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AN ECONOMETRIC MODEL OF THE DETERMINANTS OF MARRIED WOMEN'S LAND RIGHTS IN A1 RESETTLEMENT AREAS IN ZIMBABWE

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Keywords
A1 model
Assets
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Multinomial logistic regression
Resettlement area.

ABSTRACT

The study investigated the major determinants of married women's land rights under the fast track land reform programme, 2000-2002 in A1 resettlement areas in Zimbabwe using econometric analysis on national baseline survey. Case data collected in Goromonzi District through in-depth interviews, direct observations and documentary reviews were used to complement results from the econometric model. Although the focus was on women beneficiaries of the fast track land reform programme, the study adopted a gender approach to study both men and women. The study revealed that extra-household factors such as the method used to make beneficiaries aware about the fast track land reform programme, the size of arable area cultivated and provincial differentials of male and female beneficiaries determined the probability of women's land holding. This meant that social assets were a strong determinant of women's land rights and hence the socio-political environment should not be ignored when analysing the distribution of land under the fast track land reform programme. The study recommended that individual level asset ownership data should be collected in order to evaluate and understand how benefits of development programmes are shared between men and women and that allocation of land under the land reform programme should focus on individuals within households. Methods should be devised to inform women about their land rights and the avenues through which these rights can be enforced. A study of each province would be required to unravel the underlying factors for the differential land distribution patterns by sex in provinces.

Contribution/ Originality: and non-oil sector exports should be encouraged as this will enhance BOP position in Nigeria.

1. INTRODUCTION

At independence in 1980, Zimbabwe had a dual agricultural sector (Deininger *et al*., 2002) and a racially skewed land distribution system (UNDP, 2002; Chaumba *et al*., 2003). Whites (resident and absentee landlords), foreign-owned companies and church orgnaisations dominated large scale commercial agriculture while the resource-starved small-scale agricultural subsector was made up of indigenous blacks. Land redistribution was undertaken in two phases. Phase I was launched in September 1980 and was aimed at resettling 162,000 families and acquiring 8.3 million hectares of land from white commercial farmers for the purpose (GOZ, 1998). Two methods of land acquisition were used during Phase I, namely, land acquisition through the market (willing seller-willing buyer) and compulsory land acquisition (Moyo, 1998). Phase II was characterised by spontaneous land occupations (seizures). The scale and intensity of farm invasions and occupations increased after the rejection of the draft constitution in February 2000 (Marongwe, 2008). District War Veterans Associations spearheaded the farm invasions and occupations (Chaumba *et al*., 2003). The reasons why the government condoned farm invasions after the referendum included declining popularity of the ZANU-PF government; the question of allocation of multiple farms to the elite; lack of financial resources to implement the land reform programme; rising pressure for land from landless people and rising popularity of the Movement for Democratic Change in the face of impending elections in June 2000 (Chaumba *et al*., 2003). According to Marongwe (2002) similar land invasions were experienced in Brazil where land reforms were a response to land occupations by land hungry peasants.

In order to formalise and regularise the haphazard farm occupations , the government launched the Fast Track Land Reform Programme on 15 July 2000 (Goebel, 2005). The government also enacted the Rural Land Occupiers (Protection from Eviction) in order to legalise all land occupations which took place from 16 February 2000 to March 2001 (Masiiwa and Chipungu, 2004). The Fast Track Land Reform Programme (FTLRP) was designed to be undertaken in an accelerated manner (GOZ, 2003) and involved surveying and pegging the already invaded farms (Chaumba *et al*., 2003).

Two models of resettlement were created under the FTLRP, namely model A1 and model A2. Model A1 has two variants: A1 villagised model and A1 self-contained (GOZ, 2003). For the village model, an individual family farm is six hectares plus a common grazing land (GOZ, 2001). In A1 self-contained units, farmers settle in self-contained plots (or farms) that can be used for crops and livestock. Model A2 was based on full cost recovery from the beneficiary and was aimed at creating a cadre of 51,000 small-medium and large scale black indigenous commercial farmers (GOZ, 2003) and de-racialise the commercial agricultural subsector (UNDP, 2002). The resettlement areas changed the distribution of land and the construction of land tenure regimes. Although both A1 and A2 schemes are untitled, farmers have offer letters as evidence and a guarantee of security for their access to land (UNDP, 2002). Unequal access to and control over land along gender lines has remained the major problem confronting married women in the resettlement areas. How many married women obtained land in their own right under the FTLRP? What factors determine the security of women's land rights in A1 resettlement areas?

How secure are married women's land rights in A1 resettlement areas? These were the overarching questions addressed in the study.

Chingarande (2008); Gaidzanwa (1988; 1995; 2011); Goebel (2005); Jacobs (2000); Pasura (2010); Peters and Peters (1998) and ZWRCN (2008) attributed women's marginalisation in access to and control over land to discriminatory customary laws and practices. Other factors identified include education and agricultural training (Ncube, 1997; ZWRCN, 2008) lack of access to credit and basic infrastructure (access roads and clinic) (Chingarande, 2008) workings of marriage (Jacobs, 2000) and inheritance practices (ZWRCN, 2008). Jacobs (2000) refuted that inheritance practices discriminated against women and argued that widows inherited the plot ahead of the deceased husband's brother (s). In all these studies, no quantitative analysis was made to ascertain the relative significance of these factors. This study makes a contribution to filling this lacuna.

2. RESEARCH OBJECTIVES

- To identify intra-household and extra-household factors that determine the security of women's land rights in A1 schemes.
- To construct an econometric intra-household and extra-household model on determinants of land distribution in A1 resettlement areas.

