LAND RENTAL POLICY AND LAND MARKET IN MASHONALAND EAST PROVINCE, ZIMBABWE: IMPLICATIONS ON FARMER DECISIONS, EFFICIENCY AND EQUITY UNDER A1 AND A2 MODELS

By

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Declaration

I, Simbarashe Tatsvarei, do hereby declare that this thesis is my own original work and that other scholars' works referred to herein have been duly acknowledged. I also declare that this thesis is original and has not been submitted elsewhere for a degree.

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Simbarashe Tatsvarei Date

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Dedication

To my wife, kids and siblings, your strong belief in me is well cherished.

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Abstract

Government promulgated the land rental policy starting in the year 2007. The policy required that A1 (market residual) and A2 (indigenous commercial) farmers pay rentals to the state. Since then, there has also been an emerging trend in which farmers have been renting in and out land, resulting in an informal market for land rentals. The study therefore assessed farmers' perceptions of land rental policy and evaluated the possible association of this policy to farmers' decision making on land rental markets as well as its implications on farmers' efficiency and equity. The study was carried out in Mashonaland East Province of Zimbabwe, covering two districts, Goromonzi and Marondera. The focus was specifically on A1 and A2 farmers, as the rental policy was directed at these resettlement models only and much of the informal land rental markets were prevalent among these categories of farmers. Data collection utilised the survey approach. This was supported by key informant interviews and focus group discussions, with a final sample of 339 households selected using multi-stage sampling method. Survey data were transcribed on CsPro 6, and analysed using Stata, SPSS and Frontier 4.1.

Results showed that about a third of household respondents was from Marondera and two-thirds was from Goromonzi, while 79% and 21% was A1 and A2 farmers respectively. About 80% was male headed households and the remainder was female headed households. About half of the households were not participating in land rental markets while the other half was split almost equally between those renting-in and renting-out land. In general, A2 farmers were better in agricultural productivity than A1 farmers.

It was concluded that farmers had a fairly good knowledge of the agricultural land rental policy enunciated in the Finance Bills. A1 farmers were more knowledgeable than A2 farmers, but no

significant differences were observed between male and female headed households and farmers involved and not involved in land rental markets. Farmers' attitudes in relation to policy were categorised as fair, with significant differences based on gender and land market participation. Practice scores showed a poor adherence to policy for all categories of farmers. Overall perceptions of farmers on rental policy was inferred as fair with significant differences existing between land rental market participants and non-participants (autarky).

The results of a bivariate Tobit model results showed that the decision to rent-in land was significantly influenced by gender, household income, permanent labour, cultivated area, tenure certainty, irrigable land size and crop diversification. On the other hand, age, permanent labour, irrigable land size and crop diversification significantly influenced farmers' decisions to rent-out land. The conclusion was that household characteristics, land endowments and transaction costs significantly influenced the decision to rent-in land while the former two were strong in influencing renting-out decisions.

Results from the linearized Cobb Douglas model showed that economic efficiency for most farmers was above 50%. Farmers renting-out land under A1 were found to be the most economically efficient, followed by those who were renting-in and least efficient were farmers not participating in land rental markets, though the differences were marginal. For the A2 model, renting-in farmers were the most efficient, followed by those in autarky position, while renting-out farmers were the least. Overall, the most efficient farmers were those renting-in, followed by those renting-out while farmers in autarky were the least efficient. Overall efficiency was higher for A2 farmers than for A1 farmers. For farmers not participating in rental markets, the sources of inefficiency were crop type, crop area and labour. For farmers renting-in, it was proportion of irrigable land, size of irrigable land, crop type, crop area and

labour, while inefficiency drivers for renting-out farmers were crop type and associated area. Equity analysis showed that participation in land rental markets reduced inequality for farmers in the two districts and male and female headed households. Inequality was increased among A1 farmers and remained unchanged among A2 farmers. Overall, the emerging position was that participation in land rental markets resulted in higher efficiency and reduced inequality in land holding among the sampled farmers.

It is recommended that government should be consistent on land rental policy and bring into place effective administration of land rental policy. Government may also consider formal acceptance of land rental markets in light of the marginal efficiency and equity benefits shown in the study. However, formalizing land rental markets alone may not be a panacea to improved efficiency and needs to be supported by other productivity measures given the average efficiency values for farmers. Crop and livestock production based on compatibility with the natural regions and defined minimum size of land should be encouraged to improve efficiency.

Key words: A1 and A2 farmers; efficiency; equity; farmer perceptions; informal market; land; rental policy; Zimbabwe

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List of Abbreviations and Acronyms

ARDA	Agricultural and Rural Development Authority
AP	Average Product
BSAC	British South Africa Company
CONPI	Certificates of No Present Interest
CSC	Cold Storage Company
CSPro	Census and Survey Processing System
DA	District Administrator
DAEO	District Agricultural Extension Officer
DEA	Data Envelopment Analysis
DLC	District Land Committees
DLO	District Land Officer
DSG	Department of Surveyor General
EUT	Expected Utility Theory
FAO	Food and Agriculture Organization
FGD	Focus Group Discussions
FTLRP	Fast Track Land Reform Program
GoZ	Government of Zimbabwe
GMB	Grain Marketing Board
KAP	Knowledge, Attitudes and Practice
LSCFS	Large Scale Commercial Farming Sector
MDC	Movement for Democratic Change
MDG	Millennium Development Goals
MoLRR	Ministry of Lands and Rural Resettlement

MP	Marginal Product
NCA	National Constitutional Assembly
NGO	Non-Governmental Organisations
NPA	Native Purchase Areas
OLS	Ordinary Least Squares
PLC	Provincial Land Committee
RDC	Rural District Council
RTS	Returns to Scale
SFA	Stochastic Frontier Analysis
SPSS	Statistical Package for Social Scientists
SSCF	Small Scale Commercial Farmers
TFP	Total Factor Productivity
TTL	Tribal Trust Lands
UK	United Kingdom
UMP	Uzumba-Maramba-Pfungwe
UNDP	United Nations Development Programme
USA	United States of America
ZANU	Zimbabwe African National Union
ZAPU	Zimbabwe African People's Union
ZimStat	Zimbabwe Statistics Agency
ZJC	Zimbabwe Junior Certificate

CHAPTER 1: INTRODUCTION

1.1 Introduction

The World Bank (2012) estimates that economic growth in agriculture is twice as effective in reducing poverty compared to other sectors of the economy. Attainment of economic growth in agriculture requires maximum utilisation of land as a resource endowment (Deininger and Jin, 2009). Exploiting this resource fully demands appropriate policy intentions. One such need for policy is designing an appropriate land tenure system for a particular nation to adopt (Hoken, 2012). Land tenure apportions usufruct rights to land, which in sub-Saharan Africa (SSA) is recognised as a key determinant to agricultural households' poverty levels, food security and vulnerability to shocks (Chamberlin and Ricker-gilbert, 2016). Holden *et al.* (2009) postulated that land rental and sales markets are now very wide spread even though traditionally they have not been regarded as features of land tenure systems. This misconception makes studies on land rental policy and market development and their impacts of considerable interest to both researchers and policy makers.

Most land tenure systems are aimed at addressing equity and poverty alleviation, improving economic efficiency, as well as ensuring environmental and institutional sustainability (Zikhali, 2008). According to Fenske (2011), four fundamental tenure systems are recognised globally and these are customary, private, collective and state tenure systems. In almost all these tenure systems, pursued policies have been in the areas of share tenancy as well as land rentals and leases (Norton, 2003). Awasthi (2009) emphasized the need for low-cost and supple land tenure systems to maximise on the productive use of land and to generate opportunities for agriculturally based economies and to increase welfare benefits. Rahman (2010) noted that

land rental demands less capital investments when compared to land sales and provides superior inter-temporal tractability, giving a chance to owners working off-farm to benefit from on-farm wealth creation activities. Vranken and Swinnen (2006) argue that in a typical Zimbabwean environment characterised by high risks and transaction costs, defective credit and insurance markets as well as thin land sales markets, land rentals are pivotal in improving efficiency and equity in land utilisation and usufruct rights. Theoretically, by equalizing the marginal product of land among households with different land-labour resources, land rental markets enhance equity and agricultural productivity through transferring land resource from less to more productive uses (Feng, 2008).

1.2 Background

Zimbabwe has a long history with land reforms. This date backs to pre-independence (Moyo and Chambati, 2013). Four distinct phases of land reforms can be delineated, namely land discrimination on the basis of race (1930-1979), willing buyer willing seller (1980-1989), government first refusal right to land (1990-1998) and the fast track land reform program (FTLRP) from 2000 to 2010. The major thrusts of the FTLRP was to fast track identification and distribution of at least five million hectares of land for compulsory acquisition and resettlement, accelerate planning and demarcation of acquired land and subsequent resettlement of indigenous black farmers together with provision of basic infrastructure and farming support services within the resettled areas (Matondi and Dekker, 2011). Resettlement was done under two models; model A1 mainly aimed at self-sufficiency, food and nutrition security and limited marketed surplus production, and A2 model, which is a commercial production settlement scheme catering for small to medium and large-scale commercial farming. Under this model, farmers are expected to be private entrepreneurs, farming on full cost recovery basis (Matondi and Dekker, 2011). The majority of farmers were resettled under

model A1. The established resettlement in principle allows for permits issued by the District Administrator's Office to be used as evidence of tenure for A1 farmers and offer letters and 99-year leases with an option to purchase from Ministry of Lands for A2 beneficiaries.

According to Moyo and Chambati (2013), there have been massive successes in changing the structure of the land ownership in the agricultural sector. Farming area for white owned large-scale commercial sector was reduced by 38.6%, while an increase in hectarage for both A1 (17.5%) and combined A2 (10.7%) was observed over the two decades of implementing land reforms. Currently, 10.8% of farmers are now in the A1 model and 1.7% in A2 model. The number of white large-scale farmers reduced from about 5 400 in 1980 to about 200 in 2010 (Moyo and Chambati, 2013). The average hectarage per white farmer reduced from about 2400ha in 1980 to about 600ha in 2010 (Moyo and Chambati, 2013).

Over the same period of the FTLRP, production of most commodities plummeted to record low, with tobacco, beef, horticulture and wheat all showing negative trajectories. Tobacco, for example, declined from above 200 million kg in 2000 to an all-time low of 45 million kg in 2006 and bouncing back to above 100 million kg in 2010 while wheat declined from 230 million kg in 2000 to 18 million kg in 2010 (FAO, 2016). There have been arguments that eventually the success or otherwise of land reforms are dependent on the structure of the tenure systems, especially as it relates to wealth creation. Some of the strongest arguments put forward are that land tenure policy focussed too much on equity without addressing the capacity of the resettled farmers to be productive, which could not eventually achieve welfare improvements that were envisaged in that objective (Moyo and Chambati, 2013).

As a way of addressing the implementation shortcomings of the FTLRP, government in 2007 gazetted farm rentals under the Finance Bill to encourage productive and efficient use of farm land under the A2 model (Finance Act, 2007). From 2007 until 2015, there was no evidence that government was following up on these rentals and enforcing the Bill. There could be a myriad of reasons for that, chief being the absence of an administrative framework to implement the Bill and the tepid approach by government to see this policy through (Moyo, 2016).

In 2015, the Government of Zimbabwe (GoZ) amended the Finance Bill to introduce farm rentals and levies specifically targeted at both A1 and A2 resettled farmers, backdated to the time farmers were allocated land (Finance Act, 2016). According to the Bill, the government policy is aimed at paying for some of the developments former white commercial farmers had made on the farms and to develop current underdeveloped resettled areas (Herald, 2015). After most of the former white commercial farmers were evicted from the farms, they approached international, regional and local courts to seek compensation for both the land and developments that they had made over the period they were farming. The government rejected their demands for quite a long time until 2015 when it finally agreed to pay for only the developments that had been made on the farms (Herald, 2015).

Farmers resettled under both A1 and A2 models are required to pay both rentals and levies to the government. A1 farmers are expected to pay US$5 development levy and US$10 rental annually irrespective of the size of the land, bringing the total payments per farmer to US$15 per year. For A2 farmers, the rental charge was pegged at US$3 per hectare and US$2 per hectare for development per year, giving a total of $5 per hectare per year (Herald, 2015). With an average of 234 hectares per farmer for the A2 farm resettlement model (Moyo and Chambati,

2013), the implication is that on average a farmer is expected to pay about US$1,170 annually. These rentals and levies are staggered on a quarterly basis. The target by government is to raise US$5 million per year for infrastructure development and for developmental payments to the former white commercial farmers. The development levy is housed in the consolidated revenue fund and is supposed to be used in gully reclamation, soil conservation, prevention of soil erosion, provision and operation of hospitals, clinics, dispensaries and schools in those resettled farming areas. The Ministry responsible for land is the designated authority for this statutory instrument (Finance Act, 2016). There are penalties set for farmers failing to pay rentals for allocated land. Both A1 and A2 farmers have their offer letters cancelled for failing to pay for three consecutive quarters. For farmers who are in arrears not exceeding three consecutive quarters, government is not expected to give any financial support until a time when they pay up.

Many of the resettled farmers (especially A2) have been accumulating state rental arrears. While the political will has not been adequate to fully implement the policy, the trend has been that some farmers are engaging in land rental markets, albeit at an informal level. Matondi and Dekker (2011) noted the same findings, though the extent was limited. Literature review however does not show whether this trend is due to the need to raise money for state rental payments or just the need to generate on-farm income whilst also earning from off-farm activities.

1.3 Statement of the Problem

The rentals and levies set by government are regarded in production economics as taxes with the effect of increasing the cost of production for the farmer. Thus, farmer production decisions are negatively affected by such a policy and their perceptions of the policy determines the

extent to which they comply with the policy. If farmers deem that the policy is beneficial then the rate of compliance is increased, while negative perceptions bring about inconsistent adherence to policy. The degree to which stakeholders have understood this policy and their perceptions have not been adequately researched. It is therefore imperative to understand farmers' perceptions of this policy.

Matondi (2011) revealed that one key result area of the rentals policy was encouraging farmers to only retain the size of land they are able to efficiently utilise. Thus, the expectation was that rental policy encourages farmers to make informed decisions about the use of their allocated land since they are going to be paying for its use or lack of. There is need to establish if farmers are going to spend more time off-farm, working for higher wages to pay for the rentals in order to retain their allocated land or they are going to devote more time to farm business in order to ensure that the returns to farm production are more than the increased cost of production. There are a number of scenarios that farmers may choose and these would determine the categories into which the resettled farmers belong. One group of farmers is simply able to use or underutilise allocated land, and not involve itself in any land market transaction. Another group of farmers may have adequate resources to fully utilise their current land allocation and in addition also rent from those farmers not fully utilising their land. In such a scenario of increased production, farmers adopt a commercial approach to farming; borrow resources to finance intensive production systems, hire more qualified personnel and focus on mostly cash crops as opposed to a bias towards food security and self-sufficiency, as is the case with most resettled farmers (Moyo and Chambati, 2013). In the process, this group of farmers may look for any underutilised parcel of land from fellow farmers, which they rent to increase their land holding. This process is referred to as renting-in land.

Another scenario that farmers encounter is one characterised by an inability to pay the rentals. Under this condition, farmers may move out of the farms, and government will reallocate the farms to other willing farmers, though this has been rare. Alternatively, current farmers may enter into formal and informal arrangements with productive farmers to rent-out land and receive rentals which compensate for the payments to government, especially where they are not utilising or are underutilising the land. The contracts are still referred to as informal since current government policy forbids any farmer to subdivide land, unless one enters into an investment partnership, which is formalised subject to approval by the ministry responsible for lands. There have been substantial reports of resettled farmers entering into such agreements with evicted white farmers for rent seeking purposes (Moyo and Chambati, 2013). Where there is renting-in and out, there is need to understand what factors influences such a decision. Also, at stake are the possible opportunities and threats that could arise from this policy. Opportunities include increased production, efficient utilisation of land and more equitable distribution of farm land as farmers release underutilised and unproductive land. Possible threats are concentration of land holding among a few farmers, which negates equity gains. In essence, the farm rental policy in its present state has the potential to create an informal market for land.

Some lessons can be learnt from similar studies with respect to land rental policy. A study in India (Awasthi, 2009) showed that where land tenure systems are restrictive and inefficient, the results are higher transaction costs, which includes stamp duties which eventually increases land sales and rental costs. According to Awasthi (2009), optimum utilization of land can be achieved through a well-developed land market, supported by proper land policy. This environment ensures optimum utilization of land, facilitating transfer of land from less productive to more productive producers. Deininger *et al* (2008) posit that restrictions on land

rentals have the effects associated with large efficiency losses by excluding efficiency-enhancing transfers of land and diversification of rural income sources as evidenced by studies in India where rental markets decreased from 26% in 1971 to 11% in 2001 due to high transaction costs. In contrast, China and Vietnam rental markets increased and this had a ripple effect on productivity. A pertinent question is whether rental land markets can contribute to increased efficiency in agriculture and also improve land access. There is a global consternation that rental land markets and leasing arrangements might lead to re-concentration of land and invalidate the equity gains made when initial distribution of land was made. While acknowledging that evidence on such phenomena is mixed and limited (Vranken and Swinnen, 2006); Jin and Deininger, (2009) pointed out that in environments characterized by asymmetric access to information, capital, and legal means of enforcement, such as Zimbabwe, re-concentration of land that repudiates equity gains may be a realistic outcome.

Another consideration that has gained prominence in land rental markets is the relationship between two important resources in farm production; land and labour (Deininger and Jin, 2008). This significance is derived from the fact that, elasticity and effectiveness of farm land markets determine the extent to which large-scale transfer of labour out of the agricultural sector will cause greater inequality or otherwise. The presence of well-functioning land markets permits household members with higher agricultural potential (productivity) not to join off-farm work by having access to additional land, thereby increasing their operational farm size and income, and lower overall inequality. The experience of China for example (Deininger and Jin, 2008) has shown that reallocations of land have been achieved through administrative channels rather than rental transactions based on individual demand and supply of land. However, recent data (Moyo, 2016) suggest that with the emergence of off-farm labour markets as households move from primary production to services, land rental markets have become

prominent. This study therefore assesses perceptions of farmers on land rental policy, its link to land rental market participation decisions, and impacts of this market on efficiency and equity under A1 and A2 models.

1.4.1 Research Questions

Q_1 What are the household characteristics of A1 and A2 farmers in Mashonaland East Province of Zimbabwe?

Q_2 What are the perceptions of A1 and A2 farmers towards the country's land rental policy?

Q_3 What are the socio-economic factors that determine A1 and A2 farmers' decision to rent-in or rent-out land?

Q_4 Does participation in land rental markets improve farmer efficiency?

Q_5 Do land rental markets reduce land holding disparities (improve equity) among farmers?

1.4.2 Objectives of the Study

The overall objective is to assess land rental policy in Mashonaland East Province, Zimbabwe; its (the rental policy's) link to rental markets participation decisions and impact of this market on efficiency and equity under A1 and A2 models. The specific objectives are as follows:

i. characterise A1 and A2 farmers in Mashonaland East province;
ii. assess A1 and A2 farmers' perceptions towards Zimbabwe land rental policy;
iii. determine the socio-economic factors influencing farmers' decisions to rent-out or rent-in land;
iv. assess land use efficiency for farmers renting-in, autarky and those renting-out, and
v. evaluate the impact of land rental markets on social equity across gender, districts and settlement type.

1.4.3 Research Hypotheses

Based on the aforementioned research objectives, the following research hypotheses were formulated to aid the research process:

H_1: There are no significant differences in socio-economics characteristics among A1 and A2 farmers.

H_2: There is no significant differences in the extent to which A1 and A2 farmers adversely or positively perceive Zimbabwe's land rental policy.

H_3: There is no correlation between perceptions on land rental policy and participation in land rental markets.

H_4: Socio-economic factors do not influence A1 and A2 farmers' decision to rent-in or rent-out land.

H_5: Participation in land rental markets does not increase farmers' efficiency of production.

H_6: Land rental markets do not reduce land holding disparities among farmers.

1.5 Justification of the Study

It is expected that the land rental policy thrust by the Zimbabwe government is going to have important impact on farmers, government, and the economy at large. The focus of this study was two-fold, a predictive approach on some of the impacts that are expected at the initial phases of implementation and some impacts well after the initial phases of implementation of the policy. It is important to understand farmers' perceptions on this policy as stakeholder buy-in usually has a higher potential of implementation success. The study also informs government about possible direction(s) concerning land markets given past studies showing strong impacts of land markets on improving efficiency and equity. Globally, a number of studies have been done on farm land rental policy and markets and impact on efficiency and equity, with most of

those studies being in the Asian economies (Deininger *et al*; 2008; Feng, 2008; Hoken, 2012). A few studies have been done in Africa, specifically Central and West Africa (Deininger and Jin, 2005; Fenske, 2011; Ali *et al*; 2014). Other studies have researched on related tenure systems such as titling, (Jin and Deininger, 2009), gender (Ali *et al*; 2014) and on determining optimal prices for rentals (Bert *et al*; 2015). In South Africa, Zwelendaba (2014) researched on land tenure and impact on on-farm investment and productivity, while Keswell and Carter (2014) did a study on land reform, poverty and general welfare issues. In Zimbabwe, a few studies have focussed on tenure and productivity (Mushunje *et al*; 2003); tenure and on-farm investments (Zikhali, 2008) and efficiency of land reform farm models (Musemwa, 2011). These studies have focussed on both the old and new models of resettlement with the aim being to reveal the degree of efficiency. However, this study was carried out in light of the agricultural land rental policy being pursued by the GoZ, and no studies reviewed showed that this area has been researched before. An important contribution of this study would be the efficiency and equity effects of the rental policy given strong evidence that agricultural land is underutilised by the current beneficiaries of the FTLRP. There is need to understand if the nation is going to experience re-concentration of farms as was witnessed previously but in a different mode. All these aspects will be analysed to inform stakeholders about possible impacts of the rental policy and a possible way forward will be suggested.

1.6 Limitations of the Study

The major limitation relates to the availability of the required data. While this policy started in 2007, there was not much political will on the part of government to fully implement it. It was only in 2015 that government moved in to enforce this policy and since it is in its initial stages, the required data may not all be available. In order to mitigate this challenge, data collection was done. Secondly there are political connotations associated with this research, given the

process of land reform in Zimbabwe, and the possibility that some farmers were not entirely open in giving out data required for this study, either for fear of losing their farms or losing their produce. As a mitigation strategy, the researcher also sought data from key informants like extension officers after establishing rapport and using enumerators familiar with the area and the farmers.

1.7 Study Assumptions

The following assumptions were made for the study:

i. Scarcity of land – supply of superior grade of land is limited.

ii. No alternative use of land except farming.

iii. Constant returns to scale of production

iv. The rental policy will force farmers on to the rental market to be efficient as it represents a transaction cost.

1.8 Outline of the Thesis

The rest of the thesis is organised into seven chapters. Chapter 2 gives relevant literature of the area under study, while Chapter 3 outlines the methodology, which includes conceptual framework, sampling, research instruments, data collection process and analytical framework. In Chapter 4, farmers are characterised according to basic demographic variables as well as endowments. A1 and A2 farmers' perceptions on Zimbabwe's land rental policy are enunciated in Chapter 5, while the determinants of land rental decisions are espoused in Chapter 6. Chapter 7 is centred on efficiency and equity assessments of land rental market participation. The thesis ends with a summary, conclusions and policy recommendations.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter is devoted to reviewing the issues that are related to land rental policies and perceptions, rental markets, possible existing linkages and impacts of these markets on farmers. The chapter begins with a description of the theories underlying perceptions, renting decisions, and efficiency considerations. Land reforms and tenure systems are then explained, with specific reference to the experiences and impacts in Zimbabwe. There is also a discussion of the tenure challenges relating to the FTLRP. This is followed by a discussion of formal and informal land rental markets. Lastly, the chapter reviews past studies on land renting decisions and associated efficiency and equity impacts.

2.2 Theoretical Underpinnings of the Study

There are a number of theories that define issues of tenure, production, decision making and equity. These theories are related in one way or the other and they define whether a farmer is successful or not in the business of farming. This section is therefore devoted to understanding these theories and their implications for both A1 and A2 farmers.

2.2.1 Theory of Farmers' Perceptions in Land Rental Markets

Farmers' perceptions on a policy can be explained in terms of the Expected Utility Theory (EUT). Utility is defined at the attractiveness of an economic opportunity to a farmer and the associated risk. The EUT is a combination of two subjective notions, personal utility function and the associated distribution function (Borges *et al*, 2015). It states that if a rational farmer believes a policy has possible personal outcomes defined as $\{x_i\}$, each with a utility $U\{x_i\}$, a

farmer's choice is based on this utility function combined with the subjective probability of each subjective outcome p{x_i}, giving the following expected value of the utility:

$$\sum_i U\{x_i\}P\{x_i\} \quad [1]$$

If the farmer decides against choosing {x_i}, the person chooses {y_j}, the farmer's new subjective utility would be as follows:

$$\sum_j U\{y_j\}P\{y_j\} \quad [2]$$

The preference between the two decisions is dependent on the value of utility for each decision (Arbuckle Jr *et al*, 2015). In relation to the land rental policy, the farmer makes a decision a policy depending on the perceived (subjective) value of utility brought about by the policy. Arbuckle Jr, *et al* (2015) finds that behavioural responses to policy pronouncements depend on perception, or beliefs about the utility value to that particular farmer with regard to that policy. The actions that farmers take are influenced by their perceptions of benefit or risk of policy. The perception of risk or benefit (utility) might differ from objective assessments of risk or benefit. Since perceptions are social constructs, differences in personal experiences, expectations, trust in institutions can bring about different decision making among the farmers from same policy pronouncement (Borges *et al*; 2015). Thus, understanding farmers perceptions of rental policy through subjective expected utilities and the actions that follow thereof is important as it allows one to appreciate the perceived utility value that each household attaches, which is important in shaping possible policy direction.

2.2.2 Theory of Farm Production and Economic Efficiency

Production can be defined as methods and processes involved in transforming tangible factors and resources (raw materials; semi-finished goods; or sub-assemblies) and intangible factors (ideas, information, knowledge) into final goods and services, also referred to as output (Oluwatayo *et al*; 2008). At the farm level, resources are organized with different objectives in

mind, such as profit maximization, cost minimization, output maximization, utility maximization or a combination thereof (Oluwatayo *et al*; 2008). A farmer is concerned with employment of factors of production in the production process for the attainment of technological or economic efficiency. Economic efficiency occurs when the cost involved in the production of a given output is at its lowest. This objective of economic efficiency gives insight concerning the rules in which factors of production and processes are combined by farmers to produce goods and services (Oluwatayo *et al*; 2008).

Production theory is regarded as an application of constrained optimization. The farm-unit attempts either to reduce to the lowest level production costs of a given level of output or maximize the profit attainable with a given cost level (Oluwatayo *et al*, 2008). Both of these optimization options should lead to the same rule in deciding resource allocation and technology choices. The alternative ways of achieving production goals implies facilitation of a proper selection of choices among alternatives for the attainment of one or more objectives of the farmer. This can be understood in terms of parameters often expressed as a production function, which shows the technical relationship between factor inputs and outputs involved in the production process. The production process is normally specified as;

$$Q = f(X_1, X_2, \ldots X_n) \qquad [3]$$

where Q represents a farmer's output and $X_1 \ldots X_n$ represents the production inputs used by the farmer. These inputs may include labour, fertilizers, seeds and land.

Given the production function, production efficiency measures can be computed as;

$$AP = MP = f_1(X)$$

where AP is average product and MP is marginal product. Together with the returns to scale (RTS) concept, the AP and MP help the farmer in determining the use of resources and the

pattern of outputs which maximize farm profits. The RTS concept shows the changes in output when all inputs are increased by a certain factor (Oluwatayo *et al*, 2008).

According to Dangwa (2011), efficiency is always a major concern of economics in decision making. Early economists such as Smith in Dangwa (2011) analysed the link between land tenure and economic efficiency. The approaches used by different writers over the past four decades in efficiency analysis can be traced to the work of Farrell (Førsund and Sorofoglou, 2000), including development of quantitative methods of analysing efficiency (Dudu, 2006). Such quantitative methods include Stochastic Frontier Analysis (SFA) and Data Envelopment Analysis (DEA), which economists use to get insights into efficiency measurements. The former employs econometric methods while the latter make use of linear programming.

Efficiency can be decomposed into three components, which are technical, allocative and economic (Kibaara, 2005). Farrell in Dangwa (2011) defined technical efficiency as the capability of farmers to produce in a constrained situation in terms of inputs and technology. In contrast allocative efficiency was described as the farmer's capability to attain a best possible mix of inputs that gives maximum output (Oluwatayo *et al*, 2008). However, both Kibaara (2005) and Dangwa, (2011) considered the issue of factor prices in the definition of allocative efficiency. According to Kibaara (2005), allocative efficiency is achieved when a farmer makes decisions in inputs use in a way which equalises the marginal product value to the factor costs. Dangwa (2011) defines it as the choice of the optimal inputs proportions given relative prices. On the other hand, economic efficiency, also known as total efficiency refers to the combination of both technical and allocative efficiency. Of these forms of efficiencies, technical efficiency is probably the core since it is obtained from production function (Chirwa, 2007). An efficient technical frontier is formulated and the level of measurement of deviation

of observed from the potential output becomes the measure of efficiency of that particular observation (Oluwatayo *et al*, 2008). Any point along the production frontier is referred to as efficient and those that lie below the frontier are referred to as inefficient (Oluwatayo *et al*, 2008).

2.2.3 The Land Problem, Institutions and Land Policies

Land is so central to economics and production that Thomas Malthus and David Ricardo as early classical economists devoted a lot of their work to this resource (Stilwell and Jordan, 2004). It did not however receive the same prominence by development analysts as did trade and education as the major economic development drivers. It came closest to be recognised as a key development driver in the 1970s at a time when priority was in redistribution of land over economic growth (Hamberlin and Ilbert, 2016). The supposition was that land utilisation and rural development through redistribution would result in economic development (Obeng-odoom, 2012). Oil shocks in the 1930s and stagflation among industrialised countries led to loss of interest in land as an economic driver and a re-focus on economic growth in driving economic development (Obeng-odoom, 2012). This shift resulted in land then being referred to as the victim of shifting intellectual fashion. However, since beginning of the 21st century and in pursuit of Millennium Development Goals (MDGs), land is again re-emerging as a top priority in both developing and developed countries (Otsuka and Place, 2014).

At the heart of tenure systems in land are sustainability and institutional issues. The presence of effective institutions is increasingly being recognised as an important facet in sustainability. Tenure systems are continuously evolving from informal to customary systems to solemnized systems characterised by maintenance of rights records and bureaucratic systems (Moyo, 2011). For nascent economies such as that of Zimbabwe, with weak public institutions, the

challenge is multi-faceted from maintaining record systems, empowering systems for dispute resolutions to respecting the legal framework of such institutions. The effectiveness of institutions is recognised as an essential ingredient for the attainment of allocative efficiency (Hall, 2009). The policies and regulations that govern land rentals and sales are decisive to equity goals and consequently sustainable development. In most developing countries, institutions and systems for land dispute resolution are weak, or in some cases virtually non-existent. They are characterised by courts located in distant urban areas with limited access and a process that is extortionately time consuming and costly for farmers. Rosset (2010) points out that an integral property of security of tenure are judicial systems that permit swift, unprejudiced and economical rulings of land disputes. Attainment of sustainable development places high esteem on appropriate regulatory framework and the institutional capability for administering the framework. It is critical for institutional capacity to guarantee fairness in application of land access rules, and justice to all irrespective of income status and political affiliations (Kepe and Cousins, 2002).

The economic and societal institutional structures are moulded within the integral acceptance of land and property rights. Institutions can be categorised into three, namely constitutional order, normative behaviours and institutional arrangements (Feder and Feeny, 1991). Constitutional order relates to fundamental rules to organise society and is enshrined within country constitutions. Institutional arrangements refer to rules and regulations that are created to operationalize the constitutional order. Normative behavioural codes are cultural values and norms which give legitimacy to the institutional arrangements and may constrain behaviour. Normally, normative behavioural codes and constitutional order evolve over time while the institutional arrangements are at the mercy of political establishments and can be changed much easily. The challenge for developing countries like Zimbabwe is adherence to coherence over

these three types of institutions (Feder and Feeny, 1991). For example, while institutional arrangements may give aliens access to land through a legal system, such transfer of land from one ethnic group to another may be viewed as a violation of the normative behavioural codes (cultural norms). Likewise, even though a constitutional order may give rise to the establishment of institutions that protect property rights through enactment of formal laws, the implementing arrangements may be absent (Feder and Feeny, 1991).

Property rights (private or lease) are often regarded as bundled characteristics comprising of inheritability, enforcement mechanisms, exclusivity and transferability and are classified as important institutional arrangements (Feder and Feeny, 1991). The conferment of property rights implies legitimate exclusive rights being bestowed to certain individual or institutions. The nature of these rights can include passage, grazing, hunting, use of trees, mineral mining and cultivation, and may include the right to dispose of resources. Enforcement of institutional arrangements are subject to availability of supporting mechanisms which include but are not limited to the police, courts, financial institutions, land surveys, the legal profession, social legitimacy of property rights, titling agencies and record-keeping systems.

