-yes)	categorical	30.1%	n.a.
HH head spouse related to headman (1=yes)	categorical	9.9%	n.a.
Highest education attained by a hh member	Years	7.07	3.47
Female headed married (1=yes)	categorical	4.1%	n.a.
Female headed single (1=yes)	categorical	17.6%	n.a.
Number of years settled in locality	Years	14.23	11.4
Market access			
Distance to nearest tarmac road	kilometers	24.52	34.2
Distance to nearest district town	kilometers	34.59	22.8
District Variables			
Population density	person per km^2	22.72	41.86
Is district located on line of rail (1=yes)	categorical	32.9%	n.a.
Agro-ecological zone1	categorical	21.5%	n.a.
Agro-ecological zone2	categorical	26.0%	n.a.
Agro-ecological zone3	categorical	12.8%	n.a.
Agro-ecological zone4	categorical	39.8%	n.a.
Matrilineal district dummy (1=matrilineal)	categorical	65.2%	n.a.

Note: [a]includes rented land.

6.1.3. Social Capital/kinship Ties

The amount of land available to households may also be hypothesized to be affected by aspects of social capital or kinship ties. The 99/00 Supplemental Survey contained questions asking whether the husband's family or wife's family was related to the headman of the area at the time of the family's settlement in the area. These two categorical variables were included in the regressions. In some models, we included a district-level categorical variable

for areas of matrilineal inheritance and interaction terms between this variable and the household kinship relation variables. This allows us to examine whether the effects of kinship ties on landholding size are different in districts of matrilineal vs. patrilineal inheritance.

6.1.4. Access to Markets

Maps of road networks and district town locations were superimposed on maps of the SEA/village sites in the 99/00 PHS survey by the Central Statistics Office to develop variables for the distance of each SEA to the nearest tarmac road and district town. These variables are defined at the SEA level and are included in the regressions as proxies for access to markets.

6.1.5. District-level Variables

We used two approaches for controlling for geographic effects. First, information was available to construct the following variables at the district level: agro-ecological zones (four different zones); population density (persons per square kilometer); a 0/1 categorical variable taking a value of one for districts located on the line of rail; and a 0/1 categorical variable for districts of primarily matrilineal land inheritance systems. This approach allows us to measure the direct effect of these variables on household land size and perceptions of their access to unallocated land. The second approach was to estimate a district fixed-effects model using district dummy variables. In this case, the district-level variables described above were omitted. Descriptive statistics on these variables are presented in Table 2.

6.2. Results

The results are presented in Table 7. Households' perception of land availability is associated with the amount of land currently under their control, but the effect is quite small. A ten hectare difference in landholding size is associated with a six percentage point increase in the probability of perceiving that additional land is available. Of the socio-demographic variables, none were significant except female-headed households. Single female-headed households were 10% less likely to perceive that additional land was available in their area. Neither household composition nor the age of the household head, nor education of the most highly educated household member was statistically related to respondents' perceptions as to the availability of unallocated land.

Kinship ties between the husband and wife's family and the village headman at the time of the family's settlement in the area were significantly associated with the perception of unallocated land available in the area (an 6.5% and 5.5% higher probability, respectively, than households claiming no lineage to the headman at the time of the family's settlement in the area). Proximity to towns and markets tends to be negatively correlated with the perception that additional land is available. A 20 km reduction in the distance to the nearest district town is associated with a five percentage point decline in the perception that additional land is available.

The number of years in which a household has been residing in the area was negatively correlated with perceptions as to land availability, other factors constant. This variable may be picking up effects of intra-district differences in population density, because the settlement duration variable is correlated with population density at the district level.

The major finding from this regression model is that a variety of factors influence perceptions of land availability. Factors that are positively correlated with perceptions of land availability are kinship relations to the local headman, distance from roads and district towns, and the amount of land and most other kinds of productive assets. Factors that are negatively correlated with perceptions of land availability are female-headedness, and the duration of settlement in the area. No one factor clearly predominates over the others.

Table 7. Probit Model Results on Perception as to Whether Village Authorities Have Unallocated Land That Could Be Allocated to this Household (1=yes)

	Coefficient	t-statistic
Household Assets		
Land access	.006**	2.73
Land access squared	-3.38*e-5*	-1.72
Household owns bicycle, motorbike or canoe (=1)	-.023	-1.50
Household owns radio or tv (=1)	.043**	2.59
Household owns grinding mill, pump or well (=1)	-.126**	-3.24
Household has asbestos or iron sheets (=1)	-.125***	-5.43
Livestock plus traction equipment	-3.73e-10	-0.08
Socio-demographic variables:		
Number children under age 5	-0.013	-1.64
Children between 5 and 11 yrs	0.007	1.47
Boys aged between 12 and 16	-0.0146	-0.77
Girls aged between 12 and 16	-0.069	-0.37
Male adults aged between 17 and 59	0.021	1.19
Female adults aged between 17 and 59	-0.030	-1.72
Males 60 yrs and above	-0.117	-0.64
Females 60 yrs and above	0.023	1.33
Age of the household head	-2.429*e-5	-0.42
Highest level of education attained by household	-0.004	-0.62
Female headed married	-0.022	-0.65
Female headed single	-0.098*	-1.91
Kinship ties/social capital variables		
Household head related to headman	0.065***	4.05
Household head spouse related to headman	0.055***	2.36
Settlement Patterns		
Number of years settled in locality	-0.003	(-4.02)***
Distance from a main road	6.146*e-4	
Distance from district town	0.0025	(6.76)***
District Dummies:	---------- included ----------	
Degrees of freedom	6,785	
Pseudo R2	0.212	
Log likelihood	-3,697.44	

Source: Supplementary Survey to the 1999/2000 Post Harvest Survey, Central Statistical Office, Lusaka, Zambia.

Notes: Coefficients are expressed in marginal probabilities; numbers in parentheses are z values. *, **, *** statistically significant at less than 10%, 5%, and 1%, respectively. The categorical variable "ownership of cars or vans" was excluded due to orthogonality.

