Drivers of small scale farmers participation in agricultural land rental markets in Kenya

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ABSTRACT

The study used a sample size of 386 small scale farmers to jointly determine the drivers of small-scale farmers' rental market participation in Kenya. The results of a bivariate probit model show that renting in participants were young, more educated and owned relatively small farms while renting out participants were relatively old, less educated and owned large pieces of land. Transaction costs, access to extension services and ownership to oxen were the main determinants of land rental market participation. To heighten land equalization, policies that enhance reinvestment in agricultural assets, access to extension services and reduce transaction cost are important.

Key words: Agricultural rental market, bivariate probit, Kenya, renting in, renting out, transaction costs

RÉSUMÉ

Dans cette étude, un échantillon de 386 petits exploitants agricoles a été utilisé pour déterminer les facteurs de participation au marché de location de terres agricoles au Kenya. Les résultats du modèle probit bivarié montrent que ceux qui louent les terres agricoles étaient jeunes, plus éduqués et possédaient des fermes de taille relativement petites tandis que les propriétaires terriens étaient relativement âgés, moins éduqués avec de grandes parcelles. Les coûts d'exploitation, l'accès aux services de vulgarisation et la possession de bœufs étaient les principaux déterminants de la participation des petits exploitants agricoles au marché de la location des terres. Pour accroître la répartition des terres, des politiques favorisant le réinvestissement dans les actifs agricoles, l'accès aux services de vulgarisation et la réduction des coûts de transaction sont importants.

Mots clés: Marché de location agricole, probit bivarié, Kenya, location, coûts de transaction

INTRODUCTION

In developing countries including Sub-Saharan African countries (SSA), access to arable land is a key factor in determining the household's food security, poverty level and its vulnerability to shocks (Chamberlin and Ricker-Gilbert, 2016; Kidido *et al.,* 2017). Purchasing land is fraught with institutional rigidities and other transaction costs making procedures of participation in agricultural market lengthy, cumbersome and expensive (Otsuka, 2007; Nyangena, 2010).

This creates uncertainties and proliferation of costly litigation matters (Njuguna and Baya, 2000). In addition, most people are poor and face lots of financial constraints. These challenges associated with the land sales market have led to the emergence of formal and informal land rental markets (Holden *et al.,* 2009; Jin and Jayne, 2013).

Land in Kenya is critical to the economic, social and cultural development of many of its

citizens and it is a central category property in the lives of Kenyans (Jin and Jayne, 2013). Moreover, it is a principal source of livelihood and material wealth as well as being culturally significant for many people in Kenya. Due to the increasing population and demand for food, farm households tend to participate in agricultural land markets to enhance household food security. The Coastal region of Kenya has had historical land injustices for long leading to a high number of squatters and unregistered parcels of land, which the natives have lived on for generations (Wakhungu *et al.,* 2008). Land issues stem from the requirement by the Land Titles Ordinance passed in 1908[1] that all claims to land ownership were to be presented to Land Registration Court. All unclaimed land were deemed to be crown land. Many African residents were dispossessed of their land due to unverifiable ownership claims and dearth of information. The process meant that other persons made claims without the knowledge of the residents and they have continued to live as "tenants at will" at their mercy (Syagga, 2006; Wakhungu *et al.,* 2008; Syagga, 2011). Generally, there has been limited land redistribution, where most parcels of land are either under group ranch or communal land with few households having private land ownership (Wakhungu *et al.,* 2008; Syagga, 2011). The unbalanced landholding pattern and increased population has resulted in landlessness (Njuguna and Baya, 2000).

Despite experiencing the landlessness and land ownership challenges, there is emerging informal agricultural land rental market for residents to get a source of livelihood through agricultural production. Agricultural land rental market can be beneficial to less land endowed farmers provided they are more labour endowed (Deininger and Jin, 2005; Jin and Jayne, 2013; Chamberlin and Ricker-Gilbert, 2016) and helps in reducing land fragmentation (Tan *et al.,* 2006). It could also help in increasing agricultural output and consequently increase in agricultural

incomes through effective utilization of unused agricultural land (Jin and Deininger, 2009; Jin and Jayne, 2013; Chamberlin and Ricker-Gilbert, 2016).

