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An empirical assessment of women's access to land and credit in North West Province, South Africa: A probit analysis

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This study investigates women's access to land and credit in Disobltla, North West Province. Land is an important resource for the survival of rural women. A probit model was used to analyse the factors influencing both access to farming land and credit, based on cross-sectional data collected from a sample of 82 women. The findings show that access to farming land is influenced by variables, the average production of tomatoes per hectare and off-farm income being the main determinants. The variables that were significant determinants of access to credit by female small farmers in the study area were the average tomatoes production per hectare, the type of farming, the average farm income, the labour force used, and the objective of the farmer.

Key words: Female smallholders, access to farmland, access to credit, agricultural development, poverty reduction, North West Province, South Africa.

INTRODUCTION

The problem

Land is the basis for many social and political struggles in South Africa, particularly for rural people. Women's land rights and access to land are at the core of women's livelihoods in rural South Africa. Access to credit and ownership of land still remain unobtainable for women. Despite the guarantee of gender equality, decisions about land ownership are still deeply entrenched in patriarchal norms (Beukes, 2006). Women's access to land and credit is constrained in both the customary and statutory tenure systems, although in different ways. In the customary tenure system, access is indirect, through their male kin. Derman et al. (2007) challenges the customary tenure system by expressing the wish that women may exercise land rights in their own persons. The privatisation of land undermines traditional rights by causing women to lose access to land, while the titling process excludes women and they may lose the support of their families by asking for individual title (Spichiger, 2008). Both the customary and the privatisation tenure systems increase poverty by reducing agricultural

production in different ways (Kingwill et al., 2006). Both tenure systems produce patterns of poverty and exclusion, especially with regard to poor people and women (Peters, 2004; Ravazi, 2007).

Access to and control of land and other natural resources is crucial for sustainable livelihoods, resource management and overall rural development. Yet major social, political, and institutional challenges prevent women from gaining secure tenure rights. Unequal access to land, inputs such as seeds and fertiliser, and credit, constrains women's productivity (Cossa, 1997). In addition, women also face some other challenges, that is they have limited decision-making power and depend on men for use rights-which are easily lost if they are widowed or divorced (Pallas, 2010). Women outnumber men in rural South Africa and they derive their livelihoods from agricultural and non-agricultural activities. Agricultural development is the engine to promote growth, development and food security in South Africa. Agriculture contributes about 2.6% of the total GDP and 19% of formal employment in the Province. Some 5.9% of the South African GDP in agriculture and 16.96% of

the total labour in agriculture are based in the North West. As about 30% of the population of the Province is engaged in informal and subsistence farming, agriculture is the most important sector in the economy. Women are not only managers in the Farmer Support Programmes, but also a source of labour in major field operations such as: planting, watering, harvesting and threshing (North West Invest, 2009). Given the role women play in farming, it is critical to transform the rural economy by investing more in female small farmers (Kongolo and Bangbose, 2002). Given the aforestated introduction, the main aim of this study is to analyse the socio-economic factors which may influence the decision about whether or not female small farmers should have access to farmland and credit.

METHODOLOGY

Data collection and analysis

The data used in this study were collected between May and July 2009 from the five districts of the North West Province, namely: Disobotla, Uthuseng, Ramatlabama, Lehurutse, and Madikwe, giving a total sample of 82 female small farmers. A structured questionnaire was used to collect information on the socio-economic factors affecting them, particularly with reference to their access to farmland and credit. The researcher first identified a group of female small farmers and thereafter selected some of them for interviews. A representative from the North West Department of Agriculture facilitated the making of appointments for interviews between the researcher and the farmers. A probit model (a binary model) was used to analyse the socio-economics factors determining women's access to land and credit.

Descriptive statistics were used to calculate the mean values and percentages of the selected variables. The socio-economic factors used in the bivariate probit model are explained in the model formulation. Bokosi (2007) argues that the binary probit model constrains the probability of estimated coefficients between 0 and 1, while the dependent variable is maintained constant in its different predicted values, using the linear probability model with error term distribution. This is the reason why it is often used (Albert and Chib, 1993).