7. DETERMINANTS OF LANDS ACCESS AMONG SMALL HOLDER FARMERS IN ZAMBIA

To discuss the determinants of household access to land in Zambia we regress landholding size per household and landholding sizes per capita on a set of exogenous household and community characteristics. Rented land is included in landholding size, although less that 0.01 hectares of land is rented on average across the sample. The model is estimated using ordinary least squares (OLS). Table 8 shows the regression results for four models where the dependent variable is total household income. The first two models are agro-zone dummy variables, meaning that the results control for unobserved differences between agro-zones and should be interpreted as within agro-zone effects. The last two models use district dummy variables to control for unobserved district-level factors.

With regard to assets, the model results suggest that ownership of household assets such as bicycles, motorbikes, canoes, radios, televisions, grinding mills, water pumps or wells is positively related to land ownership for all the models including the last two models where district dummies are introduced. These relationships are generally highly statistically significant. Not surprisingly, wealth is correlated with landholding size.

The value of household livestock assets, ploughs, harrows and carts, is positively related to land access, and the relationship is statistically significant in all four models. The relationship is non-linear, indicating that beyond a certain value of household assets, there is little or no contribution of additional assets to household access to land. Livestock assets are arguably endogenous, so these models were re-estimated to examine the robustness of the coefficient estimates on the other variables. While these results are not reported here, for the most part there was little change in the other variables, except where noted below.

With regard to demographic variables, the models indicate a positive relationship between land access and the number of children under age 5 and the number of children between 5 and 11 years old for all the four models. These relationships are highly statistically significant. When the household members reach adulthood (12 years according the PHS), the relationship becomes negative and as such the variables “boys aged between 12 and 16” and “girls aged between 12 and 16” have a negative relationship to land access for all models. The relationships are significant between 5% and 10% confidence level. The relationship between landholding size and the number of adults is complex because it is affected by the age of the household head. For example, according to model 1a in the first column of Table 8, if the male head of household were 30 years old, his presence in the household is associated with only 0.13 additional hectares (=0.117*30 - .22). However, if the male head were 50 years old, his presence is associated with 0.37 additional hectares of land (=0.1171*50 - .22). A similar relationship between the age of the female head/spouse and landholding size is observed.

The number of household members over 60 years of age was also positively related to land access. More senior and therefore perhaps more influential household heads do appear to have more land allocated to them, other factors constant. The findings also indicate that this is consistent with the finding that the age of the household head is also positively related to land access in all models.

With regard to kinship ties, the models suggest that there is a positive effect on landholding size when the household head is related to the headman and this relationship is statistically significant at all levels of confidence for all the four models. When the household head’s

spouse is related to the headman this also has a positive effect on land access. The magnitude of additional land is roughly in the 0.2 to 0.4 hectare range for households in which the headman relations are with the male head's family, and in the 0.2 to 0.6 hectare range for households in which the headman relations are with the female head/spouses' family. The positive influence of the wife's family relation with the local headman pertains only in patrilineal areas; in matrilineal areas, this effect is wiped out, as can be seen by results in model 1b. This is not unexpected, because in matrilineal societies in Zambia, the heir to the estate of a deceased male is normally selected from the male relatives on the widow's side; the widow of the deceased typically does not benefit from this arrangement although one of her brothers does. The positive effect of the husband's family relations with local authorities applies in both matrilineal and patrilineal areas. Given that the mean farm size in the sample is three hectares, kinship connections appear to account for roughly a 10-15% increase in the household's access to land.

The level of education attained by the most educated household member is positively related to the household landholding size. This relationship is statistically significant at the 5% significance level for model 1a, 1b and 2a at the 10% level of confidence for model 2b. Based on the results from model 1a, 12 years of education is associated with over half a lima (about one-sixth of a hectare) more land than a household whose members have no more than a grade 7 education. The importance of education in influencing landholding size may account for the effect of entrepreneurial ability and willingness to innovate as suggested by Kajoba (2001).

Female-headed households – both those with a non-resident husband as well as those without a husband – have 0.7 and 0.5 less hectares than male-headed households. This amounts to a 20 to 25% difference from the mean landholding size in the sample. These findings are very robust and statistically significant across all models estimated.

The number of years settled in a locality is positively associated with landholding size and is statistically significant at all levels of confidence for all the four models. If the coefficients in model 1a are used, households settling in the area 20 years earlier than the mean tend to have landholdings that are roughly three limas (3/4 hectare) larger than the mean. This finding validates the first settler phenomenon, in which early migrants appear to have greater access to land than more recent arrivals.

The results also indicate that differences in agro-ecological potential, and the distance of the household to the nearest tarmac road, district town, and line-of-rail all have strong and highly significant association with household landholding size. For example, an additional 30 kilometers closer to the nearest district town is associated with a 0.3 hectare smaller farm. This is to be expected, as the economic value of land increases as it becomes more accessible to markets and infrastructure. These relationships are significant at the 1% significance level. Communities tend to cluster around infrastructure, thereby increasing the density of population. In concert with this logic of clustering, the district density of population is negatively related to land access as shown in models 1a and 1b. The relationship is also significant at the 1% level for the three models. In contrast, the presence of a major rail line is positively related to land access and is statistically significant at the 1% level.

When the district dummies (models 2a, and 2b) are introduced we exclude Mumbwa district which had the median landholding size. The districts where the landholding sizes are larger than the median Mumbwa (at least at the 5% level of significance) are Chibombo, Chililabobwe, Kalulushi, Luanshya, Mpongwe, Mwense, Chinsali, Isoka, Kaputa, Kasama,

Mbala, Mpika, Mporokoso, Mpulungu, Mungwi and Nakonde. The districts where the relationship is negative and significant at 5% or less are Chama, Lundazi, Luangwa, Zambezi, Gwembe, Mazabuka, Sinazongwe, Lukulu, Senanga, and Shangombo.

To test the robustness of these findings, we re-estimated each of the four models using land access per capita as the dependent variable. These models provide a fundamentally consistent picture as to the factors driving households' access to land (Table 9). Several minor differences are that ownership of a car, pickup, or van becomes statistically insignificant. And the sign of several of the variables measuring the number of household members in various age/sex categories switched as expected from positive to negative when the dependent variable is measured in per capita terms. This result means that while larger families tend to have larger landholdings, an additional member is generally associated with a relatively small increase in land, such that the per capita landholding size is inversely related to the number of family members. The coefficients of the remaining variables change slightly to moderately but the direction of the relationship remains the same as in the total landholding regressions for all variables.