Despite the potential positive effects posed by participation in agricultural land rental markets, the market is still emerging amidst the existing land issues in Coastal region of Kenya. In addition, there is inadequate literature in developing countries on drivers of agricultural land rental markets participation (Jin and Jayne, 2013) particularly in regions that still experience land injustices. In light of the low incidence of participation in the land rental market, empirical evidence on its drivers is needed by policy makers and local governments on modalities of spurring the sector. From the foregoing, the objective of this study is to provide empirical evidence on drivers of smallholder participation in agricultural land rental markets in regions still experiencing historical land injustices in Kenya.

The paper contributes to existing body of literature three fold. First, it determines the factors influencing participation in the agricultural land rental market in areas that are experiencing challenges of historical land injustices. The Coast region of Kenya in general still experience many cases of historical land injustices. This informs the high level of squatters in the county with relatively high poverty and food insecurity levels of 74.9% and 30% of the population, respectively (GoK, 2013). Secondly, the study establishes the link between transaction costs (search, screening, negotiation, monitoring and enforcement costs) and participation in the agricultural land rental market. Transaction cost creates a wedge between the land market participants (the lessors and lessees), which eventually raises the reserve price of prospective lessor while lowering the price of prospective lessee (Crookes and Lyne, 2003; Araujo *et al.,* 2007; Huy *et al.,* 2016). Previous literature

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[1]For brevity, detailed information on land issues in coastal Kenya check Wakhungu *et al.,* 2008 and Syagga, 2011

(Bezimana, 2011; Holden and Ghebru, 2013) used possession of a title deed as a proxy for transaction costs. The study uses the transaction cost measured in monetary terms.

Thirdly, the study analyses the drivers of agricultural rental market participation (renting in and renting out) jointly using a bivariate probit model. To incorporate such a scenario, the study uses the bivariate probit model that acknowledges the jointness of the process of decision making process and allows the correlation of error terms. Previous studies (Jin and Jyne, 2011; Ricker-Gilbert and Chamberlin, 2016) studied these decisions independently thus ignoring their interdependence.

The rest of the paper is organized as follows; methodology section including the study area and analytical framework, and subsequently we discuss our results including the descriptive and econometric results and concludes with key recommendations.

METHODOLOGY
Study area. The study was conducted in Kwale County, one of the six counties in the coastal region of Kenya. The County was chosen due to its history of poor land tenure systems and historic land injustices, which has resulted in a high number of land squatters. Kwale County is located at geographical coordinates of 4 33'18 0" South, 39 7'23 0" East (GoK, 2013). According to the most recent 2009 Housing and Population Census, the population of Kwale County was 649,931 persons and was projected to increase by 9.8% to 713,488 persons by 2012, and by 28.2% to 833,527 persons by 2017 (GoK, 2013) and it covers an area of 8,270.30 km².

The agriculture sector plays a central role in guaranteeing food and nutrition security, reducing poverty, and creating employment in Kwale County, where subsistence farming accounts for about 80% of the average household income. The key agricultural value chain commodities produced by the overwhelming majority of farmers are maize, cowpea, poultry and goat, which contribute to household food and livelihood security. According to GoK (2014) the County is predominantly rural and agriculture-based with lower livelihood indicators. In total, 82.4% of the population (535,543 people) live in the rural area where subsistence farming employs 62,681 people and contributes 80.6% to the household income. Mixed farming is the primary occupation for most households (male-headed, 55.2%; female headed, 43.8%; and youth-headed, 26.6%). In spite of the reliance on agriculture, food insecurity is widespread in the County; an estimated 14% of households do not have enough food to meet their needs and require food relief (GoK, 2013).

Land is an underutilized resource in Kwale County (MoALF, 2016). There has been a constant land tenure problem along the coastal strip and the coastal uplands. To deal with this, trust and government land within these areas has since been adjudicated and government settlement schemes established. In the drier areas of the Nyika Plateau (Kinango, Kasemeni, Samburu Ndavaya, and parts of Lunga Lunga Divisions), the land is held in trust and under group ranches. Most of the group ranches are currently not functioning well, resulting in unplanned human settlements, small-scale farming, mining, and quarrying (GoK, 2013). About 45.7% of the households own land without formal documents such as title deeds or letter of allotment, while 27.1% have land under communal ownership. Only 11.4% of households have formal land ownership documents and just 22.5% of the land has title deeds (GoK, 2015).