3. RESEARCH QUESTIONS

- What are the intra-household and extra-household factors that determine the security of women's land rights in A1 resettlement areas?
- How can an econometric intra-household and extra-household model on determinants of land distribution in A1 resettlement areas be constructed?

3.1. Stating Hypotheses for the Study

The following two hypotheses, H1 and H2 were derived from the model and relevant literature.

H1: Married women obtain land rights through joint-registration of offer letters.

H2: Higher levels of education increase women's propensity to obtain land rights.

Marital status of women mattered as far as their access to and control over land was concerned. The researcher expected married women to obtain rights to land through joint-registration of the offer letters with their husbands. Women married under Chapter 5:11 and those married under customary law are co-owners of the A1 farms at law. In Latin America, joint titles were put forward as a means to secure women's land rights (Deere and Leon, 2003). The level of education is a property of individuals (Deere and Doss, 2006) and equips women with the necessary legal literacy on how to claim and defend their rights to land (Deere and Leon, 2001). A multinomial logit model was used to test H1 and H2. The dependent variable is a categorical

variable of the name in which the offer letter was issued. The significance of independent or explanatory variables was tested with different probabilities of obtaining varied outcomes the dependent variable could take.

4. RESEARCH METHODOLOGY AND DESIGN

A mixed methods research design was used where the case data occupied a secondary role to the variable-oriented national survey data. The quantitative and qualitative approaches were integrated throughout the analytic and interpretive phases of the study.The following sub-sections present quantitative and qualitative data used in the study.

4.1. Quantitative or Survey Data

The household baseline survey was conducted by the African Institute of Agrarian Studies between November 2005 and December 2006. The survey covered six districts; Chipinge (Manicaland Province), Chiredzi (Masvingo Province),Goromonzi (Mashonaland East Province), Kwekwe (Midlands Province), Mangwe (Matabeleland South Province) and Zvimba (Mashonaland West Province). The sample size for each sampled district averaged 15 percent of the total district which is considered statistically representative of the sampled area (AIAS, 2009). Of special importance to this study, the data was collected from individual farming households and contained key intra-household and extra-household variables required to test the hypotheses of the study using econometric analysis. However, an inspection of the original baseline survey data showed that there were variations in the composition of the different farming households interviewed by the African Institute of Agrarian Studies (AIAS) and some observations were missing. The missing observations were due to errors during the initial data collection or from data entry into the SPSS spreadsheets. The 433 households from A2 schemes were removed from the sample survey because the focus of this study was the distribution of land between men and women in A1 schemes. The remaining sample survey contained 1,656 A1 villagised and A1 self-contained households.

4.2. Qualitative Data

Qualitative data was meant to complement the national survey data and to give a deeper understanding of the phenomenon under study. Given that the researcher was actually involved in the fieldwork and talked to A1 farmers, Goromonzi District Administrator, District Lands Officer, the headwoman of Bains Hope Farm, headman of Ingwenya Farm and a farm worker from Bains Hope Farm, this generated stories about gender relations on land in A1 resettlement areas. Such stories served as good supplements to survey data analysis and more specifically assisted in exemplifying the econometric results. Five techniques were used to collect case data: questionnaire, interviews (semi-structured), focus groups, observation and documentation in order to triangulate the evidence (Bryman, 2001; Saunders *et al*., 2009) and hence improve the accuracy of the research findings. Of these methods, no single source had complete advantage over others. Instead, the methods were complementary to each other and where possible, they

were used in tandem in order to give an in-depth understanding of gender relations on access to and control over land in A1 resettlement areas.

The collection of case data lasted for four months, from December 2012 to March 2013. A multi-stage stratified random sampling technique was used due to the expansive nature of the study area. First, Mashonaland East Province was conveniently selected due to its relative proximity to the researcher. In the second stage, Goromonzi District was selected for budgetary and logistical reasons. Goromonzi was the only district without resettlement schemes prior to 2000 (GOZ, 2003). In the third stage, two study sites: Bains Hope and Ingwenya Farms were selected. These two farms were randomly selected from a list of former large scale commercial farms that were partitioned into A1 farms during the FTLRP. Figure 1.1 shows the two study sites of Bains Hope and Ingwenya Farms. In the fourth stage, households were stratified according to marital status: 19 women, 11 men (married to the women in the sample) and seven widows and widowers. This was because A1 farmers are not a homogenous group and a more representative sample reflecting the gender dimensions on access to and control over land could only be obtained through the stratified sampling technique. A1 farmers consist of distinct sub-populations that hold divergent views on gender relations on land and simple random sampling could not adequately reflect the balance of the different constituencies within the population. Simple random sampling was then used to select households for the sample from each stratum.