Table 8. OLS Regression Results For Total Land Access (Land Controlled Plus Rented Land), in Hectares per Household

Variable	Model 1a	Model 1b	Model 2a	Model 2b
Household Assets:				
Household owns bicycle motorbike or canoe(=1)	0.49	0.53	0.43	0.43
	(5.62)***	(6.20)***	(5.218)***	(5.255)***
Household owns radio or tv (=1)	0.33	0.31	0.35	0.35
	(3.63)***	(3.408)***	(4.011)***	(4.015)***
Household owns car pickup or van (=1)	0.73	0.742	0.741	0.743
	(1.92)*	(1.97)**	(2.072)**	(2.076)**
Household owns g mill w pump or p well (=1)	1.28	1.34	1.22	1.22
	(5.78)***	(6.033)***	(5.684)***	(5.682)***
Household has asbestos or iron sheets (=1)	-0.03252	-0.02175	0.05803	0.005674
	(-0.255)	(-0.171)	(0.473)	(0.463)
Productive draft assets	4.238E-07	4.243E-07	4.100E-07	4.097E-07
	(12.222)***	(12.279)***	(12.302)***	(12.293)***
Productive draft assets squared	-1.027E-14	-1.03E-14	-9.68E-15	-9.668E-15
	(-7.717)***	(-7.747)***	(-7.631)***	(-7.625)***
Demographic:				
Number children under age 5	0.15	0.15	0.13	0.13
	(3.471)***	(3.557)***	(3.163)***	(3.154)***
Children between 5 and 11 yrs	0.14	0.13	0.14	0.137
	(5.627)***	(5.421)***	(5.870)***	(5.849)***
Boys aged between 12 and 16	-0.2	.-19	-0.201	-0.202
	(-1.881)*	(-1.819)*	(-1.998)**	(-2.012**)
Girls aged between 12 and 16	-0.21	-0.21	-0.222	-0.222
	(-2.049)**	(-2.077)**	(-2.286)**	(-2.287)**
Male adults aged between 17 and 59	-0.22	-0.22	-0.194	-0.195
	(-2.256)**	(-2.207)**	(-2.097)**	(-2.107)**
Female adults aged between 17 and 59	-0.29	-0.30	-0.261	-0.262
	(-3.010)***	(-3.131)***	(-2.882)***	(-2.893)***
Males 60 yrs and above	0.34	0.34	0.333	0.34
	(3.29)***	(3.335)***	(3.468)***	(3.483)***
Females 60 yrs and above	0.351	0.36	0.365	0.365
	(3.636)***	(3.764)***	(4.016)***	(4.023)***
Age of the household head	0.01171	0.01136	0.01064	0.01065
	(3.694)***	(3.596)***	(3.533)***	(3.54)***
Settlement Patterns:				
Household head related to headman	0.37	0.47	0.350	0.420
	(4.283)***	(3.488)***	(4.090)***	(2.971)***
Household head spouse related to headman	0.51	1.46	0.253	0.413
	(4.031)***	(6.398)***	(2.047)**	(1.834)*
Highest level of education attained in hh	0.03404	0.0332	0.0318	0.03118
	(2.618)**	(2.561)**	(2.456)**	(2.455)*
Female headed married	-0.735	-0.703	-0.573	-0.575
	(-3.777)***	(-3.628)***	(-3.115)***	(-3.127)***
Female headed single	-0.574	-0.56	-0.517	-0.516
	(-5.146)***	(-5.035)***	(-4.900)***	(-4.894)***
No of yrs settled in locality	0.0352	0.03467	0.03365	0.0336
	(9.095)***	(8.895)***	(9.133)***	(9.116)***
Household is in matrilineal district	n.a.	-0.26	n.a.	n.a.
	n.a.	(-2.472)**	n.a.	n.a.

Table 8: Continued

Variable	Model 1a	Model 1b	Model 2a	Model 2b
Matrilineal district*hh head related to headman	n.a.	-0.21	n.a.	-0.107
	n.a.	(-1.249)	n.a.	(-0.610)
Matrilineal district*hh spouse related to	n.a.	-1.30	n.a.	-0.226
headman	n.a.	(-4.744)***	n.a.	(-0.842)
Geographic Variables				
District is in agro-ecological zone 1	excluded	excluded	n.a.	n.a.
	excluded	excluded	n.a.	n.a.
District is in agro-ecological zone 2	0.37	0.26	n.a.	n.a.
	(3.334)***	(2.313)**	n.a.	n.a.
District is in agro-ecological zone 3	0.60	0.41	n.a.	n.a.
	(4.249)***	(2.889)***	n.a.	n.a.
District is in agro-ecological zone 4	1.75	1.68	n.a.	n.a.
	(16.242)***	(15.498)***	n.a.	n.a.
Distance to nearest tarred/main road (km)	0.006544	0.008326	0.009214	9.156E-03.
	(5.641)***	(6.891)***	(4.130)***	(4.100)***
Distance to nearest district town (km)	0.01163	0.01024	0.007995	0.008017
	(6.622)***	(5.782)***	(4.113)***	(4.124)***
There is a major rail line in the district	1.024	1.039	n.a.	n.a.
	(11.153)***	(11.133)***	n.a.	n.a.
Population density 2000 census	-0.004557	-0.00422	n.a.	n.a.
	(4.578)***	(-4.234)***	n.a.	n.a.
Constant	-1.184	-0.952	-0.270	-0.266
	(-5.881)***	(-4.418)***	(-0.983)	(-0.967)
Number of Observations	6778	6778	6778	6778
Adjusted R-Squared	0.196	0.201	0.294	0.289

Source: Supplementary Survey to the 1999/2000 Post Harvest Survey, Central Statistical Office, Lusaka, Zambia.

Notes:: *, **, *** signify significance at the 10%, 5%, and 1% level. Productive assets is the sum of the value of Livestock assets +value of ploughs , harrows and carts.