The targeted population of the study consisted of all small scale farmers. The study used a multistage sampling technique to obtain a sample size of 386 farmers. The first stage was to purposively select Lunga Lunga constituency

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because of the development of agricultural land rental markets and favourable agricultural conditions compared to other constituencies in the County. The second stage involved purposive selection of Vanga and Dzombo wards among the four wards because they had the most active participants in agricultural land rental market based on information from sub-county agricultural office. From the list obtained, systematic random sampling procedure was used to get the respondents. The sample was distributed proportionately the size of the ward. Data were obtained through a farmer survey in June 2016 using a pre-tested semi-structured questionnaire adminstered by trained enumerators. Semi-structured questionnaire elicited information on socioeconomic and institutional characteristics, agricultural land market participation farm and non-farm economic activities, as well as household and contextual characteristics.

Analytical framework. To determine the drivers (socioeconomic and institutional factors) influencing small scale farmer's participation in agricultural land market (renting in and out), a bivariate probit model was used. The model assumed simultaneity between renting in and renting out of the land (Tu and Bulte, 2010). This is as opposed to estimation of the univariate probit (or logit) models which would provide biased estimates of the parameters of participation in land renting in and land renting out, since it ignores the potential correlation between the unobservable (captured by the error terms) of the two decisions. The decision to rent in is contingent on the decision to rent out (Neill and Lee, 2001; Wooldridge, 2004).

The structural form of the bivariate Probit model can be expressed as follows.

$$Y^*_{i1} = \alpha_1 Y^*_{i2} + x_{i1}\beta_1 + \varepsilon_{i1} \; ; \; y_{i1} = 1$$

$$\text{if } y^*_{i1} > 0 \; ; \; = 0, \text{ otherwise} \tag{1}$$

$$Y^*_{i2} = \alpha_2 Y^*_{i1} + x_{i2}\beta_2 + \varepsilon_{i2} \; ; \; y_{i2} = 1$$

$$\text{if } y^*_{i2} > 0 \; ; \; = 0, \text{ otherwise} \tag{2}$$

$$E(\varepsilon_{i1}) = E(\varepsilon_{i2}) = 0; \; Var(\varepsilon_{i1}) = Var(\varepsilon_{i2}) = 1;$$

$$Cov(\varepsilon_{i1}, \varepsilon_{i2}) = p \text{ and } i = 1,2,3...n \tag{3}$$

The unobservable, perceived utility y^*_{i1} from participation in the land renting in market depends on a vector of explanatory variables x such that the binary outcome $y_{i1}=1$ arises when the latent variable $y_{i1} > 0$. While on the other hand, we observe y_{i2} (renting out) if and only if y_{i2} (renting out) = 1. The empirical model was expressed as follows

$$\text{Re } ntin^*_{i1} = \alpha_1 \text{ Re } ntout^* + x_{i1}\beta_1 + \varepsilon_{i1}; \text{ Re } ntin_{i1} = 1$$

$$\text{If Re } ntin^*_{i1} > 0; = 0, \text{ otherwise} \tag{4}$$

$$\text{Re } ntout^*_{i1} = \alpha_1 \text{ Re } ntin^*_{i1} + x_{i2}\beta_2 + \varepsilon_{i2}; \text{ Re } ntout_{i1} = 1$$

$$\text{If Re } ntin^*_{i1} > 0; = 0, \text{ otherwise} \tag{5}$$

$$E(\varepsilon_{i1}) = E(\varepsilon_{i2}) = 0; \; Var(\varepsilon_{i1}) = Var(\varepsilon_{i2}) = 1;$$

$$Cov(\varepsilon_{i1}, \varepsilon_{i2}) = p \text{ and } i = 1,2,3...n \tag{6}$$

Where Re $ntin^*_{i\,1}$ and Re $ntout^*_{i\,1}$ are latent dependent variables referring to the household's decisions to participate in agricultural land renting in and out, respectively, and is the vector of explanatory variables. Table 1 presents the description of the variables used in the analysis as used by (Rahman, 2010; Jin and Jyne, 2011; Jin and Jayne, 2013; Hoang, 2013; Chamberlin and Ricker-Gilbert, 2016; Huo *et al.,* 2016; Huy *et al.,* 2016). The dependent variables (renting in and renting out) were expressed as binary variables that is, either renting land or not. The explanatory variables were categorized into three categories. The first category was household characteristics. Land-rental decisions were assumed to be taken in particular by the household head. Thus household head's gender, age and education level were used in the bivariate probit model. Other households' characteristic variables included farm size,

oxen ownership and participation in off farm employment. Households with a relatively large household size which was used as a proxy for labour endowment were expected to more likely rent in land but less likely to rent-out land. Households with relatively more land were expected to more likely to rent in land but not renting out land as they have the inclination to become a specialized farmer by gaining scale economy. The second category was market and information access variables. The variables in this category included input market access, access to extension services, rental price and transaction costs. Households near the input market were expected to rent in land as opposed to renting out land while those who incur higher transaction cost were expected to rent in. Other variables in this category were membership to a group and credit access. The last category were village characteristics. Land fertility was measured in terms of either land was not fertile,

moderate or fertile. Households with farms of high fertility were expected to rent in less land.

