AN EVALUATION OF PILOT LAND REGISTRATION UNDER THE MiDA PROGRAMME

Draft Final Report

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Acronyms and Abbreviations

GPS	Geographic Positioning System
ISSER	Institute of Statistical Social and Economic Research
JHS	Junior High School
MCA	Millennium Challenge Account
MCC	Millennium Challenge Corporation
MiDA	Millennium Development Authority
MoFA	Ministry of Food and Agriculture
MSLC	Middle School Leaving Certificate
NGO	Non- governmental Organisations
ST	Short Term
LT	Long Term

1.   Introduction

The MCA-Ghana programme is a 5-year compact between Ghana and the Millennium Challenge Corporation (MCC) of the US. The Ghana programme which is being implemented by the Millennium Development Authority (MiDA) is aimed at reducing poverty through economic growth and agricultural transformation. Three projects in the area of agriculture, transportation and rural development form the basis for the programme. These projects are being undertaken in 30 districts in 6 regions in Ghana. As part of the agriculture transformation projects, MiDA is also piloting the titling of land in Ghana. The long term goal of this titling project is to remove production constraints inherent in land rights and use, by carrying out a pilot land registration assistance to some households living in the Awutu-Effutu district of the Central region. This study seeks to understand how this pilot land titling impacts on investments and consequently the welfare of beneficiary households.

Rigorous evidence on these relationships in general, and for Ghana in particular, is weak. So the evaluation of the pilot land registration project by MiDA does not only provide evidence for the scaling up of the programme in Ghana, but also provides evidence for policy formulation in a host of other countries. The report is structured as follows. Chapter 2 is the methodology chapter and it presents a discussion of the land titling under the MiDA programme and also the approach used in this study. Chapter 3 discusses the results where a description of the data is followed by the impact analysis. The conclusions are presented in Chapter 4.

2. Methodology

2.1. Land Titling under the MiDA Programme

For the land registration component of the program, and as part of the effort to improve the security of property rights in Ghana, the Government is undertaking two main interventions: deed registration and title registration. Deed registration allows individuals to register any set of rights that exceed a three year lease on a plot of land. Currently, this service is being offered on a demand driven basis throughout Ghana in regional offices (9 operational, 1 still to come on stream). The Government is also developing title registration. A title differs from a deed in that it moves beyond the recording of rights to establish a) authoritative adjudication, b) identifying the registrant as the owner, and c) provides state compensation if land is wrongly registered. To date, title registration has been done only in parts of Accra and Kumasi. The intervention to be evaluated will comprise the title registration currently taking place in the Awutu-Effutu-Senya area (District 01). This registration intervention will cover all plots in the registration area in a systematic fashion, with all plots mapped and registered for a nominal fee (1 Ghana cedi).

2.2. Key Hypotheses

The security of tenure for land generally is critical for economic growth. Households' welfare and growth can be engendered by improved security of tenure through increased access to credit, increased investment, and higher agricultural output. In particular, the use of landed assets to meet both short-term consumption needs, as well as long term investments needs in enhanced with titling. On the one hand households are better able to cope with adverse shocks (be it covariate or idiosyncratic) when they have secured landed assets. There are two advantages that the household with landed assets has. One is that they can more easily convert the asset into cash and use it to meet this shock. The second advantage is that such a household will get a higher value for their asset.

These two advantages are also true for household investments. Households with secured landed property are able to better take advantage of investment opportunities as they come. These arguments suggest that two broad hypotheses need to be tested in order for us to be able to tell whether titling does affect household welfare. These two hypotheses are as follows:

Hypothesis 1: C*onvertibility* – Titling improves the convertibility of land (or landed assets) to cash

Hypothesis 2: *Value* – Titling increases the value of the landed assets

Based on these two hypotheses we therefore in this study address the question of whether the land titling has impacted on the following outcome indicators; <u>Value of Land</u> (based on respondents own valuation), <u>value of credit</u> (general as well as credit for non-farm enterprises), <u>access to credit</u>, <u>agriculture related investments</u> and <u>non-farm profits</u>.

2.3. Impact Evaluation Approach

2.3.1. Empirical Method – Regression Discontinuity

The method for evaluating the impact of land titling on some of the key outcomes of interest is based on a spatial regression discontinuity design. Here we exploit the title registration taking place in the Awutu-Effutu-Senya district under the MiDA programme to construct both a treatment and comparison group. This design hinges on the assumption that households on both sides of the physical threshold that demarcates the treatment and control groups are almost identical in observable and unobservable dimensions. This assumption is reasonable given the fact that the borders do not follow any significant social, geographic, or administrative divisions. Indeed, one notes that some of the villages are split in two by this physical threshold.

Given the arbitrary nature of this division, some village chiefs that were not included in the original exercise demanded for land titling on behalf of the segments of their villages. For practical and ethical reasons MIDA agreed to design a second phase of the titling registration intervention, which was to include some areas of the villages which lie just outside of the current boundaries. The study therefore factored this into the design by adding a second control group (long-term control group). The sample therefore covers three groups – the treatment group (100 meters to the left of the road from Kasoa to Bawjaisi); the short term control group (100 meters to the right of the road); and the long term treatment group (500 meters from the road and on the same side as the short term

control). A total sample of about 2400 households forms the basis of the analysis – 800 for each of the 3 groups[1].

The quantitative method will involve the use of rigorous econometric techniques to examine the effect of the land titling on some key outcome indicators. The econometric analysis is based on a panel data from a baseline and follow-up survey.

The regressions discontinuity design is based on the simple idea that the pre-treatment relationship between the assignment score and the outcome variable (Y) is given by the following straight line linear regression

$$Y_i = \alpha + \beta_1 S + \varepsilon_i \qquad\qquad (1)$$

where, α and β_1 are regression coefficients and ε_i is the error term. After the treatment if the treated subjects are affected by a constant treatment effect β_0, on the outcome variable, then the regression equation can be revised as follows

$$Y_i = \alpha + \beta_0 T_i + \beta_1 S + \varepsilon_i \qquad\qquad (2)$$

Where T_i is the assigned indicator having a value of 1 if subject i is assigned to the treatment or 0 if it is assigned to the control group. Because of the constant effect assumption, the slope of the regression line does not change, but the intercept term changes to $\alpha + \beta_0$ for the treatment group, β_0 being the constant effect. We interpret this constant effect β_0 as the programme effect.

An important merit in the use of the econometric analytical method is the fact that this allows for the inclusion of control factors in the estimation (both time-variant and time-invariant factors within the treatment and control groups), while also ensuring that the analysis satisfies the adding-up

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[1] In all, a little above 14% of the households at the baseline dropped out of the sample. About 40% of the drop outs came from the short control group, about a third came from the long term control group while a little over a quarter (27.4%) of the drop outs came from the treatment group. Most of them came from male headed households with resident spouses (28.2%) or male single headed households (24.2%). Common reasons assigned to the drop outs are relocation of households outside the study area, refusal to continue with the study and a few cases of death of respondents who could not be replaced with members from their households.

constraint. The opportunity to employ different individual and group behavioural characteristics (including gender, marital status, age categories, etc) and other dummy variables for the different cohorts in the model also permits the evaluation of the differential impact of the interventions on these groups. In particular, we differentiate between the effects of land titling on all households in the geographic area earmarked for treatment and the effects that are detectable from households which get their lands titled because of the programme. The latter type of effects can be extended to studies on what happens to individual plots that are titled. This is normally referred to as "the impact on the treated" as compared to the former type of effects that are normally referred to as the "impact of the intention to treat".

We further exploit the fact that the data is a panel over two periods to estimate the second difference over time. In other words, we do not only estimate the constant effect as in Equation (2), which in effect tells us the difference in the outcome indicator for the treatment versus the control group. We also estimate whether the change in the outcome indicator over time is different for the treatment and control groups.

3. DISCUSSION OF RESULTS

3.1. Descriptive Statistics

3.1.1. Demographic Characteristics

This section presents the demographic characteristics of sampled households and the employment activities that the household members are engaged in apart from farming activities. Information covered by the survey on the demographic characteristics include sex, age, educational attainment, religious affiliation, marital status and the relationship to the household head. Household characteristics such as age-sex composition, household sizes, sex of household head, and household dependency ratios are also presented. The tables are generated based on households from the three groups who completed the two rounds of surveys.

3.1.1.1. Characteristics of sampled households

Generally, male headed households with spouse(s) make up the majority (27.7 per cent) of the sample followed by female headed households without spouse (18.9 per cent). Female headed households with absent spouse represent 16.9 per cent of the sample. The least represented in the sample is female headed households with spouse. The distribution across identification groups is almost evenly distributed with respect to the various household types.

In terms of gender distribution of household members, 52.9 per cent of the sample is female with relatively equal distribution for all identification groups; 53.4 per cent for Treatment, 53.5 per cent for Short term control and 51.7 per cent for Long term control (Table 3-1).

However, gender of household heads is in favour of the males generally as well as specifically to the identification groups. Male household heads make up 57.2 per cent of the sample with the treatment group recording 55.3 per cent male heads as against 56.1 per cent and 60.3 per cent for short term and long term control groups respectively.

Table 3-1 Characteristics of households, by type of group (%)

Household Characteristics	Treatment	Short Tern Control	Long Term Control	Total
Household Structure				
Single Male	12.1	13.0	14.4	13.2
Single Female	8.1	5.9	5.4	6.5
Male Head with Spouse(s)	28.3	27.5	27.3	27.7
Female Head with Spouse	0.6	0.7	0.7	0.7
Male Head without Spouse	4.0	5.4	4.8	4.8
Female Head without Spouse	19.3	20.4	16.9	18.9
Male Head with absent Spouse	10.8	10.4	14.1	11.7
Female Head with absent Spouse	16.7	16.7	16.4	16.6
Gender of HH members				
Male	46.6	46.5	48.3	47.1
Female	53.4	53.5	51.7	52.9
Gender of Head				
Male	55.3	56.1	60.3	57.2
Female	44.7	43.9	39.7	42.8
10-year age groups				
0-9	26.4	25.0	23.0	24.8
10-19	24.4	23.9	26.7	25.0
20-29	16.2	14.1	14.4	14.9
30-39	10.9	12.2	12.4	11.8
40-49	8.9	8.9	9.8	9.2
50-59	6.4	7.8	7.4	7.2
60-69	4.2	3.7	3.7	3.9
70-79	1.7	2.8	2.0	2.1
80+	0.9	1.7	0.8	1.1
Dependency age groups				
0-14	39.6	37.7	37.3	38.2
15-59	53.6	54.2	56.3	54.7
60+	6.8	8.1	6.4	7.1
Mean dependency ratio	**0.903**	**0.891**	**0.838**	**0.878**
% without an economic active member	*9.2*	*10.5*	*8.8*	*9.5*
Household size				
1	27.1	31.6	26.0	28.3
2-3	26.8	27.8	31.2	28.6
4-5	28.9	24.3	28.9	27.3
6-7	12.4	14.4	11.1	12.7
8-9	4.0	1.2	2.6	2.6
10+	0.7	0.7	0.2	0.5
Mean household size	*3.4*	*3.2*	*3.3*	*3.3*
Total	33.0	34.5	32.5	100.0

Majority of the sample are between the ages of 0-39 years. The least proportion for the age groupings is the 80+ age group (1.1 per cent). There is a declining pattern in the distribution across age groups as age increases. This pattern is also consistent with the various identification groups.

The dependency age groups and implied mean dependency ratios are also discussed. About 38 per cent of the population are child dependants (age 0-14 years) and about 7 per cent are adult defendants (age 60 years or older). These give average household dependency ratio of about 0.88. Relatively, the treatment group has a higher dependency ratio of 0.9 compared to 0.89 for short term control and 0.84 for long term control groups.

Household size of 1 (28.3 per cent) and 2-3 (28.6 per cent) make up the majority of household in the sample generally. This is followed by household size of 4-5 (27.3 per cent). There is a positive relationship between household sizes and the proportion of household in the sample. The mean household size for the treatment households is 3.4 members which is relatively higher than the short term control (3.2) and long term control (3.3). The general household size of the sample is 3.3 members (Table 3-1).

The distribution of the sample population by age and sex are represented by the charts below. From Figure 3-1, it could be observed that majority of the treatment sample population are between the ages of 0 to 19 which gives it a broader base and a narrow tip. The pyramid however has relatively more females than males. A similar pattern is observed for the short term control group as well as the long term control group in Figure 3-2 and Figure 3-3.