Where there are provisions for property rights, those conferred with the rights are incentivised to efficiently use the land, including investments in conservation of land. The rights conferred through establishing and enforcing come at a cost. Transaction costs associated with provision of the rights may be higher than the gains that come with property rights, especially where land is abundant. Where land is scarce, there is pressure to invest in productivity enhancing technologies and provision of property rights brings about multiplier effects (Feder and Feeny, 1991). For communal rights, if the land is limited, even when opportunities to invest exist, locals may exclude outsiders from using the land, in which case transaction costs are reduced.

The reduced costs act as incentives not to exclude outsiders from owning land, implying that transaction costs relating to regulation of land use are accommodating (Feder and Feeny, 1991).

Institutional arrangements that provide incentives for the reduction of asymmetric information and uncertainty are either absent or underdeveloped in rural areas. These institutional arrangements that could serve as collateral include active credit markets, fertility enhancement technologies and population to land ratio, with adequacy of public resources being also a challenge (Libecap, 1986). The paucity of resources ranges from inappropriate information management technology to insufficient labour resources. In most rural setups of developing countries, institutions for enforcing property rights such as the police and judiciary do not have satisfying enough incentives or are understaffed. This creates conducive environments for rent-seeking behaviour and in the process undercuts the enforcement of property rights. In other cases, complex legal instruments and documentation for conferment of property rights may not be appropriate in a rural setting, where households are not exposed to modern information technologies (Feder and Feeny, 1991). The complexities associated with these transactions increase fixed cost of enhancing the security of property rights such as requiring lawyers whom they barely afford and substantial time inputs demands from farmers. Invariably, these transaction costs turn to favour farmers who are wealthy, with land holding which are larger as compared to those with small land holdings. Institutional arrangements that impede substitution of weak public infrastructure with private provision of these arrangements aggravate public sector resources' inadequacy to reduce property rights uncertainty. There is congestion in some countries in use of public resources since there are no institutions that give effect to the establishment of private providers of property rights security such as surveyors. This increases uncertainty of property rights because of failure of public institutions to champion the reduction of these uncertainties. Consequently, institutions which are less effective in reducing

uncertainty emerge, normally informal and localised, and the citizenry view these as better than not having institutions at all. This leads to inefficient resource allocation since institutional arrangements become fragmented, and the volume of transactions are reduced compared with what would have been otherwise obtained had the system been well-functioning (Feder and Feeny, 1991).

2.3 Agricultural Land Policy and Experiences in Zimbabwe

Land tenure, encompassed under land policy, is defined as the set of laws and rules underlying land ownership, usufructuary rights, the content of the rights, how they are regulated and protection at law as well as their discarding and/or extermination (Matondi and Dekker, 2011). It is a relationship with respect to land, whether defined in terms of statutes or according to customary provisions among individuals or group of people in a society. Land tenure is also referred to as an institution as it is a collection of rules created to regulate societal behaviour and allocation of property rights to land as defined by these rules, including usufruct rights, associated responsibilities and restraints (Munyuki-Hungwe and Matondi, 2006).

According to Norton (2003) there are five tenets to a good land tenure regime. The first is democratic accountability, which is necessary for allowing intervention by the state in such a way that the resulting configuration matches national and economic goals, within the macro-economic, technological environment and when market mechanisms have shortfalls. One such example is when a country chooses to pursue freehold system of tenure to secure food security when there is full urbanization and industrialisation. The second is flexibility, which refers to the ability of a nation to accommodate different types of markets such that it allows trading and changes in size of land to cater for changes in investments, skills and capacity to produce. Such markets may include rentals, sales and leases. Third, is the ability of the tenure system to

perform a credit and investment facilitation function. This is achieved when land can be mortgaged as collateral and credit facilities are made available against land in combination with different mechanisms for guaranteeing credit such as farm equipment, livestock, buildings and urban assets. Associated with this are regulations, institutions and processes aimed at making this facilitation complete.

Fourth, land tenure system should also provide a regulation mechanism against capture. In any society where, capitalist economic systems are adopted, inequalities are likely to result in land speculation by investors. The capture by elites can result in inequitable and inefficient land consolidation and can cause land disenfranchisement among the poor and women. The resultant output of accumulation of land for speculative purposes and mass sales from both local and foreign entities during recessions often militate against expected developmental trajectories (Norton, 2003). Lastly, a good tenure system should allow for a conducive market mechanism. It should allow land holders to inherit, bequeath, sell, lease and rent land independently and be duly recognised by the laws of that country, including the rights of women to also own land. The attainment of such a system is through recognition of permits, titles and lease possibilities and putting together administrative mechanisms. The administration mechanisms should not put a heavy burden, both technically and cost-wise on land holders. Specific issues to be considered include cadastral surveys, land administration and registration. For the state, the focus should be on generating revenues from survey, lease, permit and title fees while at the same time offering incentives that discourage issues like taxation in land to cause underutilisation of land (Norton, 2003).

Under the neoclassical theory, land tenure security is a key ingredient in determining sustainable long-term investments and use of land (Roth and Haase, 1998) and this is

essentially achieved in four ways. The first is more use of credit from the collateral value of land, implying more incentives for investment and the creditworthiness of projects. Secondly, land tenure assists in facilitation of transfer of land from those who are less efficient to those who are more efficient, and in the process increases land transactions and reduces transaction costs, which are critical for sustainable use. Thirdly land disputes are reduced when the definitions and protection of property rights are clearer and lastly, agricultural investments are increased, raising productivity in the process (Roth and Haase, 1998).

There are studies which have refuted the neoclassical theory. Neef *et al* (2007) in a study conducted in Thailand and Vietnam concluded that ethnic groups in the mountainous regions of northern Thailand had higher incidence of long-term investments even though they did not have secure land tenure systems. This was in contrast to farmers in Son La province, who even though they had more secure tenure rights, practiced mono cropping with no complementary soil conservation practices. The study concluded that long term investments are made even in an environment of insecure tenure regimes, thus disputing the neo-classical theory. Such findings serve to highlight the fact that land tenure issues are more complicated than what is suggested by the neoclassical theories (Moyo and Vudzijena, 2004).

Most developing countries with a past colonial history often blame colonisation for low agricultural productivity, inequitable distribution of resource and income, environmental degradation and gender imbalances (Moyo and Vudzijena, 2004). This argument often points to land tenure systems, inherited from past colonial regimes and that often create dual citizenry of superior on one hand and oppressed on the other, but not offering solutions towards the improvement of the welfare of the majority of the citizens. This challenge is most prevalent among African countries (Moyo and Vudzijena, 2004), as most of their land tenure systems are

inundated with rising population pressures in the face of artificial land shortages. Moyo and Vudzijena (2004) contended that reforms in land tenure through individualizing and titling of land often results in skewed land distributions and turn to create more conflicts than solutions *vis-a-vis* security of tenure (Moyo and Vudzijena, 2004).

It is on the basis of this realisation that a number of formerly colonised states have introduced land tenure reforms, with one such focus being to enhance tenure security. Where a government adopts a market approach to tenure security, and there is individual ownership of private property, then what becomes critical is access to land and tenure relations. On the other hand, where customary tenure systems are adopted, the link between land and people is one of stewardship and use but not of ownership (Roth and Haase, 1998). Normally any variations in land tenure within the context of market economies has an inclination to alter the notion of property from control of capital on the basis of cultural, social and use values to the rights of material and saleable goods and services. Consequently, it is more difficult enforcing practices and rules of community resource allocation in societies practising customary tenure system on the basis of meeting household welfare through providing resources to the community (Moyo and Vudzijena, 2004).

A number of land tenure systems are available for a nation in pursuit of its national objectives and aspirations. Globally, there are many forms in which land is held, but they all can be summarised into five basic types (Norton, 2003). These are freehold, leasehold, customary, collective and statutory, as explained with reference to Zimbabwe.

2.3.1 Large Scale Commercial Farming Sector (LSCFS) - Freehold

All land that was designated as commercial agricultural land was owned under freehold tenure until 2001, when government nationalised all agricultural land. Close to 5,000 white commercial farmers (either as individuals or families), owned commercial land that they either had bought on the open market or inherited from their fore fathers (Matondi and Dekker, 2011). Mining and agricultural companies, such as Lonrho or Anglo-American Corporation, NGOs and churches also owned land under freehold tenure in designated commercial land (Matondi and Dekker, 2011). Also included were estate plantations mainly in Masvingo and Manicaland Provinces that are mostly foreign owned. After independence, some white farmers acquired commercial agricultural land under the willing-buyer-willing seller arrangement which was agreed upon under the Lancaster agreement. Others purchased land on the basis of certificates of no present interest (CONPI), initiated in the second phase of land reforms after government moved from the willing-buyer-willing seller arrangement to new legislative changes in 1980. Government still owns large tracts of land through a number of parastatals that are involved in agriculture. Some of the parastatals include Agriculture and Rural Development Authority (ARDA), Cold Storage Company (CSC), and Forestry Commission (GoZ, 2010). Interestingly, a greater proportion of land under LSCFs is still retained for cricket grounds and golf courses (Matondi and Dekker, 2011). A number of black commercial farmers also acquired land post-independence (Moyo, 2000). Research by Moyo (2001) showed that by the year 2000, about 1000 black farmers had acquired land under the LSCFS, up from 350 in 1986.

Following the FTLRP, half of that land (approximately 222,000ha) was under cultivation, implying a decrease of about 50%. By 2003, the major crops that had been affected in terms of reduced area were tobacco, maize, soyabean and wheat. In the past, former white commercial farmers used to produce above 90% of tobacco, soyabean and wheat. Other crops such as beans,

potatoes, tea and beans did not experience much drastic production changes up to 2004, before experiencing a decline also while sorghum production expanded (Moyo, 2011).

A number of lessons can be learnt from the LSCFS. This sector was complex with well-developed input and output markets, supported by a finance system and a good labour market. It had arguably one of the best farming capabilities and infrastructure in Africa. In a continent where famine, poverty and civil wars dominate, Zimbabwe was the envy of most countries in terms of food self-sufficiency and security, an achievement brought about through both LSCF and communal farmers (Matondi and Dekker, 2011). The farming experience of large commercial farmers, cumulating more than half a century and benefiting from farm institutional memory explains also the excellent perfomance of agriculture in Zimbabwe. The agricultural skills that the commercial farmers had among a myriad of enterprises represented a sophisticated and well-developed human resource base in agriculture. Rukuni (1994) argued that this expertise was a fundamental pillar in the agricultural revolution of Zimbabwe. The skills were buttressed by policies of government which promoted agricultural research. A combination of approaches emphasised included research stations on-farm trials at Chibero, Kutsaga, Mlezu, Gwebi, (agricultural education), Blackfordby (tobacco), Matopos (livestock and small grains), Henderson (veterinary science) and Grasslands focussing on pastures (Rukuni, *et al*, 2006). This was again supported by government policy that prioritised farm infrastructure including energy, water, paved roads, farmhouses, etc.

2.3.2 Small Scale Commercial Farming (SSCF) – Freehold/Leasehold

The small-scale commercial farming scheme (SSCF) started around 1930s following the Land Apportionment Act promulgated in 1931 and Morris Carter Commission. Farms close to communal areas were identified and demarcated into what was then known as Native Purchase

Areas, renamed to SSCF. At its initiation, the sector had 2.98 million hectares of land which constituted 7.7% agricultural land. Of this area, approximately half of it was successfully allocated to SSCF. This comprised of 10,629 farms allocated in 66 different settlements and the form of tenure was freehold for 48% of the land and the rest was under leasehold, which was long term (Chigaru, 1997). Roth (1990) noted that most documents which are official state that SSCF land allocation as a proportion of total country agricultural land is about 3.8%. It suffices to note that some SSCF operators had their land taken for resettlement under the FTLRP. It seemed that with the FTLFP, this sector was never mentioned. It is clear that since independence, government has always viewed this sub-sector as one that has no potential beyond that it was put forward politically by the colonial government and over the past two decades government subsidised communal, A1 and A2 farms, with hardly any reference made to this sub-sector.

Rukuni Commission (1994) reported that 48% of landholders received deeds of transfer after having fully paid for their land, which is a significant percentage when compared to communal areas. The rest of these farmers (52%) were yet to complete payment for their land and therefore still leasing government land. The terms under which farmers were given land for leasing were that they should reside on the farm permanently, not involve themselves in farm partnerships, not involve in subdivision of land, and carry out all farming activities for the sole household benefit, in addition to practicing good use of agricultural land (Moyo, 2004). Lessee would make annual rental payment which would go towards the full payment of the purchase price of the farm. There was however concern in the method used to assess the lessee's performance for qualification of a title deed as noted in the Rukuni Commission (1994). The criteria were so subjective to the extent that a number of farmers still failed to acquire title deeds well after having fully paid for their land.

Unlike other forms of freehold tenure under Zimbabwe's statutory laws such as in LSCF, agricultural plots and urban areas, there are a number of conditions attached to freehold tenure for SSCF areas. One of the conditions is that in succession inheritance and transfers, farm purchasers and heirs need a government seal to proceed with the transaction despite the granting of deeds of transfer. The law is also silent on the allocation of the farm in cases where the heirs are more than one. Further to that, the state recognises usufructuary rights to freehold land that is owned by others (Rukuni Commission, 1994), implying that the state can allow other users to the land even though one is holding on to a title deed.

Some lessons can be learnt from this sub-sector. One would expect that exclusivity of property rights within the SSCF would be automatic given that there is freehold tenure after land purchase. However, customary practices and freehold tenure systems clash, partly because tenure under SSCF does not address adequately issues of succession. Farmers have in many cases tended to resist giving away their tenure rights during their life time bringing in a number of challenging situations (Matondi and Dekker, 2011). The first is a situation where with time and physical incapacitation, the farmer becomes reluctant to adopt new technologies and this decreases productivity on the farms. Secondly, an anointed heir may have interest in farming but if the succession is not clear, they may start developing off-farm interests. If there are other siblings who are actively involved in farming, this may create resentment towards the heir to the detriment of farming operations and ultimately agricultural output (Moyo, 2016).

2.3.3 Communal Tenure System - Customary

Communal lands are an inheritance of the colonial system of marginalising black indigenous farmers to the periphery of economic activities. Most of these communal lands are located in

the natural regions III to V, known for high temperatures, low rainfall and poor agricultural activities. The dominant economic activity is subsistence and small-scale farming. Land area varies from as low as 0.1 hectares to less than 2 hectares (Matondi and Dekker, 2011). High population density, overgrazed land, poor and highly eroded soils for farming characterise many communal lands of Zimbabwe. Settlements differ, some have residential and arable lands in the same location, some models have them in different areas, but all share community grazing areas. Communal ownership of land is vested in the state, while chiefs and headmen superintend allocation of usufructuary rights to a farmer, who can bequeath it along primogeniture lines, in the event of the original owner passing on (Zikhali, 2008).

Zimbabwe's communal lands are managed under customary tenure, with a number of state and local administrative arrangements specifying the expectation to land holders in those communal areas (Matondi, 2001). Communal lands are defined in the Communal Land Act as composed of all land formerly refereed as Tribal Trust Land in accordance with Tribal Trust Land Act depending on alternations the President can make. All communal land ownership is vested in the President who permits its use in accordance with the Act's provisions. In the old Tribal Trust Lands Act, the President had the powers to hold in Trust land for its inhabitants, whereas in Communal Lands Act, he does not. This implies a possible relationship which is not of Trusteeship between the President and the inhabitants and consequently the occupants of the land are allowed to use the land not as right but at the prerogative of the President (Matondi, 2011).

District councils are vested with the legal authority in communal areas in allocating rights to occupy and utilise land, though in practice it is common to have community leaders such as kraal heads, chiefs, headman and village chairpersons for ruling party allocating land

occupation and use rights. This conflict often makes it a challenge for creditors to even consider availing credit facilities to communal farmers (Matondi, 2011). The conditions under which land can be transferred in the communal arrangement are generationally, through marriages, and through inheritance. Moyo (2016) noted that an incipient land market has developed in the communal areas, where land is sold. This trend is more prevalent in communal areas which are in proximity to urban areas, where it has taken a commercial dimension. In these areas, households are doing away with most agricultural activities such as cropping and livestock production due to limited amounts of land, and most were forced to diversify to non-agricultural incomes. However, in remote communal areas, this practice has been limited (Matondi and Dekker 2011).

Lessons can be learnt from this system of tenure. Productivity has generally been low in communal areas, though issues of climatic conditions and soils also come to the fore. Land occupation in communal areas is a privilege and not a right. There are informal land markets that are developing in rural areas in proximity to urban centres and there is diversion to non-agricultural activities. The legal authority structures as defined by the law are different from the existing structures in practice. Cases where communal farmers have been removed without compensation have given the impression that this tenure system in not a secure one.

2.3.4 Old Resettlement Scheme - Leasehold

The establishment of Old Resettlement Schemes began in the early1980s and gives useful insights for informing discourse on tenure for A1 and A2 as these are also based on the same permit tenure. Three permits were allocated to resettled farmers under the first resettlement phase, one for 12 acres of arable land, another for one acre of residential stand and a third one for grazing area. A study by Matondi (2001) shows that most of the farmers in the resettlement

scheme accessed land either through facilitation from civil servants or from headmen. This shaped allegiance that these farmers had in seeking leadership, communication and access to information, as the facilitator was often regarded as the true leader in that area. In addition, agricultural extension officers were also regarded as influential in these resettlement schemes. They had powers to recommend withdrawal of permits for farmers who were deemed not to be productive. However, there is still evidence of settlers defying rules and regulation and not much action was taken to revoke the permits for these farmers (Matondi and Dekker, 2011). In the late 1990s an insignificant market for informal rentals subsisted in the schemes. Studies showed that about 5% of farmers were engaged in informal renting and or leasing arrangements with fellow farmers for payment either in kind, cash or sometimes for free (Matondi, 2011). In the late 1990s, a study by Moyo (2001) showed that on average, a homestead in the resettlement schemes had 1.8 kitchens which is an indicator that a homestead had more than one household. Possible explanations were that in some parents' homestead, sons had established their own households.

In terms of extension services, Owens *et al* (2001) argued that the public extension provider in the country, AGRITEX was instrumental in boosting agricultural production in Old Resettlement Schemes. Production in the resettlement schemes was sufficient for both consumption and the market, especially in those years where farmers received sufficient rainfall. According to Matondi (2011), farmers' major source of income came from crop production, which accounted for above two thirds of overall income. Extension services from the public sector has a major contribution towards that achievement. There is evidence of substantial investments in productive assets such as scotch carts, ploughs and tobacco bans etc, as well as durable assets like houses, livestock and tree plantations. To some extent, this evidence seemed to point towards farmers' confidence in the tenure system, though it is not

conclusive whether this confidence arises from being on the farm for too long or a genuine belief of a secure tenure regime. Zikhali (2008) noted that over the years, farmers had access to credits facilities, though the greater proportion of these services came from contractors and group lending where the group is regarded as the collateral. In essence, this might indicate that creditors were not confident of the permit system as a form of collateral for individual farmers.

Like other tenure systems, lessons also abound in this system. The Old Resettlement Scheme was successful in terms of agricultural production for consumption and market, and extension service providers were effective. Power sources in resettled schemes were related to the source of facilitation of the allocation of land for resettlement. The legal structures under this tenure have not been enforceable. Informal markets developed for land implying institutional structures that were not very effective. Access to credit was through contractors and this implies that financial institutions did not consider this tenure system as offering security of tenure.

2.3.5 A1 Resettlement Model - Leasehold

The A1 resettlement model is one of the two resettlement models launched by government under the third phase of the land reforms, also referred to as FTLRP from 2000 to 2010. It was introduced as an improved model for the A resettlement model introduced in the first land resettlement phase. The model established farmers that produce for consumption and possibly some surplus produce for the market. It aimed at promoting small scale family farms, resettling as many beneficiaries as possible (about 70% of beneficiaries were resettled under this model) and contributing to higher food security (Chiremba and Masters, 2003). As with previous A model and the communal areas setup, each farmer was allocated a residential stand, an arable portion of land with community owned grazing areas (Zikhali, 2008). On average, a farmer was allocated between 5 to 8 hectares for residence and cultivation, and this depended on the

particular Natural Region. Allocation of land was done by the District Administrator (DA) after recommendations from the district lands committee. A certificate of occupancy was given under this model.

The tenure form provided to A1 land beneficiaries was akin to the communal areas, being based upon customary forms of allocation, regulation and adjudication. While this form of tenure has worked reasonably well, it requires improvements to enhance the tenure security of families, individuals and women. The old Model A1 (under phase one) scheme for allocation of land was maintained in designing of the A1 model, though the plot sizes for arable and grazing land were considerably reduced (Lebert, 2010). Grazing area per beneficiary in old Model A scheme ranged from 20 to 200 hectares, but under A1 model it was reduced and ranged from 7 to 60 hectares. According to Moyo (2011), across and within provinces and natural regions, variations exist between official land size limits and demarcated allocations. Unlike in the first phase of the resettlement programme after independence, where resettled farmers were given permits for arable, grazing and homesteads as a guarantee notwithstanding their limitations, farmers under A1 model do not have secure formal tenure (Munyuki-Hungwe and Matondi, 2006).

Statutory permits were issued to A1 farmers for occupation of land into perpetuity. This permit is similar in its provisions to the rights provided under communal tenure system in Zimbabwe, but the difference is in legal status. There is direct control by the state of the land allocation process even where there is traditional leadership involvement in allocation and access to land (Shaw, 2003). A1 model tenure system represents a social and vertical legal relationship between the households and state, with complementary elements of customary administration

of land. There is also empowerment of traditional leaders in compliance enforcement in natural resources management, land disputes, inheritance and land use (Keswell and Carter, 2014).

There is a strong notion that land tenure insecurity among A1 farmers has led to numerous land disputes and potential eviction by the state (World Bank, 2009). The offer letter in clause 7 states that withdrawal of offer is at the discretion of Ministry of Lands and Rural Resettlement (MoLRR) and can be done without any obligation to compensate for farm improvements. There were cases where offer letters were withdrawn and some cases where demarcated A1 farms were re-allocated into A2 farms. Such scenarios had the tendency to diminish farmer confidence in relation to secure land tenure and also reduce the commitment that farmers eventually had over investment in farm infrastructure. During the implementation phase of the FTLRP, when some 'new' farmers were being relocated, others evicted and farms remodelled, tenure insecurity was high, with 20% of respondents confirming this. The insecurities resulted from land conflicts over competing land allocation claims, natural resources use rights and control over farm assets left by former white farmers (Moyo *et al*, 2009). With respect to the A1 farm areas, government policy on infrastructure allocation and utilization treats social infrastructure as state property for use for public benefit, whilst productive facilities are treated as state property available for shared use among beneficiaries. Generally, issues concerning A1 infrastructure relates to finding the best mechanisms for sharing infrastructure in a way that maximises capacity utilisation. The conflicts do not necessarily undermine security of tenure for A1 model by itself, but rather reflects administrative deficiencies by the state. A study by Moyo *et al.* (2009) showed that about 16% of A1 beneficiaries had been threatened with eviction at some point, particularly those in better agro-ecological regions. Some A1 beneficiaries kept their communal area homes for fear of eviction at some future time (Moyo *et al*; 2009).

2.3.6 A2 Resettlement Scheme Design - Leasehold

Model A2 was an adjusted version of the white commercial farming sector envisaged to create a cadre of indigenous commercial farmers capable of managing the farm as a going concern. Applicants for resettlement under this were mandated to show proof of having acquired enough capital or required assets and considerable knowledge about commercial farm production for them to successfully be allocated land under this model (Chiremba and Masters 2003). The Ministry of Lands was responsible for allocation of land under this model after recommendations from the provincial lands committee. Farms allocated ranged from small, medium to large-scale depending on capacity of farmers and natural region (NR) of the area. Commercial farmers are involved in either crop or livestock production, or both depending on the natural region, whilst peri-urban farmers are involved mostly in crop farming, market gardening or horticulture. Size of land was as small as 50ha and could go up to 1500ha depending on NR and farming systems i.e. plantations, conservancy, crop or livestock (Matondi and Dekker, 2011). Land allocation for A2 model varied depending on agro-ecological zones, with size of farms increasing proportional to increases in NR from I to V. However, this is not consistent across all-natural regions, provinces and districts. To a larger extent the variations of the land sizes seems to have been influenced by the provincial political leadership at the time of allocation as they had a greater say in how allocations were handled. While in general A2 land allocations were below prescribed maximum, in most provinces a small proportion of large scale A2 plots which exceed the maxim were allocated for these farmers. There are still cases of multiple land ownership for large scale farms for both indigenous blacks and remaining white commercial farmers, though for the latter it's not that rampant. The same goes for some plantations that are above the prescribed levels though they

have been exempted through delisting or as suppliers of agro-industries. Those allocated land were given either an offer letter or a 99-year lease offer as security of tenure (Moyo, 2011).

According to Vudzijena (2007) government policy with respect to the financing of social infrastructure development differs between models A1 and A2 schemes. Model A2 is expected to finance much of their infrastructure development needs using commercial banks and state institutions' financial loan packages such as ARDA.

The policy on allocation of infrastructure, management and use differs between A1 and A2 models. There are various sources of information concerning the expectations on the use of these infrastructures left behind by former white farmers. Such sources include policy statements by government officials, offer letters and lease agreements (Sukume, 2007). The position on offer letters is that the farmer allocated land where there is infrastructure becomes the owner of that infrastructure. Infrastructure that is on allocated land was easily given to farmers on those subdivisions, while infrastructure that is on non-allocated land was designated as state property. From these two custodian scenarios, it can be concluded that there were variations in maintenance, use and control of these assets. The offer letter is also silent as to the fate of other farmers surrounding farmers in terms of use rights. For A1, such infrastructure is to be shared by all farmers on subdivisions which the infrastructure was serving. Thus, issues of efficiency and equity in the utilisation of these assets remained major challenges in pursuance of maximisation of resource use (Munyuki-Hungwe and Matondi, 2006).

Although the lease agreement does give control rights to those plot holders who are on lands in containing an item of infrastructure, it does not confer ownership rights. The farmer with control rights has the power to sublet and give service to other farmers who intend to use the

infrastructure at a cost subject to granting of permission by the ministry responsible for lands. Controlling farmers are also expected to exercise care and safeguard the infrastructure on behalf of government. Included under infrastructure are also farm compounds that have been the subject of tussles among the politically powerful as each one wanted land where they were compounds. The practices in terms of application of infrastructure clause differ. There have been cases where some farmers were allowed to use the infrastructure for free and some at a cost. Other cases also were of farmers monopolising use of this infrastructure (Moyo, 2016), refusing to give use rights to farmers from subdivisions under which the infrastructure falls. Where government has appointed caretakers to look after the infrastructure, the reference terms have also not been made clear, including the obligations of both parties and remedies to contract violations. These unresolved issues have had the tendency to create conflicts in land and can negate efficient utilisation of resources (Moyo, 2016).

There is no policy as to the structure of charges to be levied to those farmers who want to use infrastructure from a farmer with control rights. In the first phase of resettlement, farmers who had user rights to infrastructure were levied in accordance with the value of assets on the farm and this could be a reference point (Mhishi, 2007). Expectations among resettled farmers are that precedence was to be used to determine the value of infrastructure when eventually farmers are given the option to purchase the land. This precedence has it that most of the farmers who were resettled during the first phase of resettlement purchased the infrastructure at original full value less accumulated value of rental fees, as determined by state valuers. The above calls for transparent records of such infrastructure and costing that ensures that the state does not subsidise individual farmers since at the global level, it is the state that pays for improvements on the farms which are the infrastructure and/or assets (Matondi and Dekker, 2011). Vudzijena, (2007) in a study reported that the strong belief among farmers who are not on farms with

infrastructure is that their counterparts on land with infrastructure will purchase the assets at undervalued prices. This notion is based on the view that farmers bequeathed with such infrastructure are well connected.

Under the 99-year lease, the agreement is between an A2 farmer and the ministry responsible for lands, which provides for the farmer to occupy a designated piece of land at a certain rental price for 99 years (MLRR, 2006). The lease subsists for the tenure period subject to the lessee meeting the conditions of the agreement. The lease is covered by an act of parliament, which sets the boundaries for land use. For Zimbabwe, the restrictions are on land use options for crop production and stocking levels for livestock production. Any actions to transfer or subdivide land by the lessee are subject to approval by the state and the lessee has to exercise due diligence when making such decision, as the state has the authority to terminate the agreement during its subsistence period or not renew it when it expires (Murombedzi and Gomera, 2004).

Most of the A2 farmers are yet to receive lease agreements as set out in the Ministry of Lands policy documents. However, this section describes the process for one to get a lease. A2 farmers apply for lease through the offices for ministry responsible for land at their nearest offices. Government is in the process of setting up a Land Board, which is going to evaluate all the applications after making field visits in order to make appropriate recommendations to the ministry responsible for land. The farm investments and agricultural productivity of the applicants have a greater bearing on the results of the application process. For successful applicants, then follows the process of crafting the lease. Paradzayi (2007) noted that the length of period for the lease requires that it be registered with the registry of deeds as a notary deed. Pursuant to that, the farmer is required to make payments of stamp duty to the Registrar of

Deeds as deemed fit for purposes of registering the deed. The lease when produced includes four copies and a survey diagram depicting the position of the leased land (Paradzayi, 2007).

For a ten-year lease or more, Chapter 20:12 of the Land Survey Act requires that boundaries be demarcated for any property. The Survey Regulations Board has recommended that there be five copies of survey diagram for any subdivision when the original farm has less than three A2 subdivisions. Where the subdivisions are more than two, then a general map is surveyed and for each subdivision, four copies are to be made. A copy of each subdivision is kept by the following departments; lands, deeds office, surveyor general and the lessee (Paradzayi, 2007). To prevent transfer of state land by the beneficiaries, the copies are endorsed for lease only. While the land survey act requires the existence of a remaining portion for any subdivided land, the 99-year lease does not have this provision, pointing to a potential violation of the statutes. Like any standard cadastral work, the Department of Surveyor General (DSG) assess and approve the lodged records. The DSG then present the four copies to the ministry responsible for lands, which then launches a formal request for 99-year leasehold agreements registration (Paradzayi, 2007).

The ownership of the land is valid for the tenure of the agreement and is subject to renewal upon the consent of the issuing authority (ministry responsible for lands). The inheritance is subject to judicial systems application and the line ministry governing laws. There is perpetual ownership revoked only at the instigation of the owner. The land under the 99-year lease can freely be used as collateral only to the extent of value of improvements on the farm and not for any speculative activities since its value is zero (Matondi and Dekker, 2011). The allocated land is not officially tradable and cannot be used as collateral as the ownership is still invested in that state, who is legally the owner and the lessee only retain usufruct rights.

Formal debates on the A2 lease among land stakeholders centre on the tradability of the lease. This is because even with the 99-year lease, land has a zero value since farmers are not allowed to use it to obtain collateral. The debate is centred on whether to allow lease agreements to trade by introducing land markets while the state plays a regulatory role and judiciary an adjudicating role (UNDP, 2008). This perspective is put forward from the understanding that land value can be unlocked through allowing land markets and enabling substantial resources into the agricultural sector. To manage defaulting on loans, a land market which is open becomes necessary (Mhishi, 2007). Others have put forward tradable markets for leases as an option to allow those farmers whose on-farm opportunity costs are high to leave the business of farming (Moyo, 2013). The other option is promotion of productivity and agricultural investments through elimination of those farmers who are speculative and unproductive (Sukume 2007; Vudzijena 2007). Some also hypothesise that introducing land markets gradually by allowing a lease to trade and then give farmers an option to buy after a long period of time. In support, UNDP (2008) has advocated for amendments to both customary and permit tenure to factor in buying and trading options.

The GoZ has shown little commitment for a tradable lease market but rather favours a market which restricts purchases of lease by landholders of multiple land and foreigners (GoZ, 2009). The caution is that over time, a clique of individuals will end up with high concentration levels of land, reversing equity gains that had been achieved in distributing land under the FTLRP (Mhishi, 2007). In addition, there are still inconsistencies in land tenure in the country because there is still land that is under freehold and the state has not acquired it. This is true for some agro-industrial estates and large-scale farms. Estimates are that close to 1 000 white and black land holders are still under freehold tenure (GoZ, 2010).

2.4 Tenure Challenges for Resettled Farmers in Zimbabwe

A myriad of challenges relating to tenure of land exist that the country is yet to resolve and government and other stakeholders need to take positions as a step towards agricultural recovery strategic endeavour. This section analyses some of these problems and possible solutions.

2.4.1 Land Tenure Preferences

Internationally, tenure is not a one size fits all but is dependent on the environment in which it is implemented and the broader objectives being pursued. Therefore, society weighs the advantages and limitations of each tenure regime, as no single tenure regime can meet all the objectives of the society. Studies that have been reviewed in Zimbabwe (Dekker and Matondi, 2011; Moyo and Chambati, 2013; Moyo, 2013) have shown varied preferences for tenure security, with many preferring title deeds (for e.g. 55.2% A1 and 51.4% A2 in Mazoe). This is because it ensures investments in the land such as dams and good agricultural practices. It also enables them to use land as collateral, in the process enhancing productivity on the land. For offer letters, farmers fear that they can be withdrawn at any time, there are not transferable and therefore do not offer security that can encourage investments in immovable assets and long-term capital investments. Evidence from a study in Mangwe District shows that only a limited number of livestock producers have made investments in dip tanks and paddocks from the time they were allocated land (Matondi and Dekker, 2011). The following reasons that relate to tenure of security as their positions were given, They:

(i) were allocated land but did not move in;

(ii) moved from A2 to A1 because perceived security from groups based on community groups and kinship was better;

(iii) are going back to communal areas because productivity has been low in resettled farms; and

(iv) are leasing out their lands to other productive farmers etc.