RESULTS AND DISCUSSION

Descriptive Statistics. The descriptive statistics of the variables used in the bivariate probit are presented in Table 2. Household heads who engaged in agricultural land renting in were relatively younger and more educated as compared to those who rented out land. There was a significant difference (5% level) between the age of the farmers who rented in land and those who rented out. Younger and educated farmers are more open to new ideas and opportunities and may have adequate capital to purchase land. They are also flexible in adapting to new market requirements, less risk averse, and more innovative than older farmers. Household who rented in land had a mean household size of three members while those who rented out land had a mean household size of two members.

Table 1. Definition of variables used in the Bivariate Probit

Variable	Description of the variables
Renting in	Dummy= 1 if participate in agricultural land renting in, 0 otherwise.
Renting out	Dummy= 1 if participate in agricultural land renting out, 0 otherwise
HHage	Age of the household head in years
Genderhh	Dummy = 1 if the household head is male, 0 otherwise
HHsize	Household size (numbers)
Occupation	Dummy = 1 if the household head is a pure farmer, 0 otherwise
Edulevel	Education level (1= None, 2= Primary, 3= Secondary, 4 = Tertiary (College or/ and University)
Transactioncost	Cost (search, screening and negotiation costs and monitoring and enforcement) incurred in land rental transaction KES (Kenya Shillings)
Marketaccess	Distance to the input market in Kilometres
Extensionaccess	Dummy = 1 Had access to extension services, 0 otherwise
Farmsize	Amount of land owned in acres
Oxenownership	Dummy = 1 Had ownership to oxen, 0 otherwise
Creditaccess	Dummy = 1 Had access to credit, 0 otherwise
Rentprice	Amount charged in renting in or out per acre in Kenya shillings
Groupmemb	Dummy = 1 if was a member of a group, 0 otherwise
Landfertility	Categorical 1= Not fertile 2 = Moderate fertile 3= Fertile.

Table 2. Descriptive statistics for continuous and categorical variables

Variable	Description	Renting in	Renting out	T-test
Continuous variables		Mean		
HHAge	Age of the household head in years	49.29	53.04	1.49**
HHSize	Number of people in the household	3.83	2.84	1.11
Farmsize	Amount of land owned in acres	2.05	8.08	6.01**
Rentprice	Amount of rental price charged per acre in Kenya shillings	2999.77	3153.85	1.21
Marketaccess	Distance to the input market in Kilometres	15.0	32.01	1.02
Transactioncost	Cost of communication, transport and negotiation incurred in land rental transaction Kenya Shillings	768	567	5.50***
Categorical Variables		Percentage		X^2
Educlev	% of those who had university/college level1 of education	2.68	11.34	67.69**
Genderhed	% of male household head	77.0	88.46	3.56
Occupation	% of those who were pure farmers	69.48	34.62	2.01
Extensionaccess	% of those who received extension services	61.50	23.04	56.68*
Groupmembership	% of those who were members of a group	40.85	30.77	4.1
Creditaccess	% of those who had access to credit	31.62	26.92	2.3
Oxenownership	% of those who owned an ox	62.44	23.04	44.1*
Land fertility	% of those who had fertile land	48.36	69.23	2.78
Participation	% of those who participated in land rental market	62.0	48.0	2.66

Note: ***, **, * indicate significant at, 1%, 5%, 10% level, respectively; HH Age = Age of the household head in years; HH Size = Number of people in the household

Household participation in agricultural land renting in market could possibly be because of the high demand for food and other services as a result of the larger household size, thus they would seek innovative ways such as land renting in land in order to increase food production.

The average owned farm size for the farmers who participated in agricultural land renting in market was significantly higher (2.05 acres; approximately 1ha) at 5% significance level as compared to 8.08 acres (approximately 3.8 ha)for those who participated in land renting out market. Households who rented in land were located near the input market place with an average of 15.0 kilometres compared to 35.01 kilometres for those who rented out land. Majority (62%) of the sampled small

scale farmers participated in land renting in as compared to 38% who participated in land renting out.