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Figure 3-1 Population by Age and Sex, Treatment

Treatment Sample Population by Age and Sex

Source: Land Title Survey, 2011
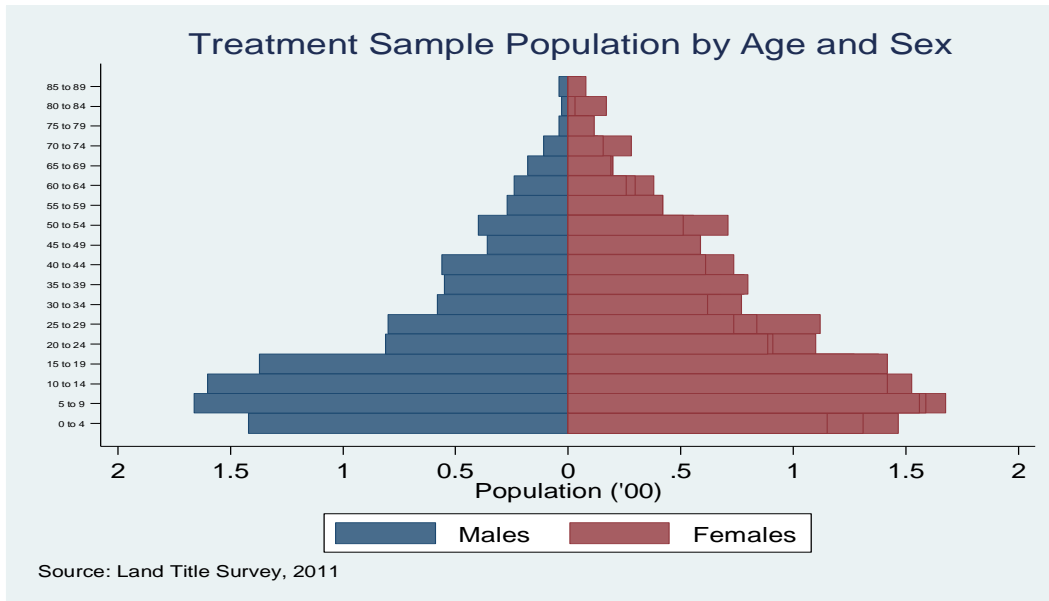
Figure 3-2 Population by Age and Sex, Short Term Control

Short Term Control Sample Population by Age and Sex

Source: Land Title Survey, 2011
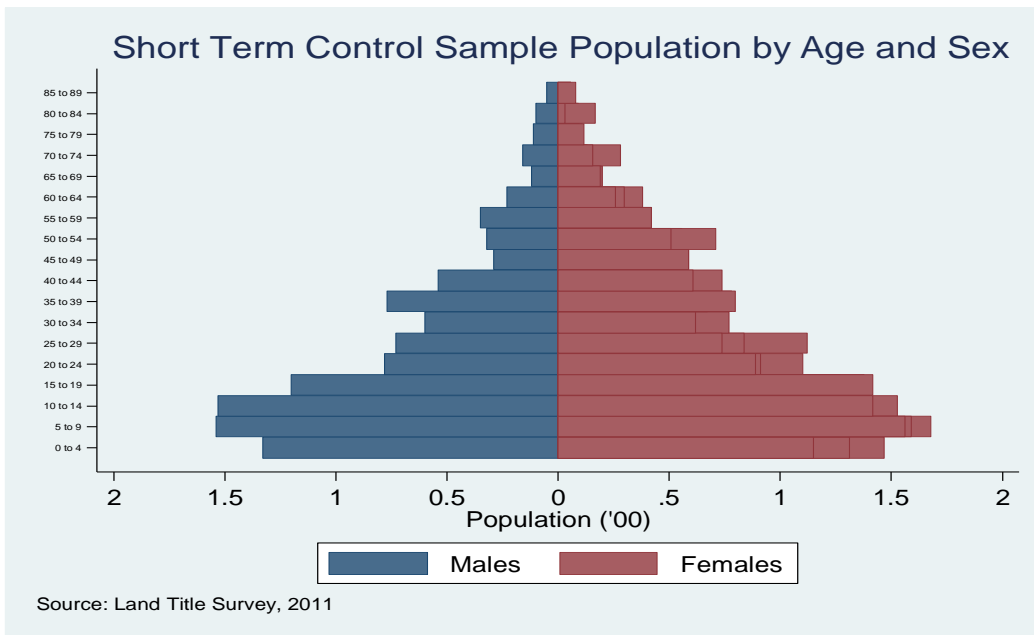
Figure 3-3 Population by Age and Sex, Long Term Control

Long Term Control Sample Population by Age and Sex

Source: Land Title Survey, 2011
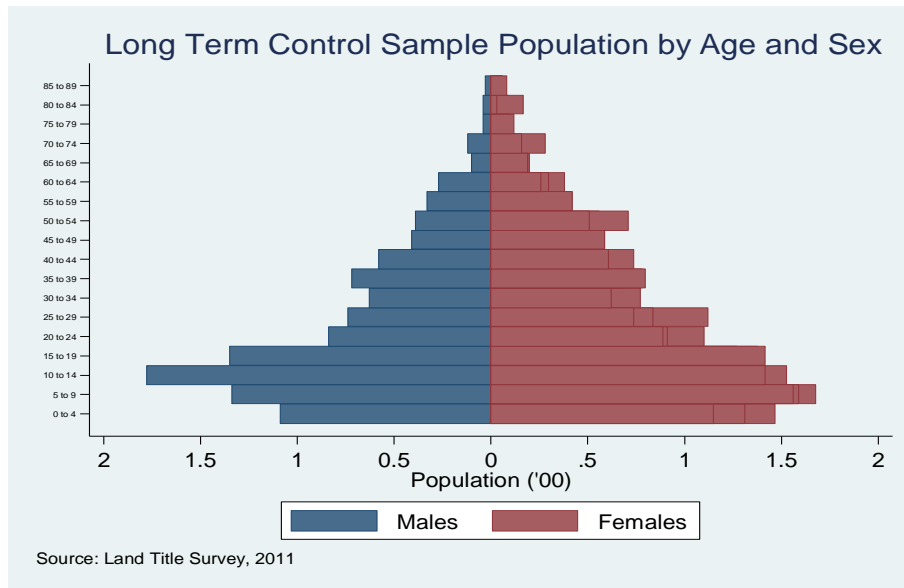
3.1.1.2.   Characteristics of adults in sampled households

Moving away from the entire household to the adults in the sampled households aged 15 years and older, issues on gender, age group, relationship to head of household, religion, marital status, highest level of education completed and literacy are discussed.

About 54.9 per cent of the adults in the sample are females but specifically there are 55.7 per cent females in the treatment group, 55.9 per cent in the short term control group and 53 per cent in the long term control group.

The 20 to 29 age group represents the highest proportion (24.1 per cent) of the adult population followed by the 30 to 39 age group (19.1). The least proportion among the age groups is the 60+ age group (11.5 per cent). The mean age for the treatment group is 35.9 years, relatively lower than the short term control (37.4) and the long term control (36.1) groups.

Majority of the adults in the sample are household heads (49 per cent) followed by 29.6 per cent who are children to the household heads. Spouses make up 14.7 per cent of the adult household members. Similar pattern is seen for the various identifying groups.

Table 3-2 Characteristics of Adults Household Members (15+ years), by type of group (%)

Characteristics of adults (15+ yrs)	Treatment	S T Control	L T Control	Total
Gender				
Male	44.3	44.1	47.0	45.1
Female	55.7	55.9	53.0	54.9
Age group (years)				
Less than 20	18.5	17.9	19.7	18.7
20-29	26.8	22.7	22.9	24.1
30-39	18.1	19.6	19.7	19.1
40-49	14.7	14.3	15.6	14.9
50-59	10.6	12.5	11.8	11.6
60+	11.3	13.0	10.3	11.5
Mean Age	35.9	37.4	36.1	36.5
Relationship to head of household				
Household Head	48.3	50.2	48.6	49.0
Spouse	15.0	14.7	14.4	14.7
Child	30.1	28.2	30.6	29.6
Others	6.6	6.8	6.5	6.6
Religion				
Christianity	85.2	81.1	84.3	83.5
Muslim	6.8	8.9	4.5	6.8
Traditional	0.8	2.2	1.4	1.5
No Religion	6.8	7.5	9.4	7.9
Other	0.4	0.4	0.4	0.4
Marital status				
Never Married	38.6	37.5	40.3	38.8
Consensual Union	9.2	11.3	9.5	10.0
Betrothed	0.1	0.1	0.1	0.1
Married	37.4	32.6	34.9	35.0
Separated	1.8	2.2	2.7	2.2
Divorced	5.7	7.8	6.6	6.7
Widowed	7.3	8.5	5.8	7.2
Highest Education Level Completed				
None	21.9	30.7	22.6	25.1
Some Primary	17.2	17.0	17.1	17.1
Middle/JHS	42.4	39.3	40.6	40.8
Secondary and above	18.5	13.0	19.7	17.1
Literacy				
Able to read a Ghanaian language	49.6	33.8	48.4	43.9
Able to write a Ghanaian language	45.5	32.2	45.6	41.0
Able to read English	62.3	53.0	59.1	58.1
Able to write English	61.4	50.1	55.9	55.8
Total	33.5	33.7	32.8	100.0

The treatment group has 85.2 per cent of its adult members as Christians whiles the long term control group (84.3 per cent) and short term control group (81.1 per cent) follows in that order. The Muslim religion comes third with 6.8 per cent following household members with no religion (7.9 per cent). The highest proportion is Christianity (83.5 per cent) (Table 3-2).

About 38.8 per cent of the adult in the sample have never married whiles 35 per cent are married. The betrothed have the least proportion of 0.1 per cent, with consensual union taking 10 per cent. The widowed and the divorced represent 7.2 per cent and 6.7 per cent of the adult household members respectively.

With the highest level of education completed, 40.8 per cent have completed Middle/JHS. However, 25.1 per cent had no education while 17.1 per cent have some primary education or have completed secondary school and above. Similarly, the identifying groups follow that pattern.

In the treatment group, 49.6 per cent are able to read a Ghanaian language, 45.5 per cent could write a Ghanaian language, 62.3 per cent are able to read English and 61.4 could write English. The proportions of these abilities decline with the short and long term control groups relative to the treatment group. Generally, 43.9 per cent have the ability to read a Ghanaian language whiles 58.1 per cent have the ability to read English. With the ability to write, 41 per cent could write a Ghanaian language whiles 55.8 per cent could write English.

3.1.2. Migration

This section looks at migration but with the focus on immigration of heads and or spouses of the households interviewed. By immigration, we mean individuals who have were not born in current place of residence but have stayed for at least a year or more at current place of residence. Individuals who were born in the current place of residence are considered as Indigenes. With the two waves of survey, group identification (treatment, short term control and long term control) and gender, the proportions of immigrants as against indigenes are discussed. We further discuss the reasons for immigration using the characteristics mentioned above.

The proportion of immigrants in the sample shows an increase from 49.7 per cent in wave one to 55.3 per cent in wave. The treatment group recorded the highest increase in immigrants (increasing from 49.9 per cent in wave one to 57.5 per cent in wave two). The differences among the three groups are statistically significant as shown with the p-values (Table 3-3).

Table 3-3 Migration status of Household heads and or spouses

Migration Status	Wave one				Wave two			
	Treatment	ST control	LT control	Total	Treatment	ST control	LT control	Total
Immigrants	49.9	47.8	51.4	49.7	57.5	51.7	57.0	55.3
Indigenes	50.1	52.2	48.6	50.3	42.5	48.3	43.0	44.7
Total	100	100	100	100	100	100	100	100
P-value	0.334				0.038			

By gender, majority of immigrants are females for both wave one (57.2 per cent) and wave two (57.7 per cent), and also by the identification groups. There is not much difference in the proportions for males and females for the two waves of survey for immigrants. With the exception of the long term control group which had its majority being males in wave two (51.6 per cent for males), the pattern is generally that females dominate in terms of immigration into the area. The results show that the different groups are not independent of the gender of the respondent, (Table 3-4)

In both survey waves, the prominent reasons for immigration are in order of importance as follows, Other family reasons (27 per cent and 27.2 per cent respectively for wave one and wave two), followed by Marriage (20.3 per cent and 19.9 per cent) and then Seeking employment (16.4 per cent and 12.9 per cent). From wave one and two, the treatment and short term control groups follow similar pattern in terms of prominent reasons for immigration. However, that of the long term control had Seeking employment (16 per cent) coming second with Marriage (15.3 per cent) taking third position in wave one whiles Accommodation(17.7 per cent) came second as opposed to Seeking employment in the wave two. Land acquisition as a reason for immigration recorded about 2 per cent in wave two. Statistically, there are significant differences in the identification groups in terms of reasons for immigration (Table 3-6).