However, there has not been much movement of the government towards changing the tenure system. Government is of the opinion that title deeds would allow former LSCF to retain distributed land while rental markets and joint venture arrangements may result in A2 beneficiaries being used as the face of white farmer operations (Lebert, 2010).

2.4.2 Land Sharing, Subletting and Rental Tenure Arrangements

The A2 leasehold retains some degree of inflexibility in tenure, which can be an obstacle to addressing local problems. The proposed requirements that the lessee gets permission from the lessor without specifying possible reasons of refusing to cede or sublet the land may impinge on the rights of the lessee as it can be open to abuse by the land administrators. Also, policy does not articulate the specific problems it intends to limit or the conditions under which subletting might be beneficial (Lebert, 2010). Making clear the terms under which an A2 farmer can cede or sublet land can be crucial in making land available, improve its utilisation, investments and aid in securitisation of landholdings. These questions also affect land transactions in A1 and communal areas. In addition, benign local land transfers need to be encouraged and transparently managed (Chiremba and Masters, 2003).

Evidence showed a number of farmers in the A2 category who are not fully utilising their capacity or who have room for increasing their current levels of production. There have been a number of cases where some of the farmers are utilising land which other resettled farmers are not using. In some instances, renting arrangements are sanctioned from local authority

which allows use of either underutilised or unutilised land (Matondi and Dekker, 2011). Evidence exists of farmers who are underutilising their allocated land together with those who would want to make temporal use of that land, or the existence of potential beneficiaries who cannot use land. There have been also some farmers who have not been able to farm due to short-term or enduring challenges such as illness, bereavement, deserting, divorce, pecuniary problems but deserve to keep land until survival strategies are developed, including survival from land rental incomes (Moyo, 2016).

Farm size limits put forward by government for resettlement have not been conducive for some enterprises. Dairy farming for example has very high sunk costs, requiring sizeable land and these farmers can therefore benefit from renting more land from neighbouring farms. Some of the infrastructure such as barns for tobacco and pack sheds for horticulture can also be maximally utilised when custodian farmers or neighbours are allowed to rent more land. These could be foreclosed by the lease conditions, which instead should prioritise preventing real re-concentration of land control and promote optimal use of all land.

The capability of farmers to leverage labour, capital and technology differentiate them. Where a farmer has enough in quantity and quality of these three resources to increase production, then such a window should be available for one to pursue. According to Zikhali (2008), farmers specializing in enterprises which do not require large land holding e.g. flowers should have an opportunity to cede the remaining land for use by those farmers involved in enterprises that require large land holdings. The existence of leasing or rental markets would enable the realignments of land sizes to suite the specific enterprise needs (Zikhali, 2008) and also allow new aspiring entrants into the agricultural sector. Such a market has the distinct advantage of balancing the demands for land and the rate of utilization (efficiency and equity trade-offs). It

can also potentially increase production of other crops such as cotton and small grains. Thus, the admission by the government that maximum farm size regulations are only a guideline and that these do not preclude upward adjustment (and/or it should be said downward adjustment as well) when warranted by requirements of enterprises or land demand is welcome. But this flexibility requires that land tenure policy is refined and effective administration systems are established to prevent misuse of this provision (Matondi and Dekker, 2011).

2.4.3 Land Tenure Policy Administration

The institutions for land resettlement management are weak. Databases and information systems for land administration, including beneficiary verification and audit, are weak to a point where currently it is not known with certainty the number of land reform beneficiaries (Moyo, 2016). A dearth of greater physical and financial capacity exists, required to cater for the increasing demand for formal land subdivision and surveying, recording of title where it is required, and maintenance a register that monitors compliance with ownership and use policy (Matondi and Dekker, 2011). The tendency to create A2 farms in the model as LSCF has affected the success of the FTLRP (Aliber and Cousins, 2013).

For proper land administration, a lease agreement is a key instrument, and government has made an undertaking to complete issuing out lease agreements. However, in itself, it is not sufficient for administration of land as other instruments and policies are required to govern land maintenance and evaluation, benefits and costs of accessing land and infrastructure utilisation. The lease that government has so far issued has clear provisions for time frame for leasing, when to exercise the purchase option, environmental management practices and expected infrastructure developments. It is however vague in defining the process leading to eviction for underutilisation or misuse of land. Where partnerships are involved, the missing

link is the policy relating to how the benefits will be distributed and also the control, use and condition of infrastructure (Munyiki-Hungwe and Matondi, 2006).

Moyo (2011) identified the challenge of land policy setting approaches as one critical factor within government and which has led to a number of challenges. These include efficiency and equity issues in accessing land and infrastructure, policy implementation consistency, and clear definition of policy. Policy formulation for long term issues like land should be staggered over a period of time. This allows alignment with changing macro-economic conditions and the emergence of new preferences, investments capabilities and land use for the resettled farmers. Thus, there should be separation of policies that are considered short term and those that would emerge in the long run (Lebert, 2010).

2.5 Formal and Informal Land Markets

There has been a steady growth in both informal and formal markets for land in both east and southern Africa. This observation was made in such countries as Malawi, Kenya, Zambia and Uganda where there is a positive association between population growth patterns and the rate of increase in transfers of land to freehold tenure. This is linked to pressures for population growth, increased commercialisation of agriculture and increased incidences of private purchase of land. In fact, land sales are much higher in east Africa than any other African region (Bellemare, 2009). Research show mixed results on land sales and household sustainability. Some studies have shown that land transactions are positively correlated to the individual households' ability to sustain food security going forward, while other studies show that households that sell land end up on the labour market, unable to sustain their livelihoods. In this part of Africa, the principle of individualisation of property rights and land markets evolution within customary lands is not considered an alien phenomenon (Moyo, 2004).

Traditionally, customary tenure, by allowing selling, inheritance and loaning of cultivated land in a way is an indicator of recognition of private rights. The relationship between agricultural yields and private property rights in countries such as Rwanda and Kenya have been observed to be weak. This is because indigenous land tenure institutions are not considered to limit agricultural productivity, and farmers feel sufficiently secure to continue their farming activities without the fear of being removed from their land (Bizimana, 2011).

Also observed were incidences of land purchases and rentals done informally in the region, and this was more widespread when transfers involved unrelated and non-family individuals. Most of the arrangements are limited in duration and these include sharecropping agreements, fixed rentals, and pledges (Chamberlin and Ricker-Gilbert, 2016). Most of the land sales do not always involve a once-off payment for transfer of complete land rights. Among migrants such things as tenancies with time may develop into land purchases. Land transactions may comprise an indeterminate transfer for part of the rights, with compensation coming in-kind and not necessary through cash transactions. It is however noted that in Africa, formal markets for land have developed slowly through initiatives towards registration of land, governed with laws and regulations, especially under former colonies. Tanzania is an exception though because land purchases in Sukuma area were recorded as early as 1800 A.D (Moyo, 2004).

Outright sale of land has been considered a loss for the seller, especially where the seller is a poor farmer, as such pieces of land are often sold below market value and the purchaser ends up benefiting. Moyo (2004) noted that most land sales are done in periods of distress, implying a permanent loss to the distressed poor. Poorly endowed and food insecure households invest less in agricultural productivity or are less actively involved in land markets as more resources are spent in reducing risks associated with their farming activities. The African experiences of

reforms in land tenure have been such that they turn to perpetuate concentration of land within the urbane class of the society, foreign investors and state interests while excluding the poor from accessing the land. This concentration is primarily driven by leasing and concessions and creation of freehold land markets (Fenske, 2011). In order to understand issues of efficiency, equity and decisions to participate in rental markets, the section below reviews related studies that are critical to this particular study.

2.5.1 Land Rental Markets Experiences in the Rest of the World

The potential benefits of land rental markets are to allow more flexible adjustments of the land area used with relatively low transaction costs; to require only a limited capital outlay, thereby leaving more liquidity available for productive investments rather than locking it all up in land; to facilitate easy reallocation of land toward more efficient users than the current owners; and to provide a stepping stone toward landownership by the landless (World Bank, 2006). However, rental markets can also have problems with (a) investment incentives because of the lack of long-term security, (b) segmentation of land rental markets with insecure property rights, and (c) access to credit due to the absence of collateral options. Several of these potential problems depend strongly on the nature of the rental contracts, on the institutional environment affecting property rights and enforcement costs, and on government regulation of rental contracts. Tenure security problems refer to two separate, but interrelated issues: the security of property rights for the owners, and the security of operation for the tenants.

Security of property rights is a condition for the efficient operation of land rental markets. Where land rights are not secure, landlords who rent out will run the risk of not being able to claim their land back and will restrict renting of land to the same ethnic or social group, constraining positive equity and efficiency effects. Secure property rights in land transactions

requires transparency and enforceability of rental agreements, and the presence of reliable conflict resolution mechanisms (World Bank, 2006). An important critique on land rental markets is that rental agreements, which are temporary by nature, provide insufficient incentives for efficient farm investments by tenants. In Western Europe, governments have introduced legislation to improve tenant security by imposing minimum lengths for rental contracts and by regulations for compensating tenants for land improvements and investments (Holden, *et al,* 2016), which are discussed below.

In Western Europe**,** land renting is widespread but is varied strongly among countries, with more than 70% of farmland rented in some countries, and less than 20% in others. These variations in land renting have historical and institutional roots which are reflected in different landownership and rental regulations. In some countries, rental conditions for small tenants were improved through regulations, while in others, governments helped tenants to become owners of the land (World Bank, 2006). The renting of land is also related to how land is passed from one generation to the next in farming families. There are several patterns of succession and inheritance of farms and land in Western Europe, with significant impact on the land markets (Deininger *et al,* 2013).

The importance and nature of land renting has changed significantly throughout history. Historically, European countries were dominated by large landlord-small tenant relations with weak bargaining power for tenants, resulting in poor tenure security and few tenant rights, albeit with significant variations across the region. Changes in the importance of land rental reflected changes in institutions and in economic and political conditions (Vranken and Swinnen, 2006). One can, in broad terms, distinguish two types of policy strategies to improve the situation of the tenants. The first strategy was to improve the rental conditions for the

tenants through regulations. The second strategy was to help the tenant become the owner of the land. The first strategy was followed in countries such as Belgium, France, and the Netherlands, where rent regulations were introduced that focused primarily on improving the tenure security for farmers. These were not introduced all at once, but incremental increases throughout the 20th century led to a situation where farmers no longer wanted to purchase land because their tenure security was very high, and they could use their capital for other investments. In these countries, the rental share is relatively high (Vranken and Swinnen, 2006).

The second strategy, to help tenants become landowners, was the dominant strategy in countries such as Denmark, Italy, and Ireland. There, the government set up state funds to purchase farms for poor tenants, or to subsidize the purchase of land by poor tenants, either directly or through regulating prices, subsidized loan conditions, or tax benefits for purchasing land. Notice that in all these countries, the share of land rental is relatively low. The most dramatic impact occurred in Ireland, where almost all land was rented in the beginning of the 20th century, but this share has declined to around 17 percent today. In summary, the same policy objective led to different policies, different institutions, and different tenure situations in Europe (World Bank, 2006).

In Latin America, one would expect considerable land renting given the high inequality of landownership. While land renting can be efficiency and equity enhancing, relatively limited renting is going on in several Latin American countries. The reason appears to be the high transaction costs, insecure property rights, and restrictions on rental markets. In particular, weak property rights and the lack of reliable conflict resolution mechanisms constrain rental transactions. Landowners are reluctant to rent out land for fear that tenants will establish a

claim to the land. Hence, rentals are few, informal, short-term, and often limited to closely related people to facilitate enforcement (Aryal and Holden, 2013).

In Asia, there is considerable variation in land tenancy across countries, reflecting a variety of factors. In the East Asian transition countries, China and Vietnam, land rental markets have developed only slowly in the first decade after land reforms. With high rural poverty and high labour/land ratios, most rural households used their land themselves to provide income and ensure food security. Other reasons for this scenario are regulations and rights insecurity. However, since the mid-1990s, land rental markets have developed rapidly as incomes have grown, off-farm employment opportunities have emerged, property rights have become more secure, and rental restrictions have been removed (Deininger and Jin, 2003). The land rental market has allowed land reallocation across households with differential endowments or abilities in an environment of rapid economic growth and has thus contributed to significant gains in efficiency and equity (Dwayne *et al*, 2000).

In summary, there is considerable evidence from across the globe that land rental markets can help to improve efficiency and equity. These effects are to some extent conditional on a variety of factors. The evidence indicates that land rental markets have considerable potential to improve productive outcomes, suggesting that failure to harness their potential could forgo large equity and productivity benefits. To realize these benefits, governments need to ensure that tenure security is high enough while avoiding unjustified restrictions on the operation of land rental markets (World Bank, 2006).

2.5.2 Lessons from Regulation of Land Rental Markets

Rental market regulation is critical in managing such a market and there is evidence of a number of countries that have regularized rental markets. In a study in Nepal, Aryal and Holden (2013) found that high-caste landlords still dominate and rent out land to other high-caste households or to low-caste more land-poor households. They established that low-caste households are rationed in the market. Even though they are more efficient in using the land as Marshallian inefficiency is not revealed in their contracts, many landlords prefer to rent out their land to other high-caste households where the study revealed substantial inefficiency. Due to tenure insecurity, many landlords do not dare to rent out to the more efficient and land-poor low-caste tenants. The tenure insecurity created by the land-to-the-tiller policy has therefore reduced the land access for land poor low-caste households who only can get short-term informal land contracts. It has also resulted in less efficient land use due to the choice of less efficient tenants and rapid turn-over of tenants that do not have the incentive to work hard to get their contract renewed (Aryal and Holden, 2013). The effects of this tenancy reform have therefore been the opposite of its intention. Caution is required when attempting to improve land access to the poor through the land rental market. West Bengal in India had a more successful tenancy reform called, Operation Barga. This reform strengthened the tenancy rights of tenants by prohibiting eviction and putting a ceiling on the share (25% with no cost sharing and 50% with full cost sharing) of the output that could be paid to their landlords. Holden, Bezu and Tilahun, (2016) assessed the impact of the bargaining and the tenure security effects of this reform using aggregate data. They found that tenants increased their investments on the land due to the increased tenure security and the fact that they could retain a larger share of the marginal product from the land.

A study by Deininger *et al* (2013) compared productivity and investment on rented land of tenants with that on their owner-operated land in Bangladesh. They found that productivity and investment levels were significantly lower on the rented land. Rented plots were 26% less likely to have received labour-intensive investments and 7% less likely to have irrigation investments while productivity was 14-16% lower. Possible reasons proffered include the rigidity of the reform, and the fact that tenants are not full claimants of the marginal return to their investments that cause the full potential of secure property rights not to be realized. In Ethiopia, the regulation of the land rental market goes back to the prohibition of both land sales and land rentals under the Derg regime from 1975 while short-term rental contracts were allowed under a new regime after 1991 (Holden, Bezu and Tilahun, 2016). The constitutional right to access land for all rural residents without an alternative source of livelihood was behind the land redistribution policies, the maximum farms size restriction of 10 ha under the Derg regime.

2.5.3 Improving the Functioning of Land Sales and Rental Markets

The fear of the undesirable consequences associated with land market operation in an environment characterized by market imperfections seem to have in the past motivated policy-makers to impose restrictions on the operation of such markets. Administrative restrictions on land sales have, however, generally proven to be costly to enforce and were often ineffective in preventing outcomes that were undesirable from an equity perspective. Administrative restrictions on land sales typically take the two main forms of limits on tradability of land and ownership ceilings. In many cases beneficiaries of land reform or settlers on state-owned land are not allowed to sell or mortgage their land. This would deprive them from accessing credit - often in the establishment phase when credit would be most needed. It has been shown that, in the presence of such restrictions, small-holders are forced to resort to less efficient arrangements (e.g. usufruct-mortgaging and the associated use of wage labour contracts) to

gain access to credit (Otsuka *et al,* 1992). The desirable goal of preventing land reform beneficiaries from selling out in response to temporary shocks would be better served by adequate training and preparation, as well as ensuring that they have access to the resources and know-how necessary to establish productive investments, and in complementary reforms of credit markets and institutions (e.g., liberalizing interest rates). Permanently precluding land reform beneficiaries from rental or sales is likely to reduce efficiency by permitting the existence of large tracts of uncultivated or less than optimally utilized land reform land; allowing for some adjustments in response to differential settler ability may be preferable to the losses imposed by this measure (Deininger and Feder, 2014).

Another restriction intended to facilitate the breakup of large farms and the associated sales of land to small producers has been the imposition of land ownership ceilings, often together with land taxes. Although little rigorous evidence concerning the impact of such ceiling laws exists, they appear to have imposed extra cost on landowners who often took measures to avoid them and, on the bureaucracy, which had to decide on exceptions to allow for the utilization of economies of scale in plantation crops - a process conducive to red tape and corruption. Even in the most favourable case such ceilings would constitute a temporary second-best measure to allow government to deal with the problem in a more thorough way (Aryal and Holden, 2013). If, as suggested by the evidence, the reason for land concentration is not in a relative inefficiency of small farms but rather imperfections and policy-induced distortions in product and financial markets and the limitations on small farmers' ability to self-insure, it would be more effective for government to focus on the root of the problem rather than trying to deal with the symptoms. This implies that concerns about potential adverse equity impacts of land sales should be addressed by helping small farmers to compete, taking measures to improve

the functioning of financial markets, and providing relief to avoid distress sales in cases of disaster (Deininger and Feder, 2014).

Land taxation: A moderate land tax levied and collected by local Governments can make an important contribution to effective decentralization. The theoretical attractiveness of a land tax derives from two reasons. On the one hand, taxation of land is one of the few cases of a lump sum tax where using asset rather than production values- the effective tax rate on income decreases with the income generated from the land, thus encouraging more productive resource use. On the other hand, a land tax is one of the few taxes that can provide revenues for the local governments, and that -through the capitalization of local amenities in land values- establishes a direct relationship between tax level and the benefits received by taxpayers (Deininger and Jin, 2003).

Several countries have attempted to implement progressive land taxes, where the tax rate would increase with land area or value, as a means to make land speculation less attractive and to induce large landowners to use their land more intensively or to break up large estates. Experience with this instrument has not been very positive as implementation and collection of progressive land taxes have been frustrated by political difficulties and resistance in countries as diverse as Argentina, Bangladesh, Brazil, Colombia, and Jamaica. Deininger and Feder, (2014) used simulations to show that a progressive land tax by itself is unlikely to be effective even if it is enforceable. Effectively collecting a uniform land tax may be a more realistic goal. However, in environments characterized by high risk, introduction of a land tax may not be desirable for equity reasons and a mix of land tax (which will have to be paid regardless of realized output) and output tax (contingent on realized output) as argued by Dwayne, Brandt, and Rozelle, (2000). To avoid negative equity consequences that might be

associated with a land tax, a number of developing countries exempt small producers below a certain size from the need to pay land taxes.

Land rental markets: Their potential shortcomings notwithstanding, rental markets are more effective than sales markets in moving the distribution of operational holdings closer to the optimum. The analytical literature suggests that both the efficiency and the equity impact of the land rental markets depend on tenants' bargaining power, i.e. their reservation utility. Mere prohibition of certain contractual forms that do not change the underlying forces and may lead to a worsened resource allocation by forcing market participants to resort to even less efficient arrangements. Rather than recognizing the potential of land rental markets to improve agricultural productivity and to augment the welfare of landless poor people, governments have often focused efforts on restricting tenancy markets through advised bans on share tenancy and limits on cash rental fees. From a theoretical point of view, the expected impact would be ambiguous. On the one hand, there is a negative direct effect as prohibition of tenant eviction precludes the landlord from using the threat of eviction as a device to elicit higher effort by the tenant and would therefore be expected to reduce productivity. On the other hand, the reallocation of bargaining power in favour of the tenant would increase incentives to supply effort and thus productivity. While one would expect the adverse incentive effect to dominate at low wealth levels, the positive effect would be dominant for farmers with intermediate wealth (Dwayne *et al;* 2000).

Empirically, district level data from West Bengal suggest that effective implementation of tenancy registration which protected tenants from being evicted and fixed an upper ceiling for rent yielded significant productivity gains of about 40% - larger than the static loss estimated by Shaban (Deininger and Feder, 2014). While this suggests that tenancy reforms can be

effective, one should not forget that the study area is the only state in India where regulation of tenancy was actually implemented, that costs of implementation need to be considered in assessing the economic benefits from such a measure, and that tenancy reform may not have been the only alternative available.

Regulatory interventions such as tenancy regulation lead to reduced investment incentives on the part of the landlord, while tenants may not perceive sufficient security to invest at what would be a socially optimal level. The trade-off between the positive effect of greater security to tenants and the investment incentives of owners is not easily balanced. Therefore, scarce financial and administrative resources might be better spent in efforts to foster general pro-poor development (e.g. education, infrastructure, credit and insurance, markets, and off-farm employment opportunities) that improve the bargaining position of would-be tenants, and that facilitate more fixed rent contracts, than in trying to enforce tenancy regulations. The difficulty of striking such a balance is illustrated by the fact that, in areas where tenancy was prohibited, wage labour (which is less conducive to productivity than tenancy or owner operated farming due to lower effort by workers) is common, leading to inefficient factor substitution away from labour (Deininger and Feder, 2014).

2.6 Key Determinants of Land Market Participation

The shadow price of land for different types of heterogeneous agents is determined by the agricultural production function, the households' inherent managerial ability, and by a number of imperfections in labour, credit, and land markets that are common in rural areas. If credit and land rental markets were perfect, the supervision costs associated with the use of hired labour would make smaller farms more productive and would lead households to lease in or

lease out the amount of land required to maintain a uniform ratio of family labour endowment to operated area, irrespectively of the land ownership distribution (Feder and Fenny, 1991).

However, imperfections in other markets may change this, with implications for the functioning of land rental and sales markets. If, in the presence of credit market imperfections, supply of working capital depends on the amount of land owned, the optimal size of the operational holding would vary systematically with size of the owned holding even if land rental markets were perfect (Feder and Fenny, 1991). While the magnitude (and direction) of this effect would depend on the elasticity of output with respect to effective labour and of labour effort with respect to supervision, it can overwhelm the productivity advantage of family farmers and give rise to a positive relationship between owned farm size and productivity. In addition to this, capital and insurance market imperfections may also affect the production activities of poor producers – possibly leading them to pursue less risky but also less productive activities (Deininger and Jin, 2003). Below a review of the factors which affect the productivity of farmers, and thus determine their demand for land is presented.

Economies of scale: The presence or absence of economies of scale will systematically affect the shadow price of land for different farm-size classes. Possible economies of scale can arise from the presence of indivisible factors of production or cost elements leading to an initial range of farm size where the average cost of production declines with farm size (Feder and Fenny, 1991). In cases where other markets function reasonably well, optimal farm sizes tend not to exceed the scale at which family labour is fully occupied (utilizing seasonal hired labour for specific tasks). Agricultural activities where significant economies of scale in the production process exist are few (Deininger and Feder, 2014). Some economies of scale are associated with the processing and marketing of many agricultural products, but this does not

have important implications for the unit cost of farming operations as long as competitive markets for outputs and inputs exist. Alternatively, access to such markets is sometimes arranged through cooperatives. Only for a few plantation crops such as sugarcane, bananas, or tea can the need for immediate large-scale processing or marketing transmit economies of scale from the processing stage to production. To reap the economies of scale associated with the former, production of these crops is generally organized on a scale that corresponds to the optimum scale of the processing factory (Deininger and Feder, 2014).

Credit market access: According to (Deininger and Feder, 2014), a key reason why land markets' transfer from large to small producers are rarely observed is that it is very difficult for small farmers to access markets for credit and insurance. This implies that, on the one hand, the value of accessing credit markets is capitalized in land prices, making it very difficult to acquire land in the sales market with the expectation of paying off the debt from agricultural profits alone without recourse to equity. On the other hand, credit market imperfections that increase the shadow price of credit for small producers will reduce small farmers' competitiveness in the land sales market and at the same time outweigh the supervision cost advantage they enjoy (Deininger and Feder, 2014).

Asymmetric information and moral hazard lead generally to quantity rationing in credit markets (Aryal and Holden, 2013). Formal credit markets can overcome the problem of asymmetric information by utilizing a collateral requirement. However, the costs of and political impediments to foreclosure on smallholders' land are often quite significant. This is part of the generally high transaction costs associated with providing credit to small producers. In informal credit markets, close familiarity and social control is used to select promising clients or projects. This is quite costly as the scope for effective supervision is limited.

Furthermore, informal lenders have only limited scope to diversify covariate risks, and they typically do not provide much long-term credit. Interest rates on informal loans are thus high. Thus, both limited availability of credit and high cost of borrowing of credit and high cost of borrowing will prevent those who do not have accumulated savings from acquiring land. Credit market imperfections can thus offset small farmers' supervision cost advantage. In the case of Sudan, for example, yields for virtually all crops are lower for poor (small) farmers and higher for rich (large) farmers, thus turning the farm-size productivity relationship upside down. Furthermore, the land rental market leads to land transfers from poor and labour-abundant small holders, to rich and relatively labour scarce households (Deininger and Feder, 2014). The reason is that capital market imperfections combined with reasonably functioning land and labour markets and a technology that is not supervision intensive make it more attractive for small credit-constrained households to rent out land and work for a wage than to engage in owner-cultivation without capital inputs. In contrast, using panel data from Burkina Faso, an inverse farm size-productivity relationship was observed even though a positive correlation found between yields and cash inflows from non-agricultural employment suggests the presence of capital market imperfections (World Bank, 2006). The conclusion is that imperfections in land, labour, credit, and insurance markets have to be analysed together. Efforts at land redistribution that do not simultaneously address credit market imperfections may be costly and ineffective.

While the discussion of costs associated with land rentals in the literature is less extensive, government regulations appear to have reduced the amount of land leasing below what will otherwise take place (Deininger and Feder, 2014). Even in countries that avoided the imposition of explicit restrictions on tenancy, which were associated with significant efficiency losses, the threat of expropriative land reform in many countries implied that renting out land

to more productive smaller producers exposed the landlord to a considerable risk of losing ownership rights in the course of land reform. To prevent this from happening, many landlords appear to have evicted tenants altogether, resorting instead to mechanization, cattle ranching, or cultivation using a hired labour force (de Janvry *et al;* 2001). The implications for land rentals, though not rigorously quantified in any of the cases appear to have been considerable.

2.6.1 Land Rental Market Participation Studies

Jin and Jayne (2013) characterised smallholder farmers in Kenya who were renting land in and out and the associated household income impacts. Their conclusion highlighted five key findings. The first is that, rental markets contributed to increased productivity of agriculture when households who are less efficient release land to those who are better in efficiency. Secondly, results suggested that there is scant support for widespread apprehension that markets for land cause land to be concentrated among rich households. On the contrary, land rental markets in Kenya appeared to be promoting land transfer to smaller farms from larger farms. Farm size was found to be inversely correlated to land renting-in land but directly related to renting-out land (Jin and Jayne, 2013). The Gini coefficient for size of land *per capita* declined to 0.57 from 0.60 after land reallocations.

Thirdly, the study also shows that renters are making for themselves net revenue twice as much from crop production compared to the rental that they are paying to the landowner. There is an inverse relationship between rental payment net revenue ratio and size of farm of the renter. This ratio was prior to renting above 2.7/1 among smallest smallholder farms but declined to 1.6/1 for 20% of renters with biggest farms. A fourth conclusion of the study was that crop and total incomes are higher for those farmers that are involved in land rental markets and the differences were statistically significant. Land renting in had the effect of increasing total

income by 6.7% and crop income by 25.1% on average after accounting for rental and other production costs. This increase in total and crop incomes was found to be uppermost for farms which were smallest (41.6% and 11.4%) in comparison with households who had the biggest size of landholding (15.9% and 3.8%). While the study seems to endorse the policy of promoting land rental markets, Feng (2008) however noted that rental markets for land alone are insufficient to eradicate poverty. Findings indicate positive but statistically insignificant effects on poverty reduction. Lastly, the study concluded that land rental markets do not bring into equilibrium labour-land ratios, mostly due to high costs of transactions and other market imperfections (Jin and Jayne, 2013). Labour-land ratios for renting households were noticeably higher than those for non-renting households.

A study by Hou *et al* (2017) on the determinants of renting-in decisions by farmers in apple production region of China identified more cultivated land as having a negative effect on renting-in. Households who have more fixed assets are those with large tracts of land and rich in land endowments, and these fixed assets investments are encouraged by efficient insurance and credit provisions. Productive expenditure and household income are increased by renting-in decisions. Nyangena (2014) in a study in Kenya identified the determinants of land rental market participation in Laikiapia District. The results showed that rental markets have imperfections but offers positive efficiency and equity benefits. Poor landless households were able to access land for income and livelihood purposes through rental markets, a fate that was impossible with land sales. In a study carried out in Ethiopia to determine farmer decisions to participate in land and labour markets using multivariate Probit estimation methods (Shifa, 2016), results showed that access to land and labour resources on factor markets is increased when households are endowed with capital (both physical and social) and livestock assets such as oxen and farming skills. On the other hand, resource poor farmers are likely to rent-out land

and look for off-farm employment opportunities. The study recommended that authorities should focus on developing off-farm employment opportunities. This reduces poverty given the complementarity between renting-out decisions and off-farm employment opportunities (Shifa, 2016).

In a study by Rahman (2010) in Bangladesh, results showed that failure by government to ensure equity in the scarce land resource allocations had resulted in prevalence of land rental markets. A bivariate Tobit model was used to determine the joint factors affecting the decisions to rent-in and rent-out land. The model was used due to high positive correlation between renting-in and out of land. Renting-in was significantly influenced by lower cultivated land, large livestock herd size, high capital assets ownership, as well as general poor area infrastructure and soils. On the other hand, higher levels of cultivated land, poor extension contact, low family sizes, inadequate farm livestock and capital assets and higher levels of education were associated with households' decisions to rent-out land. The study recommended a strong interventionist approach by government to balance renting-in and renting-out decisions through investments in education, infrastructure and extension (Rahman, 2010). Amare and Beyene (2015) examined participation and intensity of land rental market involving 118 households in Oromiya Region, Ethiopia. The study shows that household age, and land size has a negatively significant effect on decisions to rent-in land. The same variables had a negative effect on renting-out decisions, while low livestock herd size had a positive influence. The efficient functioning of land rental markets was being impeded by tenure insecurity, credit market imperfection and poor state of infrastructure. Amare and Beyene (2015) recommended strengthening institutions involved in land rental markets, including credit providers and public awareness as critical for the success of these markets.

2.7 Efficiency in Farmland Rental Markets

In developing and transitional economies, which are characterised by tenure insecurity and market imperfection, rental markets often have better allocative efficiency and play important roles than sale markets (Deininger and Jin, 2009). From an efficiency perspective, the land rental market entails an opportunity cost to underutilized and unused land and this reduces the expected efficiency outcomes. This promotes allocative efficiency, as rental income is preferred by owners of underutilized or idle land than just leaving land to fallow. Consequently, transactions conducted in a land rental market which is efficient tend to shift farmland from less effective to more effective farmers, implying those that have effective capabilities to farm (Crookes and Lyne, 2003). Through renting, farming efficiency can be improved by land consolidation and consequently benefits associated with scale economies of new technology adoption are realised (Hung *et al*; 2007).

Furthermore, efficient land rental markets are critical in overcoming imperfections in insurance, credit and machinery markets by interlinking contracts such as crop sharing arrangements (Otsuka *et al*; 1992). Both the lessor and lessee stand to benefit from voluntary transactions conducted in an efficient rental market. Moreover, renting does not create a landless class, and where insurance and credit markets are imperfect or missing altogether, it can help farmers avoid permanent loss of land following adverse events such as crop failure. According to Nieuwoudt (1990), an efficient land rental market is characterized by reduced transaction costs and land tenure security. Deininger and Jin (2009) define transaction cost as the cost associated with obtaining information, bargaining positioning and arriving at a group decision, as well as enforcing decisions made. Transaction costs includes the costs of searching for trading partners and of negotiating and specifying the terms of the contracts, renegotiating, monitoring, enforcing the terms of contract, and danger of losses associated with contract

breach. The higher the transaction costs, the less efficient are the markets, and both legal infrastructure and social norms turn to influence the transaction costs (Williamson, 2000).

The legal systems have a bearing for transaction costs in land markets through their vigour to enforce property rights (Place *et al*; 1994). Lessors perceive high risk in a rental transaction if they lack confidence in the legal system and its ability to defend their property rights against a claim made by tenants. This tends to increase the offer price for the lease as transaction costs are raised by the perceived high risk (Lyne and Thomson, 1997). Similarly, transaction costs are also raised when the lessee perceive that the duration of their contractual use right is not assured and may result in a possible threat of eviction. Additionally, social capital is considered to be an important asset in consideration of transaction costs and consequently marketing efficiency (Williamson, 2000). It is defined as social networks that can facilitate productive actions between individuals (Moran, 2005) and encompasses such important factors as trust (Le *et al*; 2013). Trust is critical to social capital as it has an influence on transaction cost reductions, such as finding suitable trading partners and no-ncompliance (Raiser, 2008).