Econometric Results. Table 3 presents maximum likelihood estimates of bivariate Probit model regression results used to determine drivers of small scale farmer's participation in agricultural land rental market. The log likelihood for the fitted model of -55.2112 and p-value of 0.000 indicated that at least one of the regression coefficients was not equal to zero. The rho value of 0.02 indicated that, agricultural land rental market participation decisions of renting in and renting out were likely to be interdependent thus validating the use of the bivariate Probit model. The variables, education level, farm size, rental price, transaction cost, ownership of oxen and

access to extension services were statistically significant in determining agricultural rental market participation.

Better educated household heads were more likely to participate in agricultural land renting in but were less likely to participate in renting out. The education level of the household head was statistically significant at 10% and 5% significance levels for renting in and renting out, respectively. Higher education levels improve household heads the ability to perceive, interpret and respond to new information faster than the less educated household heads (Teklu and Lemi, 2004). Ricker-Gilbert and Jayne (2010) argued that, more educated household heads have more farming skills and are therefore are expected to be more productive in agricultural activities as well as be more aware of the potential benefits of land investment. On the other hand, higher education levels of the household head exposed them to new ideas, farming skills and technologies which helped them to identify the potential benefits that can be derived through

farming on land instead of renting it out. Previous studies (Tikabo and Holden, 2004; Masterson, 2007; Holden and Bezabih, 2009) reported that, education levels of the household head had a negative effect on renting out agricultural land, implying imperfection in the human capital market.

Households with smaller farm sizes had higher probability of renting in land. Conversely, it reduced the probability of renting out land at 1% significance level. Due to increased demand for land for the agricultural purposes, households with small land holdings tend to rent in land so as to meet the growing demand for food. This finding is consistent with previous studies (Nyangena, 2010; Jin and Jayne, 2011) who argued that agricultural land rental markets increase access to land for households with relatively little owned land. In terms of renting out, households with relatively large landholding do not tend to specialize in agricultural production and therefore they rent land to get an extra income to invest in other

Table 3. Bivariate Probit on the determinants of agricultural land rental market participation

Variables	Renting in		Renting out	
	Coefficient.	Std. Error.	Coefficient.	Std. Error.
Occupation	0.252	0.583	-0.413	0.376
Agehead	-0.031	0.030	-0.004	0.014
Genderhed	0.800	0.753	0.186	0.449
Educlev	0.492*	0.293	-0.458**	0.195
HHsize	0.194	0.145	-0.122	0.083
Ownedfarmsize	-0.544***	0.154	0.128***	0.034
Rentprice	-0.002***	0.000	0.001***	0.000
Transactioncost	-0.004**	0.002	-0.005*	0.003
Oxenownership	1.069*	0.580	-0.769**	0.385
Marketaccess	-1.281	0.939	0.548	0.535
Extensionaccess	0.076***	0.570	-0.765*	0.420
Groupmembership	0.991	0.703	0.601	0.414
Creditaccess	0.496	0.655	-0.429	0.454
Landfertility	-0.961	0.660	0.256	0.346
Constant	-3.493	2.031	-1.513	1.191

Number of observations	=	381	Wald chi2 (28)	=	76.84…rho = 0.02	
Log likelihood	=	-55.211171	Prob. > chi2	=	0.0000	

Note: ***, **, * indicate significant at, 1%, 5%, 10% level, respectively

activities. Ricker-Gilbert and Jayne (2010) in Zambia argued that rental transactions tend to equalize farm sizes, with agricultural land transferred from land-rich to land-poor households due to the increased demand of land in most of Sub-Saharan Africa.

High agricultural land rental price reduced the probability of a household to participate in renting in land; however, it increased the probability of participating in land rent out. The influence of agricultural land rental market on participation was statistically significant at 1% level. Agricultural land rental price is the cost of renting in or renting out agricultural land. High land rental price implies that farmers pay more to acquire land and this reduces the resources which can be used for renting more land and make investments. Higher rental price means that farmers sacrifice the little financial resources they have to acquire agricultural land and this discourages them from renting in agricultural land (Jin and Jayne, 2011). In terms of land renting out market, land rental price acts as income for household engaged in land rent out. An increase in agricultural land rental price translates to better earnings which can be invested in other off farm income generating activities hence motivating famers to rent out land. Vranken and Swinnen (2010) noted that land renting out was more important in regions where the land sale price corrected for soil fertility was high due to its increased value.