Table 3-4 Migration status of Household heads and or spouses by gender

	Wave one							
	Immigrants				Indigenes			
Sex	Treatment	ST control	LT control	Total	Treatment	ST control	LT control	Total
Male	42.0	39.1	47.3	42.8	44.9	49.9	48.5	47.8
Female	58.0	60.9	52.7	57.2	55.2	50.1	51.5	52.2
Total	100	100	100	100	100	100	100	100
P-value	0.053				0.317			
	Wave two							
Male	41.5	39.6	45.9	42.3	47.1	48.9	51.6	49.2
Female	58.5	60.4	54.1	57.7	52.9	51.1	48.4	50.8
Total	100	100	100	100	100	100	100	100
P-value	0.143				0.488			

Table 3-5 Reasons for Immigration by Household heads and or spouses

Reason for Immigration	Wave one				Wave two			
	Treatment	ST control	LT control	Total	Treatment	ST control	LT control	Total
Job Transfer	5.3	4.3	4.1	4.6	7.7	3.0	5.0	5.3
Seeking Employment	18.1	15.1	16.0	16.4	11.4	13.7	13.8	12.9
Own Business	4.8	4.6	5.7	5.0	7.7	5.8	7.3	7.0
Spouse's Employment	4.0	1.0	1.0	2.0	2.0	0.9	0.9	1.3
Accompanying parent	11.1	17.6	14.4	14.4	9.6	15.7	13.4	12.8
Marriage	20.4	25.2	15.3	20.3	23.0	23.6	12.9	19.9
Other Family Reasons	26.6	25.2	29.2	27.0	31.1	27.3	23.1	27.2
Political/Religious Reasons	0.8	0.2	0.2	0.4	0.8	1.3	0.7	0.9
Education	0.5	0.0	0.0	0.2	0.4	0.6	1.3	0.8
War	0.0	0.2	0.2	0.2	0.0	0.2	0.2	0.1
Fire	0.0	0.0	0.2	0.1	0.2	0.0	0.2	0.1
Flood, Famine/Drought	0.0	0.0	0.5	0.2	0.0	0.2	0.0	0.1
Accommodation	3.0	1.2	3.6	2.6	3.5	3.7	17.7	8.2
Land acquisition	0.0	0.0	0.0	0.0	0.4	1.5	0.9	0.9
Farming	0.3	0.2	0.0	0.2	0.2	0.0	0.0	0.1
Pension/retirement	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.2
Financial difficulty	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1
Health related reason	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.1
For peaceful atmosphere	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1
Accompanying spouse	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.2
Learn a trade	0.0	0.5	0.0	0.2	0.0	0.0	0.0	0.0
Other	5.3	4.6	9.6	6.5	1.8	1.7	1.7	1.8
Total	100	100	100	100	100	100	100	100
P-value	0.000				0.000			

Table 3-6 Reasons for Immigration by Household heads and or spouses by gender for wave one

Reason for Immigration	Wave one								
	Treatment			S T control			L T control		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Job Transfer	10.2	1.7	5.3	5.5	3.6	4.3	5.6	2.7	4.1
Seeking Employment	22.9	14.7	18.1	28.7	6.4	15.1	24.5	8.6	16.0
Own Business	7.2	3.0	4.8	6.1	3.6	4.6	7.1	4.5	5.7
Spouse's Employment	1.8	5.6	4.0	0.6	1.2	1.0	0.0	1.8	1.0
Accompanying parent	10.8	11.2	11.1	20.1	15.9	17.6	14.8	14.0	14.4
Marriage	6.0	30.6	20.4	3.1	39.7	25.2	3.1	26.1	15.3
Other Family Reasons	28.3	25.4	26.6	28.7	23.0	25.2	28.6	29.7	29.2
Political/Religious Reasons	1.2	0.4	0.8	0.0	0.4	0.2	0.5	0.0	0.2
Education	0.6	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0
War	0.0	0.0	0.0	0.0	0.4	0.2	0.5	0.0	0.2
Fire	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.2
Flood, Famine/Drought	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.5
Accommodation	3.6	2.6	3.0	0.6	1.6	1.2	4.6	2.7	3.6
Land acquisition	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Farming	0.0	0.4	0.3	0.6	0.0	0.2	0.0	0.0	0.0
Pension/retirement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial difficulty	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health related reason	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
For peaceful atmosphere	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accompanying spouse	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Learn a trade	0.0	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.0
Other	7.2	3.9	5.3	6.1	3.6	4.6	10.7	8.6	9.6
Total	100	100	100	100	100	100	100	100	100
P-value	0.000			0.000			0.000		

In terms of differences by gender and the reason for immigration we note in wave one and for the treatment group, that males immigrated for reasons like 'Other family reasons', 'Seeking employment' (22.9 per cent) and 'Job transfer' (10.2 per cent). Males were not so likely to immigrate because of 'Spouse's employment '(1.8 per cent) and 'Marriage' (6.0 per cent). On the other hand, females immigrated for 'Marriage' (30.6 per cent), 'Other family reasons' (25.4 per cent), and 'Seeking employment' (14.7 per cent). With the other identification groups (i.e. the control group), 'Marriage' as a reason for immigration is quite important (39.7 per cent and 26.1 per cent for short and long term control respectively). Statistically, there are significant differences

among males and females in the various identification groups in terms of reasons for immigration for wave one (Table 3-7).

Table 3-7   Reasons for Immigration by Household heads and or spouses by gender for wave two

Reason for Immigration	Wave two								
	Treatment			ST control			LT control		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Job Transfer	12.0	4.6	7.7	3.8	2.5	3.0	6.2	3.9	5.0
Seeking Employment	16.4	7.8	11.4	23.1	7.5	13.7	21.4	7.5	13.8
Own Business	12.5	4.2	7.7	9.1	3.6	5.8	11.9	3.5	7.3
Spouse's Employment	0.5	3.2	2.0	0.5	1.1	0.9	0.0	1.6	0.9
Accompanying parent	11.5	8.1	9.6	17.7	14.3	15.7	12.9	13.8	13.4
Marriage	6.7	34.9	23.0	5.4	35.7	23.6	3.8	20.5	12.9
Other Family Reasons	31.7	30.6	31.1	26.9	27.5	27.3	20.0	25.6	23.1
Political/Religious Reasons	1.0	0.7	0.8	1.1	1.4	1.3	0.5	0.8	0.7
Education	0.5	0.4	0.4	1.6	0.0	0.6	1.4	1.2	1.3
War	0.5	0.0	0.2	0.0	0.4	0.2	0.5	0.0	0.2
Fire	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.2
Flood, Famine/Drought	0.0	0.0	0.0	0.5	0.0	0.2	0.0	0.0	0.0
Accommodation	5.3	2.1	3.5	5.9	2.1	3.7	17.6	17.7	17.7
Land acquisition	0.0	0.7	0.4	1.6	1.4	1.5	1.4	0.4	0.9
Farming	0.5	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Pension/retirement	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.4	0.7
Financial difficulty	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2
Health related reason	0.0	0.4	0.2	0.0	0.0	0.0	0.5	0.0	0.2
For peaceful atmosphere	0.0	0.0	0.0	0.5	0.0	0.2	0.0	0.0	0.0
Accompanying spouse	0.0	0.0	0.0	0.0	1.1	0.6	0.0	0.0	0.0
Learn a trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	1.0	2.5	1.8	2.2	1.4	1.7	0.5	2.8	1.7
Total	Total	100	100	100	100	100	100	100	100
P-value	0.000			0.000			0.000		

For wave two and for males in the treatment and short term control group, 'Seeking employment' comes right after 'Other family reasons' whiles the males in the long term control group immigrated mostly because of 'Seeking employment' (21.4 per cent) and 'Accommodation' (17.6 per cent). The females on the other hand, cited 'Marriage' as the most prominent reason for immigration in the treatment (34.9 per cent) and short term control groups (35.7 per cent) but cited it second in the long term control group (20.5 per cent). For wave two, there are statistically significant differences

among males and females in the various identification groups in terms of reasons for immigration (Table 3-7).

3.1.3.   Paid Employment

3.1.3.1.   Overall Employment Distribution in Survey Area

This section discusses the summary statistics in relation to the labour force in paid employment (i.e. it excludes the self-employed or unemployed). In other words, this section discusses the summary statistics for individuals or household members 15 years and older who were engaged in paid employment (that is worked as someone else's employee) in the past 3 months.

People are considered to be engaged in paid employment if they did some work for pay, profit or family gain during the reference period, which was the past 3 months prior to the interview. The employment module in this survey did not capture self-employment as well as unemployment.

Table 3-8   Proportion of Paid employees from household members aged 15 years and older

Employment Status	Wave one			
	Treatment	ST control	LT control	Total
Paid employees	10.7	9.8	9.9	10.1
Others	89.4	90.2	90.1	89.9
Total	100	100	100	100
P-value	0.753			
	Wave two			
Paid employees	12.5	11.7	10.4	11.5
Others	87.5	88.3	89.7	88.5
Total	100	100	100	100
P-value	0.261			

The proportion of paid employees among household members aged 15 years and above in wave one was about 10.1 per cent but had an increase to 11.5 per cent in wave two. By identification groups, there were higher proportions of paid employees in wave two as compared to wave one. For both wave one and two, the proportion of paid employees for the treatment group (10.7 per cent for wave one and 12.5 per cent for wave two) was more than the short term control (9.8 per cent for wave one and 11.7 per cent for wave two) and long term control (9.9 per cent in wave one and 10.4 per cent for wave two) groups (Table 3-8).

3.1.3.2. Distribution of Paid Employment in Survey Area

By main occupation, industrial classification, age group and gender, we discuss the distribution of paid employment in the two waves of the survey with respect to identification groups (treatment, short term control and long term control). Although information was sought on up to two jobs that a person had done during the 3 months preceding the interview, this section presents summaries only of the main job of individuals.

Table 3-9 Main Occupation of Paid employment of Household members aged 15 years and older by gender

Main Occupation	Treatment			S T control			L T control			Overall Total
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Wave one										
Legislator/manager	1.1	0.0	0.8	0.0	2.8	0.8	0.0	0.0	0.0	0.6
Professionals	11.1	18.9	13.4	3.5	19.4	8.3	18.8	37.1	24.4	15.2
Technical and associate professionals	6.7	13.5	8.7	5.9	0.0	4.1	5.0	5.7	5.2	6.1
Clerks	2.2	2.7	2.4	3.5	5.6	4.1	6.3	2.9	5.2	3.9
Service/sales workers	5.6	10.8	7.1	2.4	13.9	5.8	8.8	8.6	8.7	7.2
Agric/fishery workers	18.9	16.2	18.1	31.8	30.6	31.4	13.8	17.1	14.8	21.5
Craft and related trade workers	16.7	13.5	15.8	17.7	19.4	18.2	22.5	5.7	17.4	17.1
Plant and machine operator	23.3	2.7	17.3	23.5	5.6	18.2	12.5	2.9	9.6	15.2
Elementary occupation	7.8	18.9	11.0	4.7	2.8	4.1	2.5	14.3	6.1	7.2
Armed/Security personnel	6.7	2.7	5.5	7.1	0.0	5.0	10.0	5.7	8.7	6.3
Total	100	100	100	100	100	100	100	100	100	100
P-value	0.106			0.002			0.036			0.013
Wave two										
Legislator/manager	3.6	0.0	2.6	1.7	0.0	1.4	0.0	0.0	0.0	1.4
Professionals	10.7	20.0	13.2	6.9	21.4	9.7	16.3	28.6	19.8	13.9
Technical and associate professionals	7.1	15.0	9.2	5.2	7.1	5.6	5.8	8.6	6.6	7.2
Clerks	3.6	5.0	4.0	3.5	7.1	4.2	4.7	2.9	4.1	4.1
Service/sales workers	6.3	17.5	9.2	2.6	7.1	3.5	4.7	20.0	9.1	7.2
Agric/fishery workers	15.2	15.0	15.1	27.6	32.1	28.5	11.6	31.4	17.4	20.4
Craft and related trade workers	15.2	7.5	13.2	14.7	7.1	13.2	11.6	5.7	9.9	12.2
Plant and machine operator	22.3	2.5	17.1	20.7	3.6	17.4	20.9	0.0	14.9	16.6
Elementary occupation	12.5	12.5	12.5	13.8	14.3	13.9	19.8	2.9	14.9	13.7
Armed/Security personnel	3.6	5.0	4.0	3.5	0.0	2.8	4.7	0.0	3.3	3.4
Total	100	100	100	100	100	100	100	100	100	100
P-value	0.038			0.140			0.000			0.201

In wave one, Agriculture/fishery workers dominated with 18.1 per cent for the treatment group followed by plant and machine operators (17.3 per cent). By gender, females were more involved in Elementary occupations (18.9 per cent) as well as being Professionals (18.9 per cent) whiles males were mostly involved as Plant and machine operators (23.3 per cent) and Agriculture /fishery workers (18.9 per cent). Females in the short term control group also were mostly into Agriculture/fishery work (30.6 per cent) followed by Professionals and Craft and related trade work (19.4 per cent). Their male counterparts were also into Agriculture/fishery work (31.8 per cent) with 23.5 per cent involved as Plant and machine operators. The long term control group had majority of their females in paid employment as Professionals (37.1 per cent) whiles their males were mostly into Craft and related trade (22.5 per cent). In wave one there are significant differences among males and females for short term and long term control groups. The treatment and long term control groups had differences which were similar across the two waves of the survey (Table 3-9).

For the treatment group in the follow up survey, instead of Agriculture/fishery work dominating as in wave one, Plant and machine operators dominates with 17.1 per cent. Females in paid employment are mostly Professionals (20.0 per cent) whiles males are involved as Plant and machine operators (22.3 per cent) as was in wave one. A similar pattern exist as in wave one for the females in both the short and long-term control groups. However, males in paid employment in the long term control group are dominated by Plant and machine operators with about 20.9 per cent (Table 3-9).

We also discuss the broad industry group to which the main occupations of household members fall. For the treatment group in wave one, majority of the main occupations fell under Manufacturing (22.1 per cent) followed by Agriculture (19.7 per cent) and Transport and communications (18.1 per cent). For the short term control group the order is Agriculture (30.6 per cent), Manufacturing (20.7 per cent), and Transport and communication (16.5 per cent). For the long term control group we note the order Manufacturing (22.6 per cent), Education (21.7 per cent) and Agriculture (13.9 per cent).