Table 9. OLS Regression Results For Land Access (Land Controlled Plus Rented Land) in Hectares Per Capita

Variable label	Model 1a	Model 1b	Model 2a	Model 2b
Household Assets:				
Household owns bicycle motorbike or canoe (=1)	0.094	0.105	0.088	0.086
	(4.465)***	(4.934)***	(4.124)***	(4.138)***
Household owns radio or tv (=1)	0.067	0.062	0.070	0.070
	(2.966)***	(2.776)***	(3.197)***	(3.194)***
Household owns car pickup or van (=1)	-0.006	-0.002	-0.020	-0.019
	(-0.054)	(-0.017)	(-0.198)	(-0.205)
Household owns g mill w pump or p well (=1)	0.198	0.210	0.196	0.196
	(3.567)***	(3.779)***	(3.573)***	(3.573)***
Household has asbestos or iron sheets (=1)	0.021	0.023	0.041	0.041
	(0.650)	(0.726)	(1.322)	(1.312)
Productive assets	6.729E-08	6.758E-08	6.425E-08	6.424E-08
	(7.365)***	(7.412)***	(7.164)***	(7.162)***
Value of productive assets squared	-1.649E-15	-1.667E-15	-1.461E-15	-1.462E-15
	(-3.807)***	(-3.856)***	(-3.473)***	(-3.474)***
Demographic:				
Num. children under age 5	-0.100	-0.111S	-0.103	-0.103
	(-9.231)***	(-9.176)***	(-9.859)***	(-9.853)***
children btwn 5 and 11 yrs	-0.085	-0.086	-0.084	-0.084
	(-13.659)***	(-13.853)***	(-14.036)***	(-14.035)***
boys aged btwn 12 and 16	-0.059	-0.058	-0.058	-0.058
	(-2.242)**	(-2.185)**	(-2.267)**	(-2.277)**
girls aged btwn 12 and 16	-0.024	-0.025	-0.027	-0.027
	(-0.93)	(-0.962)	(-1.082)	(-1.080)
male adults aged btwn 17 and 59	-0.048	-0.047	-0.040	-0.040
	(-1.972)**	(-1.925)*	(-1.720)*	(-1.716)*
female adults aged btwn 17 and 59	-0.024	-0.026	-0.016	-0.016
	(-0.991)	(-1.091)	(-0.704)	(-0.699)
males 60 yrs and above	-0.011	-0.010	-0.013	-0.013
	(-0.432)	(-0.413)	(-0.524)	(-0.524)
females 60 yrs and above	-0.048	-0.045	-0.045	-0.045
	(-1.97)**	(-1.868)*	(-1.921)*	(-1.925)*
Age of the household head	0.002	0.002	0.002	0.002
	(2.374)**	(2.281)**	(2.275)**	(2.284)**
Settlement Patterns:				
Household head related to headman	0.072	0.096	0.074	0.094
	(3.407)***	(2.863)***	(3.436)***	(2.630)**
Household head spouse related to headman	0.106	0.276	0.050	0.043
	(3.359)***	(4.865)***	(1.599)	(0.748)
Highest level of education attained by hh	0.007	0.007	0.006	0.006
	(2.295)**	(2.254)**	(1.949)*	(1.954)*
Female headed married	-0.150	-0.143	-0.103	-0.103
	(-3.100)***	(-2.963)***	(-2.213)**	(-2.214)**
Female headed single	-0.077	-0.074	-0.063	-0.063
	(-2.794)***	(-2.692)***	(-2.355)**	(-2.344)**
Number of yrs settled in locality	0.008	0.008	0.008	0.008
	(8.701)***	(8.614)***	(8.522)***	(8.529)***
Household is in matrilineal district	n.a.	-0.056	n.a.	n.a.
	n.a.	(-2.192)**	n.a.	n.a.
matrilineal district*hh head related to headman	n.a.	-0.048	n.a.	-0.031
		(-1.13)	n.a.	(-0.696)
matrilineal district*hh spouse related to headman	n.a.	-0.231	n.a.	0.011
		(-3.39)***		(0.166)

Table 9. Continued

Variable label	Model 1a	Model 1b	Model 2a	Model 2b
District is in agro-ecological zone 1	excluded	excluded		
	excluded	excluded		
District is in agro-ecological zone 2	6.43E-02	0.041	n.a.	n.a.
	(2.302)**	(1.428)	n.a.	n.a.
District is in agro-ecological zone 3	0.159	0.121	n.a.	n.a.
	(4.546)***	(3.402)***	n.a.	n.a.
District is in agro-ecological zone 4	0.349	0.336	n.a.	n.a.
	(13.083)***	(12.432)***	n.a.	n.a.
Distance to nearest tarred/main road (km)	0.001	0.002	0.002.	0.002
	(4.488)***	(5.562)***	(3.238)***	(3.203)***
Distance to nearest district town (km)	0.002	0.002	0.001	0.001
	(4.648)***	(3.947)***	(2.095)**	(2.098)**
There is a major rail line in the district	0.208	0.212	n.a.	n.a.
	(9.121)***	(9.269)***	n.a.	n.a.
Population density 2000 census	-8.326E-04	-7.603E-04	n.a.	n.a.
	(-3.374)***	(-3.073)***	n.a.	n.a.
Constant	0.351	0.401	0.561	0.562
	(-7.004)***	(7.467)***	(8.032)***	(8.041)***
Number of Observations	6778	6778	6778	6778
Adjusted R-Squared	0.143	0.147	0.217	0.217

Source: Supplementary Survey to the 1999/2000 Post Harvest Survey, Central Statistical Office, Lusaka, Zambia.

Notes:: *, **, *** signify significance at the 10%, 5%, and 1% level. Productive assets is the sum of the value of Livestock assets +value of ploughs , harrows and carts.

8. LAND POLICY IN ZAMBIA

8.1. Background

Policy can be defined as the rationale justifying a particular course of action by government. Policy is reflected in the laws, regulations, and decisions that government makes to influence a particular sector over time. In some cases governments produce documents that describe and explain their stated policies.

This section relates the findings of this study with the evolution of land policy in Zambia. We aim to distinguish policies influencing the form of control over land (e.g., title deeds, customary tenure, rent arrangements) from the more central issue of policies designed to influence who has the ability to allocate land, and the restrictions put upon them in the allocation of land.