The probit model

Two bivariate probit models were used for the purposes of this study, one expressing access to farmland and another expressing the use of credit by women small farmers in the study area. In expressing the bivariate probit model of factors determining access to farmland, the hypothesis that access to farm land is higher amongst female small farmers with more output/yield per hectare was made. These women work in the project and have had greater access to farming credit than women with more off-farm income. Following this assumption, the bivariate probit model used was that described (Firel, 2005; Sydsaeter and Hammond, 2006):

$$FALAH\ (PROBIT) = \beta o + \beta 1\ AVTOH + \beta 2FAMEGE + \beta 3EDUFA + \beta 4MARST + \beta 5FARTY + B6FALAH + \beta 7CREDUS + \beta 8\ HOUSI + \beta 9LANUSHA + \beta 10OFFINC + \beta 11FAMEXP + \mu \quad (1)$$

Where: AVOUTP = Average output of tomatoes per ha; FAMEGE= Age of the farmer in years; EDUFA= Education/standard passed by the farmers; MARST= Farmer's marital status (1 = married, 0 = unmarried); FARTY = Farmer's type (1 = project farmer, 0 =

otherwise); FALAH (Y) = Farmland (1 for farmer wanting more land, and 0 otherwise); CREDUS = Credit used (1 = Yes, and 0 = otherwise); HOUSI = Household size (number of people in household); LANUSHA = Land used in ha; FAMEXP = Farming experience in years; OFFINC = Off-farm income; βo = Constant; βi = Estimated coefficients; μ = Error term.

In expressing the bivariate probit model of the factors determining access to credit, the hypothesis was made that access to credit is higher amongst female small farmers with a greater yield per hectare. These women have more income from farming activities as they are project farmers. In contrast, the income is lower amongst non-project and female subsistence farmers. The following three independent variables were added to the model, namely the average income of farmer, the objective of farming and the labour used;

$$CREDUS\ (PROBIT) = \beta o + \beta 1\ AVTOH + \beta 2FAMEGE + \beta 3EDUFA + \beta 4MARST + \beta 5FARTY + B6FALAH + \beta 7CREDUS + \beta 8\ HOUSI + \beta 9LANUSHA + \beta 10AVINFA + \beta 11OFFINC + \beta 12FAMEXP + \beta 13LABFO + \mu \quad (2)$$

Model 2 is the same as model 1. However, three more variables were added to describe the use of credit by female small farmers in the study area. The three variables are given as follows, namely:

1. AVINFA = Average income from farming in Rands;
2. OBJFAR = Objective of farming (1= commercial, 0 = subsistence), and
3. LABFO = Labour force, while keeping the meaning of other variables equal.

The performance of both female and male farmers is given in Table 1a.

RESULTS AND DISCUSSION

Here, the results of the study for both female and male farmers investigated in the study area are presented. The mean values of the tomatoes produced per hectare and the number of small female farmers wanting farmland and credit in the study area are presented in Table 1a. Table 1a shows that the mean values of the tomatoes produced by both male and female small farmers are 1483.49 and 2108.75 kg/ha respectively. This suggests that female small farmers are doing well in comparison with male small farmers, and are more efficient than their male counterparts. This is also the reason why women have more income from farming (R7179.47) than men (R4318.20). In contrast, off- farm income for men is higher (R1210.66) than for women (426.13). Also, men use more land (11.21 ha) and labour (7.29) than women (3.27 and 4.64 ha respectively). The fact that men have access to more farmland than women is an indication that women's access and rights to land is very constrained. Given the gender disparity in land issues, the programme. Promoting Women's Access to Land seeks to respond to the problems and challenges of gender equity in land and agrarian reform for women in South Africa (Cross and Hornby, 2002).

Table 1b shows that the majority of women farmers, about 86.6%, expressed that they were not happy with

Table 1. Mean values of farming activities, access to farmland and credit.

1a. Variable	Male farmers	Female farmers
Tomatoes production (kg/ha)	1483.49	2108.75
Average income from farming (R/year)	4318.20	7179.47
Off-farm income (R/year)	1210.66	426,13
Labour force (No. of people)	7.29	4.64
Total land used (ha)	11.21	3.27

1b. Want more land	Total number	Percentage
Yes: No. of women	71	86.6
No: No. of women	11	13.4
Total: No. of women	82	100.0

1c. Characteristics	Answers	No. of women (%)
Have you used credit?	Yes	35(42.7)
	No	47(57.3)
Wanted credit?	Yes	54(65.9)
	No	28(34.1)
Total		82(100.0)

Source: Research data, 2010.