Table 3-10 Industry group of Paid employment of Household members aged 15 years and older by gender

Industry group	Treatment			S T control			L T control			Overall Total
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
				Wave one						
Agriculture	20.0	18.9	19.7	31.8	27.8	30.6	15.0	11.4	13.9	21.5
Mining	1.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Manufacturing	22.2	21.6	22.1	17.7	27.8	20.7	25.0	17.1	22.6	21.8
Trade	7.8	5.4	7.1	4.7	0.0	3.3	7.5	11.4	8.7	6.3
Hotels and restaurant	0.0	2.7	0.8	0.0	2.8	0.8	0.0	2.9	0.9	0.8
Transport and communications	23.3	5.4	18.1	20.0	8.3	16.5	15.0	2.9	11.3	15.4
Financial services	1.1	2.7	1.6	0.0	0.0	0.0	1.3	2.9	1.7	1.1
Real estate	5.6	5.4	5.5	3.5	0.0	2.5	7.5	2.9	6.1	4.7
Public administration	1.1	2.7	1.6	3.5	0.0	2.5	5.0	2.9	4.4	2.8
Education	8.9	16.2	11.0	5.9	16.7	9.1	17.5	31.4	21.7	13.8
Health and social work	0.0	5.4	1.6	2.4	8.3	4.1	0.0	8.6	2.6	2.8
Other community service	7.8	10.8	8.7	3.5	5.6	4.1	5.0	2.9	4.4	5.8
Activities of private households	1.1	2.7	1.6	7.1	2.8	5.8	0.0	2.9	0.9	2.8
Extra-territorial organization	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.9	0.3
Total	100	100	100	100	100	100	100	100	100	100
P-value		0.220			0.085			0.062		0.032
				Wave two						
Agriculture	17.9	15.0	17.1	25.9	28.6	26.4	12.8	31.4	18.2	20.6
Mining	1.8	0.0	1.3	1.7	0.0	1.4	0.0	0.0	0.0	1.0
Manufacturing	19.6	10.0	17.1	22.4	7.1	19.4	26.7	5.7	20.7	18.9
Trade	10.7	12.5	11.2	5.2	7.1	5.6	2.3	5.7	3.3	7.0
Hotels and restaurant	0.0	0.0	0.0	0.0	7.1	1.4	1.2	5.7	2.5	1.2
Transport and communications	22.3	0.0	16.5	24.1	3.6	20.1	19.8	0.0	14.1	17.0
Financial services	0.0	0.0	0.0	1.7	0.0	1.4	3.5	2.9	3.3	1.4
Real estate	3.6	5.0	4.0	0.9	0.0	0.7	4.7	5.7	5.0	3.1
Public administration	3.6	5.0	4.0	1.7	3.6	2.1	4.7	0.0	3.3	3.1
Education	8.9	27.5	13.8	9.5	14.3	10.4	12.8	25.7	16.5	13.4
Health and social work	0.9	5.0	2.0	0.9	10.7	2.8	0.0	5.7	1.7	2.2
Other community service	8.9	17.5	11.2	4.3	14.3	6.3	11.6	5.7	9.9	9.1
Activities of private households	1.8	2.5	2.0	1.7	3.6	2.1	0.0	5.7	1.7	1.9
Extra-territorial organization	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100	100	100	100	100	100	100	100	100	100
P-value		0.009			0.003			0.000		0.124

In wave two, the treatment group had Agriculture and Manufacturing at par (17.1 per cent) unlike in wave one where Agriculture following Manufacturing. Transport and communications follow with 16.5 per cent. For the short term control group, Agriculture still dominates with 26.4 per cent, followed by Transport and communications (20.1 per cent) and Manufacturing (19.4 per cent) which were the opposite in the baseline. Manufacturing (20.7 per cent), Agriculture (18.2 per cent)

and Education (16.5 per cent) were the majority for the long term control group. With the exception of the treatment group for wave one, all other identification groups in both waves had statistical differences in the industry groupings for males and females (Table 3-10).

Table 3-11 and Table 3-12 discuss the main occupations and industry groupings of paid employment by age groupings. In terms of industry groups for the treatment group in wave one, Manufacturing make the majority in the age groups 15-24 (30 per cent), 35-44 (34.3 per cent) and 55-64 (31.3 per cent). For age groups 25-34 and 45-54, Transport and communication (31.6 per cent) and Agriculture (32.1 per cent) make up the majority respectively. For the short term control group, Agriculture makes the majority for the age groups 25-34 (28.9 per cent), 35-44 (37.5 per cent) and 45-54 (35.7 per cent). Manufacturing recorded the highest proportion for age groups 15-24 (35.7 per cent) and 55-64 (25 per cent together with Activities of private household and Health and social work). In the long term control group Education, Trade and Manufacturing had the highest proportions (21.4 per cent) for individuals aged between 15 and 24. For age groups 25-34 (32.3 per cent) and 55-64 (21.4 per cent), Manufacturing had the largest shares. Education and Transport and communications recorded 19.4 per cent under 35-44 age group while 30 per cent was also recorded for the 45-54 age group for Education (Table 3-11).

In wave two under the treatment group, Education takes the highest shares in 15-24 (26.3 per cent), 45-54 (20 per cent) and 55-64 (23.1 per cent with Transport and communications and Other community services) age groups. The age groups 25-34 (26.1 per cent in transport and communications) and 35-44 (25.9 per cent in Manufacturing) maintained their highest share in same industry group as in wave one. In the short term control group, age groups 15-24 (40.9 per cent), 25-34 (23.6 per cent together with Transport and communications), 35-44 (26.8 per cent) and 45-54 (28.6 per cent) had its majority in the Agricultural industry as was in wave one with the exception of the 15-24 age group which had the highest in Manufacturing. Other community services and Education had the majority for the 55-64 (25 per cent) age group. Under the long term control group, Manufacturing had the majority in the 15-24 (46.2 per cent) and 35-44 (21.6 per cent) age groups whiles Agriculture had the majority in 25-34 (22 per cent) and 45-54 (28.6 per cent) age groups. The 55-64 (33.3 per cent) age group had its largest share in Education. In the various age

groups, there are differences in terms of industry groupings for the short term control group in wave two (Table 3-10).

In terms of main occupation under the treatment group, the age groups 25-34 (29 per cent for wave one and 23.9 per cent for wave two) and 35-44 (25.7 per cent for wave one and 18.5 per cent for wave two) in both wave one and two were recorded for those in Plant and machine operators and Craft and related trade works respectively. With regards to the short term control group, different age groups accounted for different shares in the agriculture employment – for instance the short term control group, the 45-55 year olds have the highest proportion of paid employment in agriculture in wave one. However in the wave two, the 15-24 year olds have about 41 per cent in paid employment in agriculture. In the long term control group, we note that Professionals category seemed to be quite important for the age groups of 15-24 in both waves (21.4 per cent in wave one and 23.1 per cent in wave two). The other categories of main occupation that constituted an important source of paid employment (for all identification and age groups) in wave one did not repeat their dominance in the follow up. Statistically, it is only for the treatment group in wave one that we find significant differences in industry groupings for the various age groups (Table 3-11).

Table 3-11 Industry group of Paid employment of Household members aged 15 years and older by age grouping

	Wave one																	
	Treatment						S T control						L T control					
Industry group/Age group	15-24	25-34	35-44	45-54	55-64	Total	15-25	25-35	35-45	45-55	55-65	Total	15-26	25-36	35-46	45-56	55-66	Total
Agriculture	20.0	21.1	11.4	32.1	12.5	19.7	21.4	28.9	37.5	35.7	12.5	30.6	14.3	9.7	16.7	20.0	7.1	13.9
Mining	0.0	0.0	2.9	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufacturing	30.0	15.8	34.3	7.1	31.3	22.1	35.7	13.3	20.0	28.6	25.0	20.7	21.4	32.3	16.7	20.0	21.4	22.6
Trade	0.0	7.9	11.4	7.1	0.0	7.1	0.0	2.2	5.0	7.1	0.0	3.3	21.4	9.7	8.3	5.0	0.0	8.7
Hotels and restaurant	0.0	2.6	0.0	0.0	0.0	0.8	0.0	2.2	0.0	0.0	0.0	0.8	0.0	0.0	2.8	0.0	0.0	0.9
Transport and communications	10.0	31.6	14.3	7.1	18.8	18.1	21.4	26.7	10.0	7.1	0.0	16.5	0.0	12.9	19.4	5.0	7.1	11.3
Financial services	0.0	0.0	2.9	3.6	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	7.1	1.7
Real estate	0.0	7.9	5.7	0.0	12.5	5.5	0.0	4.4	2.5	0.0	0.0	2.5	7.1	6.5	5.6	5.0	7.1	6.1
Public administration	0.0	0.0	0.0	7.1	0.0	1.6	0.0	2.2	5.0	0.0	0.0	2.5	7.1	0.0	0.0	10.0	14.3	4.4
Education	10.0	5.3	5.7	21.4	18.8	11.0	7.1	11.1	7.5	14.3	0.0	9.1	21.4	22.6	19.4	30.0	14.3	21.7
Health and social work	0.0	0.0	2.9	0.0	6.3	1.6	0.0	4.4	2.5	0.0	25.0	4.1	0.0	3.2	2.8	0.0	7.1	2.6
Other community service	20.0	5.3	8.6	14.3	0.0	8.7	0.0	2.2	7.5	0.0	12.5	4.1	7.1	0.0	5.6	5.0	7.1	4.4
Activities of private households	10.0	2.6	0.0	0.0	0.0	1.6	14.3	2.2	2.5	7.1	25.0	5.8	0.0	0.0	0.0	0.0	7.1	0.9
Extra-territorial organization	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.9
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
P-value	0.160						0.367						0.754					
	Wave two																	
Agriculture	21.1	19.6	16.7	15.0	7.7	17.1	40.9	23.6	26.8	28.6	8.3	26.4	7.7	22.0	10.8	28.6	22.2	18.2
Mining	0.0	2.2	1.9	0.0	0.0	1.3	0.0	0.0	0.0	7.1	8.3	1.4	0.0	0.0	0.0	0.0	0.0	0.0
Manufacturing	5.3	15.2	25.9	15.0	7.7	17.1	22.7	20.0	22.0	14.3	8.3	19.4	46.2	17.1	21.6	19.1	0.0	20.7
Trade	15.8	15.2	9.3	10.0	0.0	11.2	13.6	3.6	4.9	7.1	0.0	5.6	7.7	2.4	5.4	0.0	0.0	3.3
Hotels and restaurant	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	2.4	0.0	0.0	1.4	0.0	4.9	2.7	0.0	0.0	2.5
Transport and communications	5.3	26.1	11.1	15.0	23.1	16.5	9.1	23.6	24.4	21.4	8.3	20.1	7.7	17.1	13.5	9.5	22.2	14.1
Financial services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	1.4	0.0	4.9	0.0	4.8	11.1	3.3
Real estate	0.0	2.2	5.6	0.0	15.4	4.0	0.0	1.8	0.0	0.0	0.0	0.7	0.0	4.9	2.7	14.3	0.0	5.0
Public administration	0.0	2.2	5.6	10.0	0.0	4.0	0.0	3.6	2.4	0.0	0.0	2.1	0.0	2.4	5.4	0.0	11.1	3.3
Education	26.3	6.5	11.1	20.0	23.1	13.8	9.1	12.7	4.9	7.1	25.0	10.4	23.1	7.3	18.9	19.1	33.3	16.5
Health and social work	5.3	0.0	1.9	5.0	0.0	2.0	0.0	3.6	0.0	0.0	16.7	2.8	0.0	2.4	2.7	0.0	0.0	1.7
Other community service	10.5	10.9	9.3	10.0	23.1	11.2	0.0	3.6	4.9	14.3	25.0	6.3	7.7	12.2	13.5	4.8	0.0	9.9
Activities of private households	10.5	0.0	1.9	0.0	0.0	2.0	0.0	0.0	7.3	0.0	0.0	2.1	0.0	2.4	2.7	0.0	0.0	1.7
Extra-territorial organization	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
P-value	0.285						0.078						0.784					

Table 3-12   Main Occupation of Paid employment of Household members aged 15 years and older by age groupings

Main Occupation/Age group	Treatment						S T control						L T control					
	15-24	25-34	35-44	45-54	55-64	Total	15-25	25-35	35-45	45-55	55-65	Total	15-26	25-36	35-46	45-56	55-66	Total
Wave one																		
Legislator/manager	0.0	0.0	2.9	0.0	0.0	0.8	0.0	0.0	0.0	7.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Professionals	0.0	10.5	8.6	14.3	37.5	13.4	0.0	13.3	2.5	14.3	12.5	8.3	21.4	22.6	22.2	35.0	21.4	24.4
Technical and associate professionals	10.0	5.3	8.6	14.3	6.3	8.7	7.1	4.4	5.0	0.0	0.0	4.1	7.1	3.2	2.8	5.0	14.3	5.2
Clerks	0.0	2.6	5.7	0.0	0.0	2.4	7.1	4.4	2.5	0.0	12.5	4.1	7.1	3.2	8.3	0.0	7.1	5.2
Service/sales workers	20.0	13.2	5.7	0.0	0.0	7.1	7.1	2.2	7.5	0.0	25.0	5.8	21.4	9.7	5.6	5.0	7.1	8.7
Agric/fishery workers	20.0	21.1	11.4	28.6	6.3	18.1	28.6	28.9	35.0	42.9	12.5	31.4	21.4	12.9	13.9	20.0	7.1	14.8
Craft and related trade workers	20.0	13.2	25.7	7.1	12.5	15.8	28.6	11.1	17.5	28.6	25.0	18.2	7.1	22.6	16.7	15.0	21.4	17.4
Plant and machine operator	0.0	29.0	17.1	7.1	18.8	17.3	21.4	28.9	12.5	7.1	0.0	18.2	0.0	9.7	16.7	5.0	7.1	9.6
Elementary occupation	30.0	2.6	8.6	21.4	6.3	11.0	0.0	2.2	10.0	0.0	0.0	4.1	7.1	9.7	5.6	5.0	0.0	6.1
Armed/Security personnel	0.0	2.6	5.7	7.1	12.5	5.5	0.0	4.4	7.5	0.0	12.5	5.0	7.1	6.5	8.3	10.0	14.3	8.7
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
P-value	0.062						0.210						0.970					
Wave two																		
Legislator/manager	0.0	6.5	0.0	5.0	0.0	2.6	0.0	3.6	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0
Professionals	21.1	13.0	7.4	25.0	7.7	13.2	9.1	10.9	2.4	14.3	25.0	9.7	23.1	14.6	24.3	19.1	22.2	19.8
Technical and associate professionals	15.8	6.5	5.6	5.0	30.8	9.2	0.0	10.9	2.4	0.0	8.3	5.6	0.0	4.9	5.4	9.5	22.2	6.6
Clerks	0.0	4.4	7.4	0.0	0.0	4.0	0.0	3.6	7.3	7.1	0.0	4.2	0.0	2.4	0.0	19.1	0.0	4.1
Service/sales workers	10.5	6.5	11.1	10.0	7.7	9.2	0.0	1.8	2.4	7.1	16.7	3.5	15.4	14.6	8.1	0.0	0.0	9.1
Agric/fishery workers	21.1	19.6	14.8	10.0	0.0	15.1	40.9	23.6	34.2	28.6	8.3	28.5	7.7	22.0	10.8	23.8	22.2	17.4
Craft and related trade workers	10.5	13.0	18.5	0.0	15.4	13.2	18.2	9.1	19.5	14.3	0.0	13.2	15.4	9.8	13.5	4.8	0.0	9.9
Plant and machine operator	5.3	23.9	16.7	15.0	15.4	17.1	13.6	18.2	19.5	21.4	8.3	17.4	23.1	14.6	10.8	14.3	22.2	14.9
Elementary occupation	15.8	6.5	13.0	20.0	15.4	12.5	18.2	14.6	9.8	7.1	25.0	13.9	15.4	14.6	24.3	4.8	0.0	14.9
Armed/Security personnel	0.0	0.0	5.6	10.0	7.7	4.0	0.0	3.6	2.4	0.0	8.3	2.8	0.0	2.4	2.7	4.8	11.1	3.3
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
P-value	0.251						0.349						0.206					

3.1.4.   Borrowing

In this section we discuss some of the basic descriptive statistics related to the borrowing activities in the households. The statistics presented here are mainly those that deal with the sources of household loans, the types of collateral used in acquiring loans and the amounts of loans that individuals received.