8.2. Legal Provisions

The land sector in Zambia is governed by three statutes; the Land Act of 1995, the Agricultural Lands Act of and the Town and Country Planning Act of 1991. The Lands Act concerns itself with the ownership (titling) and allocation (procedure of acquiring land) of land in Zambia, the Agricultural Lands Act concerns itself with the Ministry of Agriculture and Cooperatives' (MACO) role in planning for agricultural land, and the Town and Country Planning Act concerns itself with regulating and controlling the construction of permanent buildings and structures. The Town and Country Planning Act has very little bearing on tenure and access issues and will not be discussed in this document. The majority of smallholder farmers reside on communal land and are affected mostly by the Lands Act which governs both state and communal land. Planning of agricultural land by MACO involves the identifying of suitable areas for agriculture and planning for basic infrastructure development. Much of the deliberation over land policy in recent years concerns how to transfer unutilized customary land under the control of chiefs to the state, so that it can be allocated for commercial and productive use. However, frequent reports in the press cite irregularities and corruption in the allocation of state land (e.g., Sunday Mail 2007; The Post 2007).

The Lands Act is the first attempt to legally recognize customary land and to make some legal provisions for administration of land under this tenure system. It has provisions that permit an occupant to covert communal informal title into a formal 99-year leasehold title. Implicit in this could be government's policy to convert communal land (with allocation rights resting with traditional authorities) to state land (with allocation rights vested in the state). In order to convert land from traditional to state land, the local traditional rulers (the headmen, in conjunction with their chiefs) must approve that an applicant can be granted land in their area. This written consent then has to be approved by the local council before being sent to the Ministry of Lands for allocation. Ministry of Land officials have informally indicated that convincing the local traditional rulers to cede land is not an easy task and often requires substantial inducements due to the many competing prospectors. In short, the

traditional authorities control a valuable economic asset and tend to allocate it sparingly based on economic and/or political considerations.[5]

The Act remains silent on the problem of inadequate access to land by land-constrained small-scale farm households. It concerns itself mostly with which authorities are to control the allocation of land, and does not appear to reflect an underlying concern for redressing the problems of inadequate access to land, nor how to provide stronger incentives for land currently within the communal lands sector to be productively utilized through a comprehensive sector investment program.

The Agricultural Lands Act of 1960 gives power to MACO to plan for the allocation and development of what is termed agricultural land. This applies only to state land, not communal land. Hence, government may have a strong motive to have more land shifted over from communal to state land, since obtaining the authority to allocate land is a major source of power, influence, and possible rent extraction. At this time, however, the Agricultural Lands Act is not being exercised, because it requires the formation of an Agricultural Lands Board to actually implement the powers contained in the Act and it covers a very small portion of the country (Southern, Central and Lusaka provinces). In the absence of a Lands Board, the MACO Land Use Planning Unit has continued to identify areas that it deems suitable for agricultural use in conjunction with the Ministry of Lands. The unit then plans the type of development in the area, which includes mapping out where the roads and other infrastructure will be situated and also the sizes of the holdings. In the past, MACO used its own equipment to build some of this infrastructure but it now retains only planning responsibilities.

8.3. Recent Developments

8.3.1. Farm Blocks

Other than the release of the revised Lands Act in 1995 there have been other developments in the land sector that provide an indication of government policy, the main one being the creation of farm blocks. According to the Ministry of Agriculture and Cooperatives, farm blocks are large tracts of land identified by the Ministry and obtained from the traditional land and turned into state land where new farms are created. Basic infrastructure such as roads and electricity are provided in these areas. Intentions to create these new large farms are advertised in the press and interested parties apply. Technically land is allocated to applicant investors who show the most potential to develop that land and promote out-grower schemes that can generate employment, provide extension, inputs and markets to local small-holder farmers.

In January 2001, the Ministry of Agriculture and Cooperatives issued what was termed the Agricultural Sector Investment Program Successor Program (ASIP II). This program had sub-programs among them the Land Development and Settlement sub-program.

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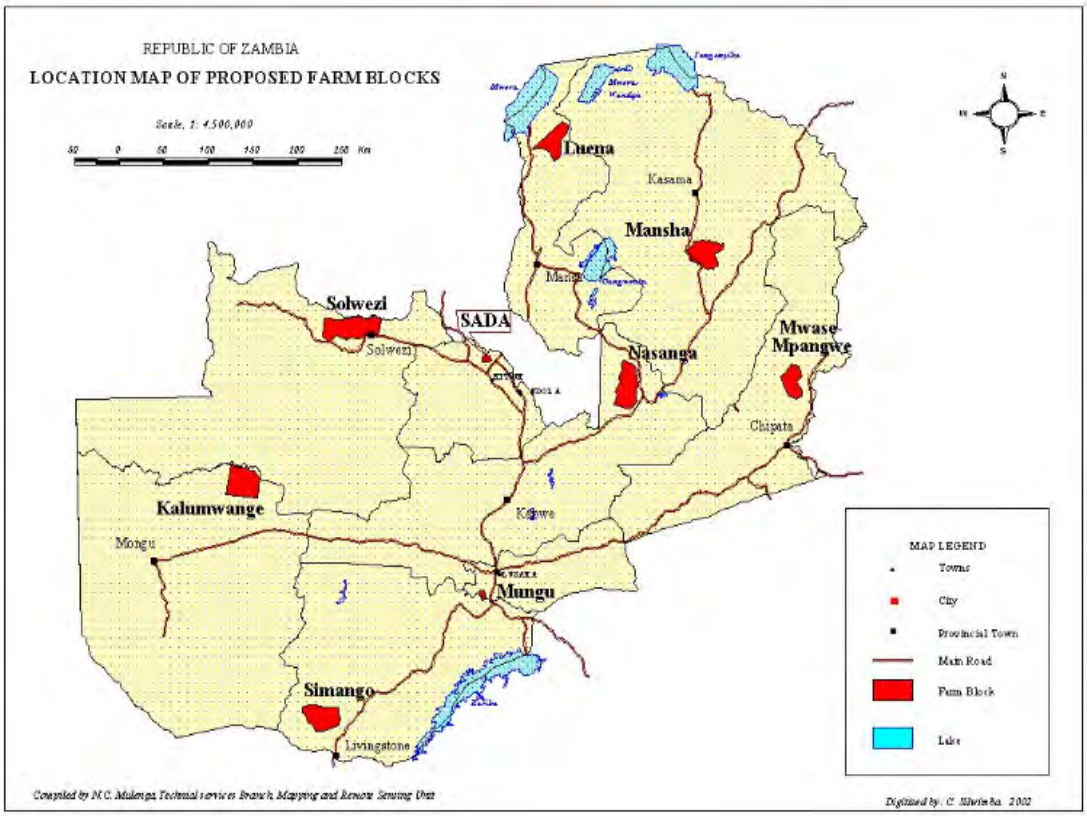
[5] On the other hand, Chileshe (2005), in his study of 2 villages in the Copperbelt Province, did not find one case where the process of State approval with signed documents had been completed although a number of cases were found to be in process, some apparently for years. However, having the necessary letter from the chief approving of the lease-tenure agreement is treated as if the State had approved. It was reported that getting the letter of approval from the chief is facilitated by making payments to the Chief or his representatives. This means that it is much easier for a relatively wealthy person to acquire land in the area than someone simply seeking the right to participate in the usual means of gaining access to land.