the size of land they use, and only 13.4% said they were happy with the size of the land used. Only 42.7% of female small farmers have used credit as a result of working in projects (3), while 57.3% have never used credit in their businesses, while 65.9% said they wanted credit, and only 34.1% said that they did not want it (Table 1c). Although men have always been dominant in agricultural related business, having more access to land and credit than women, women's contribution to agriculture is estimated to be between 60 to 80% of the total agricultural tasks performed (The Nations, 2009). Male farmers influence the decision to produce and produce more for the markets (commercial farmers). While female farmers ensure food security by producing for domestic consumption in their respective areas (Damisa et al., 2007). Women in developing areas of Africa perform most of the tasks related to agricultural production as men. However, women are not given a consideration they deserve and the benefits they gain are not in line with the number of hours they spend on these activities (Auta et al., 2000). The study observed that women farmers were within active productive age of between 21 and 50 years, while only few were above 50 years (3.7%). This however, suggests that women between the age of 21 and 50 are actively involved in agricultural activities than old women (Africa Avenir, 2011). Men farmers were also within active age of between 25 and 65 years, while only few of them (8.4%) were above 65 years. This is an indication that male farmers within the age 25 and 65 are actively involved in farming businesses. Regression coefficients of the

factors affecting women and men demand for farmland are presented in Table 2b respectively. The coefficients of bivariate probit model for access to farmland (Table 2a) indicate that the coefficients of independent variable average tomatoes production per hectare (AVTOH), marital status (MARST), farmers' experience (FAMEXP) and off-farm income (OFFINC) were statistically significant at the 10 and 5% and have a positive sign, suggesting that they are significant determinants of female small farmers' access to farmland. Following Gujarati (2006), the Chi-Square of both access to more farmland and credit indicate that the models were reliable. In contrast, the coefficients of variables farmers' age (FAMAGE), education (EDUFA) and credit (CREDUS) were also significant at the 5%, but were negatively correlated with access to farming land (a dependent variable). Their negative sign contrasts with the principle of farming. Educated married farmers with access to credit would be able to purchase inputs and related services to increase their production.

In accordance with economic theory, these farmers could be expected to increase the size of their land till they attain the point of diminishing marginal returns (Frank, 2003). Compared to Table 2a, the coefficients of bivariate probit model for access to farmland (Table 2b) shows that estimated coefficients of variables average tomatoes production per hectare (AVTOH), farmer's educational level (EDUFA), credit used (CREDUS), land used in ha (LANUSHA) and farmer's experience (FAMEXP) were all significant at the 1% level and were positively correlated with access to farming land.

Table 2a. Probit regression coefficients of factors affecting women's farmers demand for farmland.

Y = Access to land (0 and 1)	Estimated coefficient	t-value	Standard error	Probability
Variable				
AVTOH(Aver tomatoes/ha)	0.0521*	1.4205	0.0463	0.0507
FAMAGE	-0.0437**	-2.2297	0.0199	0.0174
EDUFA	-0.1168**	-2.0223	0.0608	0.0391
MARST	1.0777**	1.0409	0.1902	0.2453
FARTY (Farmer type)	0.0728	0.3301	0.2140	0.0877
CREDUS (Credit used)	-0.5707**	-2.6414	0.2264	0.0881
HOUSI (Household size)	-0.0007	-0.2026	0.0738	0.9746
LANUSHA (Land used in ha)	-0.2713	- 0.7522	0.0303	0.3564
FAMEXP	0.0672*	1.6634	0.0384	0.0553
0FFINC	0.0553*	0.8575	0.0473	0.0680
INTERCEPT	5.9784***			

Source: Author's calculations, 2010. *, ** and *** significance at 10, 5 and 1% respectively.

Table 2b. Probit regression coefficients of factors affecting male farmers demand for farmland.

Y = Access to land (0 and 1)	Estimated coefficient	t-value	Standard error	Probability
Variable				
AVTOH(Aver tomatoes/ha)	3.8751***	3.5335	0.0656	0.0817
FAMAGE	-0.0437**	-2.4437	0.0528	0.0436
EDUFA	0.1168***	-2.7543	0.0854	0.0542
MARST	1.0777**	1.7833	0.2546	0.2765
FARTY (Farmer type)	0.0693	0.3972	0.2670	0.0799
CREDUS (Credit used)	0.5707***	-2.5783	0.2886	0.0769
HOUSI (Household size)	-0.0023	-0.3147	0.1664	0.8744
LANUSHA (Land used in ha)	2.5573***	- 0.6901	0.0538	0.3982
FAMEXP	1.6724***	1.5982	0.0467	0.0578
0FFINC	0.0553*	0.8664	0.0489	0.0773
INTERCEPT	5.9784***			

Source: Author's calculations, 2010. *, ** and *** significance at 10, 5 and 1% respectively.

Estimated coefficient of farmer's age (FAMAGE) was significant at the 5% and had a negative sign. In line with the economics of production theory, its negative sign contrasts the farming principles (Pindyck and Rubinfield, 1991).The coefficient of marital status (MARST) was also significant at the 5% and was positive. The Chi-Square of both access to more farmland and credit indicate that the models were reliable (Gujarati, 2006). Table 3 presents probit analysis of women's access to credit.

