

Factors influencing sale and renting out traditional land where customary laws normally have regulated land transactions: Malawi case study

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Abstract:

Poverty and scarcity of land, combined with mostly customary land available for agricultural activities, may present a dilemma when it comes to land transactions. In principle, customary land cannot be used freely by the household allocated the land, but will be distributed and redistributed by the traditional authorities of the community. Hence, the individual household cannot freely use land as a commodity to dispose of in times of need, or to acquire more of, in times of plenty. Hence land transactions by households would be expected to be rare where customary land is involved. However, land transactions on the household level do occur, both in the form of sales, and less drastically, of renting out. This paper seeks to explore what factors can be used to explain such land transactions in Malawi, using data from the NACAL project and a logistic regression approach. It will explore whether the same, or different regression models, can explain the two forms of land transactions analysed.

Key words: Land scarcity, customary land tenure, land transactions, community values.

Introduction

Malawi is a landlocked country with 118,484 sq km and an estimated population of about 12.34 million as at mid 2005. The population is growing at about 2% per annum and the country has one of the highest population densities in Africa, with 96 inhabitants per square kilometre of land surface and 176 inhabitants per square kilometre of arable land.

Agriculture is the mainstay of the economy in Malawi and the population is highly dependent on agriculture. The majority of the population lives a subsistence existence, and an estimated 85% rely mainly or partially on agricultural output, either directly or indirectly, for their livelihood. Agricultural output generates over 90% of export earnings, and 30-40% of GDP, most of which is produced by smallholders.

The country has a diversity of cultures: several major ethnic groups, both patrilineal and matrilineal, which have their own rules for the transfer of land between persons and over generations. For all groups, land is generally regarded as the main basis for social security. Due to urbanisation, population pressure and rampant poverty, there are expanding land problems, and the traditional ways of handling land transactions are under transition.

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About three quarters of the land used by agricultural smallholders is customary land. Customary land means all land which is held occupied or used under customary law but does not include public land².

The structure of land ownership in Malawi can be summarized in the following way:

- Most land is passed on from parents, either through inheritance or borrowed. About 20 percent of land is obtained from the village headman. Very little land is bought or rented.
- Most land is operated by the household head and about two thirds of the household heads are male
- Most land is located close to where the household resides
- High Population to Land Ratio
- Land Scarcity in spite of idle lands

This paper will present a statistical analysis at the factors influencing sale and renting out traditional land among Malawians, based on data from the ongoing NACAL (National Census of Agriculture and Livestock).

Data

The data from this study comes from the Malawi National Census of Livestock and Agriculture (NACAL) carried out in 2007. The census was based on a sample of 25 000 households and was nation wide in scope. Concurrently with the quantitative data collection, the Malawian Land Tenure and Social Capital” (MLTSC) Group collected qualitative data from a number of villages within the same geographical location as some of the villages covered by NACAL. Hence, the complete data sets collected on land transactions in Malawi, will include both quantitative and qualitative data, enabling research combining those two approaches to get a more complete understanding of the processes underlying land transactions, as well as quantitatively assess the occurrence of such transactions and the explanatory power of the factors affecting them. Other papers will present results based on the qualitative approach, while the present paper will concentrate on the quantitative approach to the study of land transactions.

Objectives

- To investigate the incidence of land sales and renting out of land in Malawi
- To determine the factors affecting land transactions in Malawi
- To determine whether poverty affects land transactions in Malawi

Methodology

To answer the objectives of the study two separate logistic regression models were developed.

² For a more thorough definition of customary land, see the paper presented by Paul Kishindo and Berge (2008) The changing role of village headmen in Malawi’s customary land tenure in matrilineal Southern Malawi

- Whether a household had sold land in the past 10 years or not.
- Whether a household had rented out land in the last agricultural season or not.

Specification of the multivariate models

The explanatory variables used are partly on the household level, partly characteristics of the head of household and partly factors related to the social and geographical environment of the household, mainly characteristics of the village in which the households reside. The list of variables used is shown below:

Household level variables

- Poverty level of the household
- Household size
- Dependency ratio
- Holding size
- Fear of land being taken away
- Fear of encroachment
- Had any land dispute last 10 years

Characteristics of the head of household

- Age
- Sex
- Marital status
- Education

Characteristics of the geographical and social environment of the household

- Region
- Major ethnic group in the village
- Most common type of marriage in the village
- Bridal payment
- Whether the village has any uncultivated land
- Any lands currently owned by persons not living in the village
- Any lands currently rented out to persons not living in the village
- Any lands taken over by the government
- Giving out of lands in the village during the last 5 years (2001-02 to 2006-07)
- Whether outsiders sometimes get land in the village without the village head being consulted.