Chamberlin and Ricker-Gilbert (2016) characterized smallholder participation of rural land rental markets in Zambia and Malawi and associated welfare impacts. Results showed that rural rental market participation was higher in densely-populated Malawi than in lower-density Zambia, reflecting the role of land scarcity in driving rental market development. The research concluded that rental markets contribute to efficiency gains through facilitation of land transfer to producers who are more productive in both countries. Land rental markets were found to have the purpose of re-allocating land resource from those farmers with abundant land to those with limited land holdings. Results also showed that returns to renting in land varied strongly with scale of production. This implied that tenants producing more have higher margins to

renting in, and many smallholder farmers who rent in are doing it at an economic loss. The impacts of renting out (i.e. participating in markets as landlords) had mixed results, with Malawi having overall negative returns to landlords while in Zambia returns to landlords were negligible (Chamberlin and Ricker-Gilbert, 2016).

Feng (2008) did a study in China's Jiangxi Province focussing on technical efficiency, rental markets and off-farm employment for farming households. Using a one-step stochastic frontier approach, Feng (2008) established mean technical efficiency in production of rice ranging between 0.36 and 0.97, while the average was found to be 0.82. Results also showed that households participating in land rental markets had higher technical efficiency compared to those not participating.

Jin and Deininger (2009) examined the direct effects of rental markets in China. The results suggest that in a growing economy, land rentals can increase productivity by much as 60%, translating into tenants' increased well-being estimated at 25%. The extent of these impacts can imply that understanding the major factors impacting the involvement of rural farmers in rental markets may help in complementing the large literature on contract choice. However, the same results provided no evidence that the existence of markets for land rentals had any effect of disadvantaging the poor. The evidence from growth effects and factor equalization showed that improvements in education levels led people to move out of the farm in search of non-farm opportunities. This created room for land-poor farmers to increase their incomes by accessing additional land for renting. As households' wealth increases, so does their exposure to off-farm development and opportunities, thereby increasing supply of land rental markets. Though higher transaction costs in the study significantly reduced participation in rental markets, the scale concerned was miniature when evaluated to greater institutional factors.

Increased off-farm wages and properly functioning rental markets can increase growth and harmonize customary channels of investments in activities related to land and resource mobilisation towards markets development (Jin and Deininger, 2009).

2.8 Social Equity in Land Rental Markets

Two broad conceptual perspectives underlie land rental markets and equity debates on possibility of poor households to profit from these markets. These are the optimistic theory which says the smallholder farmers are poor but efficient and the pessimistic theory which says that poor but efficient smallholder farmer is unattainable under land rental market system (Tian *et al*; 2012). The poor but efficient debate assumes that there is a converse association between productivity and size of land since economies of scale in producing agricultural products are limited (Tian *et al*; 2012). The arguments are that a converse association between size of land and efficiency implies a productive superior smallholder farm in comparison to large commercial farms (hired-labour). Subsequently, where there is an initial high unequal land ownership, land rental markets offer a chance to cut the gap between the landless poor and land-abundant rich (Tian *et al*; 2012). In line with this argument, land rental markets enhance distributive equity through transferring land to poor but more efficient smallholder farmers (Deininger *et al*; 2008). Indeed, there is global evidence to support such a claim (Deininger and Feder, 2001; Deininger and Jin, 2006). In Western Ghana for example, land rental markets brought to par land distribution from different income groups (Deininger *et al*; 2016).

The other negating perspective, the 'poor but inefficient farmer' argues that land rental markets, though providing access to land to the poor, cannot guarantee equity enhancement. This discourse argues that land on its own cannot achieve equity and productivity but is affected by a myriad of complicating factors mainly relating to access to credit and insurance (Tian *et al*;

2012). Where credit markets are close to perfect functioning, a positive association between productivity and farm size is highly likely than simply overcoming labour market imperfections (Jin and Deininger, 2009). Tian *et al.* (2012) found from a study in Sudan that the ability of large-scale farmers to access capital from financial markets had led to higher productivity of all their crop produce over those of smallholder farmers. Consequently, land is transferred from labour-abundant but poor farmers to labour-scarce households (rich large-scale farmers). The argument is that credit market imperfections can cause land renting and wage labour to be attractive for smallholder farmers who are constrained on credit than being involved in own production as evidenced from India (Tian *et al*, 2012).

In some circumstances where there is limited access to credit, participation in land markets may systematically be a preserve of wealthier and land-rich families (Deininger and Jin, 2009). In such instances, land markets may end up being regressive on both efficiency and equity outcomes. Practical facts on this discourse is varied in Africa with research showing net land transfers from land-scarce to land-abundant farmers (Deininger *et al*; 2008; Ghebru and Holden, 2009). Others report net transfers in a reverse order (Lunduka, Holden, and Øygard, 2009; Jin and Jayne, 2013).

Tian *et al* (2012) studied markets for land rental impacts on distribution of land. A Gini coefficient was used for measuring land holding changes pre and post surfacing of land rental markets. This was accompanied by a multivariate analysis as a way to assess rental market activities distribution by income groups within villages. The specified model had rented-in land as an explained variable, with the inclusion of the following as independent variables; labour force, land productivity, initial distribution of land, province and income composition. Results showed that an increase in land holding disparity within villages from 'land grabs' in the rental

market, which means that rental markets for land are inadequate to limit inequality in land in rural China (Tian *et al*; 2012).

Akter *et al.* (2006) researched on India's rental markets for land with equity and efficiency considerations. Findings were that there is widespread and relatively efficient land market participation in 12 villages of Andhra and Madhya Pradesh. The Probit model used showed that the major beneficiaries in rental market transfers were those who had more assets to invest, those with relatively smaller farms with higher input output ratios, families with more adults available for labour, fewer off-farm opportunities and younger and full-time farmers. Renting in was also found to be dominant in areas not fully integrated within mainstream infrastructure and institutions such as villages (Akter *et al*; 2006). Land rental markets had positive equity implications in those villages with high land rentals and where land distribution was high without land rental markets. The study recommended the promotion of policies that favour land rental markets and more efforts towards the advancement of infrastructure investment and off-farm employment development capacity.

2.9 Conclusion

The chapter reviewed land tenure and related issues to bring out an understanding of the subject matter of the study. Though land has been recognised as a fundamental resource for sustainable development, over the past century, focus on this subject matter has not been consistent in both academic and development discourses. For many of the countries that have reformed their land tenure systems, the route has been through land reforms.

Zimbabwe has experimented with almost all known tenure systems in its land tenure reforms since independence. There is no evidence of any tenure system that has been acknowledged as

having been successful and having achieved both equity and efficiency goals, though the macroeconomic environment has had a greater sway over the past few years. Even the freehold tenure which is associated with increased growth in production of most commercial agricultural products has more to do with the support that was provided then by the government rather than tenure on its own. Evidence suggests that in communal and old resettlement schemes, informal markets for land have developed with farmers selling and leasing out land.

The FTLRP shows a lack of consistency in policy or its adherence. Studies have shown clear differences depending on geography, livelihoods, regional and local administration together with related power bases. Such disparities reflect in production and perceived land tenure systems as well as in productivity. Studies have revealed that while there are a sizable number of beneficiaries for the land reform under A2 model, only 150 farmers have been given 99-year leases. In addition, very few farmers are paying the established rentals nationally, which is accounted by both economic and political reasons. A number of farmers are involved in sub-letting and rental practices, even though this is happening at an informal level. The major challenges that have been identified relating to current farmers are security and state of tenure for both FTLRP and prior beneficiaries and land policy administration.

There is no single theory that underlies studies in land tenure and associated impacts on farmer decision making, efficiency and equity. The major theories that have been identified relate to farmers' perceptions, farm production, and economic efficiency and transaction costs. Together, these theories serve as the body of knowledge for the study at hand. Research has shown that the factors that determine participation in land markets are: scarcity of land (whether densely or lower populated), household characteristics, land endowment and transaction costs factors. There are mixed results on who benefits more from rental markets,

whether those who rent-in or out, but the indication from Southern Africa are that the scale of production is positively related to returns and incomes, with small farmers being on the receiving end, unless there is a strong off-farm market for labour. Studies in Asian countries have shown that farmers participating in rental markets for land have higher probabilities of being more efficient than those that do not. While transaction costs can reduce participation in land rental markets, broader economic forces are more important in defining the level of participation. The results of most efficiency studies point to farmers being involved in land rental markets as better off than those who do not, though efficiency tends to diminish as size of land is reduced. Results of studies on equity and rental markets are mixed, some showing that they increase land disparity while some showing that they reduce it. For those studies where disparities increased, the factors that led to that were strong asset base, higher technical efficiency, more labour and low non-farm opportunities. In studies showing increased equity, high rentals and strong distribution of land were contributing factors.

Having put forward the objectives of the study in Chapter 1 and the supporting evidence in this chapter, the next chapter looks at the methods for achieving all the objectives.

CHAPTER 3: METHODOLOGY

3.1 Introduction

An overview of how the research was conducted is presented in this chapter. It begins by giving a background of the area in which this study was carried out, which is Mashonaland East Province of Zimbabwe. This section also enunciates the background characteristics of the province, including the districts sampled, the climatic characteristics, population size and household agricultural characteristics. A detailed description of the research philosophy, strategy, population and sample is presented. The chapter then looks at the conceptual framework, which guides the research process. A description of the methodology of data collection, collection tools, field work processes, management and analysis of data is also presented. Finally, different methods of analysing data for satisfying study objectives are elaborated, including justification for the selected analytical methods.

3.2 Characterisation of Mashonaland East Province

The study was conducted in Mashonaland East Province, one of the ten provinces in the country with a population of 1 344 955 (Zimstat, 2012), representing approximately 10% of the country's total population. The provincial capital is Marondera Town. The province has an approximate total land area of 32 230 km² and is divided into nine administrative districts which are Chikomba, Goromonzi, Marondera, Seke, Wedza, Mudzi, Murewa, Mutoko, and Uzumba-Maramba-Pfungwe (UMP) as indicated in Figure 3.1. Goromonzi District has the highest population in the province, approximated at 17% of the provincial population whilst the other districts contribute between 4 and 15% each (Zimstat, 2012). The FTLRP was most pronounced in three Mashonaland provinces, namely East, West and Central. This study was undertaken in

the context of beneficiaries of the FTLRP, namely A1 and A2 farmers. Therefore, Mashonaland East Province was chosen as it has one of the highest numbers of A1 and A2 beneficiaries.

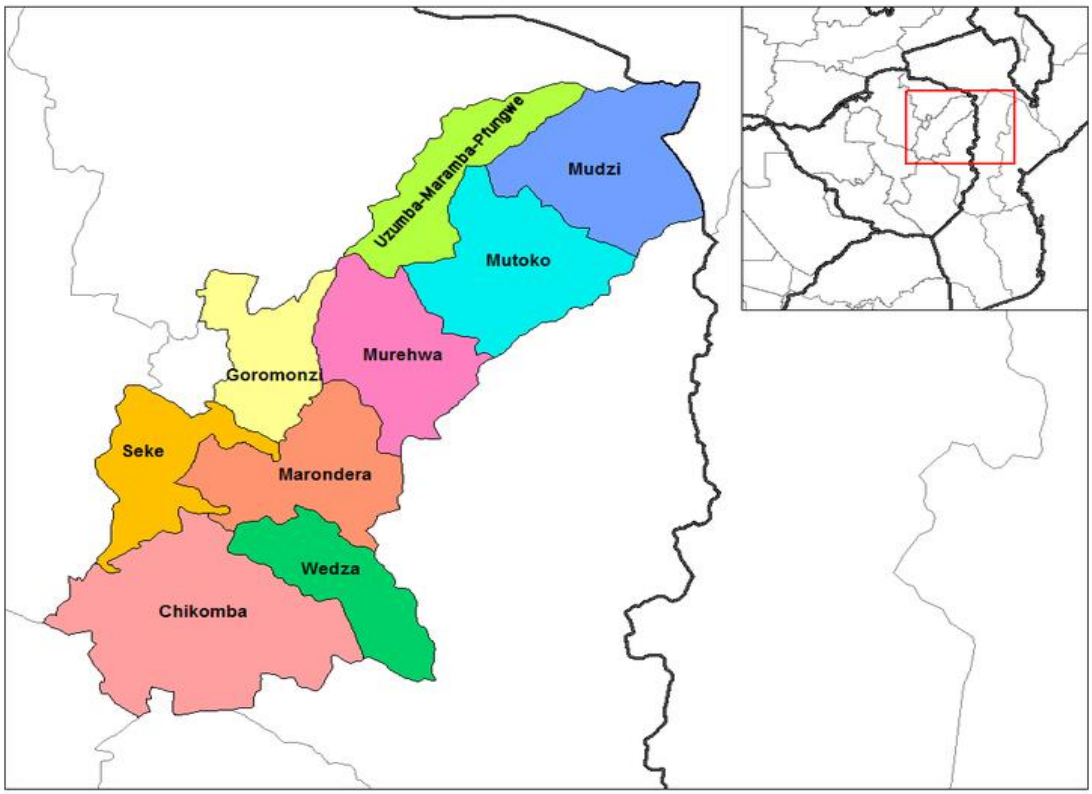

Figure 3.1: Mashonaland East Province Map[1]

The province has an estimated 326 825 households with average household size of three members. The population density of the province is 42 persons per square kilometre and 86% of the population is rural based. According to the MLRR (2016), there are 17 731 A1 and 4 700 A2 households. The FTLRP was implemented in Chikomba, Goromonzi, Marondera, Wedza, and Seke Districts since these districts had large scale commercial farms. The other districts are mainly populated with communal farming areas mostly in NR III to V, which do not support intensive agricultural activities.

[1] Source: Available from: https://en.wikipedia.org/wiki/Mashonaland_East_Province Accessed 24 March 2017

Mashonaland East Province generally consists of a flat topography and the major soil types range from clays to sandy, with just a few pockets being mountainous. Soil fertility is relatively good in those areas where commercial farmers were concentrated and poor in most areas occupied by communal farmers. In districts such as UMP which lie in agro-ecological zone IV, the soils are extremely shallow and found mostly on middle to upper slope positions, while in areas that lie in natural regions IIb, the soils are of high quality (Muir-Leresche, 2006). Land degradation is major challenge in the province and is being worsened by gold panning, deforestation and overgrazing. In addition, according to Utete (2003), following the FTLRP in the province, there have been great environmental concerns. This was as a result of the indiscriminate cutting down of trees to open up new arable land. Again, the shortage of coal has exacerbated the situation leading to the cutting down of trees for curing of tobacco.

The province lies in agro-ecological regions IIa to IV as such there is a wide variety of farming activities that are practised ranging from intensive crop farming, dairy, horticulture and the production of small grains (Utete, 2003). In NR II rainfall is confined to summer and is moderately high at 750-1000 mm (Campbell, 2003). Districts in the province that fall within NR III and IV practice semi intensive farming and semi-extensive farming respectively (FAO, 2016; Muir-Leresche, 2006). In NR III rainfall is moderate (500-750 mm/ annum) and is characterised by mid-season droughts and relatively high temperatures, reducing its effectiveness for smallholder farmers' dry land farming. There is a part of the province that borders Mozambique which lies in region IV. This region receives very low rainfall (450-650 mm) and is subjected to severe dry spells and frequent seasonal droughts (FAO, 2016; Muir-Leresche, 2006). As such, the province is considered a semi–extensive farming region with

persistent droughts in the drier regions, but in former white commercial areas, where A1 and A2 farmers were resettled, they practice dry land farming with substantial yields.

Temperatures vary from one area to another because the province is characterised by a wide range of agro-ecological regions. Generally, annual temperatures tend to rise with latitude and summer temperatures can rise to more than 37 degrees Celsius. Winters are generally cool to warm and dry. Dependence of farmers in the province on rain-fed agriculture has exacerbated vulnerability to climate change leading to increased incidences of food insecurity.

3.2.1 Agricultural Activities in Mashonaland East Province

Agricultural activities play a central role in the province with about 67% of the labour force in the province engaged in agriculture related occupations (Zimstat, 2012). Major agricultural activities are intensive crop farming, dairy, horticulture and the production of small grains (Utete, 2003). Maize is the major crop grown by resettled farmers in the province, though cash crops like tobacco and soya beans are also frequent. This is because it is less capital intensive and relatively easy to produce compared to other cash crops, especially given limited resources at the disposal of the farmer. Districts such as Wedza, Mudzi, Mutoko and UMP which are located in semi-arid parts of the province are prone to droughts and chronic food insecurity. For this reason, at times some households in these districts especially UMP and Mudzi turn to gold panning as an alternative livelihood option (FAO, 2016). Nonetheless, even those districts such as Goromonzi which lie in high potential regions are also being rendered food insecure due to persistent droughts experienced in the country. Jaenicke (2000) noted that in Mashonaland East Province, horticulture is mainly concentrated in NR II up to IV and is most dominant in Seke, Murehwa, Goromonzi and Mutoko.

Dairy farming is also practised in those districts that fall under agro-ecological region IIb mainly by commercial farmers because of the province's proximity to urban centres, particularly Harare. Other livestock production farming activities which are practised by resettled farmers in the province include cattle, poultry, pig and goat rearing. Communal farmers in the province keep cattle primarily for draught power, manure and as a store for wealth and not for beef production (Zimstat, 2012).

3.2.2 District Demographic and Agro-ecological Summaries

This section outlines the major districts in which the study was undertaken focussing on A1 and A2 farmers, with the intention of bringing out the context under which the sample was selected. These two districts are Marondera and Goromonzi. Marondera District is located about 72 km east of Harare and has a population of 29 657 households (Zimstat, 2012). It was one of the earliest centres of Zimbabwe's large forestry and farming district and marketed timber, tobacco, maize, beef, and dairy products before the land reform of 2000 (FAO, 2017).

Its growth point is Mahusekwa. Goromonzi is located about 32 km southeast of the country's capital, Harare. It covers an approximate area of 9,100 km^2. According to Zimstat (2012), the district has a total population of 224 987. This is the district with the highest population in the province constituting about 17% of the total provincial population. Prior to the land reform, the district used to have viable commercial farming activities and the major crops that used to be grown were horticultural produce such as flowers and gourmet vegetables for export (FAO, 2016). Subsistence farming is the mainstay of most smallholder farmers in the district, and they grow crops such as maize, groundnuts and horticultural produce (e.g. rape, pumpkin, tomatoes). The district is predominantly rural with less than 4 per cent of the population living in urban growth points (Zimstat, 2012). It has some of the most fertile soils in the country and receives average annual rainfall of between 750-1000 mm (FAO, 2016). The main livelihoods

of farmers in the district is cash crop production and major crops are maize, tobacco, and horticulture. It is one district that has a lot of resettled farmers, both A1 and A2 (FAO, 2016).

3.2.3 Justification of the Study Area

Mashonaland East Province was selected for this study to assess land rentals as it is one province with a high number of resettled farmers under the FTLRP, coming second after Mashonaland West Province. Secondly, there was conscientisation in the province about rentals through a comprehensive land audit by the Ministry of Lands and it is assumed that resettled farmers are making farming decisions taking into account possible future impacts of this policy. It is for these reasons that the province was chosen as the area of study. The specific districts selected for the study were chosen because they have the largest number of beneficiaries of land reforms in the province. The remaining districts are predominantly communal and old resettlement areas which have no significance to the study at hand. Also related is the fact that most commercial farming is concentrated in Goromonzi and Marondera Districts, it becomes imperative to analyse efficiency issues and the decisions to either rent-in or rent-out land for commercial purposes.

3.3 Conceptual Framework

There are three ways in which smallholder farmers' lives are impacted on by land rental markets according to theory (Holden, Otsuka, and Place 2009), namely; equity, efficiency, and welfare. Farmers are being issued with lease agreements/permits and paying state rentals. This is done within the context of moderating factors, which are governance (policy administration and macro-environment), farmer perceptions and practises, land use as well as capital and land markets. These interventions then give rise to drivers of change, which in turn results in decreased or increased use of resources. This leads to farmers engaging in land rental markets.

The ultimate goals are welfare, efficiency and equity. Equity gains are achieved from equality as a result of the reallocation of land across households with varied assets, which process occurs in a way that likely equilibrates land and non-land factor ratios (Holden, *et al*; 2009). The efficiency gains are achieved when land is transferred from less productive to more productive users. Literature postulates that welfare gains become apparent in rental markets through facilitating increased access to land for farmers as the major resource within their production system. Welfare gains can manifest in higher household incomes and food and nutritional security associated with improved equity and efficiency outcomes from land rental markets (Rahman, 2010). Figure 3.2 shows the basic elements of the conceptual framework which outlines moderating factors, mechanisms of change, intermediate outcomes, and impacts that are critical in appreciating the impacts of land policy and land rental markets. Policy includes the land rental policy and other relevant polices including the institutions and social norms of that particular population. This framework was used to understand how the various facets in rental policy and land markets interact and impacts on households in terms of efficiency and equity effects. The modifications made to Tian et al, (2012) model to suite the specific objectives of this study were the addition of interventions and immediate outputs.

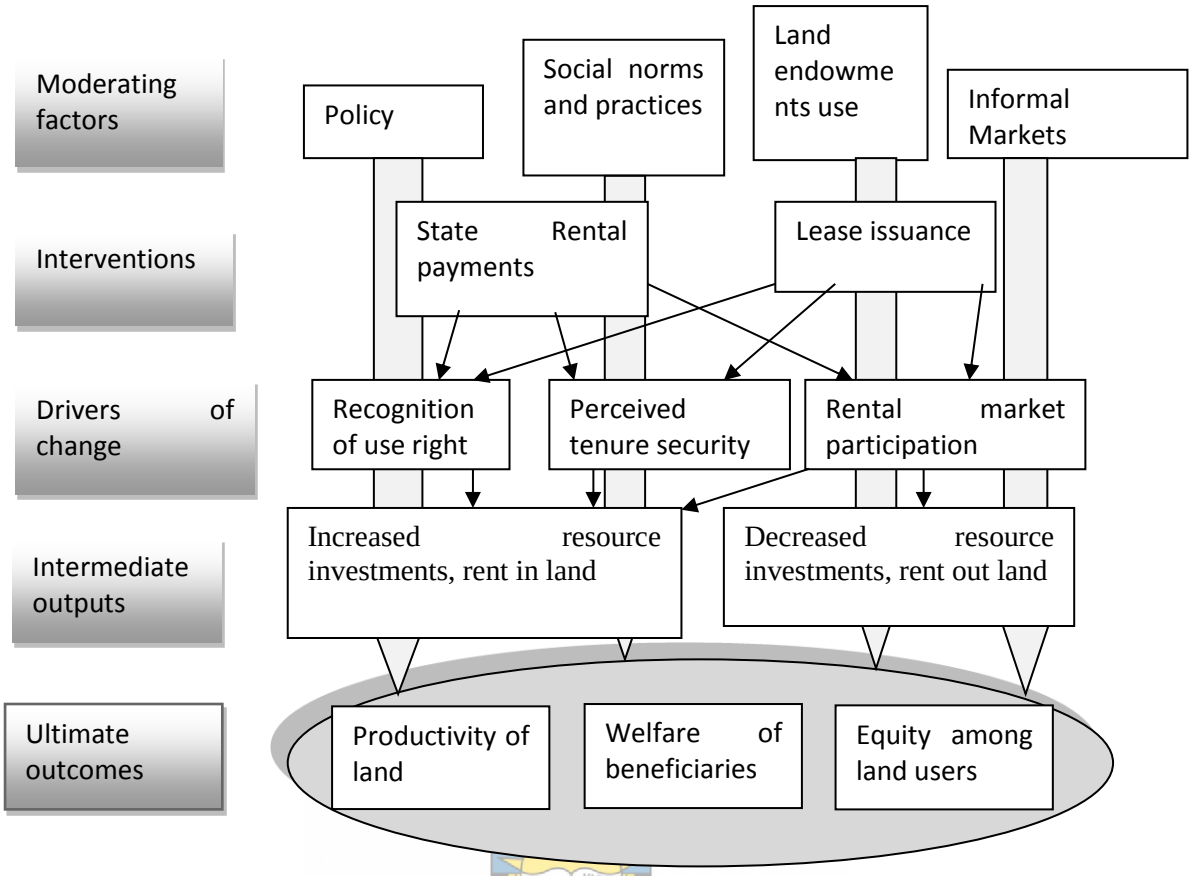

Figure 3.2: Conceptual framework (adapted from Tian *et al*, 2012)

3.4 Methodology

This section dwells on how the research was conducted. It covers sampling procedure and sample size, research methods and associated instruments, field data collection, processing and interpretation.

3.4.1 Sampling Techniques and Sample

For the purpose of this study, the population was taken as all A2 and A1 households in Mashonaland East Province. According to the Zimstat (2012), the total number of households as enumerated during the 2012 national census stands at 329 287 households. Out of this 17 731 are A1 and 4 700 are A2, representing 5.4% and 1.4%, respectively of the total provincial households. Therefore, the total population for the purpose of this study was taken as 22 431,

being all the households resettled under both A1 and A2 resettlement models in the province. The study thus adopted a combination of sampling methods in the selection of the sample. Thus cluster (settlement models, wards and districts), stratified (gender and land rental participation) and simple random sampling (choice of respondents in the clusters) and purposive sampling (participants in land rental markets) were used in the selection of the elements of the sample.

The main considerations made in calculating the sample size were the margin of error and the significance level. The margin of error is the amount of error that can be tolerated in the survey research, which was set at 5% in this study. Lower margin of error requires a larger sample size while the reverse is true. The confidence level is the amount of uncertainty that can be tolerated in making conclusions about the survey, which was set at 95%. In order to calculate the sample size, the following formula was used (Saunders *et al*; 2001).

$$\boldsymbol{n} = \frac{\boldsymbol{X^2 * N * P * (1-P)}}{[\boldsymbol{ME^2 * (N-1)}] + [\boldsymbol{X^2 * P * (1-P)}]} \quad [4]$$

Where:

n = Sample size

X^2 = Chi-square for the specified confidence level at 1 degree of freedom

N = Population Size

P = Population proportion (assumed at 0.5)

ME = desired Margin of Error (expressed as a proportion).

Considering a population of 22 431 households in Mashonaland East Province as indicated in the national census of 2012 (Zimstat, 2012) and the aforementioned margin of error and significance level, a sample size of 378 households was arrived at. First, this study was carried out in two of the five districts of the province where land reforms were effectively undertaken.

The two districts selected are Goromonzi and Marondera, where there are a significant number of famers that were resettled both under A1 and A2 models. About 65% of the sample was taken from Goromonzi and 35% from Marondera. Also, to cater for different categories of the type of farmers, 21% of the sample were A2 farmers and 79% were A1 farmers. The sample was stratified according to the district proportion of A1, A2 and wards in the district. For those farmers purposively selected, the following considerations were made; distribution, accessibility, availability and manner of participation in land rental markets (Wegner, 2003). The different categories covering the chosen sample are shown in Table 3.1.

Table 3.1: Targeted distribution of sample according various categories

District/Variable	**Goromonzi**	**Marondera**
A1	194	104
A2	52	128
Males	197	106
Females	49	26
Land rental market participants	123	66
Rental market non-participants	123	66
Wards covered	5	3
District sample size	**246**	**132**

3.4.2 Data Collection Methods

Three instruments were used, which are the questionnaire, key informant guide and focus group discussion guide. A structured questionnaire was used to collect data from households and this was done through face to face or in-person interviews. The questionnaire is presented in the appendix 1. Focused group discussions (FGDs) were used as an additional method to collect

in-depth information from the farmers about the issues of interest to the study. The FGD guide was the research tool used. In each district, two FGDs were held, covering A1 farmers. These categories are distinguished further according to gender implying that for A1 farmers, one group was for male and another for female farmers. The separation according to gender was done so that there was no dominance of one gender group over another especially given the society's cultural background. A maximum of 10 members were allowed to participate for each FGD. It was almost impossible to assemble A2 farmers due to geographical distribution challenges and therefore the FGDs did not include this category of farmers.

Group discussions followed a discussion guide as presented in the appendices, and topical issues in the study were discussed. Efforts were made to ensure that the discussions were interactive and limiting the number of participants to 10 increased the opportunities for all to make their contributions. The participants in the FGDs were different from those participating in household survey for triangulation purposes.

Interviews were held with key stakeholders of the land reform program and these included District Administrator (DA), District Agricultural Extension Officer (DAEO), District Lands Officer (DLO), local agricultural extension officers and local leadership. An interview guide was used to lead discussions with the key informants. The list of the key informants and the interview guidelines are attached in appendix 2.

3.4.3 Pre-testing and Actual Field Survey

Five graduate enumerators who were extension officers, with a background in agriculture and experience in data collection were engaged in the data collection. These enumerators went through a half-day training on administering the questionnaire, focussing mainly on translating

into local dialects, asking the respondents, recording of obtained data and time management. They then went into the field for pre-testing of the questionnaire and then came back to enable the researcher to refine the instruments for use in the actual field survey on the basis of the outcome of the pre-testing process. These local extension agents were engaged as they had in-depth knowledge about farmers who were involved in informal land renting activities. Also, the choice was meant to make farmers involved in land renting activities open up since they regard the enumerators as their local extension officers. A field supervisor was also employed to manage the whole field work and was selected from the agricultural extension supervisors in Goromonzi District.

The field survey involved administering the necessary research instruments in the collection of primary data. The data collection tools were the questionnaire, focus group discussions guide and the interview guide. Approval was obtained from the Ethics Committee of the University of Fort Hare for undertaking the study.

3.4.4 Data Management and Analysis

Responses to questionnaires obtained from the field work were cleaned for errors and those found to have a lot of missing responses were discarded. A total of 39 copies of the questionnaires were removed from the 378 copies of the questionnaires collected to remain with 339 after data cleaning. Data collected from A1 and A2 farmers were captured in CSPro (Census and Survey Processing System). The main advantage of using CSPro is that a template is created whose face is similar to the questionnaires; hence this reduces errors when capturing the data. Also, CSPro is programmed to have a system that checks for potential errors. After capturing the data, it was exported to SPSS (Statistical Package for Social Scientists) and STATA. Data analysis was done using SPSS, STATA and Frontier 4.1

3.5 Analytical Framework - Descriptive Analysis

The study relied on descriptive statistics to characterise farmers in the study area. Quantitative statistics (measures of central tendency, dispersion, Pearson correlations) were applied to ratio and scale variables and qualitative statistics (proportions) were used for ordinal and nominal data. Variables analysed included but were not limited to the following: household characteristics (e.g. age, sex, education, assets, family demographics etc), crop and livestock production, incomes and expenditures, land use, land and capital markets etc (Wegner, 2003).

3.6 Assessment of Farmers' Awareness and Perceptions

The study followed the work of Esa (2010) and Kassa *et al.* (2014), who used the knowledge, attitudes and practice (KAP) framework to gauge perceptions. A set of questions were included specifically to measure and score knowledge, attitudes and practices relating to land rental policy, specifically those issues in the Finance Bill. Knowledge questions were used to test the actual knowledge by the respondents on land rental issues. Attitudes questions were used to gauge the opinions of the respondents on an issue and practice questions were used to confirm the actual compliance and practices with respect to rental policy administration (Kassa *et al;* 2014). Knowledge questions were yes/no questions and each correct answer in the knowledge domain carried 1 mark while wrong or do not know had a 0 mark. Seven questions were asked on knowledge of policy, awareness on state rental payments, and the relationship between rentals and access to state assisted agricultural programmes. Attitudes were measured on a Likert 5 type scale (strongly agreed, agreed, neutral, disagreed and strongly disagreed). Neutral responses carried 0 mark while positive attitude such as strongly agreed and agreed carried a score of 2 and 1, respectively. Negative attitude such as disagreed and strongly disagreed were given -1 and -2, respectively. The same issues raised on knowledge were asked on attitudes to

gauge farmers thinking. Practices questions had two approaches. A Likert type scale on practices was used with the following responses (never, rarely, sometimes, frequently, and always). 'Never' is scored 0 while 'Rarely', 'Sometimes', 'Frequently' and 'Always' were scored as 1, 2, 3, and 4, respectively. Another set were yes/no questions and each correct answer carried 1 mark while wrong or do not know carried 0 mark. Seven practice questions were also asked and ranked using the aforementioned criteria. The scores from knowledge, attitude and practice were added together to give an overall mark for each of the areas. The three scores were then added together to give a score on KAP (Kassa *et al*; 2014). This score was then used to gauge overall perceptions of each farmer on land rental policy. All the scores were tested for reliability (consistency) using Cronbach's Alpha criteria shown in Table 3.2.

Table 3.2**:** Interpretation values for Cronbach's alpha

Cronbach's alpha	**Internal consistency**
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	unacceptable

Source: (Kassa *et al*, 2014)

The scores in these categories of knowledge, attitude and practice domains were then summed up and categorized as poor (less than and equal to 50 %), fair (51 to 69 %) and good (70 % and above). These categories were then compared among the different created categories of farmers

(rent-in, rent-out, autarky), between A1 and A2 farmers and between male and female headed households. For the former, the Kruskal-Wallis test was used to check if there were significant differences among the farmer categories and where such differences existed, the post-hoc test was used to identify the specific groups that show the differences. For the latter two categories, tests of difference between groups were carried out using the Mann–Whitney tests, at 0.05 level of confidence (Kassa *et al*; 2014).