Figure 3. Location Map of the Proposed Farm Blocks



Source: Chizyuka et al. 2006.

The main thrust of the recommendations in this ASPI II is where to create farm blocks/resettlement schemes in all the provinces in Zambia. One farm block has been identified in each province, of which three are being actively developed (Figure 3). These are in Kawambwa (Northern province), Serenje (Central province) and Kaoma (Western province). There have been some roads built in the Serenje farm block but most of the work is at the surveying and planning stage. This is not an entirely new concept and farm blocks have been created before with varying degrees of success.

The current plan is to demarcate commercial agricultural land with one core large scale farm (core venture) of 10,000 hectares and will be complemented by many commercial farms of 1,000 to 5000 hectares and small-holdings of 30 to 700 hectares preferably for out-grower arrangements on similar lines like Nakambala Sugar Estate and Kaleya Small Holdings.

The creation of farm blocks has meant that Ministry of Lands and MACO officials have had to negotiate with the traditional leaders in the respective areas so that these leaders release the land for the creation of farm blocks. Ministry of Lands officials state that this is necessary because there is very little state land left where these farm blocks can be created. This argument of insufficient state land necessitating access to customary land is also reflected in the draft land policy.

Another argument given for bringing more land under state control is the very cumbersome and tedious process involved in granting title to formerly customary land. Traditionally, customary systems grant land to local tribesmen and have very little tolerance for "outsiders". Recently, however, there has been an upsurge of cases involving outsiders getting land in a traditional area especially if the investment is approved by the main chief. One such case is in the Mwanachindalo area of Southern Province, where the subjects sued the Chief when he allocated a large portion of his area to foreign investors. In the end the court ruled in favor of the chief.

Perceptions of inadequate state land to undertake agricultural development efforts, as reflected in various government documents, highlights two important points for future land policy discussions. First, it indicates that pressure will mount over the coming years to induce chiefs to release control over part of their land, so that it can be converted into state land which can be allocated to investors to be developed. Von Loenen (1999) argues that it seems inevitable that statutory control of land will progressively replace customary rights, with the state increasingly taking control of land allocation away from the chiefs. With urbanization, increasing mixing and relocation, and states' desires to control resources for both development and patronage activities, many African states appear to be succeeding in slowly wresting control of resources from traditional authorities (Herbst 2000).

The second point highlighted by recent government land documents is the apparent view that state development can take place only on state-controlled land. The rationale for moving land from customary tenure arrangements to state-allocated and privatize-able land is to facilitate state investment in agricultural development. Little consideration appears to have been given to the possibility of state investment in public goods and services to raise the economic value of land in the customary tenure areas and promote agricultural investments by smallholder farmers within these areas. It is possible that this reflects the assumption that the state is in a better position to allocate land in an equitable and pro-poor manner than traditional authorities. However, recent developments in Zambia suggest that this is a highly questionable assumption (e.g., the Post 2007; Sunday Mail 2007; NewsfromAfrica 2007; Machina 2005). In the end, the ability to pursue a land policy that allows for equitable and pro-poor agricultural productivity and income growth will require the commitment of both state and traditional leaders to principles of equity and access to land for the millions of smallholder farmers in Zambia.

There is a perception within government circles that the state is seen as more neutral and a faster delivery channel which can put more land to productive use. In some areas this might create a trade-off because land is plentiful and lots of it remains unallocated. However, the transfer of land from the chiefs to the state may also accelerate the allocation of land to large commercial interests, which could leave less land available for allocation to small-scale farm households. While a great deal of land in Zambia remains unutilized, the amount of utilizable land available is much less, after considering the sparse network of infrastructure and other types of service provision in rural areas which determine how much unutilized land is actually utilizable. This brings to the fore the need to distinguish between the total stock of unutilized land in Zambia and the stock of unutilized land that could feasibly and productively be utilized given available settlements, roads, health facilities and markets. In other words, much land in Zambia remains unutilized because it cannot really support commercially-oriented farming systems due to its current remoteness, distance from markets, and lack of basic services to make it hospitable for migration and settlement.

It is not clear how much funding is available for infrastructure development in the farm block program but aggressive road and other infrastructure development coupled with service provision to could create incentives to cultivate land in the now remote areas. This approach probably has the best chances for a pro-poor development strategy in districts where settlement is already dense in some parts, and remote in other parts of these districts. From the evidence in the preceding sections there is a very uneven pattern of population density in most districts such that the most cost-effective public goods investments could be in the districts where there land constraints already exist in some parts but where there is nearby currently inaccessible but productive land in other parts of the district.

Another potential limitation of the farm block approach is that it does not give cognizance to the small holders concern for more land. It does not look at ways of relieving land pressures in areas where smallholders are already densely settled in the rural areas, leading to small landholdings and low agricultural incomes in the absence of viable off-farm jobs. There has been little examination to date as to why so many smallholders seem to think that there is no more arable land to be allocated. It is not clear what empirical study or theory is backing the creation of more farm blocks.

Conversely, if farm blocks were carefully sited so as not to pose trade-offs with smallholder access to land in coming decades, and if they are successful in become dynamic sources of employment and growth, they could facilitate demand for downstream off-farm activities and other forms of growth linkages and employment in a virtuous cycle. However, this assumes that the activities are designed in such a way as to stimulate profitable commercial agriculture.

According to the CSO Supplemental PHS survey data, 6.5% of households nationwide were evicted from their land in the period between 1990 and 2000. This ranged from 3.9% of households in Southern Province to 11.1% of households in Luapula Province. Such results indicate that the phenomenon of forced eviction of households from land that they perceived to be under their control is not uncommon in Zambia.