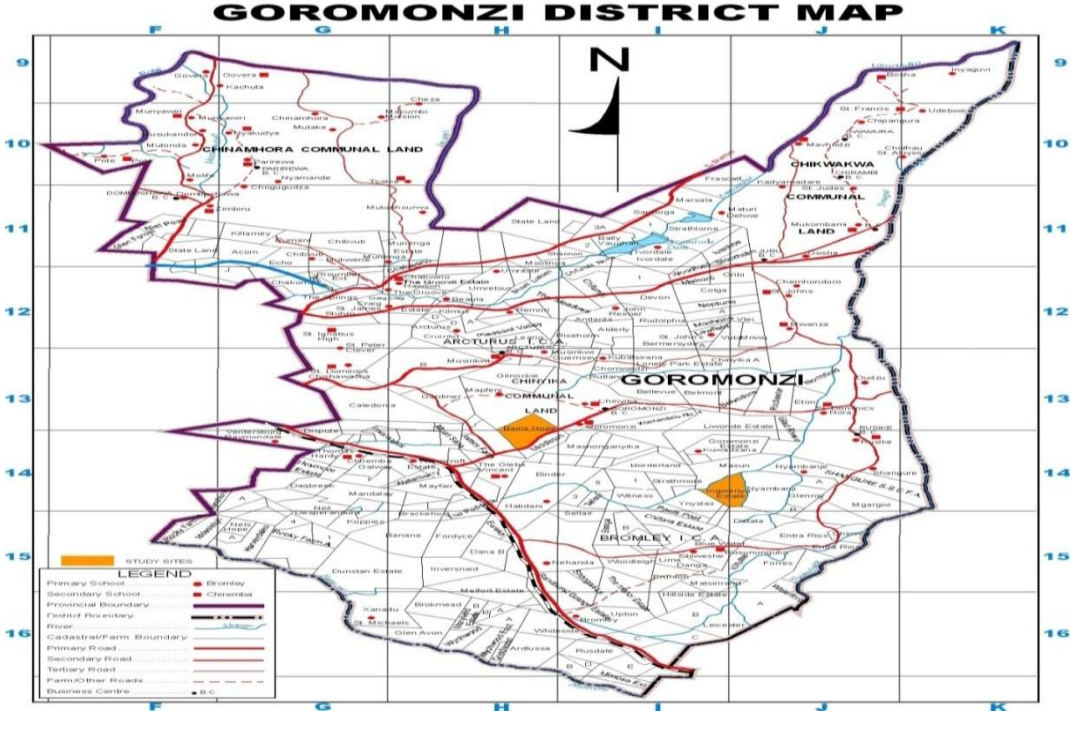

Figure-1.1. Map of Goromonzi District showing the two study sites

Source: Surveyor General, 2013

5. ECONOMETRIC RESULTS

The dependent variable is a non-numeric and multi-category variable, *farmdoc* . The variable, *farmdoc* specifies in whose name the offer letter was issued: 1=household head; 2=spouse's name; 3=joint registration; 4=other(s). In this test, *farmdoc* was applied to observations with offer letters only, that is, when the dummy variable, *Offerle*=1. The sub-sample for the test included households headed by couples (*dualhead*=1). The single-headed households were excluded from the multinomial logit model (MNLM) because the researcher expected women in such categories to obtain land in their own rights.

Marital status and level of education were however, not the only determinants of women's rights to land. Following the advice of Deere and Doss (2006), Fuentes and Wiig (2009) and Gujarati (1988; 1999), the researcher included other independent variables to increase the model's statistical validity. Hosmer and Lemeshow (2000) warn that adding more and more variables to the model makes it inefficient as over fitting may occur. In fact, a model can never completely capture reality (Gujarati, 1999) and should therefore be parsimonious to include relevant key variables suggested by theory (Gujarati, 1999; Hosmer and Lemeshow, 2000). The other independent variables (IVs) that determine the security of women's rights to land include household head's sex and age; size of the household; availability of irrigation and credit; geographical region and method used to acquire the plot (Deere and Doss, 2006; Fuentes and Wiig, 2009). In this study, the number of males and females in the household and the form of media used to make people aware about the FTLRP were also expected to influence the allocation of land rights between men and women in A1 schemes.

5.1. Econometric Model

Having identified the dependent variable and independent variables (IVs), the next task was to specify the econometric model and justify the selection and inclusion of the explanatory variables into the model. The econometric model used in this study is:

$$\Pr(Y_i = j) = f(HHHAge, SizeHH, Marstat, SpouseAge, SpouseEdu, AraArea, Soilqual, Modeacq, Provsd, Irrig, Credit, Merespg, Wom1-6, Man1-6,)$$

for j=1, 2, 3,4

Equation 1.1

If parameters are included, then the econometric model to be estimated becomes:

$$\Pr(Y_i = j) = \beta_0 + \beta_1 HHHAge + \beta_2 SizeHH + \beta_3 Marstat + \beta_4 SpouseAge + \beta_5 SpouseEdu + \beta_6 AraArea + \beta_7 Soilqual + \beta_8 Modeacq + \beta_9 Provsd + \beta_{10} Irrig + \beta_{11} Credit + \beta_{12} Merespg + \beta_{13} Wom1-6 + \beta_{14} Man1-6 + u_i$$

Equation 1.1a

where β_0 is the intercept term; $\beta_1$to β_{14} are partial regression coefficients and u_i is the error term. The error term or stochastic error term is used to keep the model simple and captures variables that have been omitted from the model, inherent randomness in human behaviour and

errors of measurement (Gujarati, 1999). Y_i is a polytomous dependent variable, *farmdoc* and has four nominal outcomes (j=1, 2, 3, 4): 1=offer letter in the name of the household head; 2=offer letter in spouse's name; 3=joint registration, both spouses' names appear on the offer letter; 4=other, offer letter in other person's name, for example child or relative. Equations 1.1 and 1.1a are the probability of observing any of the four possible outcomes of variable *farmdoc* given the selected IVs. The IVs and their expected signs are shown in Table 1.1. The direction of the effect of the IVs on the dependent variable is shown by means of "–" or "+". A question mark (?) is put where the category is not specified for sex and where the direction of the effect of the IV on the dependent variable is unclear or is not known.