The Spearman's rank correlation coefficient (r_s) was used to test the correlation between perceptions on land rental policy and participation in land rental markets. The objective was to understand to what extent was policy perceptions associated with involvement in land rental markets. The assumption was that if farmers have knowledge about the issues in the policy, particularly state rental payments, the probability of participation in rental markets would be high so as to raise the required rentals. The Spearman correlation coefficient, r_s, usually range from -1 to +1, where a value of +1 indicates a perfect positive association of ranks, zero indicates no association between ranks and a value of -1 represent a perfect negative association (Saunders *et al*, 2001). The closer r_s is to zero, the weaker is the association between the ranks. The formula is given as follows:

$$r_s = 1 - \frac{6\sum_{i=1}^{n} d_i^2}{n(n^2-1)} \qquad [5]$$

Where *r* is the correlation coefficient, *d* is the difference between the ranks and *n* is the sample size. While tests of significance are important, they do not provide enough information about the strength of the association and therefore emphasis is on the value of r_s. Categorised perceptions on KAP (poor, fair and good) were correlated with participating in land rental markets (0=autarky, 1=participating). This correlation was chosen because the considered variables were non-parametric (Saunders *et al*, 2001).

3.7 Socio-economic Analysis of Farmer's Renting Decisions

A number of factors have been identified in literature to influence farmers' rental market participation (either to rent in or rent out land). These factors can be broadly categorised into household characteristics, land endowments and transaction costs. Household characteristics include its size, household head's gender, marital status, age, level of education etc. Land endowments include level of enterprise diversification, size of arable land, crops grown, irrigated land, permanent labour etc, while transaction cost is an important determining factor in land markets. Parties to land rental markets must establish trust in their transactions. Such trusts can be a function of cultural practices and norms to prevent the moral hazard problem. It also reflects on past trading experience and available reputational experience of the potential transaction partners in addition to relations involving kinship. In general, the higher the level of trust the lower are the transaction costs and those transaction costs involving close kinship are associated with lower transaction costs when compared to non-kinships (Benin, 2016). Transaction costs are costs related to finding a potential party in the market (Awasthi, 2009). In most cases search, screening and negotiation costs are high the first time a leaseholder or a tenant want to enter into an agreement. They also do not depend on the size of the land though where the size of the transaction is huge, costs associated with an improper search turns also to be high. If done properly, these costs on average tend to decline as the size of transacted land increases (Awasthi, 2009).

Enforcement and monitoring costs relate to processes involved in ensuring that the agreement between the two parties is followed to the letter, and these costs tend to reduce as the size of transacted land increases. Access to the land rental market and the degree of participation may depend on a tenant's characteristics (Benin, 2016). It is assumed that access to land is a function of the possession of non-land resources, social distance and reputation/farm skills, and trust.

The tenant may be able to use kinship relationships to increase access to rented land. Access may also be increased by good performance in previous contracts thus increasing the trust between tenant and the landlord and improving reputation in the community as a good/reliable farmer (Hagos and Holden, 2013). In order to analyse determinants of farmers' land renting decisions, the Tobit model was used as described in the next section.

3.7.1 The Tobit Model

A Tobit model is one where the dependent variable is composed of both continuous and discrete properties. This implies that for a variable, some values are continuous and some are discrete. In these instances, a variable Y is said to be censored for all *X* values, and Y is restricted to its observations. Where Y is not censored and X can be observed, Y is then said to be truncated. The Tobit model is derived from the following (Rahman, 2010):

$y_i = \beta\, x_i + \varepsilon_i$ if $\beta\, x_i + \varepsilon_i > 0$ (OLS part) [6]

$y_i = 0$ otherwise (Probit part)

The assumption from the Tobit model is one of the same distribution of errors of both the censored and uncensored data. The model is estimated as follows:

$$E(y \mid x) = pr(y>0 \mid x)^* E(y \mid y>0, x) \quad [7]$$

The equations that identify cases which are not censored are as follows:

$y_i > 0$ mean $\beta\, x_i + \varepsilon_i > 0$

and $pr(y>0 \mid x) = pr(\beta x + \varepsilon) > 0$ [8]

hence $pr(y>0 \mid x)$ is a z-score associated probability $z = \beta\, x / \varepsilon$ [9]

Hence, β and ε can be estimated for cases which are non-censored, and consequently, the probability of a case being non-censored can be estimated. In order to get an understanding of the regression, the predicted values for un-censored cases are identified as follows:

$$E(y) \mid y > 0 = \beta x + \varepsilon \qquad [10]$$

where β is the slope of the regression line and where ε is an *x* conditional standard deviation of *y* (Rahman, 2010). The strength of the Tobit model lies in that there is no assumption that the error is zero. With the Tobit model, the value of the error is estimated based on the number of censored cases for comparable values of X and Y. In other words, the estimates are done on the basis of maximum likelihood of both censored and non-censored cases. The weakness of the Tobit model however is that it is prone to the violations of the assumptions of the ordinary least squares (OLS). Of particular note is the assumption of homoskedasticity, which in the Tobit model results in strong biases of the coefficients (Jaenicke, 2000).

3.7.2 Specification of the Tobit Model

Most of the studies on land rental market participation uses either Probit (Shifa, 2016) or Tobit models (Hou *et al*; 2017; Bizimana, 2011; and Rahman, 2010). While studies using Probit models use a qualitative binary variable as the dependent variable, Tobit models additionally quantifies the extent of rental participation in terms of the size of the land. Following the study by Rahman (2010) this study also hypothesizes a chronological order of decision making where a farmer makes the decision first to get involved in land rent markets followed by the decision of the size of the transaction.

A censored regression model (bivariate Tobit model) is regarded as the appropriate model to use to identify the determinants of renting behaviour, where all observations (above, zero and below limit) are taken into account. The bivariate model analyses renting-in and renting-out

decisions within the same model and not as two separate models. The specific estimation is given as follows:

$$y_i = \alpha_0 + x_{i\beta} + z_i\gamma + r_i\delta + \varepsilon_i \quad [11]$$

where: y_i is the dependent variable; x_i, z_i, and r_i are vectors of variables measuring household characteristics, land endowment characteristics, and transaction cost effects respectively; β, γ, δ are vectors of parameters related to the household characteristics, the land endowment characteristics, and transaction cost variables, respectively, and ε_i is an error term (Rahman, 2010). The selection of the bi-variate Tobit model was based on extensive literature review and considerations for best fit models. Farmers renting-out land in most cases do not let all of it but remain with some land for their own production. A number of farmers renting-in land are not just tenants but do own some of the land, which they are fully utilizing and therefore landlords are also tenants in some situations. Accepted reality is also that some farmers are multiple land owners in different locations (Matondi and Dekker, 2011) therefore they might be tenants in some physical locations and landlords in others. Moreover, the data showed that there is a strong correlation between the amount of land rented-in and that rented-out, with Spearman's rho value of -0.256 and a two-tailed significance ($p<0.01$). Consequently, a bi-variate Tobit model was used as opposed to separate models for renting-in and renting-out. The factors used in the model and their definitions are given in Table 3.3:

Following the studies by (Hou *et al*;2017; Shifa, 2016 and Rahman, 2010) the variables that were included in the model are shown in Table 3.2 as well as the explanations. The interpretation of the results is based on the signs of the coefficients and their likelihood to affect the decision to rent in or out. That likelihood is measured by the t-ratio and the significance of each variable is them measured using the t-test.

Table 3.3: Explanatory variables used in the Tobit model

Variables	***Definitions***
Land_rented_IN	Land rented-in
Land_rented_OUT	Land rented-out
Gender	Gender of household head; 1=Male, 0 otherwise
Marital status	=1 if household head is married 0 otherwise
Age	Age of household head in years
Num_Edu_yrs	Number of years in formal education
total_Hh_incom	Estimated total income for household per year in USD (reporting currency in Zimbabwe)
Total_F_members	Total number of resident family members
Permanent_labor	Number of permanent labourers
Cultivated_area	Size of cultivated area (Ha)
TenureCertainity	Security of tenure=1, 0 otherwise
Irrigable_landsze	Size of irrigable land per farm (Ha)
Crop_Dive_Index	Crop Diversification Index 0=complete specialization, 1=perfect diversification
Setlmnt_A1	Type of settlement A1=1, 0 otherwise
Capital_value_Assets	Value of farm capital assets
Livestock_value_Assets	Value of farm livestock assets

3.8 Assessment of Land Use Efficiency

According to Hagos and Holden (2013), efficiency is measured through productivity. Productivity refers to the production of a possible maximum output given a certain technology and a set of inputs or the production of a certain output with a minimum bundle of inputs and

a given technology. Farm efficiency can be measured by using total factor productivity or by using partial factor productivity. Total factor productivity (TFP) is an index measure and is computed as the ratio of agricultural outputs to total agricultural inputs. It is thus an extension of partial factor productivity to include all other inputs. TFP has been widely used by researchers (Benin, 2016) for its ability to consider long-run agricultural growth. TFP basically measures attributes such as technical change which is a result of technological frontier, technical efficiency change, which is a measure of movement away from the technology frontier, and scale efficiency change, which are movements away from the technological frontier as a result of accumulating economies of scale. TFP is considered a better measure as it captures all factors of production and indicates overall agricultural production performance.

Another measure of productivity is the partial factor productivity and is defined as the ratio of inputs to related outputs and usually focuses on a single input. Most common inputs that are used are land and labour (Thirtle, 2003). Land as an input is used when measuring land productivity while labour is used when computing labour productivity. Land productivity is measured as the ratio of output to total harvested area, while for labour it is measured as ratio of output to the total number of workers. Each measure is used depending on the context in which it as being applied (Thanassoulis, Kanjani and Maniadakis, 2015). Productivity tends to be affected by both short-term and long-term exogenous factors such as policy interventions. Short term-interventions impact more on the factor intensity (pure technical efficiency) while long-term interventions affect more the adoption of technology (technology differences). Figure 3.3 illustrates a partial factor productivity measurement, which is a measure of technical efficiency.

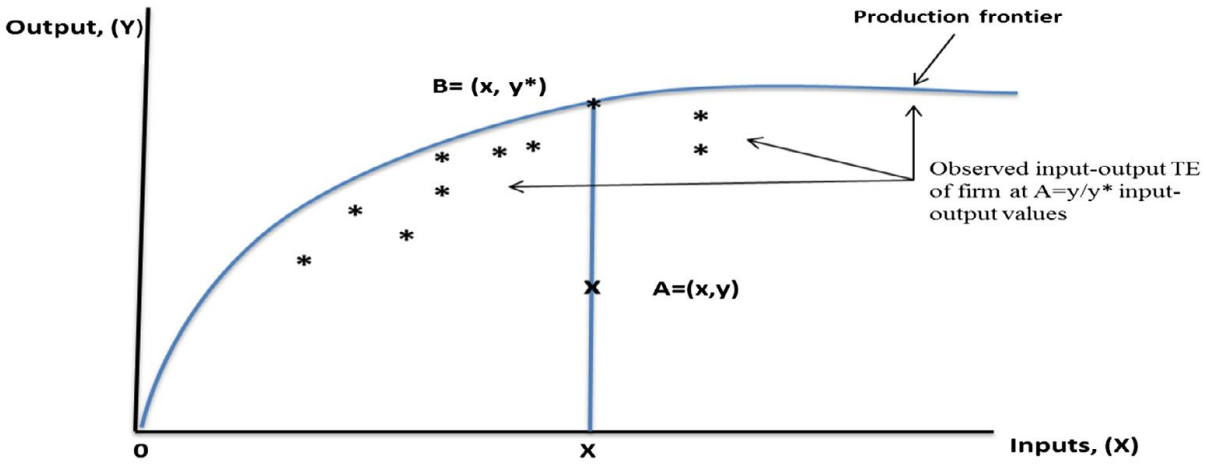

Figure 3.3: Technical efficiency of farms in input-output space

3.8.1 Efficiency under Transactions Costs

According to de Janvry *et al*. (2001), the Walrasian economics assumes that a market exists for all products and services, including for risk and credit and that the prices in these markets are the same for every market participant. However, within the developing economies context, this assumption remains ideal with no practical applications. In these economies, such markets sometimes do not exist or where they exist, the transaction costs associated with them are so high. It therefore becomes prohibitive compared to using other institutional means. These transaction costs include information search, screening, negotiating, coordinating, enforcement and monitoring costs (de Janvry *et al*; 2001). Another important cost is transportation, which increases the cost of access thereby widening the disparities between supply and demand prices. The implications of high transaction costs are that, where there is a separate price for each household and resource allocation to optimum level then efficiency differs according to the price that each household faces (de Janvry *et al*; 2001).

Transaction costs have the challenge of altering allocative efficiency while technical efficiency is unaltered by presence of transaction costs. An alternative possibility to measure efficiency

under transaction costs is to use the concept of profit efficiency. This concept is defined as the ability of farmer to attain the highest possible profit under given effective prices and a given set of overheads of that farmer (Hagos and Hogen, 2013). Using this method, a stochastic profit frontier is estimated using the same principle applied when estimating stochastic production frontiers. In this case, profit inefficiency is treated as the loss or profit made from not being on the profit frontier.

This method was applied by de Janvry *et al*, (2001) to estimate profit efficiency among rice farmers in Pakistan that focussed on two villages in Basmati. A wide range of profit efficiency was observed. An econometric analysis of the factors that accounted for the variation in profit efficiency distinguished three important groups of factors which were retained, that is; resource base, institutional and socio-economic (Coelli *et al*, 2005). More than half of the variation was explained by socio-economic factors, with more educated households having reduced profit loss than those households that have lower levels. Consequently, education was identified as the most important factor that could account for the differences in profit between households. Resource based factors were found to contribute insignificant levels towards farmers' profit. Institutional factors such as water shortage contributed not so significantly (just above 25%) to the variation in profit loss among farmers (Lawry, *et al;* 2016).

Measurement of TFP when there are transaction costs among different farmers requires use of different optimal factor allocations as well as product choices since most farmers are multi-product producers. The effective prices measured in this case are value of output and total variable costs. Therefore, TFP was computed as Q/X, where Q is taken as the gross output value and X is total variable factor costs. The differences in total factor costs among various

farms can therefore be due to factors such as effective prices, economies of scale, allocative or technical efficiency (de Janvry *et al*, 2001).

Efficiency measures were used to compare farmers not involved in rental markets, those renting-in and those involved in renting-out land. Two main methods of estimating farm relative efficiency can be used, which are the parametric stochastic frontier analysis (SFA) and nonparametric data envelopment analysis (DEA). The former is based on a functional relationship between inputs and output and parameters of the function are estimated using statistical analysis (Hagos and Holden, 2013). The functional forms and behavioural assumptions about the SFA model have greater bearing on the results of this measure of efficiency. On the other hand, DEA as nonparametric measure possess an advantage in that there are no *a-priori* parametric restrictions on the underlying model. The input-output model is constructed as a linear function with no prescription on the functional relationship between the two (Hagos and Holden, 2013). It is important to note that with both methods, it is a challenge to compute them in developing countries where information on prices is often scanty. Coelli *et al* (2005) as well as Nin-Pratt (2010) have used this analytical framework in their studies. These measures of efficiency are discussed further in the following sections.

3.8.2 Data Envelopment Analysis (DEA)

DEA constructs a linear envelop of an observed input and output data set using linear programming (Hagos and Holden, 2013). Assuming that x_i denotes the input vector to produce, where *i* corresponds to a group to which a farm plot belongs, the feasible production frontier that describes the technology of the farming units can be defined in terms of correspondence between the output vector and the input requirement set. The Malmquist Index is used for the measure for DEA and is described below.

3.8.3 Malmquist Index

The Malmquist index was established by Caves, Christensen, and Diewert in Dangwa (2011) and became widely used in productivity related studies. The authors indicated that DEA can be used to estimate productivity index. Its popularity rose due to its relative easiness to compute, no use of economic behaviour assumptions such as maximization of revenue or minimization of costs as well as not insisting on output and input prices. This is more appropriate in the African context, where prices of inputs and outputs are either unavailable or insufficient for analysing labour, land and other input and output markets. It can equally be applied in multiple-input-output modelling (Benin, 2016).

The index measures productivity changes over time. It can be decomposed into two principal indexes which are technical change and efficiency change. Studies that have applied the DEA-based Malmquist Index using surveys are Hagos and Holden (2013) and Jaenicke (2000). Malmquist productivity index can be defined as:

$$M_i\left(Y_j^1, Y_j^2, X_j^1, X_j^2\right) = \frac{\left(\prod_{j=1}^{C_\kappa} D^i\left(Y_j^1, X_j^1\right)\right)^{\frac{1}{C_\kappa}}}{\left(\prod_{j=1}^{C_\kappa} D^i\left(Y_j^2, X_j^2\right)\right)^{\frac{1}{C_\kappa}}} = \frac{1/\varepsilon_{i1}}{1/\varepsilon_{i2}} = \frac{\varepsilon_{i2}}{\varepsilon_{i1}}, \quad [12]$$

where i = 1, 2 The above ratio evaluates the distance of the farms in each group from a single reference technology i. The numerator evaluates the average (geometric mean) distance of farms in Group 1 from frontier i while the denominator evaluates the average distance of farms in Group 2 from frontier i. Since there is no practical reason to prefer either frontier as a reference technology, the analysis as done based on the geometric mean of the two indexes

generated using each group's frontier as reference. As a result, equation above can be rewritten as:

$$\left(\frac{D_o^s(x_t, y_t)}{D_o^s(x_s, y_s)} \times \frac{D_o^t(x_t, y_t)}{D_o^t(x_s, y_s)}\right)^{0,5} \qquad [13]$$

Thus, the two ratios inside the square brackets evaluate the distance of each farm from a single reference frontier. The first ratio evaluates the average distance of farms in Group 1 divided by the average distance of farms in Group 2 using a technology defined by the best-practice farms from Group 1. The second ratio is a similar quotient, taking Group 2's frontier as reference. Also, when comparing the two groups, to avoid the limitations associated with defining an ideal or representative farm to represent each group, the aggregation of the distances or efficiency scores is done using the geometric mean, which utilizes information from all farm plots.

3.8.4 The Catching-Up and Frontier-Shifter of Malmquist Index

Malmquist productivity index has two components, the catching up effect and the frontier-shift effect (Hagos and Holden, 2013) . The catching up effect is used in the comparison of technical efficiency differences, and is calculated as ratio of geometric means of distance of a farm from its technology frontier and is measured as follows:

$$M_o(x_s, x_t, y_s, y_t) = \frac{D_o^t(x_t, y_t)}{D_o^s(x_s, y_s)} \times \left(\frac{D_o^s(x_s, y_s)}{D_o^t(x_s, y_s)} \times \frac{D_o^s(x_t, y_t)}{D_o^t(x_t, y_t)}\right)^{0,5} \qquad [14]$$

$$= EC \times \left(TC_s \times TC_t\right)^{0,5} = EC \times TC$$

If the value is greater than 1, it shows a wider efficiency spread, implying lower levels of efficiency among grouped farms. The frontier-shifter effect measures the distance between

best-practice frontiers of two groups. If two groups, 1 and 2 are considered, then a value greater than one show that group 1 has higher productivity than group 2 (Hagos and Holden, 2013).

3.8.5 Weaknesses of DEA

Although DEA is a good tool, it is also not without its challenges. This section highlights some of the challenges that are associated with the use of DEA (Na Tran, 2008). Literature has shown some drawbacks that come with use of DEA methods in calculation of distance functions. One such challenge is inability to include a random error term that accounts for statistical noise; determining shadow prices when aggregating inputs; and for cross-sectional data, inputs and outputs used considering observations in the cross-section. DEA methods are not stochastic as they do not have a random error term that takes into account statistical noise. Consequently, just a small proportion of the observations (PPS frontier) define efficiency of any production unit (Benin, 2016). It is thus important to maintain reliability of data for the unit of analysis. Outliers can be detected using the relative frequency or cumulative weight that any case shows in constructing a frontier. The example below shows how this is done. If *z*-count (*Cj*) is defined as the frequency an observation shows up in constructing a DEA model, then:

$$C\,j = \Sigma\, j\ if\ z\ j\ n > 0\ 1 \quad (2A.15) \qquad [15]$$

And if *z*-sum (*Sj*) is defined as the cumulative weight of an observation in all constructed efficient sets, then *Sj i*s computed as follows*:*

$$S\,j = \Sigma\, j\ z\ j\ t \quad (2A.16) \qquad [16]$$

For all observations along the efficiency frontier, the z-sum and z-count values are non-zero, while all inefficient observations have zero value for both z-sum and z-count. Those values found to be outliers are then dropped from the observations and *Cj* and *Sj* are run again without

the dropped observations. Dropping of observations is an iterative process that ends when an ideal convergence of observed weights is achieved (Benin, 2016).

DEA does not require any prior information about the shadow prices of inputs and outputs in the measurement of TFP. This is because estimation of Malmquist indexes is made possible by use of implicit prices obtained from production surface shape (Benin, 2016). As a result, some functions are assigned a close to zero value and an input regarded as important in the model specification may in the end be dominated by those inputs considered as inferior (Na Tran, 2008).

According to Benin (2016), two challenges can arise from the number of observations relative to number of outputs and inputs, giving rise to a problem of dimensionality. The first is that instabilities of technology frontiers may lead to intersection of different periods, which leads to introduction of unlikely levels of technological regression (Hagos and Holden, 2013). The other is that the more output and input variables there are, the more an observation will appear as efficient (Benin, 2016).

DEA also has a shortcoming in that it is an approach that is deterministic and does not take stochastic elements into account. In that regard, this approach is very sensitive to errors in data measurement and outliers (Hagos and Holden, 2013). DEA makes an assumption that there is a known efficiency frontier and that any deviation from that frontier is an indicator of inefficiency. Therefore, if there are stochastic elements, then scores in efficiency tend to be very low, and where there is need to explain the estimated efficiency scores, then this method turns to be a weak one.

Most studies that use DEA rely on a pooling method, where farmers are categorised into common frontiers, whereupon performance is then evaluated. However, with this approach, the source of productivity differences is given peripheral attention. Studies that have attempted to analyse productivity differentials (Hagos and Holden, 2013) have relied on a two-step DEA approach. The first step of estimating efficiencies uses DEA while the second step of explaining productivity differentials uses a Malmquist index of productivity, which compares different groups that have specific productivity frontiers.

3.8.6 The Stochastic Frontier Analysis (SFA)

The stochastic production frontier is on the basis of the understanding that movements away from the ideal frontier are not entirely under the influence of the farm under study. For example, bad weather or high incidence of equipment breakdowns might appear as farm inefficiency when the deterministic frontier interpretation is made. Other factors that may show up as inefficiencies are measurements of variables included in the model like the log of output and even inaccuracy or errors in the specification of the model (Benin, 2016). This has been identified as a major shortcoming of specification of the deterministic frontier. This has resulted in the formulation of a plausible assumption that all stochastic elements outside the control of the farm help shape the production function such that each farm faces a specific farm frontier (Lawry *et al*, 2016). This implies that rather than comparing farm efficiency to an ideal practice, it is compared against average production frontier. With this approach to frontier analysis, the model is formulated as follows:

$$y_i = f(\mathbf{x}_i)TE_i e^{v_i} \qquad [17]$$

where all other terms take the definitions mentioned earlier and v_i is unrestricted. The unrestricted random variables encompass frontier random variations from one farm to another, errors in measurement and any other statistical noise. This refined model is then specified as follows:

$$\ln y_i = \alpha + \boldsymbol{\beta}^{\mathbf{T}}\mathbf{x}_i + v_i - u_i = \alpha + \boldsymbol{\beta}^{\mathbf{T}}\mathbf{x}_i + \varepsilon_i. \quad [18]$$

The stochastic frontier approach (SFA) uses maximum likelihood to calculate an array of stochastic frontier models anchored on the Cobb-Douglas and Transcendental logarithmic production functions, using cross-sectional farm level data (Awasthi, 2009). According to Coelli *et al*, (2005), the Cobb-Douglas and the Transcendental (translog) production functions are the most common functional forms used for SFA. The Cobb–Douglas production function was estimated using OLS by comparing different categories of farmers in terms of their response to rental policy stimuli. Three distinct categories were used, which are those that rent-in, those that rent-out and those who choose to utilise their allocated size of land. The study used the SFA to measure economic efficiency and specifically the linearized Cobb-Douglas model to determine the factors affecting inefficiency. Whilst using both DEA and SFA would have been good for comparison purposes, studies (Hagos and Holden, 2013) have shown little differences in terms of the estimates obtained.

Meeusen and van den Broeck and Aigner, Lovell and Schmidt cited in Dangwa (2011) each proposed the stochastic frontier production function. In the original specification, the production function had two components for the error term which were specified when cross sectional data were used. One of the components accounted for technical inefficiency and the other one accounted for random effects and the model is given as follows:

$Y_i = x_i\beta + (V_i - U_i)$, where i=1..., N, [19]

where Y_i = the production (or the logarithm of the production) of the i-th farm;

x_i = a k×1 vector of (transformations of the) input quantities of the i-th firm;

β = vector of unknown parameters;

V_i = random variables which are assumed to follow a distribution $N(0,\sigma_V^2)$,

U_i = random variables which are non-negative and are assumed to account for technical inefficiency and assumed to follow a distribution $N(0,\sigma_U^2)$.

Thus, the following rental market participation and modified Cobb-Douglas production function was specified. The general model for this study relating production, Y, to a given set of resources X, and other conditioning factors is given as follows:

$$Y = b_0 X_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5} X_6^{b6} \quad [20]$$

Where b_0 is a constant and b_1, b_2, b_3, b_4, b_5, and b_6, are parameters to be estimated. To use the OLS method for estimating the parameters, the model is linearized to the following specification:

$$\ln Y_i = b_{0i} + b_{1i} \ln X_1 i + b_{1i} \ln X_{2i} + b_{3i} \ln X_{3i} + b_{4i} \ln X_{4i} + b_{5i} \ln X_{5i} + b_{6i} \ln X^2_{6i} + b_{7i} \ln X_{7i} + b_{8i} \ln X_{8i} + V_i - U_i \quad [21]$$

Where the subscript i indicates the i-th farmer in the sample (i=1,2,3,……n), and given in the Table 3.4.

Table 3.4: Descriptive statistics for variables used in the SFA analysis

Label	Variable definitions
Agric_Output	Agricultural output (Kgs)
Log_Agric_Output	Logarithm of Value of Agricultural Output
Exp_Crop	Total Crop expenditure (US$)
Log_Exp_Crop	Logarithm of Total Crop expenditure
Area_cult	Area cultivated (Ha)
Log_Area_cult	Logarithm of area cultivated
Labor	Labour
Log_Labor	Logarithm of Labour
Area_crop_prod	Area put under crop production (Ha)
Log_Area_crop_prod	Log of area under crop production
Value_Assets	Value of Assets (US$)
Log_Value_Assets	Logarithm of value of Assets
Hhh_Age	Age of household head (years)
log_Hhh_Age	Logarithm of age of household head
Irrig	Share of irrigable land size
log_Irrig	Log of irrigable land size
Educ	Number of years in formal education
log_Educ	Logarithm of years in formal education
Gender_hh	Gender of household head=1 male; 0 otherwise
Irrig_share	Irrigation share (%)
log_Irrig_share	Log irrigation share
Married	Household head is married=1;0=otherwise
Edu_Atleast_Prim	Household head attained at least Primary education=1;0=otherwise
Total_F_members	Log of Household size

The V_i's are random errors and are assumed to be independent. They are obtained by truncation (at zero) of the normal distribution with mean, v_i and variance, s^2 (Mushunje *et al*, 2003). Economic, technical, and allocative efficiency were measured for farmers participating in land rental markets and compared to those not participating in the markets. Also, the drivers of

efficiency/inefficiency were determined from the above model for different categories of farmers.

3.9 Social Equity Measurements

In order to evaluate the impact of land rental on social equity (land holding disparities), Gini coefficients were measured. The Gini coefficient was pioneered by Corrado Gini, a statistician in 1912. It has been used to measure inequality, especially those that relate to income. It has however also found use in measuring inequality of land distribution (Rahman, 2010). The Gini co-efficient is calculated as a ratio between the Gini index and area under uniform distribution line. It ranges from 0 (which indicates perfect equality) and 1 (perfect inequality).

3.9.1 Computation of the Gini Index

The Gini coefficient is a ratio of the areas of the Lorenz curve. Assuming an area A between the Lorenz curve and perfect equality line, and B for the area under Lorenz curve, the Gini co-efficient is then calculated as A/(A+B). If the Lorenz curve is stated as a function Y = L(X), then integration can be used to calculate the value of B. This is illustrated in Figure 3.5.

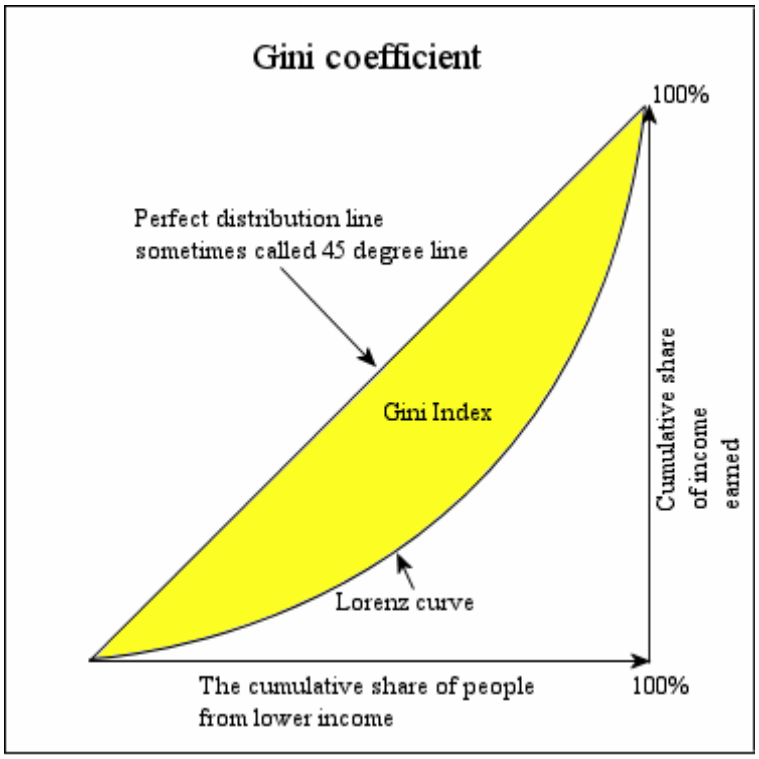

Figure 3.4: Lorenz curve in measuring Gini coefficient

In some cases, this equation can be applied to calculate the Gini coefficient without direct reference to the Lorenz curve (Xu Lan, 2012).

The hypothesis that land rental market participation do not reduce land holding disparities was examined by evaluating the distribution of own arable land and actual cultivated land. It is assumed that promotion of equity in the rental market would be achieved if the distribution of actual cultivated land is more equitable than that of own arable land. Actual land operated is found by adding own land available for production and rented-in land and then subtracting rented-out land. The own arable land is the land that was allocated to the farmers under the FTLRP. The Gini index was applied to examine equity impacts on rental market participation as it is a measure of inequality of a distribution. To assess the impact of land rental markets on land holding disparities, the study created Gini coefficients to measure land holding disparities for the farming models. The Gini coefficients are calculated using the standard method as given by equation 22 (Tian, *et al;* 2012):

$$G = 1 + \frac{1}{n} - \frac{2(Y_1 + 2Y_2 + 3Y_3 + \cdots + nY_n)}{n^2 Y_0} \qquad [22]$$

Where n is the number of households, Y_n represents land holdings per capita in each household, for households 1 through n, and Y_0 is the average number of land holding *per capita* in each household. The Gini coefficients were computed as decimals for land owned and land operated. These two coefficients were then compared to find if participation in land rental markets (represented by land operated) was reducing or increasing inequality compared to a scenario where farmers are utilising land allocated to them by the state. Comparisons are made

according to the particular districts (Marondera and Goromonzi), settlement type (A1 and A2 farmers) and gender (male and female head of household).

3.10 Conclusion

This chapter reviewed the methodology that was used in the research. The study area was Mashonaland East Province and was chosen being one of the provinces where land reforms were on a larger scale and therefore it was imperative to understand how the rental policy is impacting these communities, both A1 and A2. The research design chosen was a survey, with the instruments being questionnaire, key informant interview and focus group discussion guides. The study used multiple-stage sampling methods. Data were analysed using, SPSS, STATA and frontier 41. The analytical methods used were descriptive analysis to characterise households, KAP for analysing farmer awareness and perception on land rental policy. Tobit model was for analysing decision making for renting in or out, SFA was used to measure economic efficiency and the potential sources of the inefficiency and the Gini co-efficient was applied in assessing equity impact of rental policy across gender, district and settlement type.

The chapter that follows is a characterisation of A1 and A2 farmers in Mashonaland East Province. The analysis is focussed on demographic characteristics, assets endowments and agricultural production related issues. While comparative analysis (along the lines of gender, settlement type and districts) was performed in the other chapters, the chapter that follows is a characterisation of the households in the sample and supports Chapters 5 to 7.

CHAPTER 4: HOUSEHOLD CHARACTERIZATION

4.1 Introduction

In this chapter, the demographic and socio-economic characteristics of the sampled households are presented. The issues presented in this chapter are very important as decision making is a function of the characteristics of a given household. Households tend to make decisions by taking into cognisance the cultural, social, economic, physical and environmental circumstances in which they operate in. Therefore, in order to have a clear understanding of the detailed analysis in the chapters to follow, it is necessary to have a background appreciation of the sampled households. The household characteristics are presented from the perspective of the province and are not disaggregated according to the different categories of farmers, which is done in the subsequent chapters of the thesis. A total of 378 A1 and A2 farmers were sampled from two districts namely Goromonzi and Marondera, representing Mashonaland East Province households as benefitting from the FTLRP. After cleaning for completeness of data, the sample was further reduced to 339, which was then taken as the effective sample for the study.