We present the proportion of individuals who accessed loans in the 12 months preceding the interviews. The results are presented for each wave of survey, by sex of the recipient of the loan and the broad categories of the individuals who accessed the loan (i.e. whether they belong to the treatment, short term or long term control groups). For the baseline survey (wave one), 13 per cent of the sampled population accessed loans. The proportion of individual members who accessed loans is about 12.8 per cent for the treated group. For the males in the treatment group about 12.6 per cent of them accessed loans while 13.1 per cent of the female in the treatment group accessed loans at the baseline. In the short term control group 12.3 per cent of males accessed loans while 15.3 per cent of the females sampled in that group accessed loans. The long term control group had 11.3 per cent of the males accessing loans while 12.9 per cent of the females sampled in that group also accessed loans. Tests shown in the table suggests that gender differences across the three broad categories are not statistically significant (Table 3-13).

For the follow-up survey (wave two) we find that about 21.1 per cent of the treated group accessed loans as against 19.4 per cent for the short term control group and 18.1 per cent for the long term control group. For the sex dimension of those who accessed credit, 21.7 per cent of males in the treated group accessed credit as against 20.7 per cent for female. The short term control group had 15.6 per cent of the male population accessing loans as against 22.5 per cent for the female. Out of the male population sampled in the long-term control group for the follow up survey, 16.8 per cent accessed loans. Also for the long term control 20.6 per cent of the females sampled reported accessing loans. Generally individuals seem to have increased their borrowing activities especially for the treated group as there is a difference of 7.3% between the baseline and follow-up for this group (Table 3-13).

Table 3-13 Proportion of Individuals who accessed loans in the past 12 months (%)

Wave one				
Sex	Treatment	S T Control	L T Control	Total
Male	12.6	12.3	11.3	12.0
Female	13.1	15.3	12.9	13.8
Total	12.8	14.0	12.1	13.0
P-value	0.5190			
Wave two				
Sex	Treatment	Sh T Control	L T Control	Total
Male	21.7	15.6	16.8	18.0
Female	20.7	22.5	20.6	21.3
Total	21.1	19.4	18.8	19.8
P-value	0.4580			

Table 3-14 Proportional Distribution of Sources of household loans

Wave one				
Source	Treatment	ST Control	LT Control	Total
Bank & Non Bank Financial Inst.	40.3	55.7	43.3	48.7
Other Sources	54.7	44.3	56.7	51.3
Total	100	100	100	100
P-value	0.2470			
Wave two				
Source	Treatment	ST Control	LT Control	Total
Bank & Non Bank Financial Inst.	52.8	56.6	52.4	54.0
Other Sources	47.2	43.5	47.6	46.0
Total	100	100	100	100
P-value	0.3940			

The distribution of the source of loans for the baseline survey shows that 48.7 per cent of household loans come from bank and non-bank financial institutions with 51.3 per cent being accessed from other non-financial sources, such as from relatives and friends. There are no significant differences in the responses reported by the three categorical groups (treatment, short term control and long

term control). For the follow up survey 54 per cent of the loans received by individuals in the households were accessed from the bank and non-bank financial institutions with 46 per cent sourced from other sources. The p-value shows no significant difference in the categorical responses by the source of the loan (Table 3-14).

We show in Table 3-15 the distribution of the type of collateral that was required before a loan facility could be accessed by the three broad groupings. We note that generally collateral has not been so important for those who accessed loans in the sample. For almost all (91.5 per cent) individuals who accessed loans in the baseline survey, no collateral was required. A portion of those who accessed loans reported some forms of collateral (7.2 per cent) was required like bank accounts, their relatives or non-relatives before they were granted loans. Landed property was not too important as only 1.3 per cent used it as collateral to access loans.

In the follow- up survey, the proportion using landed property reduced even further to 0.9 per cent. For 88.3 per cent of the loans accessed, no collateral was required and only 11.5 per cent reported using some various forms of collateral (Table 3-15).

Table 3-15 Types of collateral used to access loans, by treatment group

Wave one				
Type of Collateral	Treatment	S T Control	L T Control	Total
Landed property	1	0.9	2.0	1.3
None	91.4	92.2	90.9	91.5
Other	7.6	7	7.1	7.2
Total	100	100	100	100
Wave two				
Type of Collateral	Treatment	S T Control	L T Control	Total
Landed property	0.6	0	0.7	0.4
None	86.1	93.2	85.4	88.3
Other	13.9	7	13.9	11.5
Total	100	100	100	100

Table 3-16 presents the average amounts of loans received by individuals in households by the sex of the recipient of the loan. In the baseline survey, the household members got about GH¢460 of loans on average. The average amounts received differed by gender with males receiving an average

of GH¢596 and females an average of GH¢363 across all groups. The p-value shows there is a statistically significant difference in the amounts received by the three different categorical groups and gender. While males in the treatment and long term control groups received averagely more than their female counterparts, females in the short term control group received more (GH¢470) than their male counterparts (GH¢388). In the follow-up survey, there was no difference in the amounts received by the treated, short term and long term control group though females in the short term group received more (GH¢749) than their male counterparts (GH¢598). It is generally observed that the individuals received relatively more in loan amounts in the follow up survey compared to the baseline (Table 3-16).

Table 3-16 Mean Loan Amounts by Sex, Treatment and Control

Wave one				
Sex	Treatment	ST Control	LT Control	Total
Male	653.33	388.48	770.57	596.89
Female	296.78	470.26	292.04	363.60
Total	449.59	438.86	499.24	459.99
P-value	0.0033			
Wave two				
Sex	Treatment	ST Control	LT Control	Total
Male	936.65	598.33	539.22	714.07
Female	518.37	749.42	457.16	585.67
Total	705.79	695.20	492.17	638.51
P-value	0.1230			

In the baseline survey, the treatment group received an average of GH¢601 from bank and non-financial institutions, the short term control group received an average of GH¢635 and the long term control group received an average of GH¢947 from the same source. For individuals who accessed loans from other informal sources, the treated group received an average of GH¢320, the short term received an average of GH¢194 and the long term control group received an average of GH¢246 from this source. Generally males in the three categorical groups received more in terms of amount from all sources than their female counterparts except for the amount received by females in the short term control group who received about GH¢77 more than their male counterparts.

In the follow-up survey, an increase in the average amounts received by all individuals in the three groups is observed. The treatment group received GH¢1,054 from bank and non-bank financial institutions. The short term and long control groups received GH¢988 and GH¢717 respectively from the same source. The average received by other sources was GH¢363 for the treatment group, GH¢446 for the short term control group and GH¢263 for the long term control group (Table 3-17).

Table 3-17 Mean Loan Amounts by Source, Sex, Treatment and Control

	Wave one								
Source	Treatment			S T Control			L T Control		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Financial inst.	1044.44	335	601.04	870	567.69	635.37	1697.14	491.30	947.57
Other sources	446.43	198.76	320.42	161.19	238.70	194.20	318.52	158.64	246.73
Total	680.43	268.03	448.70	392.33	466.80	438.49	789.27	328.67	548.26
	Wave two								
Source	Treatment			S T Control			L T Control		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Financial inst.	1763.33	710.81	1054.02	693.89	985	928.04	796.67	669.43	717.82
Other sources	474.26	214.14	363.23	558.33	268.94	446.71	296.13	235.58	263.60
Total	976.49	531.60	728.48	598.33	793.58	720.06	529.14	474.20	497.29

3.1.5. Land use and Agriculture

3.1.5.1. General Land Use

In comparing the average number of trees planted on individual plots by the treatment, short term control and long term control groups for both wave one and two; there is a total decline in the number of trees planted in wave two relative to wave one. For the treatment group in wave two, there is a decline from an average of 28.7 and 44.5 trees to 17.6 and 5.6 trees respectively for males and females (Table 3-18).

From the valuation of plots of land owned or used by household heads or spouses in a household, the treatment group and the short term control group had a sharp rise across waves (from wave one to wave two). An increase from GH¢6,340 in wave one to GH¢9,674 in wave two was recorded for males in the treatment group whiles an increase from GH¢3,900 to GH¢8,428 was recorded for females in same group and respective waves. On the other hand, there was a decline in the land

values for the long term control group from GH¢6,196 for males and GH¢4,619 for females in wave one to GH¢3,936 and GH¢3,737 respectively in wave two (Table 3-19).

Table 3-18 Average number of trees planted per plot by gender

	Wave one			Wave two		
Sex	**Treatment**	**ST control**	**LT control**	**Treatment**	**ST control**	**LT control**
Male	28.7	120.1	86.4	17.6	65.2	15.7
Female	44.5	64.6	57.8	5.6	26.1	11.4

Table 3-19 Average land values per plot by gender

	Wave one			Wave two		
Sex	**Treatment**	**ST control**	**LT control**	**Treatment**	**ST control**	**LT control**
Male	6340.82	6761.73	6196.69	9674.58	8512.99	3936.41
Female	3900.68	3337.90	4619.51	8428.30	4987.25	3737.23

3.1.5.2. Agriculture Investment and Crop Choice

Table 3-20 shows the amount of money households spent on seeds by the various groups. For wave one, it is seen that households in the short term control group on average spent the highest amount of money (GH¢16.4) on seeds in the past 12 months. This implies that households in the short term control group invested more in their non-labour inputs (in terms of seeds) compared to those in the treatment and long term control groups. Contrary to a priori expectations, households in the treatment group on average invested the least amount of money (GH¢3.5) into the purchase of seeds. We also note that the long term control group invested almost as much as the short term control group and far more than the treatment group. Comparing the treatment group and the short term control group, it is expected that since the households in the treatment group had their land titling process started for them, it would give them increased security on their land and therefore serve as an incentive for them to invest in their land. Households in the short term control group rather invested more in their land.

For wave two, it is seen that the number of respondents who invested in seeds increased across the three groups. The most significant increase in the number of households who now invested in the purchase of seeds is seen in the treatment group (from 46 to 124 households). The average value of seeds purchased by the same group also increased quite significantly from GH¢3.5 in wave one to GH¢ 45.6 in wave two. This increase in the amount of seed purchased in the treatment group could be attributed to the titling. The households may have felt more secure with the titling of their land and therefore were now comfortable investing in it. The short term control group still had the highest seed investment value compared to the other two groups. We further investigate in the next section whether we could attribute this increase to the titling.

Table 3-20 Value of Seeds Used

Wave one				
Group type	Mean(GH¢)	N	Max(GH¢)	Min(G H ¢)
Treatment Group	3.5	46	17.5	1.0
S T Control	16.4	145	132.0	1.2
L T Control	15.4	52	109.0	0.6
Total	13.8	243	132.0	0.6
Wave two				
Treatment Group	45.6	124	503	1.0
S T Control	50.6	150	750	1.4
L T Control	17.1	47	220	1.2
Total	43.8	321	750	1.0

Table 3-21 Value of Chemicals Used

Wave one				
Group type	Mean(GH¢)	N	Max(GH¢)	Min(GH¢)
Treatment Group	5.2	4	7.5	1.4
S T Control	28.2	31	100.0	5.1
L T Control	35.4	10	200.2	6.5
Total	27.7	45	200.2	1.4
Wave two				
Treatment Group	76.1	48	600.0	3.0
S T Control	100.2	84	5050.0	2.5
L T Control	18.6	64	140.0	3.5
Total	67.7	196	5050.0	2.5

Table 3-21 shows the average amount of chemicals purchased by households in the three groups. The chemicals include fertilizers, herbicides and pesticides. For Wave one, only 45 households used some form of chemical on their farm. Of these, only 4 households were from the treatment group. Households in the long term control group made the highest investment in chemicals. Households who invested in chemical use in the short term control group paid an average of GH¢28.2. For wave two, it is seen that the total number of households who purchased chemicals increased to 196 from 45 in Wave one. The number of households increased from 4 to 48 in the treatment group and from 31 to 84 in the short term control group.

