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## **Research Note: A PROBIT ANALYSIS OF WOMEN FARMERS' ACCESS TO FARM LAND AND CREDIT IN THE NORTHERN PROVINCE<sup>1</sup>**

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*Northern Province is predominantly a rural region where agriculture is the dominant sector and plays an important role in the provincial economy. Women are the majority of the poor living in these rural areas and depend heavily on farming. But their agricultural productivity is below potential as they don't have access to productive assets such as land and credit. This study based on a farm survey undertaken in the seven districts in the former Lebowa homeland in the Northern Province, attempts to identify factors which determine women farmers's access to more farming land and credit facilities.*

*The results show that most of the women are not satisfied with the size of the land which they own and they have never used farming credit. The probit analysis results show that productivity of the staple crop (maize), more off-farm income and access to credit are the strong determinants of the desire to increase, the size of the farming land. Access to credit is influenced by the first two variables above and farmers membership to agricultural development projects. Better access to and security for farm land, targeted credit and agricultural support services are crucial in improving the quality of women farmers in the province.*

### **SAMEVATTING: 'N PROBITANALISE VAN VROULIKE BOERE SE TOEGANG TOT PLAASGROND EN KREDIET IN DIE NOORDELIKE PROVINSIE**

*Noordelike Provinsie is 'n oorwegend plattelandse gebied waarin landbou 'n dominante sektor is en 'n belangrike rol in die provinsiale ekonomie speel. Vroue vorm die meerderheid van arm mense wat in hierdie landelike gebiede woon en hul is baie van boerdery afhanklik. Maar hul landbouproduktiwiteit is onder die potensiaal omdat hul nie toegang tot bates soos grond en krediet het nie. Hierdie studie wat gebaseer is op 'n boerdery-opname in die sewe distrikte in die voormalige Lebowatusland in Noordelike Provinsie, poog om faktore wat vrouens se toegang tot meer plaasgrond en krediet bepaal, te identifiseer.*

*Die resultate toon dat die meeste vrouens nie met die grootte van die grond wat hulle beheer tevrede is nie en dat hulle nooit landboukrediet gebruik het nie. Die probitanalise toon dat produktiwiteit van die stapelgewas (mielies), groter nie-plaas inkomste en toegang tot krediet kragtige determinante is van die begeerte om die grootte van plaasgrond te verhoog. Toegang tot krediet word deur die eerste twee veranderlikes beïnvloed sowel as deur die boere se lidmaatskap van landbou-ontwikkelingsprojekte. Beter toegang tot en sekuriteit aan plaasgrond, doelwitgeoriënteerde krediet en landbou-ondersteuningsdienste is essensieel vir die verbetering in die gehalte van vroulike boere in die provinsie.*

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## **1. INTRODUCTION**

Around the 1970's, the African reserves in South Africa were declared as self-governing states. Since that time, the homeland governments made various efforts to develop these areas. Women are the majority of the people resided in these rural areas and derive their livelihood from agriculture, and therefore the development of the agricultural sector was seen as a vehicle to stimulate economic development in these regions. Its role in the economy is summarised briefly by DBSA(1994): Agriculture as an economic sector, was second to General Government in contributing to the Gross Geographical Product (GGP) of the Northern Province (15.7%), 69% of which was derived from the commercial farm sector. It employs 17,5% of the active population on a formal basis, and a further 25% in the informal and subsistence farming sector making agriculture the most important employer in the economy. Apart from the impact of the multiplier effect on the economy, a study conducted by the DBSA(1991) concluded that only agriculture recorded a comparative advantage as an economic sector within the province.

A study carried out in Phokwane and Ndebele areas of Lebowa (Former homeland of Northern Province) in 1994 showed that women are not only dominant as managers in the Farmer Support Program (FSP), but they are also a source of labour in major field operations like hoeing, harvesting and threshing (Ngqaleni *et al*, 1995). However, given the importance of women in farming in the former homeland areas, and the limited employment opportunities, one wonders whether transformation of the rural economy can be possible without carrying women along in the process. This study attempts to identify factors which determine women farmers's access to more farming land and access to credit facilities.