4.2 Demographic Characteristics

Due to the differences between calculated sample and the actual sample after data cleaning, the descriptive statistics as pronounced in Chapter 3 differed slightly from those presented in this chapter. Goromonzi District had 67.6% of the farmers while Marondera had 32.4%, reflecting the distribution of respondents of the two districts. The sampled farmers were all taken from a total of 8 wards covering these two districts. Of the total sample, 78.5% were from A1 settlement model while 21.5% were from the A2 resettlement model. Results showed that most of the households was male headed (79.9%), while only 20.1% was being headed by females.

It is however noted that under the harsh economic environment in which the country finds itself, categorization of households according to gender has become problematic. A significant number of households in both urban and rural settings have male heads living in the diaspora, especially in South Africa due to the harsh economic environment prevailing in the country. Most interviewees often indicate in such circumstances that the head of the household is male. However, in reality, most of the day-to-day decisions are made by female spouses residing in that homestead. The same is also true for polygamous male heads who have more than a single farming homestead. This made analysis by gender much more complicated. The majority of the households also have couples (82%), and 14% indicated being widowed. The highest level of education is indicated in Figure 4.1 which showed that the majority of the household heads had attained secondary school education. This was followed by primary education, Zimbabwe Junior Council (ZJC) and tertiary institution education. Rahman (2010) highlights the importance of level of education in determining the extent to which a farmer is willing to participate in the land rental markets. This was traced to the fact that education can affect the extent to which farmers perceive the risks and transaction costs associated with land rental markets.

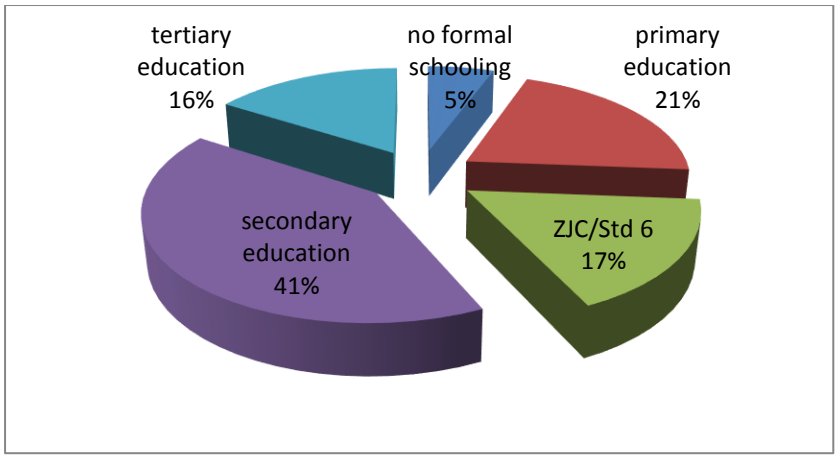

Figure 4.1: Distribution of farmers by level of formal education attained

Agriculture was the main source of income for the sampled households (77%), 8.8% was pensioners, 8.3% was in formal employment, while 4.1% was involved in informal trading activities as indicated in Figure 4.2.

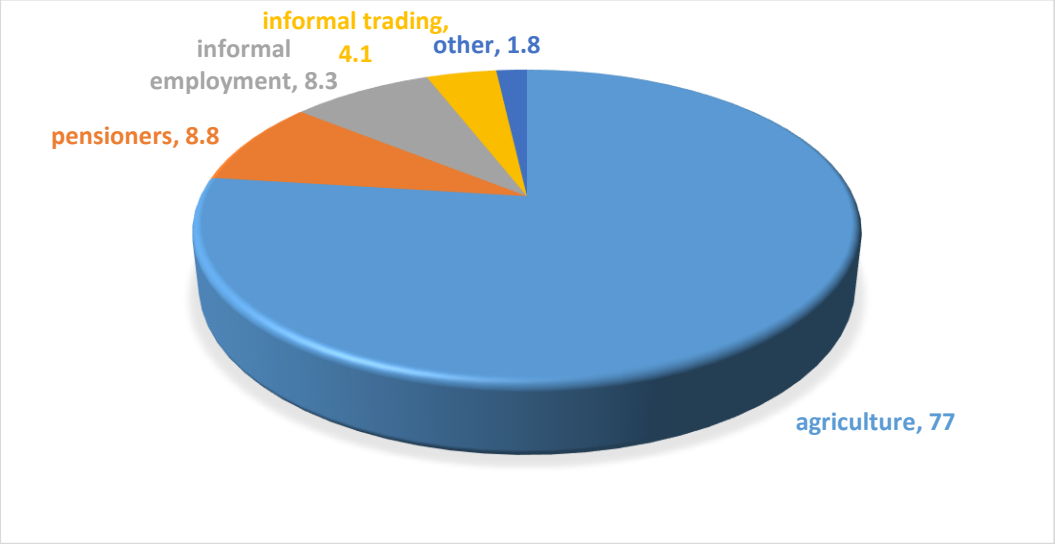

Figure 4.2: Sources of income

In terms of the land rental market activities, only about 51.3% was not involved in land markets. This is the group referred to as being in an autarky position. About 22.1% was involved in some way in renting-in activities, while 26.5% was involved in renting-out activities. These figures are collaborated by findings from the studies done by Matondi (2011) and Moyo (2016), who showed that there is a trend of an emerging rental market for land in Zimbabwe's resettled areas. Scoones *et al.* (2010) concluded that even in the communal areas of Zimbabwe, such practices are now prevalent. However, the findings from these studies differ from that of Bizimana (2010) in Rwanda, in which it was reported that most of the farmers are actually engaged in land rental markets. Lack of financial resources, the zero value of land resulting from current land policy (state land) and lack of a business-like approach to farming by most of the resettled farmers were reported as created such a scenario (Matondi, 2011). Even at regional level, countries like Ethiopia (Deininger and Feder, 2014) and Kenya (Jin and Jayne,

2013) have very high prevalence of land rental markets. In Kenya, the practice is supported by Acts of Parliament and the markets are evolving towards efficiency in the utilisation of land. It is therefore imperative that the GoZ starts supporting the emergence of such a market so that it brings about the benefits, if any to the resettled farmers and in particular the economy. Table 4.1 shows some important statistics from the sample.

Table 4.1: Household socio-economic statistics

Variable	**Minimum**	**Maximum**	**Mean**	**Std. Dev**
Age of head	23	89	56.94	13.66
Years of formal schooling for head	0	18	9.67	5.01
Estimated household annual income ($)	200	500 000	35 103	284362
Agriculture's contribution to income (%)	2	100	67.19	26.62
Resident household size	1	8	5.32	2.41
Number of household labour	0	6	3.51	3.251

Survey, 2017

The average age of household head indicated an older generation. On the average, the respondents had been through secondary education. Of note in the above statistics is the estimated income. It must be noted that while the average annual income was $35,103 the spread was equally high and this is expected given that there are both A1 and A2 farmers in this sample. It is therefore possible that the distribution of income is a skewed distribution curve. Agriculture (on the average) contributed more than two-thirds of income made by the sampled farmers, meaning that it was the largest source of income. Unlike findings from studies in China (Hou *et al;* 2017) and Bangladesh (Rahman, 2010), where opportunities for off-farm employment and income generation are high, the Zimbabwe situation is problematic since farm

household members do not have incentives for moving off-farm to allow only efficient farmers to utilise the land better. The implication is that even if a farmer is inefficient, the chances of staying on the farm are high given the limited alternative opportunities available.

4.3 Households Involvement in Land Markets and Asset Endowments

The study established the extent of farmers participation in the land markets. This involvement takes two forms. The first one is through involvement in partnerships with investors, which the government had allowed via investment protocols, and approved by the Ministry of Agriculture. This was mainly prevalent among A2 farmers due to the size of the allocated land. The other form of participation in agricultural land markets was through informal arrangements between beneficiaries and either other farmers who want to expand their own land holding or those without the land but with the capability to utilise the land.

The various categories of farmers in terms of their involvement in land markets is illustrated in Figure 4.3.

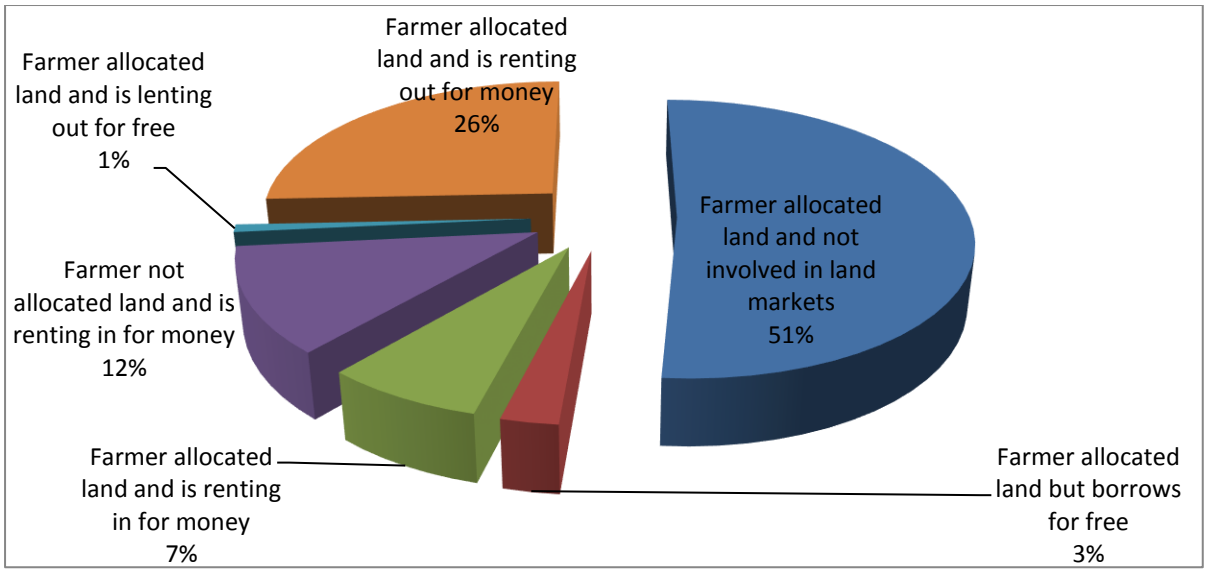

Figure 4.3: Farmers' categorization according to participation in land markets

Figure 4.3 showed that 51% of the farmers was not involved in any form in the land market (autarky). This did not necessarily imply that these farmers were fully utilising their land. The political standpoint in Zimbabwe has been that it is illegal for farmers to be engaged in land market activities though this has never been enforced as a government policy (Herald, 2015). About 26% of the farmers allocated land are renting-out possibly due to inability to fully utilise the allocated land, while about 7% of sampled farmers are involved in renting-in some portions of their land in addition to the land that they have already been allocated by government under the FTLRP. About 12% of the farmers interviewed were renting-in land and paying for the use of the land, yet they were not allocated land under the FTLRP. The remaining negligible proportion of 4% was involved in renting-in or out land for free. For purposes of understanding decision making for the farmers under study, this research categorised farmers into three broad categories; those who were not at all involved in land renting markets (51.3%), those that are renting-out (26.5%) and those that are renting-in irrespective of whether they were allocated land or not (22.1%). The analysis in this study was therefore based on these categories of farmers. Tables 4.2 and 4.3 gives information on the land that was cultivated for the agricultural season 2016/17.

Table 4.2: Cultivated land by settlement type

Settlement type	N	Minimum	Maximum	Mean	Std. Dev
Overall Sample	339	1.00	440.00	10.49	35.54
A1 model	266	1.00	73.00	2.71	4.59
A2 Model	73	1.00	440.00	38.86	69.37

Survey, 2017

Table 4.3: Cultivated land by settlement type and rental market participation

Settlement type	Rental market participation	N	Minimum	Maximum	Mean	Std. Dev
A1 model	Farmers not involved in land market	146	1.00	6.00	1.83	0.96
	Farmers renting-in	58	1.00	73.00	5.38	9.21
	Farmers renting-out	62	1.00	5.00	2.28	1.19
A2 model	Farmers not involved in land market	28	1.00	100.00	14.09	20.4 0
	Farmers renting-in	17	10.00	440.00	71.47	101.23
	Farmers renting-out	28	1.00	273.00	43.84	70.80

Survey, 2017

The study revealed, as expected that the average cultivated land for A2 farmers was higher than that of A1 as shown by the statistic in table 4.3. The result also showed that the average land cultivated for those farmers not involved in land markets was lower than that of the farmers participating in land markets both for the A2 and A1 models. The result also revealed that farmers involved in renting-in had higher average size of land cultivated than those involved in renting-out. Farmers renting-in in turn had higher cultivated land size than farmers in autarky positions. This is true for both A1 and A2 resettlement schemes.

A comparison was also made of the assets possessed by A1 and A2 farmers and participation in land rental market position. This is because assets are a proxy for the extent of wealth of the farmers as well as potential production capabilities. A1 and A2 farmers' asset means were

compared using tests of independent means. With respect to land rental market comparison, one-way anova was used. The results are shown in Table 4.4

Table 4.4: Asset ownership for selected categories of farmers

Asset	Mean number		Level of significance	Mean number			Level of significance
	A1	A2		Autarky	Renting-in	Renting-out	
Ox drawn ploughs	0.59	0.45		0.75	0.51	0.75	*
Ox drawn harrows	0.26	0.15		0.17	0.35	0.27	***
Tractor drawn ploughs	0.08	0.88	***	0.12	0.39	0.30	***
Tractor drawn harrows	0.03	0.66	***	0.11	0.23	0.23	
Cultivators	0.27	0.49	**	0.21	0.49	0.40	***
Planters	0.02	0.73	**	0.18	0.15	0.17	
Tractors	0.09	1.33	**	0.23	0.53	0.47	
Scotch carts	0.48	0.34	*	0.39	0.67	0.41	***
Vehicles	0.36	2.1	***	0.47	1.12	0.92	***
Cattle	3.5	30	***	5.71	11.55	14.26	

Survey, 2017. Notes: ***Significant at 1% level; **significant at 5% level; *significant at 10% level.

Table 4.4 showed significant differences for a number of assets between A1 and A2 farmers. Only ox drawn ploughs and harrows were not significant, and this was where A1 farmers had

on the average, more assets than their A2 counterparts. For the rest of the assets, A2 farmers had more assets, with significant differences. Generally, A2 farms were more mechanised than A1 farms, probably reflecting on the land sizes and access to government support programmes (Moyo and Chambati, 2013).

One-way ANOVA results also showed significant differences for categories of farmers in rental markets for the following assets; ox drawn ploughs, ox drawn harrows, tractor drawn ploughs, cultivators, scotch carts and vehicles. In general, for mechanised assets, those farmers renting-in had the most numbers, followed by farmers renting-out and with farmers in autarky position coming last. For non-mechanised assets, this trend was also the same. It can be concluded from the results that farmers renting-in were investing more in productive assets than the other groups of farmers. The results are consistent with those by Rahman (2010), showing renting-in farmers being better off than the rest of the farmers in terms of assets. Better assets have been reported to be associated with higher levels of efficiency (Feng, 2008), implying that farmers who rent-in land was likely to be more efficient than the other categories of farmers.

4.4 Conclusion

The survey showed that males dominated decision making in household and that farmers were the on average above 50 years of age. Literacy levels among decision makers was good but analytical capability was possible not that high. Agriculture remained the main source of income. Farmers renting-in land had higher land holding and more assets than other categories of farmers in land rental markets.

Having now developed an insight into the characteristics of the farmers under study, including the extent of participation in land rental markets, income and assets status of farmers, the next chapter is dedicated to unravelling farmers' perceptions on the land rental policy that was promulgated by the government since 2007 to try and encourage productive use of the land and to generate revenue for the state. The rationale is to understand the extent to which the different categories of farmers perceive this policy and how this policy might affect their farming decisions.

CHAPTER 5: FARMERS' PERCEPTIONS ON LAND RENTAL POLICY

5.1 Introduction

Understanding the perceptions, or the farmer's view of the land rental policy is a critical component in analysing potential for success of the policy. This is because such an understanding put forward farmers' interpretation of the policy and it is on this basis that farmers come to a decision on what to produce, how to produce and how much to produce. This chapter is therefore dedicated to gaining an understanding of these perceptions. The analytical framework used relied on three conceptual issues, which are farmer's knowledge, attitudes and practices (KAP), which, when consolidated give a farmer's perceptions. These conceptual issues are measured in terms of farmer's KAP alignment to policy position, with actions and views closer to policy being regarded as positive, while those which are further away from the policy promulgation being considered negative. This allowed for a measure of the extent of farmers' perceptions when compared to expectations as pronounced in the policy. Comparisons of KAPs are made across gender, settlement type and farmer categories presented in Chapter 4. Data on KAP had a Cronbach's alpha value of 0.811, showing that there was a good internal consistency of the data. Also, all tests were carried out at 0.05 confidence level.

5.2 Farmers' Knowledge on Agricultural Land Rental Policy

Knowledge was used as a gauge of farmer awareness of land rental policy. Figure 5.1 shoeds the frequencies of farmers' knowledge on different aspects of land rental policy.

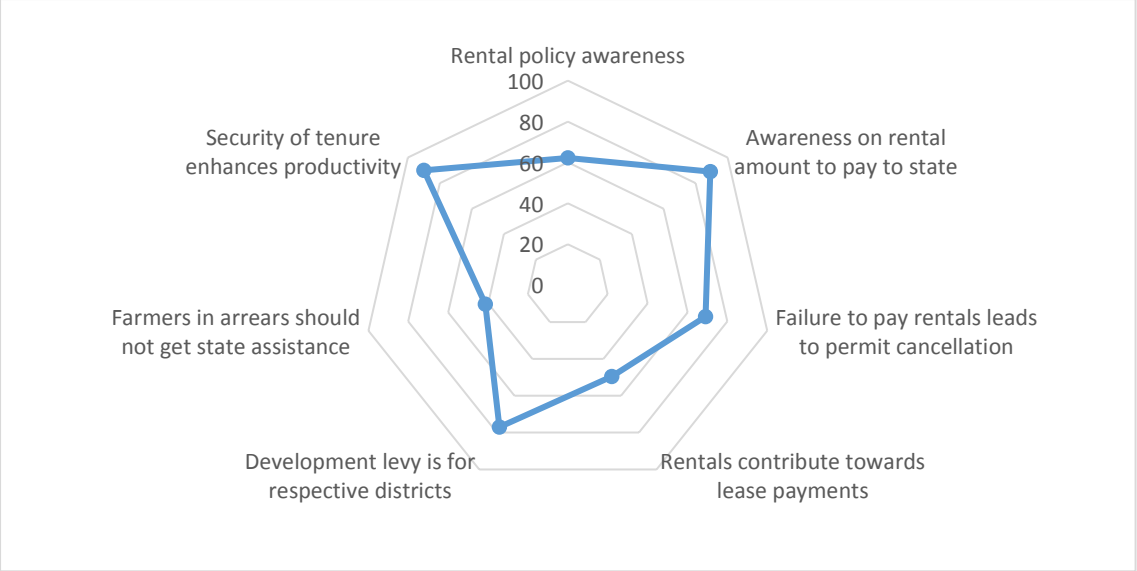

Figure 5.1: Farmers' knowledge on land rental issues

The results showed that famers had high knowledge about the importance of security of tenure in enhancing agricultural productivity. They were aware of the rentals that they were expected to pay to government and the effect of paying up their rental fees. Knowledge on the fact that the development levy that is paid as part of the rentals contributes towards the development of respective districts in which they were allocated land was also good. Many farmers were also aware that failure to pay rentals leads to cancellation of the permit, with about 70% aware of this policy position.

There are however other areas of rental policy in which farmers had less knowledge. Farmers seem to be aware of some issues covered in the Act but are not aware of the existence of the policy as a whole. This is probably the reason why most farmers were aware of the need to pay land rentals to the state but were not aware of the existence of the Act as whole that deals with state land rental payments. Results of the work by Hove and Nyamandi (2016) in Zimbabwe on both communal and small-scale resettlement areas showed that 54% of farmers was of the opinion that the government should legalise land markets so as to ensure efficient utilisation of

the land resource. This was also supported by findings of Moyo and Chambati (2013), who also recommended the issuance by government of land use and disposal rights for unlocking the full potential of land as an economic resource. While those in communal and resettlement areas are calling for legal instruments, those under A1 and A2 models have limited knowledge about the Act that governs them. It is therefore evident that it is not only the legal instrument that is important but also the process that leads to the promulgation of the instrument. In support, a study was carried out by Clark, Inwood and Jackson-Smith (2014) in USA to determine factors influencing farmers' perception of agricultural policy effectiveness. The study concluded that economic and environmental factors such as global market pressure, expectations about the future and the industry environment are more important in explaining perceptions than do farmer or farm characteristics. The results further point to the conclusion that the process of policy formulation (the consultation processes) is more important that the final policy itself.

A sizable number of farmers (41%) was not aware that if one fails to pay rentals then such a farmer is not entitled to receive any state assistance in production. Such assistance can include the Presidential Inputs Scheme, or Maguta or Command Agriculture (GoZ, 2010). This level of awareness points maybe to the possibility that there are no institutional mechanisms to effectively implement this provision or that the state has turned deaf ear to its effect, given that most of them are also beneficiaries of the programme. Also, close to half the number of farmers as indicated in Figure 5.1 was not aware that the rental payments that they were making were a contribution towards the final lease payment. In other words, the rentals were deducted from the final lease amount that was be calculated when eventually farmers were being given the 99-year leases (Finance Act, 2016). It is evident from the Figure 5.1 that farmer's knowledge differs on different facets of the policy, with some areas having high levels of awareness and

others being just above average. This points to the possibility of a very poor policy formulation consultative process, inadequate awareness campaigns after the policy enactment or lack of political will to see the policy through its implementation.

To understand further and make comparisons of land rental policy knowledge, Table 5.1 gives the categories of the sampled farmers, which are also compared across selected variables.

Table 5.1: Land rental policy knowledge scores by settlement type and gender

Score category	**Overall (%)**	**Settlement type (%)**		**Gender (%)**	
		A1	**A2**	**Male**	**Female**
Poor (<50%)	18.3	22.2	4.1	17.3	22.1
Fair (50-69%)	22.7	25.2	13.7	22.9	22.1
Good (70-100%)	59.0	52.6	82.2	59.8	55.9
Total	100	100	100	100	100

Survey, 2017

Table 5.1 showed that in terms of knowledge, most of the farmers (59%) are in the good category, followed by fair and while only a few farmers were in the poor category. It can be inferred that the level of knowledge on land rental policy was good. Knowledge comparisons were made on rental policy across settlement type. The results showed that more A2 farmers fell in the good category compared to A1 farmers. There was a smaller number of A2 farmers in the poor and fair categories. On the other hand, there was a high proportion of A1 farmers in the poor and fair categories. These results depicted a picture of A2 farmers being more knowledgeable on land rental policy compared to A1 farmers. These results are also related to the selection criteria for the allocation of land under the FTLRP. For A2 farmers, they had to

prove they possessed the capital required to start the farm business (though this was not followed strictly) and in most cases those with the financial muscle tended to have more knowledge. This is supported by results from chapter 4, which showed significant differences in assets ownership between A2 and A1 farmers. To confirm this, the Mann-Whitney U Test which showed the test results of the difference between the scores for A1 and A2 farmers was performed. The results revealed that there were significant differences between A1 and A2 farmers as indicated in Figure 5.2.

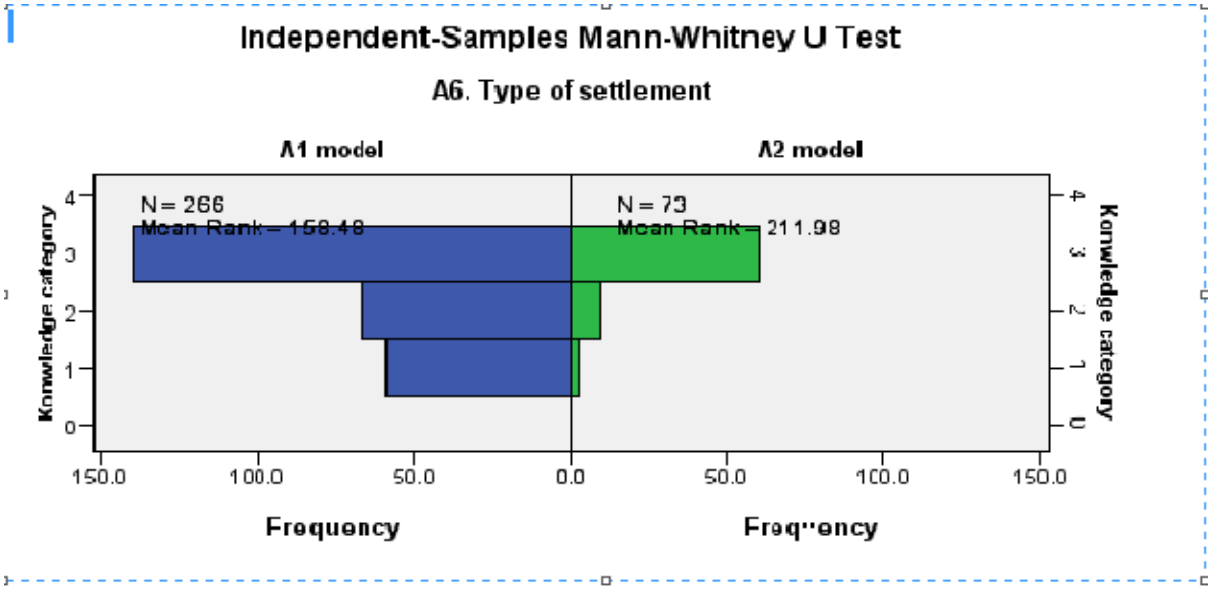

Figure 5.2: Mann-Whitney U test for A1 and A2 farmers

The Figure 5.2 showed a difference in the distribution of the score categories between A1 and A2 groups. The test value obtained was evident of the significance knowledge differences that existed between A1 and A2 farmers. Table 5.2 presents further results on the knowledge difference test.

Table 5.2: Mann-Whitney U test results between A1 and A2 farmers

Total N	Mann-Whitney	Wicoxon W	Test statistic	Std error	Standardized test statistic	Asymptotic sig (s-sided test)
339	12773.5	15474.5	12773.5	653.75	4.688	0.000***

Source (Survey, 2017)

Note: *** meant significant at 0.01 level

There are possible reasons that could be proffered as explanations for the results. One could be access to extension services (Hoke, 2012). However, in general, there are more extension agents in A1 than in A2 settlement schemes (MLRR, 2016) as government took a deliberate step to avail public extension agents to A1 farmers. A2 farmers rely more on private extension services than on public ones (Moyo and Chambati, 2013). Therefore, access to extension cannot explain the differences in knowledge between these two groups. A possible explanation is that A2 farmers have more capital (Matondi and Dekker, 2011) and are generally more informed than A1 farmers and therefore have more access to sources of information, such as newspapers and internet, giving them an advantage over their A1 counterparts. The strong informed position for A2 farmers might also be due to the fact that in general, they are more educated that A1 farmers. Results showed a significant difference ($p=0.005$) between years of formal education for A1 (9years) and A2 (11 years). A2 farmers also turn to have farm managers working for them and this gives them ample time to travel to cities and towns where access to information is much better than in farming areas.

There were no significant differences in score categories between male and female-headed households as shown in Table 5.3.

Table 5.3: Mann-Whitney test between male and female headed households

Total N	Mann-Whitney	Wicoxon W	Test statistic	Std error	Standardized test statistic	Asymptotic sig (s-sided test)
339	8742.5	1088.5	8742.5	636.867	-0.740	0.459

Source (Survey, 2017)

Female headed households normally refer to those households where the head and decision-maker is female (Tadessea *et al*; 2016). However, the Zimbabwean context is different due to the economic upheaval the country has gone through. Female headed households also include households in which the men, despite being is in diaspora, makes mostly very important decisions, but day to day decisions are made by the wife. Also encompassed are multi-farm ownership households where one of the wives and the children live on one farm and the man on another farm, maybe with a second spouse. Past studies (Moore, 2005) that have shown significant differences between male and female headed households have been attributed to differential in the levels of wealth and endowments. The absence of significant differences between the two groups can be explained in terms of farmers accessing same levels of information, especially in the mobile technology era, and supporting absent husbands who act as information conduits to spouses remaining on farms.

A comparison of knowledge was also made among identified farmers categories. The results are also indicated in Table 5.4.

Table 5.4: Land rental policy knowledge scores by farmer category

Score category	Overall (%)	Farmer land market participation category (%)		
		Autarky	Renting-in	Renting-out
Poor (<50%)	18.3	16.7	17.3	22.2
Fair (50-69%)	22.7	22.4	20.0	25.6
Good (70-100%)	59.0	60.9	62.7	52.2
Total	100	100	100	100

Survey, 2017

The Table showed that all farmer categories had a higher proportion of farmers with scores in the good category. This implied that most farmers did have good knowledge about the land rental policy. In the good score category, farmers involved in renting-out had comparably lower proportion than those not involved in rental markets (autarky) and those renting-in. This is surprising given that farmers who rent-out are land holders (Moyo and Chambati, 2013) and it is expected that they will be more of this policy compared to those renting-in because some of them do not own any land. The p-value of 0.296 for the Kruskal-Wallis test indicated no significant differences in scores among the different farmer categories.

5.3 Farmers' Attitudes on Agricultural Land Rental Policy

Attitude was used to give an indicator of the moral suasion possibility of the farmers and the extent to which they are likely to cooperate in the implementation of the policy. Success of any public policy hinges to a large extent on the engagement of the public towards that particular policy (Bert *et al*, 2015). Again, just as with knowledge, questions relating to attitude were posed to the respondents. Figure 5.3 presented the general result for the sampled farmers.

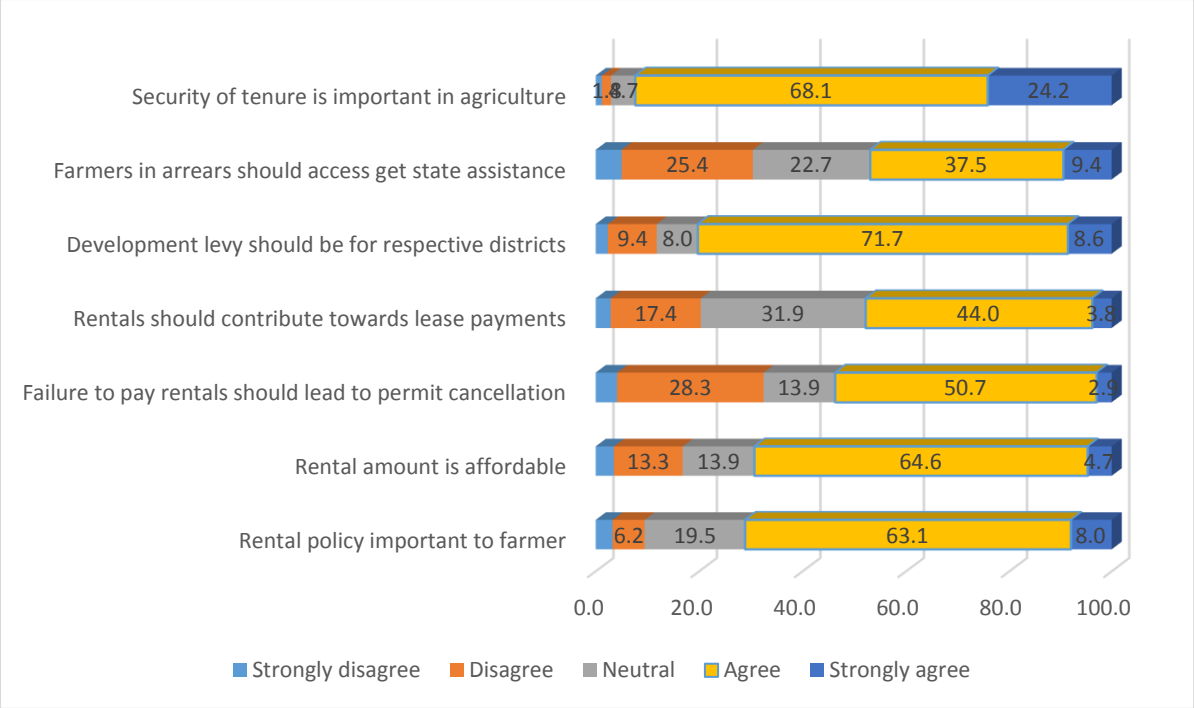

Figure 5.3: Farmers' attitudes towards land rental policy issues

The graph showed that most farmers agreed that a rental policy is an important document to the farmer, while about 20% was neutral. On affordability, 64.6% of the respondents indicated that the rental amount was affordable while 18% was of the opinion that they could not afford to pay the rental. The proportion of farmers who agreed that the permits should be cancelled should one fail to pay for the rentals was 53%, while 32% indicated that failure to pay should not lead to permit cancellation. The proportion of farmers who agreed that rentals should be part of a lease fee (48%) was higher compared to 20% who said that this should not be the case. Of significance was the high percentage of farmers who were neutral on whether rentals should contribute towards lease payments. Theoretically, according to Chingombe (2015), this should be a good policy as it saves farmers from double payments of rentals and lease payments. Therefore, the high proportion of neutral farmers was probably a reflection of lack of understanding by the farmers on what constitute a lease fee and a rental fee. It becomes imperative that more information is made available to these farmers on rental fees and lease

fees and the various stages that one goes through to eventually take ownership of a lease. This would enable farmers to have a full appreciation of the process of leasing land, which will increase confidence levels among the beneficiaries of the land reforms.