Marital status variable, (*Marstat*), was expected to influence married women's access to land through joint registration of the offer letters. As mentioned above, education is important in shaping women's land rights. In Latin America, women's land ownership is positively associated with the level of education (Deere and Leon, 2001); (Fuentes and Wiig, 2009). In this study, education was split into two: education level of household head (*HHHEdu*) and education level of spouse (*SpouseEdu*).

Table-1.1. Variables of the econometric model

Name of Variable	**Type of variable**	**Regression Models (MNLM)**			
Farmdoc (j=1,2,3,4)	Ca	**1**	**2**	**3**	**4**
Independent Variables					
Marstat	D	?	?	?	?
Dualhead	D	?	?	?	?
HHHAge	Co	?	?	?	?
SpouseAge	Co	–	+	+	?
SexHHH	D	?	?	?	?
WomenHHH	D	?	?	?	?
MenHHH	D	?	?	?	?
SpouseEdu	Co	?	?	?	?
HHHEdu	Co	?	?	?	?
SizeHH	Co	?	?	?	?
AraArea	Co	–	+	?	?
Soilqual	Ca	–	+	?	?
Modeacq	Ca	?	?	?	?
Merespg	Ca	?	?	?	?
Irrig	D	dropped	dropped	dropped	dropped
Credit	D	dropped	dropped	dropped	dropped
Provsd	D	?	?	?	?

Ca=categorical variable; Co=continuous variable; D=dummy variable;HHH=household head

Variable size of arable land cultivated (*AraArea*) was used to test if women cultivated smaller plots than men. It was used to control for land under cultivation across the four land holding constellations. Water and rights to irrigation are interlinked with rights to land (Deere and Leon,

2001; Fuentes and Wiig, 2009). Irrigation boosts agricultural productivity if it is fully utilised. The availability of irrigation was expected to influence the allocation of land between men and women where men are likely to take plots with irrigation. Variable availability of irrigation, (*Irrig*) was included in the model to control for A1 plots with irrigation for men and women. Variable predominant type of soil on the farm holding, (*Soilqual*) was used to test the effect of the type and/or quality of soil on landholding in A1 schemes. Another variable which influences land use patterns is availability of credit (*Credit*). Variable *Credit* is a dummy variable from the questionnaire used in Goromonzi District and asked if A1 farmers sometimes applied for loans or credits from banks. It tested the distribution of credits or loans between men and women farmers.

Dummies for provinces in the survey sample (*Provsd*) captured the differentials in landholding between men and women across the provinces. The following provincial dummies were used: *Provsd1*=Mashonaland East; *Provsd2*=Mashonaland West; *Provsd3*=Midlands; *Provsd4*=Matabeleland North; *Provsd5*=Masvingo and P*rovsd6*=Manicaland. The method used to acquire the farm (*Modeacq*) has influence on women's land rights. The variable, *Modeacq* is categorical variable (non-binary) and has four outcomes: 1=formally allocated; 2=occupation and self-appropriation; 3=purchase; 4=both formal and occupation. It was used to control for the different methods of getting A1 farm holding. The variable, method of acquisition (*Modeacq*) only differed between the different forms of acquisition. The method used to acquire the farm holding also determined in whose name the offer letter was issued. The key informants revealed that some married women, after being allocated plots in their own right requested the District Administrator to replace their names on the offer letter with those of their husbands. The fieldwork in Goromonzi District revealed that an increasing number of women inherited land from their husbands. This was corroborated by the District Lands Officer who explained that in the event of the death of husband, the wife automatically assumed ownership of the A1 farm holding.

The variable, (*Merespg*) sought to establish how the A1 farmers got to know about the FTLRP. This helped to test the role of social capital or assets in land acquisition during the FTLRP. Variable Merespg is categorical (non-binary): 1=local leadership; 2=political party structures; 3=media source; 4=relative or friend; 5=government office. Lastly, two interaction variables, namely, interaction variable between women-HHH and provincial variation dummies, (*Wom1-6*) and interaction variable between men-HHH and provincial variation dummies(*Man1-6*) were included to capture the interaction effect of two qualitative variables of *SexHHH* and *WomenHHH* on the mean *farmdoc*.

5.2. Estimating the Econometric Model

Given the survey data set, how do we estimate the regression coefficients of equation 1.1? The multinomial logistic regression was used to model the relationship between the non-numeric and multi-category dependent variable, *farmdoc* and selected IVs in Table 1.1. SPSS for Windows version 16.0 was used to estimate the regression parameters (β_0 to β_{14}) in equation 1.1a. In SPSS, multinomial logistic regression is found under **Analyse/Regression/Multinomial Logistic**. The

polytomous dependent variable, *farmdoc* (j=1, 2, 3, 4) was entered into the dependent variable box; numeric and continuous IVs (*HHHAge*, *SpouseAge*, *SpouseEdu*, *SizeHH*, *AraArea*) were entered as covariates and dummy or categorical variables (*Marstat*, *Soilqual*, *Modeacq*, *Merespg*, *Provsd*) were entered as factors. Variables *HHsizmle*, *HHsizefml*, *Irrig* and *Credit* were dropped due to unavailability of data while the interaction effects of Wom1-6 and man1-6 could not be sustained.