8.3.2. Draft Land Policy

In 2003 the Ministry of Lands (MOL) prepared a draft Land Policy document. According to MOL officials the document is being used to trigger debate in the hearings MOL is conducting in all the provinces of Zambia. It is the intention of MOL that the contributions received from the hearings will be used to beef up the draft document and this will finally culminate into the official land policy for Zambia.

The document mentions that 94% of the total land mass is under customary tenure with 6% under state tenure which is at odds with their data base at MOL which states that about 1% is under state tenure, 13% under customary tenure, and 86% under forests and other reserves. The document further argues that the land under customary tenure is required for the future development of Zambia (Republic of Zambia 1995, page 11). The draft land document is 32 pages long but only has two pages devoted to outlining what government policy is.

With regard to land policy *per se,* the overall policy objectives of the land policy are to:

1. recognize and promote the people's right of access to land and provide land information for the country's social economic development; and

2. improve land delivery

Among the notable strategies mentioned is "to enforce the Ministry's policy of ensuring that thirty percent (30%) of land which demarcated is allocated to women with special needs." It is important to note that this is a draft policy and is to be considered incomplete.

Several sources indicate that inequality in land allocation and ownership has increased in recent years. Cited in the Sunday Mail (2007), Henry Machina, country coordinator of the Zambia Land Alliance stated that a great deal of land grabbing was occurring through the sale of state land (some of it transferred recently from customary to state land) to politically influential people and interests. The article indicates that the Land Act of 1995 sets no upper limit on the amount of land that can be given to a particular individual or company, sets no guidelines on the price at which state land should be sold or given, and does not restrict the time that must elapse before a person could re-sell their newly acquired land, sets no limit on the sale price. Moreover, there appears to be overlapping jurisdiction between the chiefs, Ministry of Lands, and other branches of the State in the allocation of land. Because the boundaries of chiefs' land tend not to be surveyed, it is sometimes unclear where their jurisdiction ends and that of other chiefs or the Ministry of Land's begins. Developing a more clear and coherent land allocation process, with clear restrictions placed on the transfer of state land, and with a more pro-poor orientation in support of broad-based agricultural development, would seemingly be a high priority for a revised and updated Land Act.

9. CONCLUSION AND POLICY IMPLICATIONS

Zambia faces the apparent paradox of having roughly a quarter of its rural population facing near-landlessness and perceptions of no additional land available to them despite the existence of substantial underutilization of arable land. Moreover, within a given district or village, there are very wide intra-village differences in farm size within the small-scale sector. Within a given district, the top 25% of households tend to have 8 to 10 times more land than the bottom 25% of households. While mean farm size (including rented land) is 3.05 hectares, about one-third of all households have access to one hectare or less. The bottom 25% of households have a mean farm size of 0.61 hectares, while the top 25% control a mean of 8.85 hectares.

These statistics show that there is great variation in farm sizes within the small- and medium-scale farm sector in Zambia. The importance of these findings depends on the degree to which land allocation patterns reflect differences in households' ability to use land productively. For example, if households with small farm sizes are able to compensate by moving into viable non-farm activities so as to provide land-poor households with adequate alternative income sources, then disparities in land ownership should not necessarily be a policy problem. However, the findings in this paper indicate that there is a strong relationship between landholding size and household per capita income, especially for households owning less than 1.25 hectares of land (which applies to roughly 45% of the smallholder population in Zambia).

There are alternative explanations, none mutually exclusive, for the observed variation in farm size. Some of these are related to talent and effort, colonial policies, inevitable differences in the up-take of new technology, social capital and kinship relationships, and time of settlement in the area. All of these factors are tested empirically in econometric models of household farm size. Results indicate that each of these explanations has some explanatory power and contributes to the explained variation in landholding size. Landholding size is positively related to variables signifying productive farming potential and wealth, which is most likely correlated with initiative and effort. However, we also find that blood/kinship relations between the male and female head-of-household's family and the local chief at time of the family's settlement are positively and significantly associated with current landholding size. These emerging findings lead us to speculate that there may be important institutional and governance factors operating within local systems for allocating land that may be accounting for at least some of the unexplained variation in per capita landholding size within the smallholder farm sector.

However, in many areas, unallocated land appears to be unavailable, particularly in areas close to urban areas and district towns, and along major highways. The econometric analysis in this paper reinforces the view that over time the rural population has tended to cluster in areas where access to markets and services are best, leading to a highly nucleated pattern of settlement. At the same time, there appear to be large amounts of unallocated land in the more remote parts of the country, but the economic value of this land is limited because of the lack of access to markets and services. Thus, in densely settled areas where population growth and sub-divisions have created land constraints, rural poverty has become closely associated with inadequate access to land. It is for this reason that current discussions and outcomes with regard to land use and land allocation policy in Zambia are likely to influence future rates of rural poverty and the number of rural Zambians who are able to contribute to the country's agricultural growth.

Improving access to land among the most land-constrained smallholder households would be a seemingly effective way to reduce poverty. For small farms, a very small incremental addition to land access is associated with a large relative rise in income. Yet improving land access for smallholders is fraught with difficulties: even in land abundant countries, it is questionable whether much unclaimed land is available in settled areas to distribute, expropriating land reform is politically difficult, expensive, and subject to rent-seeking, and market-assisted or community-based approaches have met with very little success to date.[6]

However, there are several approaches that might be politically feasible that could improve access to land in Zambia. Both involve the future allocation of land rather than redistribution. The first approach involves a coordinated strategy to raise the economic value of customary land that is currently remote and unutilized – which accounts for the vast majority of unutilized land in Zambia. The approach would entail a public goods and services investment strategy coupled with the allocation of land in relatively small parcels for medium-scale (10-20 hectare) farmers within the customary land system. The productive value of land is related both to the quality of the land as well as to its proximity to roads and district towns -- proxies for market access. The Government of Zambia may be able to raise the economic value of currently unutilized land through investments in infrastructure and service provision designed to link currently isolated areas with existing road and rail infrastructure and through allied investment in schools, health care, water and light, and other public goods required to induce migration and investment in such currently under-utilized areas. Such investments would also help to reduce the current population pressures in areas of relatively good access and soils, many of which are being degraded due to declining fallows associated with population pressure. The approach of raising the economic value of land through public investments in physical and marketing infrastructure and service provision was pursued successfully by Southern Rhodesia and Zimbabwe starting in the 1960s with its growth point strategy in the Gokwe area, once cleared of tsetse fly. Key public investments in this once desolate but agro-ecologically productive area induced rapid migration into Gokwe from heavily populated rural areas, leading to the "white gold rush" of smallholder cotton production in the 1970s and 1980s (Govereh 1999).