Male farmers with acceptable levels of education have more support to access credit by being capable to purchase more inputs and related services that increase their income from production. Based on economic theory, such farmers would be expected to increase the size of their land till they attain the point of diminishing marginal returns (Frank, 2003). Estimated coefficients of variables average tomatoes yield per ha (AVTOH), farmers' marital status (MARST), farmer type (FARTY), off-farm income (OFFAINC), farmer experience (FAMEXP) and the objective of the farm (OBJFAR) were statistically significant at the 10 and 5% respectively and were positive. As such, they indicate that they are the main determinants of access to credit by female small farmers in the study area. In contrast, the coefficients of the variables farmers' age (FAMAGE), level of education (EDUFA) and average farm income (AVEFA) were also statistically significant at the 10 and 5% levels respectively, but were negatively related with the dependent variable access to credit. The negative sign of these coefficients suggests that access to credit is negatively related to a farmer's age, level of education and average farm income.

For obvious reasons, an analysis of male farmers' access to agricultural credit in the study area was not

Table 3. Probit regression coefficients of factors affecting women's access to credit.

Y = Access to land (0 and 1)	Estimated coefficient	t-value	Standard error	Probability
Variable				
AVTOH(Average tomatoes/ha)	0.0521*	1.4205	0.0463	0.0507
FAMAGE	-0.0437**	-2.2297	0.0199	0.0174
EDUFA	-0.1168**	-2.0223	0.0608	0.0391
MARST	1.0777**	1.0409	0.1902	0.2453
FARTY (Farmer type)	0.0628*	0.3301	0.2140	0.0877
HOUSI (Household size)	-0.0007	-0.2026	0.0738	0.9746
LANUSHA (Land used in ha)	-0.2713	- 0.7522	0.0303	0.3564
OFFAINC (Off-farm income)	0.3031**	0.4190	0.7177	0.6245
FAMEXP	0.0672**	1.6634	0.0384	0.0553
AVEFA (Av income)	-0.0864*	0.9802	0.2107	0.0771
OBJFAR	0.4121*	1.3263	0.2693	0.7115
LABFO	0.0392	1.4184	0.0269	0.0882
INTERCEPT	5.9784***			

Source: Author's calculations, 2010. *, ** and *** significance at 10, 5 and 1% respectively.

presented. Generally, the South African experience reveals that, although some few male small farmers do not have access to credit, the majority (about 80%) do have access to agricultural credit as compared to the majority of female farmers. Male farmers have not only access to credit, but also access to land, inputs, seeds, extension service and training. Inappropriate policies and discriminatory legislation not only inhibit progress at household level but also impede the path towards greater food security. Legislation and policies ensuring equal access to resources, credit, education, training and extension are essential if both men and women are to participate fully at all stages of economic development (FAO, 1998). Gender inequality in agricultural development, especially in terms of the division of labour according to tasks and productivity is of major concern (Pallas, 2010).

All the coefficients determining access to agricultural land and credit (Tables 2a, b and 3) were significant at the 10% (p<0.010), 5% (p<0.005) and 1% (p<0.001) levels respectively. Significance at the 1% by male farmers describes the highest performance for their involvement in farming business, and as a result, a qualification to access agricultural land and credit. As such, the estimated coefficients of male farmers (Table 2b) suggest their effective and sustained level of access to land and credit being of highest importance to both the government and financial institutions.

Conclusion

Access to and control of land and other resources is crucial for sustainable livelihoods, resource management and overall rural development. Yet major social, political, and institutional challenges prevent women from gaining secure tenure rights. Unequal access to land, inputs such as seeds and fertiliser, and credit constrains women's agricultural productivity. Women also have limited decision-making power and depend on men for use rights-which are easily lost if they are widowed or divorced. The results of this study suggest that greater production of tomatoes, farmer's marital status, farmer's experience, off-farm income, the type of the farm and the objective of the farming influence both access to farmland and credit. However, the degree of access to productive service which influence farmers' productivity differ among women and men farmers in the study area.

Evidence suggests that both female and male farmers in the project and commercial farmers have had access to credit to some extent. However, men farmers were the most recipients of agricultural credit besides the more farming land they own. Given that subsistence farmers, especially women, constitute the majority of the small farmers in the study area, as a group, the majority of them do not have access to credit. It is perhaps important to investigate strategies that would promote types of semi-commercial farming production. The reason would be to provide for those excluded to become eligible for credit in order that they may produce more. The increased participation of female small farmers in the projects also increases their chance of accessing credit and other productive resources. Female small farmers are the backbone of food production in the rural areas of any developing country. However, their contribution to economic development is often not recognised. To give women land is to empower them to fight food insecurity and poverty.

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