In general, farmers agreed that the developmental levy that is part of the rental fee should develop respective districts from which the rentals were paid. These results seem to contradict the current thrust with respect to rentals being taken by government. The Ministry of Lands is collecting the levies from the farmers on behalf of the state (MLRR, 2016). The councils have expressed displeasure with the Ministry (Herald, 2015) in that it is not channelling the funds back to the respective councils and this has negatively affected the ability of these councils to deliver on their development agenda. About 56% of the respondents believed that farmers in rental payments arrears should not benefit from state assisted agricultural programmes. However, about 30% of farmers disagreed with this while close to 23% was neutral. The attitude is understandable given that government is subsidizing the agricultural sector (MLRR, 2016) and respondents cannot withstand a situation where they do not benefit from the programmes due to failure to pay rentals. On tenure security, 92% agreed that tenure security is a critical component in addressing agricultural productivity. Overall, the attitude of the respondents towards the agricultural rental policy was positive, with agreement on most policy issues. There are areas of disagreement however and these relate to cancellation of permits due to failure to pay rentals; contribution of rentals towards lease fee and lack of access to state programmes owing to failure farmers to pay rentals. These overall scores for attitudes are given in Table 5.5.

Table 5.5: Land rental policy attitude scores across settlement type and gender

Score category	Overall (%)	Settlement type (%)		Gender (%)	
		A1	A2	Male	Female
Poor (<50%)	15.9	18.4	6.8	14.4	22.1
Fair (50-69%)	53.7	52.3	58.9	52.8	57.4
Good (70-100%)	30.4	29.3	34.2	32.8	20.6
Total	100	100	100	100	100

Survey, 2017

The results showed that most of the respondents was in the fair category, followed by good, with only a few in the poor category. There seem to be differences in the number of respondents falling in the poor category between A1 and A2 farmers. However, such differences were not significant with a Mann-Whitney U tests p-value of 0.77. This lack of significant differences in attitudes between A1 and A2 farmers suggested that settlement type did not influence a farmer's attitude towards land rental policy. It is suggested that the policy does not discriminate against any of the two models. It is also important to note that the attitude of farmers towards policy is positive for both A1 and A2 farmers, with more than 80% having a good attitude towards the policy.

However, with respect to gender, the results showed that were are significant differences between male and female headed households in terms of their attitudes towards land rental policy (p=0.027). This is also supported by Figure 5.4.

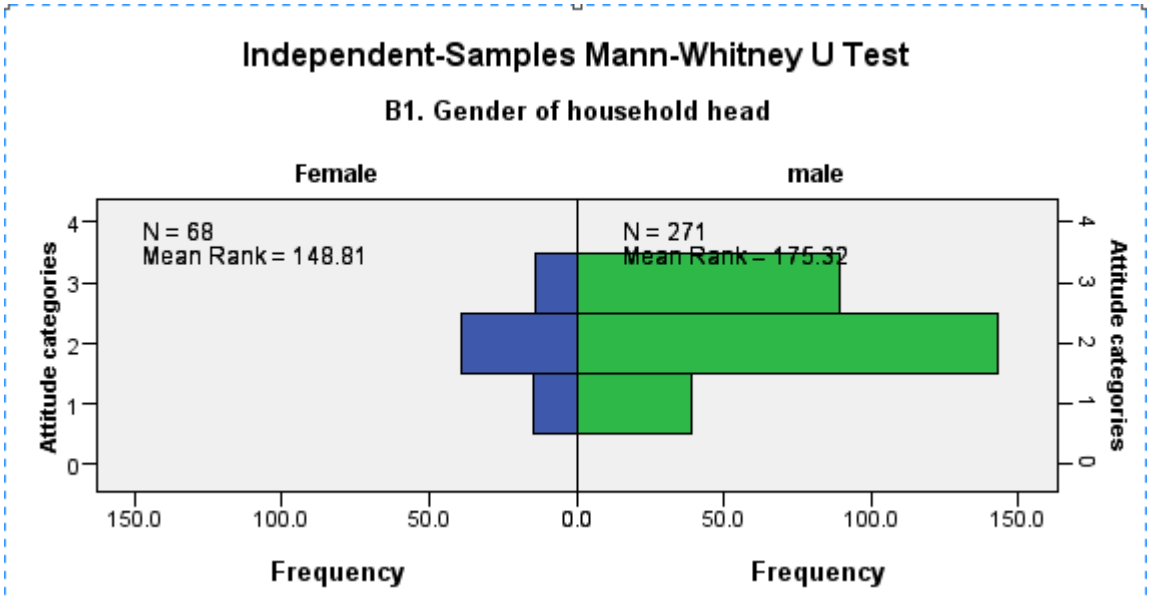

Figure 5.4: Mann-Whitney U test across gender

While there were more female headed households within both the poor and fair score categories than for male-headed ones, these were less in the good score category. The poor attitude scores for female headed households probably relates to the fact that a number of the heads are widows or divorced and at some point, in their lives, they were led by males in the household (Otsuka and Place, 2014). For those households in which the husband was away, a probable explanation is that the pressure to both make and implement decisions leaves them without much time to seek information and develop a position on the policy. Therefore, their attitude on issues raised maybe based on lack of knowledge on the overall understanding of the land rental policy. Normally, spouses in male headed households tended to leave institutional issues that may have a bearing on the household to the male heads and might not have a developed position on important matters (Paradzayi, 2007). In order for more female-headed households to build positive attitudes, they need to be more informed about the policy and wide dissemination of this policy through public agricultural extension service providers becomes imperative. An analysis of the attitudes across farmer categories showed the following results in Table 5.6.

Table 5.6: Land rental attitude scores for different farmer categories

Score	Overall (%)	Farmer rental category (%)		
		Autarky	Renting-in	Renting-out
Poor (<50%)	15.9	13.2	14.7	22.2
Fair (50-69%)	53.7	52.3	54.7	55.6
Good (70-100%)	30.4	34.5	30.7	22.2
Total	100	100	100	100

Survey, 2017

The results showed that, in general, most farmers were in the fair category across the three farmer categories, followed by the good and then the poor categories having the least number of farmers. That farmers' attitudes towards the land rental policy was mostly in the fair category implied they did not necessarily have the same sentiments as those enunciated by the policy. This calls for either fine tuning of the policy to align it with farmers' attitudes or investing in more publicity campaigns so that farmers are more informed and, in the process, align attitudes to policy impetus. Table 5.6 also showed that while farmers not involved in land markets (autarky) and those renting-in had almost the same proportions of farmers in the different categories, these seem to differ compared with farmers involved in renting-out as confirmed by the Kruskall-Wallis test ($p=0.049$).

5.4 Farmers' Practices on Agricultural Land Rental Policy

The practices are intended to measure what the farmers are actually doing in relation to the land rental policy. Farmers were asked seven practice questions relating to knowledge and attitudes. The results showed that 79.4% of the respondents indicated that they wer happy with the agricultural land rental policy in its current state. With respect to land tenure, 47.8%

indicated that they felt secure with the current land tenure arrangements. This was a fairly low proportion and is supported by the findings of Zhllima *et al*. (2010) in Albania who point to perceptions of insecurity associated with the legal rights to land and the ancestral rights associated with former owners. This is a possible situation obtaining in Zimbabwe in that while farmers obtained land legally, there are still fears of possible repossession by white former farmer owners, especially with the lack of compensation for developments made by these former owners. Also, the legal instruments upon which the farmers were resettled were not water tight, and this reduces confidence in the current tenure arrangements. The other practices are shown in Figure 5.6.

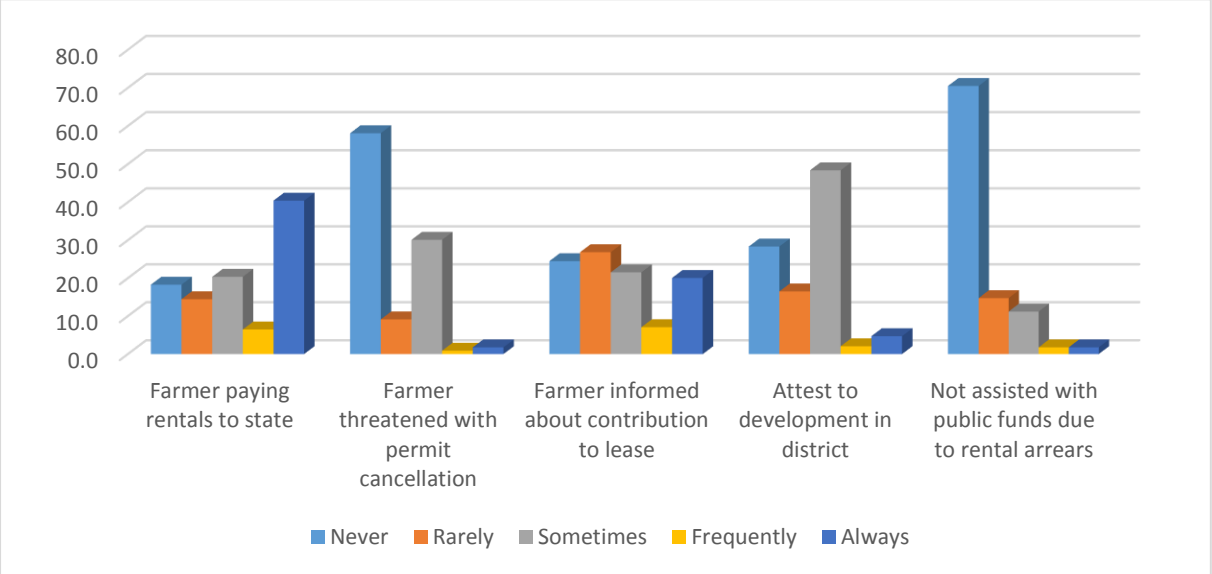

Figure 5.5: Farmers' practices on land rental policy

The Figure showed that about 40% of the farmers was consistently paying rentals to the government. It is important to note that most of the farmers in this study was A1 (78.5%) and their rentals are fixed at $15 per annum (Finance Bill, 2016), irrespective of the size of the land and this probably explains such a relatively high proportion. This result is supported by Chingombe's (2015) in which it was postulated that the land rental introduced by GoZ is the

best policy for payment for developments by former owners, development of respective districts and performance of land audits. The study finds no significant differences in the payment rate across gender and marital status, except for the divorced group, which had 17% consistently paying state rentals, even though constituting only 3.5% of the sample. The economic and political environment has played a role to a certain extent on the non-payment of rentals (Herald, 2017). Low productivity and low demand as a result of downturn in the economy has eroded the potential capability of the farmers to pay rentals. Focus group discussions also revealed that most respondents considered that as long as they are aligned to the current ruling political party, they are immune to eviction even when they are not paying rentals. Most of the land reform beneficiaries are ruling party supporters, war veterans and collaborators. Therefore, the confidence is high among them that the party will not let them down through eviction for failure to pay land rentals (Matondi and Dekker, 2011). Moreover, the institutions for effective monitoring of payments are weak. Even though the designated authority, the Ministry of Lands has District Offices, farmers are required to go to the Head Office to make payments, making it a cumbersome process. The Ministry has neither the manpower nor power to go and evict those farmers who are not paying their rentals. As Feder and Feeny (1991) have pointed out, weak and non-existent institutions weaken tenure systems and often leads to emergence of informal arrangements among the farmers for assuring tenure. Results from the study shows that an informal land rental market has emerged among the farmers and also those without the farms. About 22% of the farmers was involved in renting-in land and 27% was involved in renting-out, even though most of the arrangements did not give security of use rights as the owner may change the tenant the following season. Payments for rentals are made within the particular agricultural season. Some of those who participate in rental markets indicated their need to raise money to pay for land rentals to government as reason for engaging in land rental markets. There were however others who were paying or

receiving money from land rental markets but not paying state rental payments. That some are paying (receiving) money on land rental markets but failing to pay state rentals points to possible weak institutions for implementation of the policy.

A scenario where some farmers were paying and others were not while within the same community creates a potentially morally hazardous situation, where the belief eventually will be that there is no punishment for accumulating state rental payments arrears. Even with the new regime that came into power in November 2017, very little or no attention has been given to effective implementation of the policy Rather the new regime has focussed its attention on getting rid of those farmers settled illegally, providing security of tenure and inputs support (Herald, 2018). The new government has also paid little attention to ensuring that farmers are paying the rentals, even assuring them that the land reform is an irreversible programme. With the 2018 elections slated for July, 2018, it is unlikely that the new government might threaten the beneficiaries with eviction for non-payment of rentals as this might be construed as political suicide. However, this has strong negative implications on the ability of government to raise revenue. Government has since made a commitment to expedite compensation to white former commercial farmers for infrastructure development made on the farms (Keswell and Carter, 2014).

This study also showed that most farmers have never been threatened with permit cancellation because of failure to pay land rentals. This indicates that there is no effective implementation of the policy at the farmer level. In the past there have been political statements issued to the effect that A1 and A2 farmers should not pay the rentals because it is state land and that no one will be targeted because of failure to pay for the rentals (Herald, 2015). In addition, the Ministry of Lands, which was given the mandate to execute this policy, did not get the required political

support and as a result has just focussed more on revenue collection without effecting such measures related to cancellation of the permits (MLRR, 2006).

The issue of whether farmers are being informed about what they have contributed towards lease is very mixed. This information is supposed to be obtained from the Ministry of Lands and therefore it is possible that there could be confusion over whether farmers are getting such information or not (Moyo, 2016). The majority of farmers indicated that they sometimes observed some development in their area. This question was used as a filler since development is a function of many other aspects not just the developmental fee obtained from farmers. Moreover, not many farmers were paying up, which also made it difficult to take a position as to the level of development in the area. While the policy gives guidance that farmers who are not paid up in rentals should not be assisted from state funds, the results showed that most of the farmers have never failed to get assistance on the basis of not paying rentals. This showed that institutions mandated with supporting farmers are not using the rental policy as a guide. As was noted earlier, because a significant proportion of the beneficiaries of FTLRP were government employees, there is therefore a potential conflict of interest as they also aim to benefit from government support programmes and are inclined to pay lip service to policy provisions. In terms of practices (reflecting the implementation of policy), it can be concluded from Figure 5.6 that there was limited adherence to this policy at both the farmer and institutional level. Results of practice scores are shown in Table 5.7.

Table 5.7: Land rental policy practice scores according to gender and settlement type

Score	Overall (%)	Settlement type (%)		Gender (%)	
		A1	A2	Male	Female
Poor (<50%)	72	72.6	69.9	70.5	77.9
Fair (50-69%)	25.3	24.4	28.8	26.9	19.1
Good (70-100%)	2.7	3.0	1.4	2.6	2.9
Total	100	100	100	100	100

Survey, 2017

The Table showed that in terms of practices, most of the respondents were in the poor category, followed by those in the fair category and just a minimal proportion was in the good category. The connotation is that farmers were not abiding by the requirements of the agricultural land rental policy as reflected by the high proportion of farmers in the poor category. It also implied that implementing agencies were not being guided by this policy in executing land tenure related issues. Also, the farmers were not cognisant of how their actions relate to the policy. A comparison of scores across settlement type showed that there were no significant differences as indicated by the results of the Mann-Whitney U test (*p=0.717*) between A1 and A2 farmers in terms of their practices. This is unexpected given that there is a huge gap between the rental amounts for A1 and A2 farmers as shown in Chapter 4. However, with the evidence of little reference to rental policy at both institutional and farmers level, it is understandable that such difference was minimal. There were also no significant differences as shown by the Mann-Whitney U test p-value of 0.243 between male and female headed households. Scores comparisons were also carried out among the different farmer land market participation categories, and the results are shown in Table 5.8.

Table 5.8: Practice scores among farmer categories

Score	Overall (%)	Farmer renting category (%)		
		Autarky	Renting-in (%)	Renting-out (%)
Poor (<50%)	72	69.0	80.0	71.1
Fair (50-69%)	25.3	27.0	20.0	26.7
Good (70-100%)	2.7	4.0	0	2.2
Total	100	100	100	100

Survey, 2017

The same trend was observed in that most of the farmers was in the poor category, followed by those in the fair category. The Kruskal-Wallis p-value of *0.296* also indicated that there were no significant differences among the three farmer categories. A possible explanation for the observed results is that in general all farmers have shown limited practices that adhered to the land rental policy and therefore it becomes difficult to expect any significant differences among different farmer categories. The researcher's overall position on practice is that there was a poor implementation and adherence to the land rental policy and this was observed across the board, with no significant differences observed among various farmer categories. Weak institutions for implementing and monitoring rental policy was the greatest challenge towards adherence to policy as institutional arrangements form the core for a functional land rental system. Institutions can be categorised into three, namely constitutional order, normative behaviours and institutional arrangements (Feder and Feeny, 1991). Constitutional order relates to fundamental rules meant to organise society and, in most cases, is enshrined within country constitutions. Institutional arrangements refer to rules and regulations that are created to operationalize the constitutional order. Normative behavioural codes are cultural values and

norms which give legitimacy to the institutional arrangements and may constrain behaviour. Where institutions are weak and non-existent, it becomes difficult to enforce a land rental policy (Feder and Feeny, 1991).

5.5 Overall Scoring (KAP) on Agricultural Land Rental Policy

After looking at different areas that capture perceptions, the final scoring of knowledge, attitudes and practices was done by adding up the scores together and farmers were grouped on the basis of the final the scores, which were then compared across gender, settlement type and farmer categories. Table 5.9 showed the results for KAP scores:

Table 5.9: Land rental policy KAP test scores for different categories of respondents

Score		**Settlement type (%)**		**Gender (%)**		**Farmer renting category (%)**		
	Sample	**A1**	**A2**	**Male**	**Female**	**Autarky**	**Renting-in**	**Renting-out**
Poor (<50%)	35.7	39.5	21.9	33.6	44.1	28.2	45.3	42.2
Fair (50-69%)	53.7	48.5	72.6	55.0	48.5	59.2	46.7	48.9
Good (70-100%)	10.6	12.0	5.5	11.4	7.4	12.6	8.0	8.9
Total	100	100	100	100	100	100	100	100

Survey, 2017

Table 5.9 showed that overall, most farmers were in the fair category, followed by the poor category and lastly good category. The Mann-Whitney U tests showed that there are no

significant differences in KAP scores between A1 and A2 farmers (*p=0.093*) and between male and female headed households (*p=0.086*). Results of the Kruskal-Wallis test for differences in KAP scores among farmer categories (*p=0.012*), implied significant differences among the different categories at 5%. The post-hoc test showed that these differences were significant for all the three categories as shown in Figure 5.7:

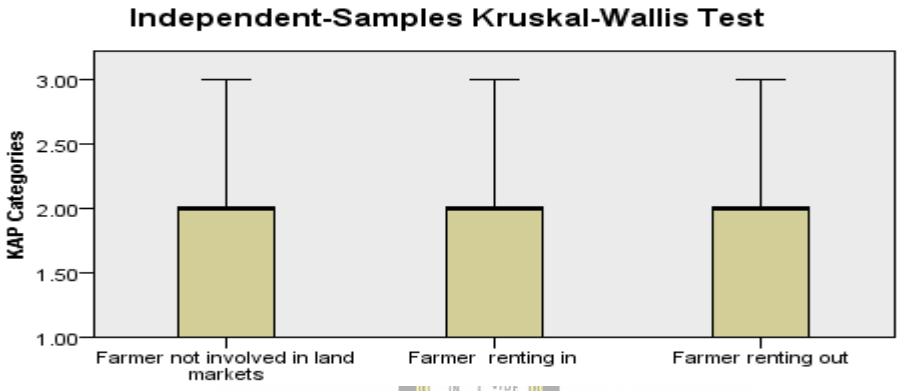

Figure 5.6: Post-hoc test for KAP scores among farmer rental categories

Thus, farmers differed in terms of their overall perceptions of rental policy depending on whether the farmer was involved in land markets or not. Farmers not involved in land markets had a lower proportion of their sample members in the poor category compared with the other two. The proportion of farmers in the fair category was higher for those not involved in land markets than the other two. The same trend was observed for the proportion of farmers that was in the good score category. Farmers not participating in rental markets fared better than the other two categories. These farmers were land owners, and most of them were not participating because they have taken heed of some pronouncements from government that they should not be involved in land rental markets as it was considered illegal. This is a provision in the land rental policy document and this differentiates them from the other farmers.

5.6 Conclusion

It can be concluded that farmers had a fairly good knowledge of the agricultural land rental policy enunciated in the Finance bills since 2007, though a better consultative process prior and post its enactment would have improved knowledge levels. Knowledge for A1 farmers was found to be significantly different from that of A2 farmers and the possible explanations were levels of education, access to information and wealth standards that differed between these two groups. Knowledge levels were not significantly different between male and female headed households and this also applied regardless of whether they were involved in the rental markets or not. Farmer's attitudes in relation to policy were categorised as fair and there were differences in attitudes based on gender of household head. There were also significant differences between farmers not involved in land markets and those who were renting-in land. The attitudes of A1 and A2 farmers were observed not to be significantly different from each other. The results of practice scores showed a poor adherence to policy for all categories of farmers. The possible identified reasons were poor macro-economic conditions, lack of political will by government and institutions weakness on the part of policy implementation, resulting in farmers taking a lack-lustre approach towards policy adherence. Overall, the perceptions of farmers on the rental policy could be inferred to as fair. However, significant differences existed in the perceptions of farmers not involved in rental markets, those renting-in and those renting-out.

This chapter looked at the perceptions of A1, A2, renting-in, renting-out and autarky farmers on the land rental policy and how these perceptions were related to their practices (actions). Chapter 6 is dedicated to understanding more about farmers participating in land rental markets by determining possible factors underlying this participation. The chapter details socio-

economic factors that have a bearing on the decisions by famers to participate in land rental markets. The focus is on only farmers renting-in and renting-out.

CHAPTER 6: DETERMINANTS OF LAND RENTING DECISIONS BY FARMERS

6.1 Introduction

Both A1 and A2 farmers have been involved in informal and formal land rental markets during the tenure of the land rental policy. There have been inconsistent policy pronouncements on rental markets. Many policy makers and administrators have given the impression that land rentals are illegal and hence a significant number of farmers have engaged in the practice clandestinely. On the other hand, a farming partnership policy was promulgated which allows farmers to partner with those who have the capital in production with the approval of the Ministry of Agriculture. Consequently, those who have been involved in land renting have disguised these practices as partnerships to formalize their rental engagements. This chapter is therefore devoted to understanding factors that determine a farmers' decision to rent-in or rent-out land. A bi-variate Tobit model was used to analyse these factors. Such an understanding could aid government in planning for appropriate tenure regimes going forward, since it has been established in the literature review that land tenure regimes in Zimbabwe are in disarray and not therefore sustainable. Any considerations on establishing a land rental market as a tenure regime option would benefit from this analysis. The chapter began with a descriptive analysis of the possible factors considered in the model and ended with the analysis of the factors that influences the decisions to rent-in and rent-out land.

6.2 Descriptive Statistics of Variables Considered

The factors that were considered, which have a bearing on a farmer's decision to rent-in or rent-out land are shown in Table 6.1. These factors were categorised into autarky, renting-in

and renting-out.

Table 6.1: Descriptive statistics for variables used in the model

Variable	Autarky	Renting-in	Renting-out
Setlmnt_A1 (1=A1)	0.839	0.773	0.689
Gender (1=male)	0.816	0.773	0.789
Marital status (1=married)	0.833	0.773	0.833
Age (yrs)	55.672	57.813	58.656
Num_Edu_yrs	9.584	10.040	9.533
total_Hh_incom ($)	9818.793	20993.333	95745.000
Total_F_members	5.224	5.667	5.222
Permanent_labor	1.126	3.147	3.211
Cultivated_area (ha)	3.968	20.360	15.212
Capital_value_Assets ($)	5298.621	19452.427	16381.167
Livestock_value_Assets ($)	5983.753	4552.760	5996.178
Tenure security (1=yes)	0.477	0.520	0.444
Irrigable_landsze (ha)	4.608	23.408	33.542
Land_rented_IN	0	19.636	0
Rental_Amnt_IN	0	64.424	0
Land_rented_OUT	0	0	20.988
Rental_Amnt_OUT	0	0	75.581
Crop_Dive_Index	0.805	0.700	0.796

Survey, 2017

Results in Table 6.1 showed the means for the variables across the different farmer categories. For most of the variables, there appeared not to be much difference in their measurements. Also, permanent labour was lowest for farmers in autarky. Land farm size, cultivated area and capital assets were all lowest for farmers in autarky compared to those farmers either renting-

in or renting-out.

6.3 Determinants of Renting-in (lessee) and Renting-out (lessor) Land

The study used a bivariate Tobit model to analyse the factors influencing farmer decision making to rent-in or rent-out land. The farmers that were considered were only those that are involved in land rental markets, either renting-in or renting-out. The results of the Tobit model analysis are shown in Table 6.2 and the detailed model results presented in Appendix 2. The log likelihood ratio, which is the analogous of the F-test in multiple regression ($p<0.01$) was significant.

VARIABLES	Land rented-in (lessee)	Land rented-out (lessor)
Gender	5.974**	-6.505
	(2.781)	(4.536)
Married	-2.992	3.301
	(2.927)	(4.655)
Age	0.031	-0.239**
	(0.072)	(0.115)
Num_Edu_yrs	0.183	0.143
	(0.186)	(0.294)
total_Hh_incom	-0.000***	0.000
	(0.000)	(0.000)
Total_F_members	-0.013	-0.824
	(0.397)	(0.633)
Permanent_labor	-1.418***	3.155***
	(0.269)	(0.433)
Cultivated_area	0.415***	-0.014
	(0.046)	(0.073)
TenureCertainity	3.521*	1.877
	(1.953)	(3.099)
Irrigable_landsze	0.117*	-0.239**
	(0.063)	(0.101)
Crop_Dive_Index	7.204*	17.616***
	(3.844)	(6.070)
sigma1	14.225***	
	(0.758)	
sigma2	22.613***	
	(1.206)	
atan_rho	-0.253**	
	(0.115)	
Log likelihood =	-1572.492	
Wald chi2(11) =	218.26	
Prob > chi2 =	0.0000	

Table 6.2: Determinants of participation in land rental markets (likelihood ratios)

Survey, 2017, Notes: ***significant at 1%; **significant at 5%; *significant at 10%; values in parenthesis are standard errors

6.3.1 Determinants of Renting-in (lessee) decisions

The results show that gender, household income, permanent labour, cultivated area, tenure certainty, irrigable land size and crop diversification are significant factors influencing the decision to rent-in land. The first four are significant at 0.01 level of confidence while the later three are significant at 0.1 level. Thus, these results show that the decision to rent-in land is influenced by a combination of household characteristics (gender, income, labour), land endowments (cultivated area, irrigable land size, crop diversification) and transaction cost (tenure certainty) factors. These factors are discussed in detail in the following sections.

The results in Table 6.2 show that compared to women, the likelihood of renting-in land is increased 5.974 times if the household head is male. This result is significant at 5% level. According to (Bert *et al*; 2015) men are likely to take risks and seek more land for expansion purposes rather than be content with the allocated land, when compared to female heads of households. In addition, results have also shown that a significant number of households not allocated land but participating in rental markets are male headed. The findings contrast that of Shifa (2016) who concluded that males are less likely to be involved in renting-in compared to their female counterparts. Ensuring more certainty to land rental markets through government policy such as formalising the markets might provide possible solution towards encouraging female headed households to participate in these markets.

A lower income has the effect of not changing much the likelihood of a farmer renting-in land. This is significant at 1% level of confidence. Given statistics that have shown that 67% of

households depend on agriculture for their income, renting-in therefore provides a means through which farmers can increase their household incomes.

Also, an increase in permanent labour by one unit reduce the likelihood of a farmer renting-in land by 1.418 points. In production economies (Rahman, 2010), farmers who have more permanent labour are mostly those with higher levels of productivity. As such they are likely to seek more land to rent-in. The results therefore are a deviation from this expected norm. A possible explanation for this deviation is that farmers who are capital intensive (less labour) are more likely to seek more land (renting-in) as they seek to achieve economies of scale from the available capital. Another reason could be that those farmers who were renting but do not have land of their own (consequently fewer permanent workers) are more involved in renting-in than those allocated land by the state. Indeed Moyo (2016) argues that farmers involved in renting-in activities turn to have reduced number of permanent workers.

An increase in cultivated area by one unit (hectare) is likely to increase the likelihood of renting-in by 0.148 points. A farmer with a more hectarage of cultivated land is more likely to be fully utilizing the land holding and be more efficient by taking advantage of economies of scale (Rahman, 2010). Therefore, such a farmer is likely to rent-in more land after fully utilising all allocated land and then start to look for underutilized land among fellow farmers. Even for those farmers renting-in but not owning any land, participation in rental markets may require that a higher hectarage of land be devoted to production to compensate for the rentals being charged by landlords if the enterprise is to remain profitable. The results of this study contrasted those of Rahman (2010) and Amare and Beyene (2015) which showed that lower size of cultivated land determined renting-in decisions. However, it is noted that for both Bangladesh and Ethiopia where the studies were done, the average size of land is about 3 hectares or less,

which is far lower than what A1 and A2 farmers are allocated in Zimbabwe. This probably explains the differences in the results obtained in this study.

Results presented in Table 6.2 also showed that perceptions of tenure security increased the likelihood of renting-in land. For those farmers without land and who are renting-in, perceptions of tenure certainty might refer to their contractual agreements with the landlord, and not necessarily state tenure certainty. For those who are in investment partnerships, tenure security is enhanced by the formal agreements which were approved by the Ministry of Agriculture, increasing the confidence in the agreements signed and reducing possible contractual violations. This result is however different from the findings by Shifa (2016) who observed no significant effect of tenure security in renting-in decisions. It is important to note that culture and social capital play an important role in production (Hou *et al*; 2017). Among those nations where private tenure has never been adopted, tenure security is enhanced by the time period one has been on the farm more than the documentation giving one access to land (Shifa, 2016). Hence in such nations as Ethiopia, tenure certainty might not be important, while it is important in the Zimbabwean context. According to Bizimana (2011), a strong secured tenure reduces transaction costs associated with land rentals and in the process encourage participation in rental markets.

Results showed that increasing the size of irrigated land by a hectare increase the likelihood of participating renting-in markets by 0.117 points. Irrigable size of land has the effect of increasing the odds of being involved in land renting-in. Where farmers have irrigable land, the risk of production is reduced, and it is expected that once irrigable land is available, then farmers become more interested in renting-in the land. Also, farmers who normally purchase irrigation facilities are resource endowed farmers who are more likely to seek more land for

renting-in. The findings however differed from that of Rahman (2010) and Hou *et al* (2017) which showed that irrigable land has no effect on renting-in decisions.

The decision by a farmer towards complete specialization in crop production as indicated by the crop diversification index had the effect of increasing the likelihood of renting-in land by 7.204 points. One of the tenets of commercial agriculture is specialization in limited enterprises (Benin, 2016). Farmers with a commercial approach to farming are more likely to seek more land to expand on production (Amare and Beyene, 2015). It is therefore possible that farmers with such an orientation are more inclined to seek more land for renting-in. A higher diversification index implied a propensity to specialize and consequently more demand for larger portions of land to practice agricultural production and consequently renting-in behaviour.

It is evident from the analysis that gender, household income and number of permanent labourers are household characteristics affecting the decision to rent-in land. Cultivated area, irrigable land size and crop diversification index representd land endowment factors while tenure security was a measure of transaction costs associated with the decision to rent-in land.

6.3.2 Determinants of Renting-out (lessor) Decisions

The results of determinants of renting-out land showed that age, irrigable land size, crop diversification and permanent labour were significant factors. The first two factors were significant at 0.05 level of confidence while the last two were significant at 0.01 level. It can be deduced that household characteristics and land endowments were the determining factors

for farmer's decision to rent-out land.

A decrease in age by one unit had the effect of increasing the likelihood of being involved in land markets by 0.239 points. Age is a culmination of level of risk tolerance, agility to farm and farming experiences. Young farmers are more likely to take the risks of renting-out land if they are not fully utilizing it (Hou *et al*, 2017). Risk taking is naturally higher for the younger generation and in the face of conflicting political statements from policy makers, it is expected that young farmers will be more involved in renting- out land compared to their older generation (Moyo, 2016). The younger generation also does not have the capital to be fully engaged in agriculture (Matondi, 2011). Furthermore, they constitute a large portion of the economically active group, preferring to seek formal employment in industry, thereby exhibiting a higher propensity towards unutilized, rented-out land. The results are supported by those of Masterson (2007); Amare and Beyene (2015); Nyangena (2014), who reported a significant and negative impact of age but contrasted with the findings of Bizimana (2011), whose conclusion was that age does not have a significant influence on the decision to rent-out land. The differences could have been accounted for by differences in the household characteristics. An increase in permanent labour by one unit also increased three times the probability of the farmer renting-out land.