Table 3-22 Proportion of Crops Grown on All Plots by Wave

Crop	Wave one				Crop	Wave two			
	Treat	ST	LT	Total		Treat	ST	LT	Total
Cassava	84.4	80.7	88.1	84.1	Cassava	74.8	83.4	83.6	81.3
Maize	58.4	64.6	64.1	63.0	Maize	61.8	58.2	54.1	57.7
Yam	5.2	11.2	6.0	8.0	Plantain	9.4	7.4	7.0	7.8
Coconut	4.1	1.6	1.6	2.2	Yam	8.9	11.1	6.7	9.0
Pepper	4.1	3.3	4.0	3.7	Sugarcane	5.3	1.6	1.8	2.6
Sugarcane	3.5	1.3	1.2	1.8	Oil Palm	2.9	2.6	4.0	3.1
Oil Palm	3.5	3.6	5.2	4.1	Pepper	2.4	4.0	3.0	3.3
Garden Egg/Egg plant	2.9	1.0	0.0	1.1	Other vegetables	2.0	0.8	0.3	0.9
Okro	2.3	0.7	0.0	0.8	Tomatoes	2.0	1.6	0.6	1.4
Plantain	2.3	7.2	4.0	4.9	Pineapple	2.0	1.3	2.1	1.8
Tomatoes	1.7	0.3	0.0	0.6	Oranges/Tangerine	1.6	0.8	0.6	0.9
Coffee	1.2	0.0	0.8	0.6	Coconut	1.6	1.6	1.5	1.6
Beans/Peas	1.2	0.3	1.6	1.0	Garden Egg/Egg plant	1.2	0.8	0.3	0.7
Cocoa	1.2	1.6	2.4	1.8	Cocoyam	1.2	0.8	0.9	0.9
Guinea corn/Sorghum	0.6	0.0	0.0	0.1	Beans/Peas	1.2	0.3	1.8	1.1
Kenef	0.6	0.0	0.0	0.1	Coffee	0.8	0.0	0.3	0.3
Leafy Vegetable	0.6	0.0	0.0	0.1	Mango	0.8	0.5	0.6	0.6
Sheanut	0.6	0.0	0.0	0.1	Banana	0.8	1.1	1.5	1.2
Onion	0.6	0.0	0.4	0.3	Cocoa	0.8	1.3	1.2	1.2
Water melon	0.6	0.3	0.0	0.3	Groundnut/Peanut	0.8	2.4	1.5	1.7
Banana	0.6	0.7	0.0	0.4	Onion	0.4	0.0	0.0	0.1
Cocoyam	0.6	0.7	0.0	0.4	Avocado pear	0.4	0.3	0.0	0.2
Tiger nut	0.6	0.7	0.4	0.6	Cashew nut	0.4	0.0	0.3	0.2
Other vegetables	0.6	1.3	0.0	0.7	Guinea corn/Sorghum	0.4	0.0	0.3	0.2
Pineapple	0.6	0.7	1.2	0.8	Okro	0.4	0.5	0.0	0.3
Oranges/Tangerine	0.6	1.0	2.0	1.2	Potatoes/Sweet potatoes	0.4	0.5	0.0	0.3
Groundnut/Peanut	0.6	4.3	0.8	2.2	Other food crops	0.4	0.5	0.3	0.4
Avocado pear	0.0	0.3	0.0	0.1	Cola nut	0.0	0.0	0.3	0.1
Cashew nut	0.0	0.0	0.4	0.1	Leafy Vegetable	0.0	0.3	0.0	0.1
Cola nut	0.0	0.0	0.4	0.1	Lime/Lemon	0.0	0.0	0.3	0.1
Woodlot	0.0	0.0	0.4	0.1	Water melon	0.0	0.3	0.0	0.1
Lime/Lemon	0.0	0.7	0.0	0.3	Woodlot	0.0	0.3	0.0	0.1
Potatoes/Sweet potatoes	0.0	0.3	0.4	0.3	Other fruits	0.0	0.3	0.0	0.1
Other food crops	0.0	0.7	0.4	0.4	Tiger nut	0.0	0.5	0.9	0.5
Total	183.2	188.9	185.7	186.4	Total	185.4	184.7	176.0	181.9

Notes: The proportions here are in relation to the cases and therefore we do get the total to exceed 100%. This means that each cell tells what proportion of the farm plots is used by households to grow a particular crop.

Table 3-22 shows the proportion of crops grown on plots by households in the various groups in the two waves. For Wave one, it is seen that cassava, maize and yam were the top three most grown crops on plots by households. In the treatment group about 84.4 per cent of the plots are used by households to grow cassava. For the short term control group the proportion of plots on which households grow cassava was about 80.7 per cent. For the Wave 2, the percentage of agriculture plots used to grow cassava dropped to 74.8 per cent whiles those for the short term control group increased to 83.4 per cent. However, the percentage of plots being used by households to grow cassava in the long term control group decreased from 88.1 per cent in the first wave to 83.1 per cent in the second wave. Maize seems to be the second most important crop. We note that about 58.4 per cent of plots used by households in the treatment group had maize grown on them during Wave 1 and this increased to 61.8 per cent in the second wave. For the short term control group about 64.6 per cent of plots in the short term control group had maize cultivated on it in the first wave; this percentage dropped to 58.2 per cent during the second wave. For the long term control group, 64.1 per cent of the plots had maize cultivated on it in the first wave and this decreased to 54.1 per cent in the second wave. In order of importance we find plantain displacing yam to become the top third crop to be grown on plots by households in the second wave. About 2.3 per cent of plots in the treatment group was used for the cultivation of plantain in the first wave. This increased to 9.4 per cent in the second wave. In general it is observed that the percentage of plots on which the top three crops was cultivated declined between the first wave and the second wave.

Table 3-23 Proportion of the Different Types of Crops Grown

Crop Type	Male				Female			
	Wave one				Wave one			
	Treat	ST	LT	Total	Treat	ST	LT	Total
High Value Cash Crops	3.9	7.2	11.6	8.1	5.6	2.7	2.6	3.5
Grains	59.8	63.4	63.6	62.7	56.3	66.7	65.4	63.5
Other crops	94.1	88.7	93.6	91.7	95.8	93.7	93.6	94.2
Total	157.8	159.3	168.8	162.5	157.8	163.1	161.5	161.2
Crop Type	Wave two				Wave two			
	Treat	ST	LT	Total	Treat	ST	LT	Total
High Value Cash Crops	7.1	7.2	10.4	8.3	5.5	2.8	0.9	2.9
Grains	65.8	58.7	52.0	58.1	56.0	57.3	59.3	57.6
Other crops	91.0	92.4	92.8	92.2	90.1	95.1	99.1	95.0
Total	163.9	158.2	155.2	158.6	151.7	155.2	159.3	155.6

Table 3-23 shows the proportion of the broad crop groupings grown on plots by households in the various groups at the different waves. It also compares the distribution by gender in both waves. High value cash crops in this table consists of cashew, cocoa, oil palm, pineapple and mango. The grains are maize, rice and millet. In wave 1, the proportion of plots on which households who grew high value cash crops was the least compared to grains and other crops. We note that about 62.7 per cent of male respondents in all the groups cultivated grains; quite comparable to about 63.5 per cent for female respondents cultivating the same type of crop. A higher proportion of male respondents (8.1 per cent) cultivated high value cash crops compared to 3.5 per cent of female respondents. For both male and female respondents, over 90 per cent of them cultivated other crops apart from high value cash crops and grains. In wave 2, a similar trend is seen between male and female respondents compared to that of wave 1.

Looking at male respondents across both waves it is seen that within the treatment group, the percentage of male respondents who cultivated high value cash crops increased from 3.9 per cent in the first wave to 7.1 per cent in wave 2. The percentage of male respondents who cultivated grains in the same group increased from 59.8 per cent in wave 1 to 65.8 per cent in wave 2. For female respondents in the treatment group, the percentage of those who cultivated high value cash crops fell from 5.6 per cent in wave 1 to 5.5 per cent in wave 2. The percentage of female respondents who cultivated grains in the short term control group decreased from 66.7 per cent in wave 1 to 57.3 per cent in wave 2. The percentage cultivating other crops however increased from 93.7 per cent in wave 1 to 95.1 per cent in wave 2 for the same group.

3.1.6. Non-farm enterprises

Detailed information was collected on whether households operate non-farm enterprises or not, the principal activity, the number of people engaged in the enterprises as well as their working hours, assets of the enterprise, the amount of expenditure and revenue generated by non-farm enterprises and their stock levels. This section of the report presents the proportion of respondents who operates nonfarm enterprises, the principal activities, the success rate of credit application, sources of the successful credit, average loan amount, firm size and average profit by group and gender.

Data from the first wave shows that more respondents in the treatment group (37.1 per cent) operate nonfarm enterprises compared to the Short term control group (28.8 per cent) and the long term control group (31.1 per cent). The p-values of chi square tests that compare the proportion of respondents who operates nonfarm enterprises in the treatment group to the short term control group is significant at 1 per cent. The other p-value compares the treatment group to the long term control group. It is also significant at 1 per cent (Table 3-24).

During the second wave, more respondents had nonfarm enterprises than the first wave for all the groups. The same pattern is seen with the second wave. More respondents in the treatment group had nonfarm enterprises than the two control groups. The proportions for females can be seen to be higher than that for males in all the groups, with about 60 per cent of the females in the treatment group having enterprises as compared to just 28.9 per cent of the males.

Table 3-24 Proportion of respondents operating nonfarm enterprise by wave, group and gender (%)

	Proportion of respondents engaging in nonfarm enterprises							
	Wave One				Wave Two			
	All	P value	Male	Female	All	P value	Male	Female
Treatment Group	37.1		21.8	49.0	46.2		28.9	59.6
S T Control	28.8	0.000	16.6	38.8	37.0	0.000	25.3	46.3
L T Control	31.1	0.0100	21.7	40.0	41.9	0.072	30.1	52.8
P value			0.000				0.000	

We note some differences in the principal activities of the enterprises. Some of the principal activities categorized under manufacturing enterprises are dressmaking, carpentry, construction, bakery and agro processing. These are small scale processing or fabricating enterprises. The trading enterprises include petty trading, buying and selling of second-hand household goods, clothes, food items, drinks (alcoholic and non-alcoholic). Some of the principal activities that dominate the other enterprises are preparations and sale of cooked meals, hairdressing, photographers, barbers, transport business and repairers of household appliances.

There is not much difference between the principal activities of the enterprises of the treatment group and that of the short term control group in the first wave (Table 3-25). More than half of the

enterprises in both groups are trading enterprises (56.3 per cent for the treatment and 51.5 per cent for the Short term control). There were more manufacturing enterprises (38.3 per cent) in the long term control than the treatment group (25.2 per cent). There were significant differences between the types of enterprises of the males and that of females, with males doing more of manufacturing whiles females did more of trading-buying and selling a wide range of goods.

For the second wave, the proportion of enterprises in particular principal activities did not differ much from that of the first wave.

Table 3-25 Principal activity of nonfarm enterprises by wave, group and gender (%)

Type of enterprise by Group						
Wave One						
	Treatment	S T Control	L T Control	Male	Female	All
Manufacturing	25.2	31.7	38.3	47.5	25	31.4
Trading	56.3	51.5	47.5	32.4	59.7	52
Other	18.5	16.8	14.2	20.1	15.3	16.6
Total	100	100	100	100	100	100
Pearson chi2		0.217	0.002	Pr=0.000		
Wave Two						
Manufacturing	26.6	27.2	45.2	48.1	26.1	32.7
Trading	53.5	49	38.6	24.8	57	47.4
Other	19.9	23.8	16.2	27.1	16.9	19.9
Total	100	100	100	100	100	100
Pearson chi2		0.342	0.000	Pr=0.000		

The success rate for credit application by the treatment group did not differ much from that of the short term control group but was higher than that of the long term control group in the first wave (Table 3-26). The treatment group were more successful than the long-term control group in their loan application. More females were successful in their loan applications than their male counterparts.

During the second wave, success rates of loan applications improved for all the groups. Again the difference between that of the treatment and the short term control group was not significant but the success rate for the treatment group was again higher than the long term control group. Success rates improved for both males and females but females were again more successful than males.

Table 3-26 Success rate for credit application for nonfarm enterprises by group and gender (%)

	Treatment	S T Control	L T Control	Male	Female	All
Success rate of credit application for enterprises by group and gender						
Wave One						
Yes, successfully	15.8	17.7	8.1	7.4	16.6	14.0
Yes, unsuccessfully	5.3	4.9	7.4	8.2	4.9	5.8
No	79.0	77.4	84.5	84.4	78.6	80.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Pearson chi2(4)		0.822	0.013	Pr = 0.001		
Wave Two						
Yes, successfully	22.3	19.3	13.4	10.8	21.8	18.5
Yes, unsuccessfully	5.1	4.2	3.8	5.8	3.8	4.4
No	72.6	76.5	82.8	83.4	74.4	77.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Pearson chi2(4)		0.455	0.002	Pr = 0.000		

Most of the enterprises (78.5 per cent in the treatment, 76.5 per cent of the short term control and 83.6 per cent of the long term control) did not use credit in the first wave (Table 3-27). There was no significant difference between the sources of the loans for the treatment group and that of the two control groups. In terms of the sources of credit we note that about 15 per cent of the enterprises in both the treatment and the short term control groups got credit from non-bank financial institutions or savings and loans companies. The next most important source was from family and friends. We note from the data that males were more likely to obtain loans from banks as compared to females. The females got credit from savings and loans companies followed by loans from families and friends.

We note from the second wave that bank loans became more accessible as compared to the first wave. The treatment and the short term control groups got more bank credit than the long term control group. For the second wave more females got credit from banks for use for non-farm enterprises than males. In subsequent sections of this report we investigate whether we can attribute some of these observed patterns to the titling of land.