## **2. METHOD OF DATA COLLECTION AND ANALYSIS**

The data used for the study were collected during September to November 1995 from the seven districts of the former Lebowa in the Northern Province; namely Seshego, Thabamoopo, Zebediela, Nebo, Naphuno, Practiseer and Bochum. A total sample of 265 farmers was drawn from 25 villages in the seven districts mentioned above. Structured questionnaire were used for data collection. Both male and female farmers were interviewed. Extension agents from the Ministry of Agriculture and Forestry in the Northern Province were used to facilitate our appointments for interviews with the farmers. The descriptive statistics were used to compute the mean values and percentages of the selected variables. Probit analysis was used to identify factors which determine farmers' access to more farming land and credit facilities.

## **3. PROBIT MODELS**

### **3.1 Factors determining access to more farming land**

The probit model hypothesised that access to more farming land would be higher amongst women farmers who produce greater maize yield per hectare, who are in the project and have access to farming credit than for individual farmers who realize more off-farm income.

The probit model can be expressed as follows:

$$\text{PROBIT}(\text{FRMLAND}) = b_0 + b_1\text{AMZY} + b_2\text{FRMTYP} + b_3\text{USCRDT} + b_4\text{FSIZE} + b_5\text{TLAND} + b_6\text{NFI} + e \quad (1)$$

Where:

- FRMLAND = Farming land, 1 if the farmer want more land and 0 otherwise,  
 AMZY = Average maize yield 1994/95 in kilograms per hectare,  
 FRMTYP = Type of the farmer, 1 for project farmers or 0 for individual farmers,  
 USCRDT = Used farming credit, 1 for yes or 0 otherwise,  
 FSIZE = Family size,  
 TLAND = Total land in hectares,  
 NFI = Non farm income in rands,  
 $b_0$  = Constant,  
 $b_i$  = Weighting coefficients, and  
 $e$  = Error term.

### 3.2 Factors determining access to credit facilities

The probit model hypothesised that access to credit facilities would be higher amongst women farmers who produce more maize yield per hectare and earn more farm income, who are project and commercial farmers, but lower amongst non project and subsistence farmers.

The probit model can be written as:

$$\text{PROBIT}(\text{USCRDT}) = b_0 + b_1\text{AMZY} + b_2\text{FMRTYP} + b_3\text{AFI} + b_4\text{NFI} + b_5\text{FRMOBJ} + b_6\text{TLAND} + b_7\text{LFORCE} + e \quad (2)$$

Where:

- AMZY, FRMTYP, NFI, USCRDT, TLAND,  $b_0$ ,  $b_i$ , and  $e$  were defined above.  
 AFI : Average farm income in rands,  
 FRMOBJ : Farming objective, 1 for commercial farmer or 0 for subsistence farmer, and  
 LFORCE : Labour force.

## 4. RESULTS

The results show that the mean values of maize production of women and men are 2 456.37 and 1 293.84 kilograms per hectare respectively (Table 1).

This may be attributed to the fact that there are more women in the projects than men, and that women are more efficient than men. This is also the reason why women earn more farm income than men. There is a significant difference in non farm income between men (R9 277.29) and women (R3 039.12) due to the fact men spend more of their time on wage employment than on farming.

**Table 1: Mean values of farmers' economic characteristics**

Variable	Women	Men
Average maize output (kg/ha)	2456.37	1293.84
Non-farm income (R/annum)	3039.12	9277.29
Average farm income (R/annum)	1176.41	291.94
Labour force(Number of people)	6.39	8.70
Total land(Ha)	2.45	13.38

**Source:** Survey data, 1995

The results also show that men have access to more land than women (Table 1). This indicate that there is a gender division in as far as land ownership is concerned. This is also supported by the RDP (1994) that even if women are the majority of the people who live in the rural areas, they are the ones who face specific disabilities in obtaining land. Most of the farmers have indicated that they are not satisfied about the size of the land which they are owning and they have never used farming credit (Tables 2 and 3).