Higher transaction costs reduced the likelihood of a household to participate in agricultural land renting in and renting out markets at 5% and 10% significance level, respectively. Transaction cost is the aggregate of search costs, screening and negotiation and monitoring and enforcement costs. They depend on factors such as trust and tenancy security. According to Holden and Ghebru (2006), high level of trust among the agricultural market participant lowers the search, screening, negotiation, monitoring

and enforcement cost. On the other hand, land fragmentation and a dispersed population and farm plots tend to increase these costs as well as transportation costs related to land use. Poor infrastructure and a rugged topography will also have a similar effect. Land rental market may work relatively efficiently in remote locations but households far from the village centre face higher transaction costs and are less likely to participate in an agricultural land rental market (Araujo *et al.,* 2007). The results imply that, as the transaction costs increases, the cost of renting in land also increase hence making it expensive for the already poor farmers. An increase in transaction costs is a deterrent to renting in of land because it increases the cost of renting in (Vranken and Swinnen, 2006; Hoang, 2013). On the other hand, high transaction costs reduce the profit from the transaction therefore households are less likely to rent out agricultural land when the cost is high. Hoang (2013) noted that transaction costs needed to be reduced in order to stimulate the rent out markets in Vietnam because it reduced the income acquired by the land owners.

Ownership of oxen positively influenced the probability of participation in land renting in market at 10% significance level but negatively influenced the probability of renting out land at 5% significance level. Oxen provide cheap labour to the rural areas and are sources of income when hired by other farmers. The extra income may be used to rent in agricultural land and other investment in new agricultural technologies. Ownership of oxen offers an opportunity for resource constraint farmers to get access to land by transferring it from those who cannot use it efficiently (say, due to lack of traction power) to those who are capable of using it efficiently. On the other hand, oxen provide cheap labour to the farms. Household who owned oxen were less likely to rent out land because of the availability of labour to work on their farms as well the alternative source

of income to finance farming activities. They were thus able to put their available land into effective use. Households who owned oxen were wealthier and therefore they were less likely to rent out their land. Furthermore, Holden and Ghebru (2006) noted that households with oxen needed to keep land so as to provide fodder for their livestock.

Access to extension services increased the household's probability of participating in agricultural land renting in land but decreased the probability of renting out land at 1% and 10%, respectively. Extension services provide farmers with farming skills, knowledge and agricultural land rental market information. Farmers who have access to extension services are more empowered on farming skills and information about new technologies and market information, which they use in understanding the dynamics in the agricultural land rental market in terms of prices and land fertility differences. However, Hoang (2013) found that access to extension services had a negative impact on renting in of land. This was attributed to the possibility of extension services targeting areas where the marginal productivity of land is relatively low and perhaps the quality of information given is low or even outdated. On the other hand, access to extension services negatively influenced household's participation in agricultural land renting out. Perhaps this is because the extension services received by the farmers enhance effective utilization of own available land instead of renting it out. Tikabo and Holden (2004) found that farmers who have contact with extension services tend to have more farming skills and therefore use their land holdings effectively. It is assumed that such contacts prompt the farmer to take measures that would increase production. As one way to increasing productivity, the farmer tends not to rent out land but rather may be willing to rent in more land.

CONCLUSIONS AND POLICY IMPLICATIONS

The objective of the study was to determine the drivers of small scale farmers' participation in agricultural land rental market in Kenya. In achieving the objective, participation was measured as to whether a household rented in or rented out agricultural land. Findings were that households with highly educated household decision makers as well small farm size were more likely to participate in renting in of agricultural land. Ownership of an oxen and access to extension services increased the likelihood of a household participation in renting in of land. These findings underpin the importance of encouraging reinvestment in agricultural productive assets such as oxen while engineering information and knowledge transfer which is important for land rental market development through provision of up to date, quality and demand driven extension services. Higher transaction costs reduced the likelihood of participation in renting in land as it increased the cost of land. This raises a policy concern on the importance of reducing the transaction costs through improvement of transport and communication infrastructure by the local and county governments. The government can also improve the land tenure security by issuing tittle deeds and other legal documents to land owners so as to reduce the monitoring and enforcement costs. Title deeds will provide the guarantee of ownership and they will be more secure even after renting out land for agricultural production. Further, efforts in encouraging trust and honesty in the market transaction between the lessee and lessor is critical in also reducing transaction cost and uncertainty.

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