Focusing on those who got credit and the sources in the first wave, the treatment group got about 71 per cent of their loans from formal sources, but for the short term and long term control groups respectively, 65 per cent and 68 per cent of their loans were from formal sources. From the gender angle we note that males got 80 per cent of their loans from formal sources as against 65.7 per cent

for females. For the second wave 79.3 per cent of the treatment group got credit from formal sources as against about 78.3 per cent and 62.5 per cent respectively for the short and long term control groups. We also note that females now got a higher percentage of loans from formal sources (76.6 per cent) as compared to males (66.7 per cent).

Table 3-27 Source of credit for nonfarm enterprises by group and gender

Source of Credit during the last year						
Wave One						
	Treatment	S T Control	L T Control	Male	Female	All
No credit used	78.5	76.5	83.6	84.0	77.7	79.5
Bank	0.6	0.4	2.2	3.7	0.0	1.0
Other financial agency	14.8	14.6	10.2	8.6	15.1	13.3
Cooperative	0.6	0.8	0.0	1.6	0.0	0.5
Money lender	1.2	2.2	1.1	0.8	1.8	1.5
Family / Friend	2.2	2.2	1.5	0.8	2.4	2.0
Government agency	0.9	0.8	0.0	0.0	0.8	0.6
NGO	0.9	2.2	1.1	0.0	1.9	1.4
Community Epicenter	0.3	0.0	0.0	0.4	0.0	0.1
Susu	0.0	0.4	0.4	0.0	0.3	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Pearson chi2		0.839	0.193	Pr = 0.000		
Wave Two						
No credit used	74.7	78.8	83.9	85.5	76.1	78.9
Bank	11.5	11.7	6.5	6.4	11.5	10.0
Other financial agency	4.8	3.4	0.5	1.7	3.6	3.0
Cooperative	3.0	1.7	2.7	1.2	3.1	2.5
Money lender	0.9	0.8	0.5	0.6	0.9	0.8
Family / Friend	3.9	2.5	4.9	3.8	3.8	3.8
Government agency	0.0	0.0	0.3	0.3	0.0	0.1
NGO	0.7	0.3	0.0	0.3	0.4	0.3
Community Epicenter	0.2	0.3	0.5	0.0	0.5	0.3
Susu	0.2	0.6	0.0	0.3	0.3	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Pearson chi2		0.727	0.002	Pr = 0.021		

For the average loan amounts for the non-farm business, there was not much difference between the average amounts received by the different groups in the first wave. The average loan amount for the treatment group is GH¢836.37 and that of the short term control group is GH¢1116.53 . However these do not seem to be statistically different from a t-test. The average loan amount for non-farm business for the long term control group is higher than the two groups. Loans from banks, savings

and loans companies or cooperatives are higher on average than those from other sources[2]. Even though the success rate for females is higher than that of males, the average amount received by the males is higher than that of the females, especially with loans from banks for non-farm enterprises.

Table 3-28 Proportions of loan sources by wave, group and gender (%)

	Wave One			Wave Two		
Group	Formal Sources	Other Sources	All	Formal Sources	Other Sources	All
Treatment	70.6	29.4	100	79.3	20.7	100
S T Control	65.3	34.7	100	78.3	21.7	100
L T Control	68.2	31.8	100	62.5	37.5	100
Male	80.0	20.0	100	66.7	33.3	100
Female	65.7	34.3	100	76.6	23.4	100
All	68.0	32.0	100	75.0	25.0	100

Data from the second wave shows little difference between the average loan amounts of the treatment group and that of the short term control group and slightly lower than that of the long term group. Between the two waves, the average loans amount of females increased but was still lower than that of males.

Table 3-29 Average loan amount per enterprise by wave, source, group and gender (GH¢)

	Wave One			Wave Two		
	Formal Sources	Other Sources	All	Formal Sources	Other Sources	All
Treatment	1050	323.67	836.37	1487.74	481.11	1279.47
S T Control	1495.94	402.35	1116.53	1378.89	345.33	1154.20
L T Control	2976.67	707.14	2254.55	2653.33	394.44	1806.25
Male	2671.88	417.50	2221.00	2365.91	559.09	1763.64
Female	1307.01	427.86	1005.34	1562.32	369.75	1283.36
All	1570.12	426.79	1204.63	1677.87	410.59	1361.05

The majority of the enterprises employed just one worker – i.e. sole proprietorship. From the baseline survey we note that the distribution of firm size of the enterprises in the treatment group

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[2] Other sources are from families and friends, government agencies, money lenders, NGOs, community epicenter, proceeds from other enterprises and from 'susu' groups.

was different from that of the short term control group at 10 per cent level of significance. However there was little statistical difference between the treatment and long term control group (Table 3-30). We note that about 64 per cent of the non-farm enterprises in the treatment group employed one worker whilst 13.5 per cent employed two workers. For the short and long term control groups 66 per cent and 62.8 per cent respectively employed one worker. Non-farm enterprises owned by males were on average bigger than those owned by females. Only 45.1 per cent of the male enterprises employed one worker but that of the female enterprises was 71.9 per cent.

Table 3-30 Firm size-proportion of enterprises employing a specific number of workers

	Wave One						
	1	2	3	4	5 or 6	7 to 9	10+
Treatment	64.3	13.5	8.9	4.0	4.3	3.4	1.5
S T Control	66.0	17.2	5.6	4.5	4.1	1.5	1.1
L T Control	62.8	13.5	6.9	6.6	5.8	2.6	1.8
Male	45.1	21.3	7.4	7.4	8.6	5.3	4.9
Female	71.9	12.0	7.2	4.0	3.2	1.4	0.2
All	64.4	14.7	7.3	5.0	4.7	2.5	1.5
	Wave Two						
Treatment	65.1	15.4	7.4	4.8	4.6	0.9	1.8
S T Control	65.4	16.8	6.4	5.3	3.4	0.6	2.2
L T Control	56.7	15.5	11.7	4.6	6.5	3.0	1.9
Male	52.9	16.6	9.9	6.7	7.0	3.5	3.5
Female	66.5	15.6	7.8	4.2	3.9	0.6	1.4
All	62.5	15.9	8.5	4.9	4.8	1.5	2.0

We do not find any significant difference between the firm sizes of the treatment and the short term control group. However we do find statistically significant differences between the treatment and the long term group at 10 per cent. Again as in the first wave male enterprises are bigger than those of females.

A simple annual profit is estimated by using the average monthly sales and cost. There are no significant differences between the annual profits of the three groups but there are gender differences. We also note no significant differences between profits of different types of enterprises for both waves.[3] On average, non-farm enterprises earned GH¢200 a month as profit in the first

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[3] P values for this t test are not shown in the table

wave. Average monthly profit for the treatment group is GH¢180. That for the short and long term control groups were respectively about GH¢250 and GH¢181. We note from obvious gender differences in the profits of the non-farm enterprises. The profits of male operated non-farm enterprises were estimated to be about GH¢411.6 compared to those of females at about GH¢125.8.

We observe a similar pattern in the profits of non-farm enterprises in the second wave although that for females improved in relative terms. The gender difference in the profits could be explained by the size of the enterprises as male enterprises are on average bigger.

Table 3-31 Average monthly profit per enterprise by principal activity, group and gender (GH¢)

	Average monthly profit per enterprise by group, type and gender					
	Treatment	ST Control	LT Control	Male	Female	All
	Wave One					
Manufacturing	137.9	435.9	150.4	493.1	67.5	239.9
Trading	213.6	174.5	204.1	374.7	161.4	198.7
Other	130.8	135.9	179.4	286.8	75.5	145.4
Total	180.2	249.3	181.6	411.6	125.8	202.7
P value		0.44	0.9774	0.0001		
	Wave Two					
Manufacturing	157.5	191.4	174.5	262.5	115.8	173.5
Trading	265.6	149.4	364.3	522.4	203.4	255.1
Other	158.3	144.7	158.4	225.0	109.1	153.3
Total	217.5	159.1	246.5	325.8	164.1	209.2
P value		0.1092	0.7309	0.0002		

3.2. Impact Analysis

In this section we provide an analysis of whether the land titling has had any impact on selected outcome indicators of interest. In particular, we discuss the impact of land titling on land values (based on respondents' valuation), investment on land (captured as the number of trees planted on the land), agriculture investments in seeds and chemical use, access to credit, and non-farm enterprise profits. The variables used in the regressions in this section are defined as follows:

Sex   *Categorical variable which takes the value of 1 if male; 0 if female*
Agric   *Categorical variable which takes the value of 1 if agriculture land; 0 otherwise*

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Com	Categorical variable which takes the value of 1 if Commercial land; 0 otherwise
Res	Categorical variable which takes the value of 1 if Residential land; 0 otherwise
Time	Categorical variable which takes the value of 1 in period 2; 0 otherwise
Treat_Int1	Categorical variable which takes the value of 1 if in treatment group and 0 if in short term control only
Treat_Int2	Categorical variable which takes the value of 1 if in treatment group and 0 if in both short term and long term control
Treat_act1	Categorical variable which takes the value of 1 if in treatment group and 0 if in short term control only
Treattime1	$Treat\_Int1 \times Time$
Treattime2	$Treat\_Int2 \times Time$
Treattime3	$Treat\_act1 \times Time$
Treattime1_sex	$Treattime1 \times Sex$
Treattime1_agr	$Treattime1 \times Agric$
Treattime1_com	$Treattime1 \times Com$
Treattime1_res	$Treattime1 \times Res$
Llandvals	Natural logs of land values

3.2.1.　　Land Values and Investments

We begin by looking at whether the titling has had any impact on land values. We note from Eqn_1 to Eqn_7 in Table 3-32 that land values increased, irrespective of the land titling, by 40 per cent over the two periods based on the variable 'Time' (with the exception of Eqn_2 which recorded 20 per cent increase). Even accounting for inflation (which averaged below 20 per cent over the survey period), the real values are still positive implying increasing values for land over the two periods. The first column (Eqn_1) shows that the treatment had no impact on the value of land in the survey area. This treatment variable however only captures the intention to treat and does not capture the actual treatment. Also the reference sample is the short term control group. When we use both short term and long term control groups, we do find an impact of about 30%. Here we are faced with the typical trade off problem as by moving further away from the threshold value (physical road) we increase the probability of biasedness. However staying closer to the threshold penalises us in terms of degrees of freedom. For the other variants of the treatment, we do not find any impact.

We further investigates differential impacts with respect to gender and also the type of plot (i.e. whether it is an agriculture, commercial or residential plot). The results for these are given in Eqn_4 to Eqn_7. We note that it is only in the case of gender that we find some evidence for differential impact. In particular we find that the impact of the land titling on the land values is positive and significant for males.

Table 3-32 Impact of Land titling on land values

VARIABLES	(1) Eqn_1 llandval	(2) Eqn_2 Llandval	(3) Eqn_3 llandval	(4) Eqn_4 llandval	(5) Eqn_5 llandval	(6) Eqn_6 llandval	(7) Eqn_7 llandval
Time	0.4***	0.2***	0.4***	0.4***	0.4***	0.4***	0.4***
Treat_int1	0.1			0.1	0.3*	0.3*	0.3*
Treattime1	0.1			0.0	-0.0	-0.0	-0.0
Treat_int2		0.1					
Treattime2		0.3***					
Treat_act1			0.3*				
Treattime3			-0.0				
Treattime1_sex				0.2**			
Treattime3_agric					0.1		
Treattime3_res						0.1	
Treattime3_com							0.1
Constant	7.8***	7.8***	7.8***	7.8***	7.8***	7.8***	7.8***
Observations	2,179	3,142	1,303	2,179	1,303	1,303	1,303

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The impact of land titling on land investment in the form of planting of trees is discussed below. From Eqn_2 and the variable "Time", the average number of trees that were planted irrespective of whether the land got titling or not reduced by 72 trees in wave two. In Eqn_1 and Eqn_4 from "Treat_int1", there was again a reduction in the average number of trees planted by 73 trees if land was in the treatment group relative to the short term control group. In relation to both the short term and long term control groups (Treat_int2 in Eqn_2), there was a reduction in the average number of trees planted by 60 trees for the treatment group (Table 3-33). We do not find any change in the number of trees planted that can be attributed to the land titling.

Table 3-33 Impact of Land titling on land investment (planted trees)

VARIABLES	(1) Eqn_1 Planttrees	(2) Eqn_2 Planttrees	(3) Eqn_3 Planttrees	(4) Eqn_4 Planttrees	(5) Eqn_5 Planttrees	(6) Eqn_6 Planttrees	(7) Eqn_7 Planttrees
Time	-65.4	-72.0***	-65.4	-65.4	-65.4	-65.4	-65.4
Treat_int1	-73.0**			-73.0**	-97.1	-97.1	-97.1
Treattime1	42.3			35.6	57.3	57.3	57.3
Treat_int2		-60.4**					
Treattime2		49.0					
Treat_act1			-97.1				
Treattime3			57.6				
Treattime1_sex				10.1			
Treattime3_agric					0.8		
Treattime3_res						0.8	
Treattime3_com							0.8
Constant	110.5***	97.9***	110.5***	110.5***	110.5***	110.5***	110.5***
Observations	424	663	242	424	242	242	242

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

3.2.2. Agriculture Investments

A key hypothesis under the land titling project is whether titling enhances investment on the landed property. This subsection explores the impact of titling on households investments on land. In particular, we sort to investigate whether titling has had any impact on investments in the form of chemical use value and seed use value on agricultural plots. Our results show that, titling does impact on investments in agro chemicals on farm lands by about GH¢14.6 (Eqn 3), Table 3-34. We also test for the impact of titling on investment by gender and found a positive impact for females with title deeds but no impact for males. This suggests that, overall impact of the titling on investments in agro chemicals are driven by females. In other words female respondents invested more into agro chemicals on their farmlands than their male counterparts as a result of the land titling.