**Table 2: Access to more land**

Want more land	Number	Percent
Yes Women	98	52.1
Men	47	61.1
No Women	90	47.9
Men	30	38.9
<b>TOTAL Women</b>	<b>188</b>	<b>100</b>
<b>Men</b>	<b>77</b>	<b>100</b>

**Source:** Survey data, 1995

**Table 3: Access to credit**

Variable	Women	Men
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		Number	Percent	Number	Percent
Used farming credit	Yes	56	29.8	22	28.6
	No	132	70.2	55	71.4
Want credit	Yes	91	48.4	43	55.8
	No	46	24.5	14	18.2

**Source:** Survey data, 1995

The results of probit analysis for access to more land and access to credit facilities are presented in Tables 4 and 5 respectively. Pearson's Goodness-of-fit statistic for both models, which compares Chi square and Degrees of freedom, indicate that the models are reliable (Norusis, 1990). The results show that the independent variables average maize output (AMZY) and Non farm income (NFI) are significant determinants of access to more farming land and have positive coefficients, whereas the independent variable used farming credit (USCRDT) is also significant, but it is negatively correlated with access to more land. This result is surprising because farmers who have access to credit might be able to purchase productive inputs which would result in increased production. Therefore, they could increase size of their land until they reach the Law of Diminishing Marginal Returns.

**Table 4: Factors influencing demand for additional land (n=188)**

Variable	Estimated coeff.	Standard error	Coeff./S.E.
Average maize output (AMZY)	0.00004*	0.00003	1.52063
Type of the farmer (FRMTYP)	0.06695	0.21600	0.30995
Used farming credit (USCRDT)	-0.65527**	0.24287	-2.69801
Family size (FSIZE)	0.01383	0.03413	0.40530
Total land (TLAND)	0.00671	0.04143	0.16196
Non farm income (NFI)	0.00021*	0.00014	1.42956
<b>INTERCEPT</b>	<b>4.89744***</b>	<b>0.28552</b>	<b>17.15278</b>
<b>Chi-square</b>	<b>188.333</b>		
<b>Degrees of freedom</b>	<b>181</b>		

\*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.10$

**Table 5: Factors affecting access to credit facilities (n=188)**

Variable	Estimated coeff.	Standard error	Coeff./S.E.
Average maize output (AMZY)	0.00046***	0.00014	3.38009
Type of the farmer (FRMTYP)	0.84952***	0.23783	3.57199
Average farm income (AFI)	-0.00061**	0.00022	-2.83241
Non farm income (NFI)	0.00001	0.00001	0.70018
Farming objective (FRMOBJ)	0.43240*	0.29691	1.45634

Total land (TLAND)	0.05681	0.04668	1.21705
Labour force (LFORCE)	0.04119*	0.02862	1.43943
<b>INTERCEPT</b>	<b>3.09119***</b>	<b>0.29361</b>	<b>10.52840</b>
<b>Chi-square</b>	<b>201.682</b>		
<b>Degrees of freedom</b>	<b>180</b>		

\*\*\*p<1%, \*\*p<5%, \*p<10%

The results also show that there is a positive relationship between access to credit facilities and average maize output, type of the farmer, farming objective, total land, labour force and non farm income. Whereas access to credit facilities and farm income are negatively related. Independent variables average maize output (AMZY), type of the farmer (FRMTYP), average farm income (AFI), farming objective (FRMOBJ) and labour force (LFORCE) are the significant determinants of access to credit facilities. That is they are the significant factors influencing women farmers' access to credit facilities in the study area. However, non farm income and total land are not.

## 5. CONCLUSION AND RECOMMENDATION

Access to more farming land is strongly affected by the productivity of staple crop (maize), more off-farm income and access to credit facilities. Whereas, access to credit is strongly influenced by the productivity of stable crop (maize), more farm income and farmer's membership to agricultural development projects. The results indicates that project and commercial farmers in the study area have access to credit facilities. Therefore, it is recommended that farming in the Northern Province should be changed from subsistence to semi-commercial agriculture. This could be achieved by providing easily accessible credit facilities to subsistence farmers, and by increasing the agricultural projects within the province so that the individual farmers could be included in the projects and gain access to productive resources. Therefore, their agricultural production could be improved and sell their surpluses. This will improve the conditions of accessing credit facilities.

### NOTE:

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