Except for household size, age of household head and dependency ratio, all the explanatory variables are categorical variables, where the first category in each variable is taken as the reference category.

Preliminary analysis

Preliminary analysis was done on all the variables. The results showed that 1200 households had rented out part of their land in last agricultural season and about 500 had sold out part of their land during the past 10 years. This was from a total of 25 000 households countrywide.

An analysis of association using the qui-square measure of association showed that not all variables initially included in the model were significantly associated with the response, or dependent variables. (Table 1).

However, this two way analysis may not uncover all significant associations once other variables are introduced in the model. Also, associations that appear in a two way analysis may not hold up once more variables are controlled for. The table of association also shows that not all the independent variables are equally significant for both the dependent variables.

Table 1. Relationship between the dependent variables and the independent variables specified

Independent variable	Degrees of freedom	Dependent variable	Dependent variable
		Rented out land last season	Sold land last 10 years
Fear of encroachment	1	0,000	0,744
Fear if own land will be taken away	1	0,001	0,000
Land dispute last 10 years	1	0,000	0,000
Household size	19	0,328	0,908
Holding size	7	0,006	0,000
Region	2	0,000	0,000
Poverty quintiles	5	0,020	0,963
Dependency ratio	43	0,036	0,512
Marital status of household head	3	0,035	0,131
Sex of household head	2	0,930	0,624
Age of household head	89	0,023	0,081
Education of household head	10	0,000	0,024
Most common type of marriage in village	5	0,000	0,000
Bridal payment	1	0,000	0,000
Village has uncultivated land	1	0,405	0,000
Village has land in reserve for the future	1	0,175	0,065
Land owned by persons not living in the village	1	0,717	0,875
Land taken over by government	1	0,249	0,009
Land sold to people outside the village	1	0,026	0,004
Land given to people outside the village	1	0,073	0,000
Outsiders sometimes get land from the village without consulting village headman	1	0,002	0,000

Creation of the models

In cases where the response variable is binary, model fitting assumption such as used in linear multiple regression models may not apply. Clearly the errors may not be

normally distributed and the variances may not be constant. Hence a different type of model is needed to account for the binary nature of the response variable. Logistic regression was a reasonable choice.

After doing the exploratory analysis of relationships between possible explanatory variables and the dependent variables, and also among the explanatory variables themselves to check for multicollinearity and relationships among the variables, a group of explanatory variables were chosen for the models.

The next stage was to use model building technique to select important independent variables for the model.

To select which explanatory variables to include in the model, stepwise selection method was used. This will maximize the chance of obtaining sample specific results. However, since this is an exploratory analysis, the method can still be valid. When it comes to the testing of the model, it has to borne in mind that all tests assume that the specified model is correct.

Entry testing was based on the significance of the score statistic, and the removal testing was based on the probability of the likelihood-ratio statistic based on conditional parameter estimates. [The entry probability was 0.05 and the removal probability was 0.1].

To analyse whether the incidence of a household selling land in the past 5 years or not were due to the factors listed above, a logistic model [with a logit link function] was fitted, and variables which were not significant were removed from the model.

The same approach and the same explanatory factors were used for the analysis of renting out of land.

These two models were checked to make sure they did not violate the assumptions of the model. A generalized linear model may be described in terms of the following sequence of assumption:

The independent variables, x_i influence the distribution of a linear predictor η , and can be written as: $\eta = \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \dots + \beta_p x_p$

and the model for n observed values of response variable y [incidence of sale or renting out land] can be written as

$y_i = \eta_i + \varepsilon_i \quad i = 1, 2, \dots, n$; where η_i is a the systematic component and ε_i the random component. Hence x_i has no influence on the distribution of y_i if and only if $\beta_i = 0$.

Using the random error component, the two models were checked. Deviance statistics were used to see the goodness of fit. Also, index plots of the Cook's Distance and leverages were used to find out influential points in the data set.

Results of model fitting for the incidence of sale of land in the past 10 years

The results of the analysis indicate that there is less evidence that the probability of a household selling part of its land in the past 10 years was influenced by age, education level, marital status and sex of head of household; Also, household size, poverty status, fear of land being taken away or encroachment, did not have a significant bearing on the probability of a household having sold land during the past 10 years.

The factors having the most explanatory power were region, holding size, ethnic group, common type of marriage in the village, whether payment of bridal price is common in the village, whether the village had uncultivated land, land owned or allocated to persons outside the village, land taken over by the government and whether outsiders could get land from families without consulting the village head.