Our results from testing for the impact of titling on the value of seeds used on agriculture lands showed no impact. We however see that over time, the value of chemicals used increases for all the variants of the regressions in Table 3-35.

Table 3-34 Impact of Titling on Chemical Use Value on Agricultural plots

VARIABLES	(1) Eqn_1 allchem	(2) Eqn_2 allchem	(3) Eqn_3 Allchem	(4) Eqn_4 Allchem	(5) Eqn_5 allchem	(6) Eqn_6 allchem	(7) Eqn_7 allchem
Time	4.0*	2.5*	5.4***	4.0*	4.0*	5.4***	5.4***
Treat_int1	-1.6				-1.6	-1.6	
Treattime1	5.1				3.8	5.1	
Treat_int2		-1.2					
Treattime2		6.6***					
Treat_act1			-1.0	-0.0		-1.0	-1.0
Treattime3			14.6*	12.3		28.1**	14.6*
Treattime3_sex						-18.4	
Constant	1.6	1.3	1.0	1.6	1.6	1.0	1.0
Observations	1,470	2,229	1,470	1,470	1,470	1,470	1,470

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3-35 Impact of Titling on Seed Use Value on Agricultural plots

VARIABLES	(1) Eqn_1 allseedsvalue	(2) Eqn_2 Allseedsvalue	(3) Eqn_3 allseedsvalue	(4) Eqn_4 Allseedsvalue	(5) Eqn_5 allseedsvalue	(6) Eqn_6 allseedsvalue	(7) Eqn_7 Allseedsvalue
Time	27.7*	14.8*	22.0*	27.7*	27.7*	22.0*	22.0*
Treat_int1	-2.3				-2.3	-2.3	
Treattime1	-15.3				-14.6	-15.3	
Treat_int2		-1.9					
Treattime2		-2.4					
Treat_act1			-1.7	-0.3		-1.7	-1.7
Treattime3			-15.2	-6.3		-7.4	-15.2
Treattime3_sex						-10.7	
Constant	2.6	2.1	1.7	2.6	2.6	1.7	1.7
Observations	1,470	2,229	1,470	1,470	1,470	1,470	1,470

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

3.2.3. Households Access to Credit

The results from the regressions shown in Table 3-36 show a general increase in the average loan amounts received by individuals in all the categorical grouping over the two periods. There is however no evidence of an impact of the titling on the average loan amounts received by individuals in the treatment group as compared to individuals in the short term group (Eqn_1). There is also no differential impact amongst the males and females in the treatment vis a vis the short term control group (Eqn_2). There is however an impact of the titling on loan amounts sourced from the bank and non-bank financial institutions (Eqn_3). When we undertake the

analysis using the larger control group (both short and long term control groups), the results are similar in the sense that there is no impact except for loans obtained from bank and non-bank financial institutions.

Comparing the average amounts of loans of individuals in the treatment group who reported owning registered lands with the short term control we do not find any impact. We also test for gender differentials in the results and do not find any significant impact for either sex.

Table 3-36 Impact of Land Titling on Loan Amounts Received by Individuals in Households

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Eqn_1	Eqn_2	Eqn_3	Eqn_4	Eqn_5	Eqn_6	Eqn_7	Eqn_8	Eqn_9
VARIABLES	Lns	Lns	Lns	Lns	Lns	Lns	Lns	Lns	Lns
Time	0.3*	0.3*	0.3**	0.3**	0.3**	0.3**	0.3*	0.3*	0.3*
Treat_int1	-0.0	-0.0	-0.0						
Treattime1	0.0	-0.1	-0.6**						
Treattime1_sex		0.3							
Treattime1_Source			1.3***						
Treat_int2				0.1	0.1	0.1			
Treattime2				0.1	-0.1	-0.6***			
Treattime2_sex					0.3				
Treattime2_Source						1.3***			
Treat_act1							-0.1	-0.1	-0.1
Treattime3							-0.0	0.1	-0.3
Treattime3_sex								-0.3	
Treattime3_Source									0.6
Constant	5.4***	5.4***	5.4***	5.2***	5.2***	5.2***	5.4***	5.4***	5.4***
Observations	590	590	590	837	837	837	338	338	338
R-squared	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0

*** p<0.01, ** p<0.05, * p<0.1

We also discuss the impact of the titling on the loan amounts received by the non-farm enterprise operators for use on the enterprise. We particularly note ex ante, that titling may increase the chances of obtaining credit, which could in turn be invested to improve performance of the business. Overall we find no impact of the titling on the average loan amounts received for nonfarm enterprises (Table 3-37). In Table 3-37, the Eqn_1 and Eqn_2 compare the impact of the titling on enterprises for the treatment with the short term control. We find no evidence of an impact of the land titling on the value of loans accessed for non-farm enterprises. We further explore the differential impact from the gender perspective. We note in Eqn_2 that the impact of the titling on non-farm enterprise loans is positive and significant for males.

A similar result is obtained when we undertake the analysis using the treatment and both control groups. However when we use those who actually have had their land registered among the treatment group, we do not find any impact.

Table 3-37. The impact of the titling on the average loan amounts of enterprise owners

	(1)	(2)	(3)	(4)	(5)	(6)
	Eqn_1	Eqn_2	Eqn_3	Eqn_4	Eqn_5	Eqn_6
VARIABLES	Loans	Loans	Loans	Loans	Loans	Loans
Time	0.0	0.0	-0.0	-0.0	0.0	0.0
Treat_int1	-0.3	-0.3				
Treattime1	0.3	0.1				
Treattime1_sex		1.0***				
Treat_int2			-0.4*	-0.4*		
Treattime2			0.3	0.1		
Treattime2_sex				1.0***		
Treat_act1					-0.2	-0.2
Treattime3					0.0	0.0
Treattime3_sex						0.1
Constant	6.3***	6.3***	6.4***	6.4***	6.3***	6.3***
Observations	261	261	331	331	146	146
R-squared	0.0	0.1	0.0	0.0	0.0	0.0

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

3.2.4.   Households Education Expenses

When the treatment group is compared to the short term control group (Eqn_1 in Table 3-38), the impact of the titling on the educational expenditure of households is positive at 10 per cent level of significance. However in Eqn_2, when the treatment is compared with both set of control groups we do not find any impact. Also when we base our analysis on the subset of the treatment groups that actually had the lands registered we find no impact of the titling on the educational expenditure of the households.

Titling may also improve indirectly the ability of households to send more children to school. When the treatment group is compared to the short term control group, impact on the number of children in school is positive at 1 per cent level of significance. Comparing the treatment group to both control groups shows that there is a positive impact of the titling on the number of children in school.

Table 3-38 The impact of the titling on the average educational expenses and the number of children in school

VARIABLES	(1) Eqn_1 edu_expd1	(2) Eqn_2 edu_expd1	(3) Eqn_3 edu_expd1	(4) Eqn_4 sch	(5) Eqn_5 sch	(6) Eqn_6 sch
Time	0.4***	0.6***	0.4***	0.0	0.1**	0.0
Treat_int1	-0.0			0.0		
Treattime1	0.3*			0.3***		
Treat_int2		-0.0			0.0	
Treattime2		0.1			0.2**	
Treat_act1			0.0			0.1
Treattime3			0.2			0.3*
Constant	5.3***	5.3***	5.3***	1.0***	1.0***	1.0***
Observations	1,403	2,093	839	2,830	4,188	1,712
R-squared	0.1	0.1	0.0	0.0	0.0	0.0

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

3.2.5.   Non-farm profits

In terms of non-farm enterprise profits we find no impact of the titling on the profits of the nonfarm enterprises (Table 3-39). No impact is found on the whole sample but there are gender differential impacts with respect to the intention to treat. We therefore note from Eqn_2 that the titling impacts on profits of non-farm enterprises for males by about 60%.

Table 3-39. The impact of the titling on the average annual profits of enterprise

VARIABLES	(1) Eqn_1 Profit	(2) Eqn_2 Profit	(3) Eqn_3 Profit	(4) Eqn_4 Profit	(5) Eqn_5 Profit	(6) Eqn_6 Profit
Time	0.1	0.1	0.2**	0.2**	0.1	0.1
Treat_int1	-0.1	-0.1				
Treattime1	0.1	-0.0				
Treattime1_sex		0.6***				
Treat_int2			-0.1	-0.1		
Treattime2			0.1	-0.1		
Treattime2_sex				0.6***		
Treat_act1					-0.3	-0.3
Treattime3					0.3	0.2
Treattime3_sex						0.3
Constant	6.7***	6.7***	6.7***	6.7***	6.7***	6.7***
Observations	1,186	1,186	1,715	1,715	660	660
R-squared	0.0	0.0	0.0	0.0	0.0	0.0

*** p<0.01, ** p<0.05, * p<0.1

4. Conclusions

This study had a simple aim of assessing the nature and magnitude of the impact of land titling on household's investments and consequently their welfare in the Awutu-Efutu district of the Central Region of Ghana. The study employs a spatial regression discontinuity design to construct treatment and control groups. Using the classification based on this design we then employ a difference-in- difference method to estimate the impact of land titling on key indicators of interest. The results are based on two waves of panel data collected on a realized sample of 2099 households. We summarise the main characteristics of the households in the sample as follows:

First, from the demographics we note that the sample is dominated by male headed households with spouse(s), followed by female headed households without spouse. For the sample as a whole however, females dominate. The majority of individuals in the households interviewed are between the ages of 0 to 39 years. The average household dependency ratio is about 0.88 and the average household size is about 3 members. Christianity is the dominant religion amongst the households and almost 2 out of every 5 adults in the sample have never been married. We also note that about 1 out of every 4 adults in the sample have had no education.

Second, in terms of migration the data suggests increasing immigration to the area over the survey periods with females dominating. We find that whiles for males the most important reasons for migrating to this area are family and employment related, that for females are more related to marriage and other family reasons.

Third, on the employment characteristics of households we note that the paid employees constitute only a small proportion of the sample and range from about 10 to 13 per cent across the two waves. Those in paid employment were mainly in Agriculture, Manufacturing and Transport and communications industries.

Fourth, we note that proportion of household members who accessed loans was higher for the follow-up period than it was for the baseline. Gender-wise, the data shows that the proportion of females who accessed loans was generally higher than that for males. The data also shows that individuals acquired more loans from bank and non-bank financial institution in the follow-up survey as compared to the baseline survey where relatively more loans were acquired from other informal sources such as relatives and friends. It is observed that the proportion that used landed property as collateral in the baseline survey declined in the follow-up survey. In terms of the average value of the loans, Individuals received relatively more in the follow-up period compared to the baseline.

Fifth the data shows an increase in land values over the two waves for both males and females – they increased from about GH¢6,433 and GH¢3,952 to GH¢7,374 and GH¢5,717 for males and females respectively over the two waves. Although these land values are based on respondents' subjective valuation, they are still indicative of increasing land values in the area.

Sixth, our data reveals that agriculture investments in agro chemicals increased on average across all the groups in the sample. However, the increases recorded were higher for the treatment group. It is also noted that, the value of agro chemical investments among the long term control group decreased over the two waves. We also note that investments in seeds increased over the two waves.

Seventh, we note that, cassava and maize were the two most cultivated crops across the two waves and groups. The proportion of agriculture land allocated to the production of high value crops was also found to have increased over the two waves.

Finally, the data shows that about 30 per cent and 50 per cent of males and females respectively operate a non-farm enterprise. Whilst the females mostly operate trade-related enterprises, their males counterparts mainly operate manufacturing enterprises. Although about 60 per cent of the enterprises operate as a sole-proprietorship, male-operated enterprises are on average bigger than female owned enterprises.

We subsequently tested for the impact of the titling on key indicators of interest using a difference-in-difference estimator. The main findings from the impact analysis are as follows:

First, we find that land values increased over the two waves generally across the sample by about 40 per cent. Even when one takes into account the average inflation over the period, this still represents a real increase in land values. Our results show a 30 per cent impact of the land titling on the value of land in the area. The results also show some gender differential of the impact on land values with the impact for males being about 20% higher relative to the impact for females.

Second, our study also tests for the impact of titling on agriculture investment and found that, titling impacted positively on the value of agro chemical investment by about GH¢14.6. However we do not find any impact on investments in seeds. We also do not find any impact of land titling on the average number of trees planted, as part of investment on the land.

Third, our results show no impact of the land titling on the average loan amounts received by individuals. However when we test for differential impact based on the source of the loan, we find for loans sourced from bank and non-bank financial institutions that land titling impacts on the loan amounts. We also do find that titling increased the average loan amount received by males for non-farm enterprises.

Finally we do find no evidence that the titling impacted on non-farm enterprise profits. However it did impact positively on the average annual profits of non-farm enterprises operated by males. It has to be mentioned here that the impact was found only in the case of 'intention to treat' and not for the actual treatment group.

Based on these findings we conclude by noting that there is some support for the *value hypothesis* in the sense that the value of land seems to have increased as a result of the titling. However there is not much evidence of the *convertibility hypothesis* from the data. Also evidence of the titling leading to welfare improvements for households is mixed. While we do find a positive and significant impact on education expenditure by households, there is limited impact on profits of non-farm enterprises. Admittedly one year may be too short a time to observe significant impacts of the titling on access to credit, higher investments, increase agriculture output and consequently improve households' welfare. However these results are positive and indicative of Pareto improvements in livelihoods of households in the area.