5.3. Challenges of Econometric Estimation Using Survey Data

There were some challenges associated with using regression analysis on survey data. First, the survey data contained clusters and there was a potential for heteroscedasticity (Gujarati, 1988). In the survey data, both A1 villagised and A1 self-contained models were sampled together while different types of households namely, female-headed, male-headed, child-headed and dual-headed households were in the same sample. Heteroscedasticity occurs when the variance of the disturbance term is not constant from observation to observation (Gujarati, 1988; 1999; Greene, 2003). Although heteroscedasticity does not destroy the unbiasedness and consistency properties of OLS estimators, these estimators will not be efficient (Gujarati, 1988; 1999; Greene, 2003). It is not easy to eliminate heteroscedasticity in SPSS. Given that multinomial logistic regression does not impose requirements for normality, linearity and homogeneity of variance for the IVs, it is a preferred method (to discriminant analysis) when the data does not satisfy these assumptions (Hosmer and Lemeshow, 2000).

Second, logistic regression requires that the explanatory variables should be independent of each other (no multicollinearity) in the model. The presence of multicollinearity among explanatory variables inflates the standard errors of the regression coefficients (Gujarati, 1988; 1999). This renders some IVs insignificant leading to null findings. In this study the problem of multicollinearity was resolved by dropping IVs with high standard errors. Dropping variable(s) leads to a specification bias (Gujarati, 1988). Third, the maximum likelihood estimation method used to compute logistic regression is an iterative fitting process that makes a series of repetitions to find an answer and will produce implausible results if it breaks down (Hosmer and Lemeshow, 2000). Some of the possible sources of implausible results include multicolliniearity, categories of predictors having no cases or zero cells and complete separation whereby the two groups are perfectly separated by the scores on one or more IVs (ibid). In this study, some of the standard errors for the parameter estimates are more than 2 showing that there are still some numerical problems with the data set. This could be due to some of categories of IVs that have missing observations.

5.4. Reporting the Econometric Results

The multinomial logistic regression results on important intra-household and extra-household determinants of women's land rights are shown in Table 1.2. The multinomial logistic regression model is arduous and difficult to interpret due to a large number of possible comparisons it considers (Fuentes and Wiig, 2009). The econometric model in Table 1.2 has four possible outcomes on the dependent variable, *farmdoc* and there are 10 explanatory variables. In

this study, not all the possible outcome combinations were considered as this required more time than is available for the scope of the study. Instead, the researcher followed the advice of Fuentes and Wiig (2009) and Jariko *et al.* (2011) to analyse IVs which are significant and relevant to the research questions and the two main hypotheses stated in 3.1. Jariko *et al.* (2011), argue that the results of a multinomial logistic model can be analysed using the likelihood ratio tests to evaluate the overall model of goodness of fit instead of analysing the individual effects of IVs on the dependent variable. Accordingly, the researcher adopted this approach.

Table-1.2. Multinomial logistic regression estimates for determinants of women's land rights

	Model Fitting Criteria	Likelihood Ratio Tests		
Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	171.232	.000	0	.
HHAge	171.885	.653	3	.884
SpouseAge	172.574	1.342	3	.719
AraArea	165.343	11.036	3	.002
HHsize	171.598	.366	3	.947
Marstat	171.494	.261	9	1.000
Soilqual	183.368	12.136	12	.435
Modeacq	177.202	5.969	9	.743
Provsd	374.535	203.303	12	.000
SpouseEdu	189.739	18.507	33	.980
Meresprg	880.490	709.258	21	.000

The log likelihood value suggests that the model has adequately explained the determinants of women's land rights in A1 schemes. The independent variables, *AraArea*, *Provsd*, *and Meresprg*have significantly affected the likelihood of determining the category of land holding. These explanatory variables are statistically significant at $p<0.05$. Interestingly, intra-household explanatory variables, *Marstat*, *SpouseAge*, *HHHAge*, *SpouseEdu* and *HHsize* are not indicating any statistical significance. This is not what the researcher anticipated. The researcher had expected marital status and level of education to influence women's propensity for land rights.

All the results of the multinomial logistic regression are shown in the appendix. Table A1 shows the results of the four multinomial logistic regression estimation using the category "other" as base. The "other" category was chosen as the reference because it was not specified by sex. In Table A1, a one unit increase in the variable *AraArea* is associated with a 0.21 decrease in the relative odds of having land holding category "household head" versus "other" category. A one unit increase in the variable *Provsd6* is associated with a 0.70 decrease in the relative odds of having land holding category "household head" versus "other" category. Lastly, a one unit increase in the variable *Meresprg* is associated with a 0.382 increase in the relative odds of having land holding category "household head" versus "other" category. The coefficients in a multinomial logistic model represent the change in log relative risk (log odds) per unit change in the predictor. For example, in this model the relative risk ratio for a one-unit increase in the variable *AraArea* is 0.813 (exp (-0.21) for obtaining offer letter in household head versus "other" category. Based on

these results, hypotheses, H1 and H2 could not be accepted. This meant that other factors besides intra-household factors (marital status and level of education) had influence on women's land rights in A1 schemes.

5.5. Model Adequacy

The econometric results in Table 1.2 were checked for model adequacy and fit. The econometric model is statistically valid with a likelihood ratio chi-square equal to 427.247 with $p<0.001$. The log likelihood ratio shows that the model as a whole fits significantly better than a model with no predictors. This suggests that the model has adequately explained the determinants of security of women's land rights in A1 schemes. This is confirmed by a "higher" pseudo R-square using McFadden's R^2 of 0.714. Although the model is statistically valid, more robust results can be obtained if the data set is expanded and the design on data collection improved. The higher standard errors showed that the data still contained some numerical problems which could not be resolved. The high standard errors affected the efficiency of the coefficient estimates. The numerical problems could be due to some categories of predictors having no cases or zero cells.