Hence, the final model could be written as follows:

$$\text{Logit}(y_i) = \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_{11} X_{11} + \epsilon_i$$

Where y_i is the probability of household selling land in the past 10 years.

The parameters are shown in Table 2.

Table 2 Parameters of the model

Variable	Parameter
Constant	B_0
Holding size	B_1
Region	B_2
Major ethnic group	B_3
The most common type of marriage in the village	B_4
Bridal payment	B_5
The village has uncultivated land	B_6
Land owned by persons outside the village	B_7
Land rented out to persons outside the village	B_8
Land taken over by the government	B_9
Outsiders get land from families without consulting the v/h	B_{10}

The model explained a little less than 20 percent of the variation in the sale of among Malawi small holder agriculture holders during the past 10 years, as shown in Table 3. However, in logistic regression there is no generally valid measure of explained variance like in linear regression. Hence substantial interpretation and use is more difficult, but can be defended in an exploratory analysis like the one presented here

Table 3 Model Summary for Probability of sale of land in the past 10 years

Stepwise iterations	-2 Log likelihood	R Square
1	3546.048(a)	.099
2	3467.816(a)	.121
3	3432.154(b)	.131

4	3389.853(b)	.144
5	3368.882(b)	.150
6	3345.096(b)	.156
7	3332.078(b)	.160
8	3323.002(b)	.163
9	3310.796(b)	.166
10	3305.386(b)	.168
11	3295.623(b)	.170

Table 4 Model and parameter estimates for land sales

Variables in equation	estimate (B)	S.E.	df	Sig.	
Holding size	Holding size	-.020	.005	1	.000
Region	Northern*			2	.018
	Central	.160	.464	1	.730
	Southern	.503	.179	1	.005
Major ethnic group	Chewa*			10	.000
	Yao	-1.031	.406	1	.011
	Tumbuka	1.549	.443	1	.000
	Nyanja	.722	.723	1	.318
	Ngoni	.778	.438	1	.076
	Sena	-1.235	.395	1	.002
	Tonga	-2.283	.438	1	.000
	Nkhonde	-1.308	.737	1	.076
	Lomwe	-1.901	.776	1	.014
	Lambya	1.943	.459	1	.000
The most common type of marriage	Matrilineal and neolocal*			5	.000
	Matrilineal and matrilocal	.225	.579	1	.698
	Matrilineal and patrilocal	-1.028	.482	1	.033
	Patrilineal and neolocal	.187	.502	1	.709
		Patrilineal and patrilocal	.670	.717	1
Bridal payment	No**	.363	.171	1	.033
The village has uncultivated land	No**	-.245	.117	1	.037
Land owned by persons outside village	No**	.236	.126	1	.061
Land rented out to persons outside village	No**	-.398	.133	1	.003
Land taken over by the government	No**	.293	.145	1	.043
Outsiders get land from families without consulting the village head	No**	-.523	.490	1	.286
	Constant	3.589	.772	1	.000

* Reference category

** Reference category 'yes'.

From the parameter estimates from the model above, fitted probabilities of the probability of selling a land parcel for each of the explanatory variables can be calculated³.

Results of model fitting for incidence of renting out of land in the last agricultural season.

It was assumed that the same factors that could be used to explained the selling of land also might influence the incidence of renting out land. The exploratory analysis was the same and the model assumptions were the same. The resultant model however, shows that the explanatory variables differ somewhat between the two analyses. For the renting out of land, fear of land encroachment, land disputes, surplus of land in the village and ‘unauthorized’ sales of land were significant explanatory factors. In addition, however, characteristics of the household head had a bearing, such as marital status and education. The factors having the most explanatory power were region, holding size, ethnic group, common type of marriage in the village, whether payment of bridal price is common in the village, whether the village had uncultivated land, land owned or allocated to persons outside the village, land taken over by the government and whether outsiders could get land from families without consulting the village head.

Hence, the final model could be written as follows:

$$\text{Logit } (y_2) = \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_{11} X_{11} + \epsilon_i$$

Where y_2 is the probability of household renting out of land in the last agricultural season

It is worth noting that less of the variation in the renting out of land can be explained by the variables included in the fitted model, only about 10 percent.(Table 5).The model with estimates is given in table 6.