Basic public investments to encourage the productive utilization of currently under-utilized areas with good agro-ecological potential also has a potential in Zambia to redress the current land constraints faced by many of its impoverished and isolated rural smallholder households. The basic investments include feeder roads linked to trunk highways, health care facilities, schools, electrification, and tax incentives for agribusiness investment. A policy environment conducive to business development can also attract new capital into newly settled areas with good agricultural potential. This public goods approach to poverty alleviation is an option to consider as an alternative to the farm block concept, in which land would be allocated in large tracts to commercial business entrepreneurs, but with uncertain effects on the poverty-related land constraints being faced by 25% or more of Zambia's rural population.

A second and complementary step would involve enlisting the support of paramount and local chiefs to contribute to national poverty reduction goals through the allocation of unutilized land to new small and medium-scale farmers. Incentives could be provided by the state to chiefs to assist in the allocation of unutilized land under their control in 5-10 hectare lots to smallholder households. It is likely that land lots of this size would discourage wealthy individuals and mainly attract poor and currently land-constrained families. However, acquiring land of this size would almost certainly enable currently land constrained

[6] See Bassett and Crummy 1993; and Ramhato 1994.

households to increase their income from farming, add to agricultural growth, and contribute to national poverty reduction objectives. Recall from Table 1 that 50% of Zambia's small-scale farm households control less than 1.4 hectares of land, and that a relatively small increase in access to land among these households is associated with a major increase in their incomes.

Questions about whether unallocated land should be allocated in large lots to few entrepreneurs vs. smaller lots to numerous farmers can be related to emerging research (e.g., Datt and Ravallion 2002 and Gugerty and Timmer 1999) suggesting that an unequal distribution of assets can significantly reduce the contribution of subsequent economic growth to poverty reduction. In a sample of 69 countries, they found that, in countries with an initial "good" distribution of assets, both agricultural and non-agricultural growth benefitted the poorest households slightly more in percentage terms; the poor in these countries closed some of the gap with the rich in percentage terms. In countries with a "bad" distribution of assets, however, economic growth accrued mostly to the richer households, meaning that the gap between rich and poor increased. It is especially noteworthy that in this latter group of countries, agricultural growth was associated with greater increases in inequality than was non-agricultural growth. This reverses what has been considered the more typical pattern, wherein agricultural growth is seen to contribute more to poverty reduction than growth outside the agricultural sector. These findings reinforce the idea that where access to land is highly concentrated and where a sizable part of the rural population lack sufficient land to earn a livelihood, then special measures will be necessary to tackle the problem of persistent poverty. This is almost certain to be a long term undertaking, but avoiding the issue will only prolong the problem.

Agricultural productivity growth, while most easily generating gains for better-off smallholder farmers, is likely to offer the best potential for sustained income growth among the poorest and land-constrained households as well. The literature on growth linkages indicates that the first-round beneficiaries of agricultural growth generate important multiplier effects by increasing their expenditures on a range of local off-farm and non-farm activities that create second-round benefits for a wide-range of other households in the rural economy (Johnston and Mellor 1961; Mellor 1976; Reardon et al. 2000). Income growth derived from agricultural productivity growth generates demand for non-farm activities that has absorbed the rural poor into more viable non-farm activities (Gabre-Madhin and Johnston 2002). In much of Africa, the consumption growth linkages have been found to be especially important (Delgado and Minot 2000). The extent and magnitude of these second round effects depend on a number of factors, including education, infrastructure, and institutional development, but importantly include whether the income stimulus is widely spread (Delgado and Minot 2000; Fan and Hazell 1999). The initial distribution of land and other productive assets influences how broad-based the first round beneficiaries of agricultural growth will be.

While sizeable segments of the smallholder populations do not have enough land assets to respond to smallholder commercial agriculture opportunities, the data suggest that there are smallholders with relatively more land and related assets, who probably can respond, and who are located in many of same villages as those who have relatively little land on a household per capita basis. This finding holds powerful implications for policy if shown to be widespread, as suggested by the data. Dynamic labor, land, and services markets, and other employment opportunities should be easier to create (other factors constant) in the very locations where some smallholders are investing and raising their output and productivity.

Pro-active public sector investment and policy support in developing these labor and service markets will be a key determinant of the magnitude of the growth linkages to be derived from agricultural growth.

The social problem of underutilized land co-existing with high underemployment suggests payoffs to making land rental markets function better. Anecdotal evidence suggests that relatively large farmers utilizing a fraction of the land they control are often reluctant to rent or enter into sharecropping arrangements with tenants for fear of eventually losing their control over the land. Local customs often allow those who cultivate land for a year or more to lay claim to that land. This obviously retards the development of land rental markets. Strengthening the security of property rights for landowners would encourage greater renting of land to link those with idle land and those with underutilized labor seeking to cultivate land. In this way, the encouragement of land rental markets would concurrently raise agricultural production and reduce unemployment.

There is also provisional evidence to show that education does have poverty alleviating properties in rural households in Zambia. Investments in rural formal education can be a powerful tool to redressing rural poverty, although the payoffs will be felt only over decades.

The findings of this paper draw out several major issues for further investigation. First, what are the costs and benefits of alternative approaches for redressing in the short run the acute land constraints being faced by a significant portion of small-scale farmers? Some of the issues might include: (a) analyzing institutional arrangements for encouraging the development of land markets (for sale in addition to rent/share cropping) and attracting greater long-term land investments; (b) assessing the potential for land redistribution between state, large-scale, and small-scale farmland; (c) identifying specific educational skills and investments that make for a mobile labor force that facilitates structural transformation; and (d) identifying cost-effective public investments to induce migration into relatively sparsely populated areas in a manner that is supportive of rural productivity growth.

Many of these are not new questions, but the need to focus on them is given new importance in the face of the empirical evidence presented as to the disparities in access to land within the smallholder sectors in many African countries, and the difficulties of nurturing other avenues to rural income growth for households lacking access to sufficient land to ensure a decent livelihood.

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