5.6. Other Determinants of Security of Women's Land Rights

This section presents IVs which could not be used in the econometric model although they could be significant. Explanatory variables, *Irrig* and *Credit* were dropped because of the non-availability of data. Irrigation variable is important because it shows gender differentials (if any) with respect to access to and use of irrigation. Besides measuring the quality of land, variable, *Irrig* shows if men and women have the same water rights in the resettlement areas. In Latin America, more men's plots have irrigation than women's plots and men have more access to credit than women (Deere and Leon, 2001; 2003; Fuentes and Wiig, 2009). The fieldwork revealed that A1 farmers did not use irrigation in their fields. Instead, small water pumps (less than 5 hp) were used to water nutrition gardens. The available irrigation infrastructure was vandalised and was lying idle because A1 farmers could not afford the cost of rehabilitation and electricity bills. The variable, *Credit* was expected to show if the allocation of loans was gendered and how this affected landholding in resettlement schemes. However, institutional lending to A1 farmers was minimal because the offer letter was non-collaterised on its own. The offer letter could only be ceded with the bank together with title deeds of immovable property. A majority of the A1 farmers did not have immovable property such as houses in towns. During the fieldwork in Goromonzi District, it was found that none of the farmers received institutional credit. Instead, some farmers depended on input dealers and informal money lenders. For example, tobacco farmers received inputs from agro-businesses under contract farming where they were given inputs upfront on the premise that they would sell their tobacco through the supplier.

6. DISCUSSION OF FINDINGS

The results of the multinomial logistic regression analysis showed that intra-household factors such as marital status, age of spouse, age of the household head, size of the household and spouse's education had no impact on the choice of landholding category. If marital status did not explain land holding in A1 schemes, it meant that married women could access land in their own right. This was supported by findings in Bains Hope where 20 out of the 33 female land beneficiaries were married women. This also demonstrated that sex was not considered when land was distributed to beneficiaries in A1 resettlement schemes in Goromonzi District. But what could have contributed to a higher number of women obtaining A1 plots in Baines Hope? More married women hold land in their names than unmarried women in Baines Hope presumably due to the proximity of the resettlement scheme to Harare and the gender composition of war veterans (one male and three females) who spearheaded the occupation of the farm in 2000.

In the survey data, married women with offer letters constituted 24.3 percent of the land beneficiaries. About 10.8 percent of the land beneficiaries in Goromonzi District were married women with offer letters in their names. Among female land beneficiaries, married women constituted 16 percent. This showed that married women lagged behind unmarried women in accessing land in A1 resettlement areas. Previous studies in Nicaragua, Honduras, Peru, Brazil and Paraguay showed that female heads owned significantly more land than female spouses (Fuentes and Wiig, 2009).

The level of education was not a significant determinant of women's land rights in A1 schemes. Both literate and illiterate people were allocated land under the FTLRP. This was confirmed by findings from the case study where 48.6 percent of the land beneficiaries did not go beyond primary education. Among the women land beneficiaries, 28 percent did not attain any formal education while an equivalent number did no go beyond primary education. This finding is not consistent with previous studies (Ncube, 1997; ZWRCN, 2008). In Peru, Fuentes and Wiig (2009) found that the level of education and being married increased women's probabilities of getting land rights as joint titles but not as individuals. The success or failure of land reforms can be defined by the type of beneficiaries who received land (Marongwe, 2008). This means that the history, education, farming experience and skills possessed by the beneficiaries are key determinants of the agricultural production patterns of the settlers. However, lower levels of education and scanty formal agricultural training among A1 farmers could heavily compromise production efficiency in the resettlement areas.

Given that both marital status and level of education were not statistically significant, H1 and H2 could not be accepted. This meant that being married did not increase women's land rights through joint registration of offer letters while the level of education did not increase women's propensity to hold land in A1 schemes. Women obtained land rights in spite of their marital status and level of education attained. This finding demonstrated the centrality of land in shaping the socio-economic livelihoods of indigenous black Zimbabweans, both male and female.

Meanwhile, extra-household factors such as method used to make beneficiaries aware about the FTLRP (*Merespg*), size of arable area cultivated (*AraArea*) and provincial variations (*Provsd*)

were statistically significant. *Merespg* is a categorical variable (non-binary): 1=local leadership; 2=political party structures; 3=media source; 4=relative or friend; 5=government office. This variable helps to examine the role of social assets in the distribution of land under the FTLRP. For example, was there political test for the land beneficiaries? The baseline survey showed that 61.5 percent of the land beneficiaries knew about the FTLRP through government office especially AREX while those who learnt about the programme through political party structures were 7.1 percent. In Goromonzi District, 71.4 percent of the land beneficiaries learnt about the FTLRP through their political party, ZANU-PF. The finding showed that the household is a permeable entity where individual and household interactions played out within the socio-political network which had influence over household decisions and actions regarding the acquisition, use and disposal of land in A1 schemes. An interesting observation in Goromonzi District was that no one said that they knew about the FTLRP through agricultural extension workers. Instead, 8.6 percent learnt about the land reform programme through electronic or print media while 11.4 percent knew about the programme through friends or relatives. A number of studies corroborated these findings in Goromonzi District that social assets in the form of being a member of a political party determined the distribution of land rights between men and women in A1 schemes (Chaumba *et al*., 2003; Chingarande, 2008; Marongwe, 2008). Marongwe (2008) found that beneficiary selection was by and large influenced by power dynamics and the role of political and social networks. This was notwithstanding the existence of an elaborate criterion that was supposed to guide beneficiary selection. The use of political and social networks in land allocation had the inevitable fundamental outcome of excluding those who did not belong to a particular social group. If there was political test in the selection of land beneficiaries, then both men and women who did not support ZANU-PF were discriminated against under the FTLRP.