Table 5 Model Summary for Probability of renting out of land in the last agricultural season

Step	-2 Log likelihood	R Square
1	7334,757(a)	,057
2	7303,802(a)	,063
3	7273,227(b)	,068
4	7257,499(b)	,070
5	7248,727(b)	,072
6	7239,171(b)	,073
7	7221,083(b)	,076
8	7215,482(b)	,077
9	7200,203(b)	,080

Table 6 Model and parameter estimates for renting out land

³ Fitted probability = exponential [estimate]/[1 + exponential [estimate]]

Variables in equation		estimate (B)	S.E.	df	Sig.
Fear of land encroachment	No**	-0,374	0,085	1	0,000
Engaged in land dispute	No**	-0,3	0,093	1	0,001
Marital status	Unmarried*			3	0,022
	Married	-0,439	0,234	1	0,061
	Divorced	0,096	0,108	1	0,371
	Widowed	-0,156	0,147	1	0,290
Education	None*	-0,362	0,129	1	0,005
	Primary	-0,383	0,125	1	0,002
	Secondary+	-0,29	0,122	1	0,018
The village has uncultivated land	No**	0,182	0,079	1	0,022
Land rented out to persons outside the village	No**	-0,281	0,077	1	0,000
Outsiders get land from families without consulting v/h	No**	-0,214	0,095	1	0,024
Major ethnic group	Chewa*			10	0,000
	Yao	-0,574	0,216	1	0,008
	Tumbuka	0,333	0,239	1	0,163
	Nyanja	-0,105	0,241	1	0,663
	Ngoni	0,031	0,247	1	0,900
	Sena	-0,393	0,235	1	0,095
	Tonga	-0,856	0,247	1	0,001
	Nkhonde	0,514	0,622	1	0,409
	Lomwe	-0,448	0,307	1	0,145
	Lambya	0,104	0,231	1	0,653
Constant		3,412	0,249	1	0,000

* Reference category

** The reference category is 'Yes'

Discussion of the results

Even though this is a highly exploratory analysis, some very interesting results came out, that should be looked further into in future research, hopefully combining a quantitative and qualitatively approach.

Initially, poverty was regarded as one of the major factors influencing both sales and renting out of land. Interestingly enough, neither in the model used to explain sales, nor in the model used to explain the renting out of land, poverty status of the household had any significant explanatory effect. The reason for this finding may need further analysis. It can also be checked against the findings from the qualitative studies also carried out on land issues in Malawi.

Even though findings by Kishindo (1993, 2006) indicates that attitudes towards selling of customary land is changing and may be more accepting, it can still be argued that at

present, selling of land is a drastic decision that will deeply affect, not only the present generation but future generations as well. Also, selling of land is not encouraged or even 'legal' under customary law. Hence, the decision to sell land must either be rooted in long term problems for the households, or take place in an environment being somewhat conducive to selling taking place. The results confirm this. Selling of land can mostly be explained by geographical and socio cultural factors, like place of residence (region) which is also a strong indicator of social and cultural values among households. It may not always be clear what the actual meaning of 'sale' in land transactions is. It can be both the actual sale of a piece of land, but also the sale of rights connected to the land, such as use of land for grassing of animals, collecting firewood, burning charcoals etc. In this analysis, sale is defined as giving a positive answer to the question of whether any parcel of land had been sold during the last 10 years that is, related to the sale of the physical land itself. Had a wider definition of sales been applied, the results may have differed, since the selling of rights may have less serious consequences than the selling of the actual land.

Renting out of land, on the other hand, might be seen as a transition to eventually sell land, but may also be a short term solution to short term problems that may be relatively easily solved. For instance, as reported by households renting out of land in the NACAL, about half the households cited reasons that can be classified as relatively short term problems, like sickness, not enough labour or the need for money. Hence a mixture of factors, both reflecting the situation of the households as well as environmental factors may explain the renting out of land. The results confirm this. Fear of loosing own land without compensation, the fact that land has already been rented out and also sold, reflect a situation where the renting out of land can be seen as a transition to eventually selling land. On the other hand, characteristics of the households, such as marital status and educational level of the household head, might reflect the households' ability to cope with short term problems related to sickness, shortage of labour and lack of money.

It can also be seen that the renting out of land is a more complex situation than selling of land, involving factors that could not be included in the multivariate models based on the quantitative data from the NACAL.

The main conclusion however, is that even though factors affecting the selling of land also may be affecting the renting out of land, the nature of the two situations are different, and may require partly different explanatory models.

Renting out of land, is a short term solution to problems encountered on a household level and thus less influenced by the social and cultural environment. Renting out of land is an individualized decision, decided partly by the social environment, but more importantly by the households' ability to cope with relatively short term problems.

Selling of land, especially customary land, is a decision going against prevailing societal norms and values, even implying the risk of negative sanctions from the environment. Selling of customary land therefore takes place in a social and cultural context. Selling of freehold land, and also the renting out of land may be less sanctioned by the community and hence may have less drastic consequences for the households involved.

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