The variable *Provsd* captured the provincial variations in the distribution of land between men and women. The provincial variations in the number of women allocated land could be attributed to the following factors: the predominant method of land acquisition used in the province; the demographic composition of war veterans spearheading land occupations in the province; proximity of the resettlement scheme to urban areas; predominant ethnic group(s) in the province and the strength of socio-cultural institutions in the province. A detailed study of each province would be required to unravel the underlying factors for the land distribution patterns by sex.

7. CONCLUSION AND RECOMMENDATIONS

The study found that intra-household factors (marital status, level of education, household size, age of household head and number of males or females in each household) were not significant determinants of women's land rights in A1 schemes. Instead, extra-household factors such as the method used to make beneficiaries aware about the FTLRP, the size of arable area cultivated and provincial differentials of male and female beneficiaries determined the probability of women's land holding. Social assets were a strong determinant of women's land rights. This was attributed to the political environment under which the FTLRP was undertaken. The

baseline survey and fieldwork in Goromonzi District showed that belonging to ZANU-PF guaranteed one's access to land in A1 schemes. This means that the socio-political environment cannot be ignored when analysing the distribution of land under the FTLRP. The provincial variations in the number of women allocated land under the FTLRP was attributed to a number of factors and further research of each province would be required to unravel the underlying factors for the differential land distribution patterns by sex.

Based on the findings from the study, the following recommendations were made:

- The distribution of land should focus on individuals within households.
- Government and NGOs should devise methods to inform women about their land rights and the avenues through which these rights can be enforced.
- Legal recognition of dual-headed households in any asset redistribution programmes like land reform. This requires joint registration of family land in the names of spouses and all dependent children. The offer letter should have a section for Plot Holder(s) which would encourage land beneficiaries to put names of both spouses on the farm document.
- Effective representation of women in the district and village land distribution committees.
- The proposed land policy reform should focus on land titling so as to promote agricultural production efficiency and investment.
- The land tenure system should take into account issues of marriage and inheritance to avoid problems associated with land market and credit access to smallholder farmers.

8. FURTHER RESEARCH AREAS

Offer letters provide security to women's land rights during the subsistence of the marriage. It would be interesting to know if the offer letter would guarantee women's land rights in the event of divorce, abandonment or migration of the husband. The study had also sought to assess the effect of credit and agricultural infrastructure (particularly irrigation) on women's land rights in A1 schemes. By completing this study, the researcher has not addressed this objective due to the unavailability of data. Further research may be undertaken towards finding out if women have less access to credit and irrigation infrastructure than men in A1 resettlement areas.

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Table-A1. Multinomial logistic regression parameter estimates

		B	SEs	Exp(B)
household head	Intercept	-100.460	77068.282	
	d4ageown	2.215	32.103	9.164
	SpouseAge	.304	59.746	1.356
	AraArea	-.207	14.134	.813
	HHsize	-7.116	170.663	.001
	[Marstat=3]	23.655	6289.131	18756975280.544
	[Marstat=4]	31.797	5950.347	64469438708614.400
	[Marstat=5]	44.119	7710.787	14471589960133010000.000
	[Marstat=6]	0(c)	.	.
	[Soilqual=1]	20.721	5995.978	997309138.245
	[Soilqual=2]	7.835	5742.340	2527.232
	[Soilqual=3]	27.480	5714.855	859526996209.070
	[Soilqual=4]	19.699	6148.814	359039979.063

	[Soilqual=5]	0(c)	.	.
	[Modeacq=3]	5.740	1607.839	311.071
	[Modeacq=4]	-26.758	3753.352	2.39E-012
	[Modeacq=5]	-8.101	2238.145	.000
	[Modeacq=6]	0(c)	.	.
	[Provsd=3]	-14.813	2192.233	3.69E-007
	[Provsd=4]	-.696	3854.823	.498
	[Provsd=5]	18.395	2337.595	97425673.423
	[Provsd=6]	1.251	2260.461	3.492
	[Provsd=8]	0(c)	.	.
	[SpouseEdu=2]	-39.398	4282.167	7.75E-018
	[SpouseEdu=3]	-34.149	2005.974	1.48E-015
	[SpouseEdu=4]	-90.664	11791.195	4.22E-040
	[SpouseEdu=5]	-30.236	9430.759	7.39E-014
	[SpouseEdu=6]	-6.245	1848.326	.002
	[SpouseEdu=7]	-20.538	5325.299	1.20E-009
	[SpouseEdu=8]	-56.845	11782.174	2.05E-025
	[SpouseEdu=9]	-18.918	805.473	6.08E-009
	[SpouseEdu=10]	-42.264	2701.732	4.42E-019
	[SpouseEdu=11]	-29.679	2453.601	1.29E-013
	[SpouseEdu=12]	-33.981	1719.870	1.75E-015
	[SpouseEdu=13]	0(c)	.	.
	[Meresprg=1]	69.301	76739.229	125086513568553800000000000000.000
	[Meresprg=2]	77.145	76637.691	318859789943732200000000000000000.000
	[Meresprg=3]	68.148	76618.550	394852546686027000000000000000.000
	[Meresprg=4]	39.331	76633.366	120546595317629800.000
	[Meresprg=5]	92.002	76679.900	903574558957329000000000000000000000000
	[Meresprg=6]	77.111	76609.572	308147122567692000000000000000000.00

				0
	[Meresprg=7]	.382	1.735	692634657259624000 0.000
	[Meresprg=12]	0(c)	.	.
spouse	Intercept	-98.167	77002.016	
	d4ageown	2.215	32.103	9.160
	SpouseAge	.335	59.746	1.398
	AraArea	-.237	14.134	.789
	HHsize	-7.179	170.663	.001
	[Marstat=3]	24.631	6609.640	49802174710.381
	[Marstat=4]	43.317	6154.167	649155303338053000 0.000
	[Marstat=5]	56.975	7869.142	554325841572437000 0000000.00 0
	[Marstat=6]	0(c)	.	.
	[Soilqual=1]	23.634	6130.747	18361625161.121
	[Soilqual=2]	7.524	5882.922	1851.586
	[Soilqual=3]	27.815	5856.098	120179414 8705.701
	[Soilqual=4]	20.544	6280.304	835567306. 428
	[Soilqual=5]	0(c)	.	.
	[Modeacq=3]	-5.027	1655.975	.007
	[Modeacq=4]	-39.666	3803.038	5.93E-018
	[Modeacq=5]	-7.807	2238.146	.000
	[Modeacq=6]	0(c)	.	.
	[Provsd=3]	-21.702	2192.233	3.76E-010
	[Provsd=4]	-18.163	3860.907	1.29E-008
	[Provsd=5]	14.159	2337.595	1409687.14 0
	[Provsd=6]	-4.935	2260.461	.007
	[Provsd=8]	0(c)	.	.
	[SpouseEdu=2]	-35.224	4282.167	5.04E-016
	[SpouseEdu=3]	-32.273	2005.975	9.64E-015
	[SpouseEdu=4]	-99.468	12158.977	6.33E-044
	[SpouseEdu=5]	-30.567	9430.759	5.31E-014
	[SpouseEdu=6]	-4.252	1848.326	.014
	[SpouseEdu=7]	-31.218	5471.509	2.77E-014
	[SpouseEdu=8]	-55.890	12152.161	5.33E-025
	[SpouseEdu=9]	-17.962	805.474	1.58E-008
	[SpouseEdu=10]	-41.634	2701.733	8.29E-019
	[SpouseEdu=11]	-39.911	2515.677	4.64E-018

	[SpouseEdu=12]	-33.160	1719.871	3.97E-015
	[SpouseEdu=13]	0(c)	.	.
	[Meresprg=1]	54.150	76645.927	328848351521488800000000.000
	[Meresprg=2]	61.705	76544.265	628410756098275000000000000.000
	[Meresprg=3]	53.836	76525.100	240185745261760100000000.000
	[Meresprg=4]	22.861	76539.934	8477393108.074
	[Meresprg=5]	75.637	76586.525	705554890390021000000000000000000.000
	[Meresprg=6]	62.571	76516.112	149321653706811700000000000.000
	[Meresprg=7]	0.112	76649.618	199725707.005
	[Meresprg=12]	0(c)	.	.
joint registration	Intercept	-113.832	99365.021	
	d4ageown	2.109	32.103	8.243
	SpouseAge	.395	59.746	1.484
	AraArea	-.093	14.134	.911
	HHsize	-7.114	170.664	.001
	[Marstat=3]	28.315	9046.440	1981852325473.224
	[Marstat=4]	40.505	7667.733	389987968822104000.000
	[Marstat=5]	33.558	9282.907	375176436340460.600
	[Marstat=6]	0(c)	.	.
	[Soilqual=1]	-.682	7661.018	.506
	[Soilqual=2]	-2.321	7412.131	.098
	[Soilqual=3]	5.840	7400.958	343.922
	[Soilqual=4]	-.466	7782.541	.627
	[Soilqual=5]	0(c)	.	.
	[Modeacq=3]	-9.260	1969.322	9.52E-005
	[Modeacq=4]	-26.689	4418.243	2.56E-012
	[Modeacq=5]	-11.251	2238.146	1.30E-005
	[Modeacq=6]	0(c)	.	.
	[Provsd=3]	-19.497	2884.893	3.41E-009
	[Provsd=4]	.870	4291.646	2.388
	[Provsd=5]	18.612	3172.180	121066363.

				516
	[Provsd=6]	14.591	2912.313	2172634.957
	[Provsd=8]	0(c)	.	.
	[SpouseEdu=2]	-38.002	4717.286	3.13E-017
	[SpouseEdu=3]	-34.293	2294.268	1.28E-015
	[SpouseEdu=4]	-93.657	.000	2.11E-041
	[SpouseEdu=5]	-7.788	.000	.000
	[SpouseEdu=6]	7.071	1991.254	1177.060
	[SpouseEdu=7]	.956	7120.069	2.601
	[SpouseEdu=8]	-46.348	.000	7.43E-021
	[SpouseEdu=9]	-16.981	1197.949	4.22E-008
	[SpouseEdu=10]	-41.448	3425.825	9.99E-019
	[SpouseEdu=11]	-11.289	3280.616	1.25E-005
	[SpouseEdu=12]	-34.675	2225.818	8.73E-016
	[SpouseEdu=13]	0(c)	.	.
	[Meresprg=1]	45.534	98900.488	595913099376654000000.000
	[Meresprg=2]	65.129	98816.903	192739578345648600000000000000.000
	[Meresprg=3]	45.101	98808.238	386468899434767400000.000
	[Meresprg=4]	30.346	98813.557	15103467355365.280
	[Meresprg=5]	78.163	98860.115	882581870557084000000000000000000.000
	[Meresprg=6]	62.544	98795.428	145342485836982600000000000.000
	[Meresprg=7]	.777	98916.905	142793510.403
	[Meresprg=12]	0(c)	.	.