An increase in the irrigable land size by a unit also decreased the likelihood of a farmer renting-out land by 0.239 points. Increase in irrigable land size allows the farmer to be efficient by maximizing output on a given piece of land (Hou *et al*; 2017). Hence, farmers are unlikely to rent-out land where there are irrigation facilities (Hou *et al*; 2017). Irrigation equipment is also expensive, and renting-out increases the risk of theft and misuse, hence the reluctance to rent-out irrigable land. This means that farmers who have irrigation facilities on their farms are

unlikely to be renting-out land.

Increased specialization in crop production (crop diversification index) had the effect of increasing the probability of a farmer participating in renting-out of land by 17.6 points. These results were supported also by Tikabo and Holden (2004) but contrasted by the findings of a study by Rahman (2010). A farmer practising specializing is likely into commercial production and is therefore most probably to have very limited amount of land to rent-out.

6.4 Conclusion

This chapter was aimed at understanding the determinants of the decisions to rent-in or rent-out land among A1 and A2 farmers. The bi-variate Tobit model results showed that the decision to rent-in land was influenced by gender, household income, permanent labour, cultivated area, tenure certainty, irrigable land size and the crop diversification index, which were statistically significant. Previous studies have shown no particular trend on the impacts of these variables on the renting-in decision. On the other hand, age, permanent labour, irrigable land size and crop diversification index significantly influenced the decisions to rent-out land. As with renting-in, literature has not shown any consistent tendencies of these variables. The conclusions were that household characteristics, land endowments and transaction costs significantly influence renting-in decisions, while renting-out decisions were influenced more by household characteristics and land endowments. It is recommended that to improve land rental market participation, the following factors should be enhanced; income generation activities, promotion of capital-intensive technologies and irrigation facilities as well as improve security of tenure.

Having understood the perceptions of different categories of farmers (including those renting-in, renting-out and in autarky position on the land rental policy in Zimbabwe in Chapter 5, this chapter identified the factors influencing farmer decision to participate in land rental markets. The next chapter focus on analysing economic efficiency for farmers renting-in, renting-out and in autarky to determine if rental markets enhances efficiency as well as the possible sources of inefficiency. In the Chapter, a determination is also made as to whether rental market participation enhances better distribution of societal land resource or not, which is the equity consideration.

CHAPTER 7: EFFICIENCY AND EQUITY CONSIDERATIONS IN RENTAL MARKET PARTICIPATION

7.1 Introduction

This chapter deals with measurement of efficiency and equity for farmers involved in land rental markets, both through renting-in and renting-out and those in autarky positions. Such an assessment helps in establishing the possible impacts of participation in land rental markets and gauging the possibility of promoting the formalization of the practise. The expectation is that farmers renting-in would be the most efficient, followed by those renting-out and lastly those farmers not participating in rental markets. On equity, the *a-priori* assumption is that participation in land rental markets should enhance equity of land holding by reducing the gap between those owning land and those who do not. The chapter is therefore structured as follows; the next section compares different facets of production among the categories of farmers, followed by analysis of economic efficiency and the determinants (drivers) of inefficiency (efficiency). The last section is concerned with determining equity impacts of land rental market participants.

7.2 Production Variables Comparison among Different Farmer Categories

A comparison of different facets of production for the 2016/2017 production season among different categories of farmers is presented in Table 7.1.

Table 7.1: Production variable mean comparison among different categories of farmers

Variable	Autarky	Renting-in	Renting-out	Sample mean	F-test sig
Total arable area (ha)	7.77	24.41	45.80	21.60	0.00
Dry land area cropped (ha)	2.15	6.85	6.71	4.46	0.00
Irrigable area cropped (ha)	0.21	4.54	2.80	1.92	0.02
Total crop area cropped (ha)	2.37	11.39	9.51	6.38	0.00
Total labour days	62.62	150.43	163.69	109.88	0.00
Land preparation costs	191.15	971.22	860.54	551.87	0.00
Seed quantity (kg)	212.87	503.86	367.77	322.92	0.29
Seed cost	208.94	734.90	686.16	458.85	0.00
Basal fertiliser applied (kg)	644.78	5284.91	3558.44	2514.34	0.00
Basal fertiliser costs ($)	400.82	2896.54	1845.37	1374.68	0.00
Top dressing (kg)	561.72	3512.28	2754.06	1838.33	0.00
Top dressing cost ($)	361.25	2220.74	1766.91	1172.00	0.00
Cost of labour ($)	283.34	901.60	737.17	549.41	0.04
Cost of chemicals ($)	85.33	603.72	606.97	344.90	0.01
Harvesting costs ($)	153.20	889.94	632.40	454.32	0.00
Transport and marketing costs ($)	115.25	620.56	482.39	331.73	0.00
Crop value ($)	5579.49	41937.09	33172.54	21459.77	0.00
Costs of crop production ($)	1799.28	9839.21	7617.90	5237.76	0.00
Livestock sales value ($)	2163.34	628.22	1314.28	1574.52	0.62
Livestock costs ($)	210.64	364.95	407.36	298.62	0.08
Total agricultural sales ($)	7742.83	42565.32	34486.82	23034.30	0.00

Survey, 2017

A comparison of farmers not participating in rental markets against those renting-in and renting-out is presented in Table 7.1. It showed that farmers not involved in land rental markets had the lowest arable land, followed by those renting-in and those renting-out had the largest hectarage of cultivated land. These differences in arable land were significant as shown by the

F-test. Results show that farmers renting-in had on average a higher hectarage under both dryland and irrigable area, followed by farmers involved in renting-out and lastly by those not participating in land rental markets and the differences were significant. In general, the results conformed to *a-priori* expectations (Zikhali, 2008) since farmers renting-in should had the highest hectarage and those not participating should have the least. It is important to note that those farmers not participating in rental markets have a hectarage which is even lower than sample averages for both dry land and irrigable land. This implied that participation in land rental markets offered an opportunity for farmers to increase land under both dryland and irrigation crop production and similar conclusions were also made by Zikhali (2008). The results also showed a marked difference between arable area and cropped area, implying a low land utilisation rate.

The same trend was observed for production costs and revenues. Farmers involved in renting-in were using higher amounts of inputs, with associated higher costs of production. There were followed by those involved in renting-out and lastly those not participating in land rental markets, who again had averages below those of the sample. Except for seed, it must be noted that the differences among these farmer groups are significant. Significant differences also exist for crop value, with the same trend observed of having those renting-in having the highest value, followed by farmers renting-out and farmers in autarky being the last. This also implied that farmers involved in renting-in had higher returns compared to those involved in renting-out and the non-participants (autarky). Higher farm returns were associated with higher productivity, decision making and better access to market.

Sales values were used in the calculation of the value of agricultural produce in the measurement of total value of produce, which is the dependent variable in identifying sources

of farmer inefficiency. Those renting-in had the least sales value most likely because the land they are renting-in was mostly for crop production. Therefore, they can barely reserve any land for livestock production and consequently, livestock sales values were low. In order to understand more about these potential differences in productivity among different land rental market categories, economic efficiencies were calculated and analysed as shown in the sections that follow. The sources of inefficiency of the different categories were also analysed.

7.3 Land Rental Market Participation and Farmers' Efficiency

In order to understand the impact of land rental market participation on farmers' efficiency, three measures of efficiency, technical, allocative and economic were used to assess different farmer categories through the Stochastic Frontier Approach (SFA). Economic efficiency was used to permit comparison of different enterprises that farmers were involved in. The efficiency measurements are presented in Table 7.2.

Table 7.2: Efficiency indicators for selected categories of farmers

Settlement type	**Farmer category**	**Technical efficiency**	**Allocative efficiency**	**Economic efficiency**
A1 model	Autarky	0.734 (0.014)	0.769 (0.010)	0.565 (0.010)
	Renting-in	0.748 (0.020)	0.774 (0.014)	0.579 (0.015)
	Renting-out	0.759 (0.018)	0.779 (0.016)	0.592 (0.182)
A2 model	Autarky	0.764 (0.029)	0.782 (0.029)	0.598 (0.301)
	Renting-in	0.786 (0.045)	0.802 (0.301)	0.631 (0.297)
	Renting-out	0.744 (0.029)	0.752 (0.231)	0.560 (0.281)
Overall	Autarky	0.739 (0.013)	0.771 (0.009)	0.570 (0.010)

Settlement type	Farmer category	Technical efficiency	Allocative efficiency	Economic efficiency
	Renting-in	0.754 (0.019)	0.779 (0.013)	0.588 (0.013)
	Renting-out	0.755 (0.015)	0.772 (0.013)	0.583 (0.015)
A1 Overall		0.743 (0.01)	0.773 (0.007)	0.575 (0.008)
A2 overall		0.762 (0.019)	0.776 (0.016)	0.592 (0.017)
Sample		0.747 (0.008)	0.773 (0.006)	0.578 (0.007)

Survey, 2017 *Figures in parentheses are standard errors

In general, efficiency was just above average among the sampled farmers as shown by economic efficiency measures. This meant that farmers were not efficient producers and were far from attaining the profit maximization objective. A lot of studies on land reform have supported this result, with studies by Matondi and Dekker (2011) showing that overall production on resettled land has declined, farmer productivity is low and returns to farming is generally on the decline in Zimbabwe. Moyo (2016) showed that both A1 and A2 farmers are to a large extent involved in maize production, even in agro-ecological regions where other enterprises will give better returns, and this has the effect of reducing efficiency. This is in contrast to studies in Kenya for example where Mburu *et al*, (2014) recorded very high levels of efficiency. Technical, allocative and economic efficiencies for small scale wheat producers in that study was 85%, 96% and 84% respectively, while corresponding values for large scale commercial wheat farmers was 91%, 94% and 88%, respectively. Most of the farmers in Zimbabwe lack the passion, resources as well as the know-how to maximise on the production and profit motive (Moyo and Chambati, 2013). This inadequacy is aggravated by the reality that land is for free and has zero value. Therefore, there is no penalty for leaving arable land idle as the opportunity cost of farming is zero. The non-aggressive approach adopted by

government towards collection of land rentals from farmers has compounded the focus on efficiency, since the opportunity costs of not efficiently utilising the land is very low. Another important factor is the dire economic environment currently prevailing in the country, characterised by depressed aggregate demand, obsolete technologies, liquidity challenges and a crippled financial sector (Hove and Nyamandi, 2016). This limits the farmers' potential for increased production.

A comparison between A1 and A2 farmers showed that on the average technical, allocative and economic efficiencies were higher for the latter compared to the former. This is largely expected given that A2 farmers were given land on the basis of having adequate capital to undertake the agricultural activities (cost recovery basis). Essentially, it is assumed that they have more resources to put the land into production and can achieve better efficiency as a result.

Results indicated that among A1 farmers, farmers renting-out land had the highest economic efficiency, followed by those renting-in and lastly farmers not participating in land rental markets had the least efficiency. This trend followed the results of Hamberlin and Ilbert (2016) and Chamberlin and Ricker-Gilbert (2016). For A2 farmers, those farmers renting-in had the highest economic efficiency, followed by those in autarky, with farmers renting-out coming last. While these results maybe inconclusive in terms of inference, overall results according to participation in land rental markets gives a better understanding. These results showed that farmers renting-in were the most efficient, followed by renting-out farmers and farmers in autarky were the last. However, such average levels of efficiency even for farmers renting-in and renting-out suggested that participation in land rental market alone cannot significantly improve farm efficiency levels. Enhancing efficiency therefore requires a raft of measures targeting technologies, agricultural extension and input and output markets (Hamberlin, and

Ilbert, 2016). In terms of technical efficiencies, the same trend was followed as with economic efficiency. Most of the farmers who were renting-in land under the A2 model either did not own land or were mostly using all the land they were allocated. In most cases, these farmers were very mobile, had managers managing production, leaving them ample time for market research and for the former white farmers, they had a strong network for both input and output markets. It therefore followed that allocative efficiency for this category of farmers was relatively higher compared to the other groups. These results were contrary to theory which postulates a negative relationship between the size of land and efficiency (Holden, Bezu and Tilahun, 2016). Most studies in Asia have shown that small farms are more efficient than larger farms though cases of more efficient bigger farms are not uncommon in the USA, Europe and Southern Africa (Holden *et al;* 2016*).*

Similar results were obtained by Akter *et al*, (2006), showing that farmers engaging in land rental markets were more efficient than those farmers who were not. These results are also supported by findings of studies done by Chamberlin and Ricker-Gilbert (2016) who concluded that participation in land rental market results in increased efficiency for the participants through transferring land from less-able to more able households. The same results of increased production due to renting-in were also obtained by Lohmar *et al.* (2001), who reported higher land productivity for farmers involved in tenting-in. Feng (2008) also concludes that farmers participating in land rental markets were more technically efficient in rice production in China compared to those that were not involved in the practice. However, Awasthi (2009) differed with results showing that there was no statistically significant difference in efficiency among different land lease arrangements. Though FTP was higher for owner cultivator land than for leasing arrangements, these were not statistically significant.

In order to understand the possible sources of the inefficiencies or drivers of efficiency among different categories of farmers, a log linearized Cobb Douglas estimation of elasticities was performed and the results are shown in Table 7.3. A number of factors that determined inefficiency were inputted into the model to determine what could be possible causes of inefficiencies. The results for various groups of farmers did not yield much significant factors in terms of determinants of inefficiency. Therefore, the study relied on the overall categorisation of farmers according to rental markets participation, and the results are presented in Table 7.3.

Table 7.3: Determinants of farmers' inefficiency in land rental market

Variables	**Autarky**		**Renting-in**		**Renting-out**	
Log_Value_Assets	0.079		-0.061		-0.074	
	(0.065)		(0.076)		(0.113)	
log_Hhh_Age	0.060		0.753		-1.017	
	(0.562)		(0.973)		(0.930)	
log_Irrig_share	-1.731		0.879**		0.220	
	(2.592)		(0.380)		(1.076)	
Gender_hh	-0.274		-0.308		-0.688	
	(0.443)		(0.870)		(0.640)	
Total_F_members	-0.113		-0.118		-0.027	
	(0.438)		(0.540)		(0.628)	
log_Irrig	-0.565		-0.832**		-0.588	
	(0.693)		(0.343)		(1.014)	
Married	-0.302		0.375		0.009	
	(0.442)		(0.907)		(0.647)	
Log_Exp_Crop	0.801***		0.808***		0.692***	
	(0.048)		(0.044)		(0.062)	
Log_Area_crop_prod	0.575***		0.146**		0.485***	
	(0.136)		(0.070)		(0.101)	
Log_Labor	0.078*		0.155***		-0.026	
	(0.041)		(0.046)		(0.060)	
Observations	279	279	134	134	144	144
Mean efficiency		0.570		0.588		0.583
		(0.215)		(0.258)		(0.196)
Wald chi2(3)		661.36***		1150.32***		535.04***
Prob > chi2		0.000		0.000		0.000

Notes: ***significant at 1%; **significant at 5%; *significant at 10%; in parenthesis are standard errors

The results presented in Table 7.3 showed that determinants of inefficiency for farmers not involved in rental markets were the type of crop, area under crop production and labour. This implied that these farmers can actually increase efficiency through better management of their labour and good decision making by choosing the right enterprises as well as the sizes of these enterprises. For the farmers involved in renting-in, results show that their sources of inefficiency were proportion and size of irrigated land, chosen crop enterprises, size of those enterprises and labour. In addition to those factors identified for land rental non-participants (autarky), farmers renting-in should also pay attention to irrigable land, as inefficiency was noted this area. Results also showed that determinants of inefficiency among farmers involved in renting-out was the type of crop and the size of that particular enterprise. It is clear from this analysis that the choice of the enterprises has a great bearing on the efficiency of farming for the household. Most resettled farmers were involved in maize production due to lack of knowledge about potential viable enterprises or an inherited communal tradition of growing maize for food security (Moyo, 2016). This practice has the effect of reducing efficiency as the traditional agricultural production in the country has been a function of climatic conditions, level of input use as well as prevailing input and output markets. Results in Table 7.3 differ from the findings of a study on wheat farmers in Kenya, where years of formal education, farm size and distance to extension advice were identified as significant factors in determining inefficiency. Results by Pender and Fafchamps (2006) seem to agree with the results of this study in that policy interventions towards promoting proper functioning of land rental markets might not yield much in terms of economic efficiency of farmers, rather more effort should be put on stabilisation of some macro-economic variables, productivity and factor markets improvements in order to improve efficiency of different categories of farmers.

Having identified possible reasons why a particular farmer would make the choice to participate or otherwise in land rental markets in chapter 6, this section was then dedicated to determine the levels of efficiency for different categories of land rental market participants, as well as point to possible sources of any inefficiency observed. The rationale was to determine if farmers participating in land rental markets are better off than their counterparts who are not participating in land rentals. Results have shown no obvious advantage in inefficiency for participation in land rentals markets. The next section analyses if there is a social benefit of participation in land rental markets, which is a possible justification for encouraging land rental markets.

7.4 Land Rental Market Participation and Equity Impacts

In an attempt to evaluate equity impacts of participation in land rental markets, a comparison was made between the land owned and the land operated for different categories of farmers. The results are presented in Table 7.4.

Table 7.4: Descriptive summaries of land owned and land operated

Category	N (number)	Mean land owned (ha)	Mean land operated (ha)
Goromonzi	229	30.18	27.88
Marondera	110	21.43	9.62
A1 farmers	266	4.8	5.12
A2 farmers	73	93.65	83.32
Male-headed	271	22.05	31.37
Female headed	68	31.46	24.32
Overall	339	23.93	21.96

Survey, 2017

As already defined in Chapter 3, land owned is the size of land allocated by the government to a farmer through the FTLRP, while land operated is defined at the land owned plus land rented-in and less land rented-out. Table 7.4 showed that for the majority of farmer categories, average land owned was higher than average land operated. This implied that these categories were actually engaging more in renting-out and hence the reduction in usable land. For Goromonzi District, on average, there were more farmers involved in renting-out than either autarky or renting-in. The same goes for Marondera, which had a very significant drop in land usage from those who own land. A2 farmers and female headed households also experienced the same drop as observed for the overall sample. On the other hand, A1 farmers on average had an increase in land usage, meaning more farmers were engaged in renting-in land compared to either renting-out or autarky. Also experiencing the same trajectory were male-headed households. Table 7.5 showed a comparison of the Gini coefficients of land owned and land operated for the same categories of farmers.

Table 7.5: Gini coefficients of land owned and land operated

Category	Gini land owned	Gini land operated
Goromonzi	0.78	0.76
Marondera	0.51	0.48
A1 farmers	0.12	0.24
A2 farmers	0.56	0.56
Male-headed	0.74	0.73
Female headed	0.76	0.74
Overall	0.75	0.74

Survey, 2017

In general, the results showed that inequality in land owned was higher for Goromonzi District, male and female headed households as well as the overall sample. Inequality was much lower in Marondera and among A2 farmers. The results implied that whenever farmers were categorised into either A1 or A2, inequality tended to be higher and this has to be understood from the land holding disparities among these two categories of farmers. Equality was very strong among A1 farmers, as land holding was almost standardised at 6 hectares per household. The difference in Gini coefficient between Goromonzi and Marondera could be a result of the high proportion of A2 farmers in the former district than the latter. Results have shown that Goromonzi had 24% of the households who were A2 farmers, while Marondera had 15% of farmers being A2. Model A2 tended to increase disparities (inequality) because of the variability of land holdings compared to A1 farmers, and this in turn caused strong positive Gini coefficients.

The results in Table 7.5 showed that participation in land rental markets has resulted in improvements in equity for farmers in Goromonzi, Marondera, male and female headed households and the overall sample. These results are consistent with the findings of Deininger *et al* (2008), whose conclusion was that land rental markets reduce inequality. For A1 farmers, participation in land rental markets actually increased inequality in land holdings, by doubling the Gini coefficient. A possible explanation is that a lot of A1 farmers were renting-out land to the same farmers and this has the effect of concentrating land in the hands of a few farmers, consequently increasing inequality. From the focussed group discussions carried out, farmers indicated that in tobacco producing areas, farmers who tend to rent-in land are mostly the same good farmers and they rent from a number of different land owners. This has the effect of increasing the Gini coefficient. A surprising feature is that there is no change in land holding inequality among A2 farmers. A plausible explanation is that the rate of renting-in is the same as that of renting-out and this exchange is equally distributed. Overall, it can be concluded that participation in land rental markets reduced inequality in land holdings among the sampled farmers and specifically for farmers in the two districts as well as male and female-headed households. This study mirrors the findings by Akter *et al.* (2006) who showed that participation in land rental markets improved equity among villagers in India and improved land use distribution. In contrast, Tian *et al.* (2012) showed that following emergence of land rental markets, Gini coefficient actually increased, implying that participation in these markets were associated with increased land disparities and consequently inequality.

7.5 Conclusion

The chapter was aimed at evaluating the possible impacts of land rental market participation on both efficiency and equity. Most of the farmers was close to average in terms of efficiency. For the A2 model, farmers renting-in land were found to be the most economically efficient,

followed by those in autarky and lastly farmers involved in renting-out, though the differences seemed marginal. For farmers under the A1 model, farmers renting-in had the highest economic efficiency, followed by those farmers in autarky, with renting-out farmers coming last. Also, efficiency for A2 farmers on average was higher than that for A1 farmers. Overall, farmers renting-in land were more efficient than those renting-out and those in autarky less efficient than those renting-out. For farmers not participating in rental markets, the sources of inefficiency were crop type, crop area and labour. For farmers renting-in, proportion of irrigable land, size of irrigable land, crop type, crop area and labour were identified as drivers of inefficiency, while for renting-out farmers, crop type and associated area were the only drivers. Results on equity showed that by participation in land rental markets, inequality was reduced for farmers in the two districts as well as for male and female households. Inequality was increased among A1 farmers. Overall, the position was that participation in land rental markets resulted in reduced inequality in land holding among the sampled farmers. These results are consistent with most of the studies that have been carried out on both efficiency and equity. The study recommends attention by government to some macro-economic variables, the need for farmers to specialise in particular enterprises that are favourable to respective natural regions and also build on economies of scale.

Having analysed efficiency of different land market categories of farmers, the possible inefficiency sources and equity impacts in this chapter, in addition to household characterisation, farmer land rental policy perceptions and land rental decisions in the previous chapters, the next chapter concludes this thesis. The chapter is a synthesis of the whole study, encompassing the research summary, conclusions, policy recommendations and areas for further study.

CHAPTER 8: SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

8.1 Introduction

This chapter is dedicated to give an overall summary of the research, which comprised of the objectives of the study as enunciated in the introductory chapter and its link to the chapters that have been presented. The chapter outlines a summary of the research, followed by a discussion of the main conclusions with respect to the objectives. This section then delves into policy recommendations and lastly areas of further study given the findings and what the study could not possibly cover with available resources.

8.2 Summary and Conclusions

The overall objective of the study was to analyse farmers' perceptions on government land rental policy, evaluate the link of this policy to farmers' decision making on the land rental markets as well as its implications for efficiency and equity. The study was carried out against the background of government announcing a land rental policy in which resettled farmers were expected to pay land rentals and development fees in preparation for issuance of leases. This was followed by a proliferation of largely informal, and to a lesser extent formal land rental markets between land reform beneficiaries and those farmers seeking land for agricultural productive purposes.

A summary of literature review showed that there were a number of theories that relate to the issues that were studied and that the conceptual framework derived from the theory of change was a more convenient conceptual framework to understanding the area which was studied. There were a few previous studies relating to farmers' perceptions on government land rentals and most have not linked these rentals to the establishment of land rental markets. Most studies

identified household characteristics, land endowments and transaction costs as factors affecting participation in land rental markets. A lot of studies on efficiency have shown that, generally, farmers involved in land rental markets were more efficient than those not participating. Studies on equity were varied, with some showing increased and others showing decreased disparities due to participation in land rental markets.

The study was carried out in Mashonaland East Province of Zimbabwe, covering two districts, Goromonzi and Marondera. The focus was specifically on A1 and A2 farmers, as the rental policy was directed at them only and much of the informal land rental markets are prevalent among these categories of farmers. The researcher thus chose these two districts being amongst the five districts in the Province in which the FTLRP was undertaken. The Province was chosen as one of three where the FTLRP had the highest number of beneficiaries. The survey method was used as the main method of data collection, supported by key informant interviews and focus group discussions. The household questionnaire, key informant interview and focus group discussion guide were the research instruments used. For the survey, a total of 339 households were eventually sampled for study. Multi-stage sampling procedure was used, comprising cluster, stratified, simple random sample and purposive sampling in order to capture all the elements required for the study. Data were collected over a month period and survey data were transcribed on CsPro 6, and was imported to STATA, SPSS and Frontier 4.1 for analysis.

Six major elements of the study were analysed. The first was the household characteristics of the sampled households. The second was an analysis of the perceptions of farmers on government land rental policy. The third element related to whether farmers involved in land rental markets were possibly doing that as a response to recently announced government land

rental policy i.e. is there a correlation between perceptions on government policy and participation in land rental markets? The fourth was analysis of possible reasons for farmers' participation in land rental markets. The fifth was whether participation in land rental markets has an effect on efficiency and the last was evaluating if equity in terms of access to land was improved as a result of farmers' involvement in land rental markets. The overall result was an understanding of both government land rental policy and land rental markets in the country, and recommendations on how the two can be linked as informed by the conclusions.

About a third of household respondents was from Marondera and two-thirds was from Goromonzi, while 79% was from A1 and 21% from A2 farms. In terms of gender, four fifths of the households were male headed. Literacy was good as most household heads had attained secondary school education. About half of the households was not participating in land rental markets, the other half was almost split equally between households renting-in or renting-out land. In general, the sample reflected that in terms of production, A2 farmers were faring better than A1 farmers.

It can be concluded that farmers had a fairly good knowledge of the agricultural land rental policy enunciated in the Finance Bills since 2007. Knowledge for A1 farmers was found to be significantly different from that of A2 farmers and the possible reasons were level of education, access to information and wealth standards that differed between these two groups. Knowledge levels were not significantly different between male and female headed households and also whether farmers were involved in the rental markets or not. Results also showed that farmer's attitudes in relation to policy were categorised as fair and there were significant differences in attitudes based on the gender of household head. There were also significant differences between farmers not involved in land markets and those who were renting-in land. The attitudes

of A1 and A2 farmers were observed not to be significantly different from each other. The results of practice scores showed a poor adherence to policy for all categories of farmers. Possible identified reasons were poor macro-economic conditions, lack of government political will and institutions to fully implement the policy, resulting in farmers taking a lack-lustre approach towards adherence to policy. Overall, the perceptions of farmers on the rental policy was regarded as fair. However, significant differences existed on the perceptions for farmers not involved in rental markets, those renting-in and those renting-out.

A bivariate Tobit model was used to understand the determinants of participation in land rental markets i.e. decisions to rent-in and rent-out land. The results showed that the decision to rent-in land was significantly influenced by gender, household income, permanent labour, cultivated area, tenure certainty, irrigable land size and crop diversification index. It can be concluded that household characteristics, land endowments and transaction costs were important in land rent-in decisions. On the other hand, age, permanent labour, irrigable land size and crop diversification index significantly influenced farmers' decisions to rent-out land, implying that household characteristics and land endowments were the deciding factors in land renting-out decisions.

The linearized Cobb Douglas model and the Gini coefficient were used to measure the impact of participation on land market on efficiency and equity, respectively. Results showed that most farmers were close to average in terms of efficiency. Farmers renting-in land were found to be the most economically efficient under the A2 model, followed by those in autarky and with those who were renting-out coming last. For the A1 model, farmers renting-out had the highest efficiency, followed by those renting-in and farmers in autarky being the least. Also, efficiency for A2 farmers on average was higher than that for A1 farmers. Overall, farmers renting-in land

were more efficient than those renting-out and those in autarky in that order. For farmers not participating in rental markets, the sources of inefficiency were crop type, crop area and labour. For farmers renting-in, proportion of irrigable land, size of irrigable land, crop type, crop area and labour were identified as the sources of inefficiencies, while for renting-out farmers, crop type and associated area were the only sources of inefficiencies. Results on equity showed that by participation in land rental markets, inequality was reduced for farmers in the two districts as well as for male and female headed households. Inequality was increased among A1 farmers. Overall, the position was that participation in land rental markets resulted in reduced inequality in land holding among the sampled farmers.

8.3 Policy Recommendations

Good knowledge but poor attitude and practice indicated that probably farmers had encountered the policy but may not feel compelled to adhere to it. This could be a challenge of an inadequate consultative processes during the formulation of the policy. Therefore, it is recommended that government brings to finality its position on the policy. If the policy is to be discarded, then this should be made clear to all the stakeholders. If the government is to proceed with the policy, then it needs a well-oiled awareness campaign in which farmers are informed about its contents as well as the potential costs and benefits. In Mashonaland Central Province for example, there was a door to door awareness covering all A1 and A2 farmers (Herald, 2015). This approach can eliminate differences observed in the study on knowledge between A1 and A2 farmers, attitudes between male and female households as well as overall perceptions between farmers participating in land rental markets and those who were not. Government also needs to have an administration arm for this policy for its effective implementation. It has also to decide whether this administration arm should fall under the already established Land Board or under the Ministry of Lands. This administration should

make it possible to put into effect all the provisions of this policy. An administration system is also required to process land leases, so as to enhance state land rental payments. It was established in the study that some farmers were paying for land use on land rental markets but not paying state rentals, therefore land leases could be one way of encouraging these payments. However, it should be noted that the administrative system should also encompass the legal system required to operationalize these leases so that they are accepted as secure tenure instruments. The state should avoid double statements on the policy but rather speak with coherence. Improvements of macro-economic conditions can have profound effects on the rate of payments of state rentals and this includes improving markets for farm inputs and produce.

The government needs to formally accept land rental markets given the marginal benefits that have been shown in the study in terms of efficiency and reducing inequality between male and female headed households. That policy position can include the processes involved and processes for seeking recourse. From the results, financial facilities such as loans specifically targeted at irrigation facilities, addressing lease agreements and enhancing the proper function of produce markets were some of the factors that could encourage increased participation of both A1 and A2 in land rental markets. Leases and formally accepting functioning of land rental markets have the potential to reduce transaction costs in land rentals and aid in improving production efficiency. However, it is noted that formalizing rental markets alone is not a panacea to improving efficiency given the average efficiency values.

Government should make concerted efforts to improve economic efficiency among the farmers by improving productivity and markets. The first area needing attention could be the stabilization of the macro-economy, including interest rates and risk so that farmers have a good environment to borrow and engage in productive use of land. Productivity can be

improved by promoting contract farming (also fusing public and private extension providers in the process), new technologies and putting mechanisms that promote overall rental market activities. Results also points to a need to promote agricultural enterprises that are suitable in respective natural regions. There should be research on finding break-even points for each crop so that farmers can benefit from economies of scale. Government could subsidize capital investments on the farms in a way that reduces the size and costs of labour, as these were identified as possible sources of inefficiencies. Instead of continuously resettling farmers on land, as the government is doing up to now at a cost, if it encourages land rental markets, then its equity objective can be achieved at a lesser cost and multiple farm owners are likely to release the land to allow it to be more productively used with limited negative political implications.

Farmers also require approaching farming as a business to enhance economic efficiency of farming. Encouragement should be on adoption of new technologies, employing qualified staff and making investments on the land. The farmer organizations could also lobby government to formally recognize land rentals as acceptable farm use. This allows freeing of unutilized and underutilized land resources to farmers who are more productive. The advantage of this approach is that it is a win-win process; productive farmers utilize the land for more profit and unproductive farmers receive rentals and can concentrate on other core areas.

The marketing actors along the value chain are encouraged to invest in improving both inputs and output markets. This can help in improving allocative efficiencies. Possible areas of improvements include using digital technologies to disseminate information, increasing distribution networks and encouraging specific enterprise production zones to reduce transaction and distribution costs.

8.4 Areas for Further Study

It is noted that after the FTLRP, there was never a determination of the minimum and optimum land sizes for particular enterprises and natural regions, given that there was subdivision of land. Even the maximum land sizes that were set under the FTLRP were not based on empirical evidence, but just experiences of agriculturalists. With results showing that crop type and land size of the crop are efficiency drivers, a study to establish minimum and optimum sizes of land would assist government in its planning processes.

To buttress the results of this study, further research can be carried out on the impacts of land rental markets on poverty reduction and employment levels for both A1 and A2 farmers.

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APPENDIX 1: RESEARCH INSTRUMENTS

Questionnaire Number .....

SURVEY ON FARMING LAND RENTAL POLICY IN MASHONALAND EAST PROVINCE ZIMBABWE: IMPLICATIONS ON LAND USE EFFICIENCY, EQUITY AND FARMER DECISION MAKING UNDER A1 AND A2 RESETTLEMENT MODELS

JULY-SEPTEMBER 2017

This survey is being undertaken in fulfilment of PhD studies by Simbarashe Tatsvarei (0773584520) from University of Fort Hare, Department of Agricultural Economics, SA. The information obtained from this study will be treated with strict confidentiality and the respondent will remain anonymous. The interview will take about 30 minutes. Your participation will be highly appreciated (request for their consent to be interviewed).

SECTIONA: HOUSEHOLD IDENTIFICATION DETAILS

	Question	***Response***
A1.	Interview date (*DD/MM/YYYY*)	
A2.	Name of the interviewer	
A3.	District name (1=Goromonzi; 2=Marondera)	
A4.	Ward number	
A5	Farm name	
A6.	Type of settlement *1=A1 model, 2=A2 model*	

SECTION B: HOUSEHOLD CHARACTERISTICS (Complete the Table)

SECTION C: HOUSEHOLD PRODUCTION ASSETS (Complete the following)

B1.	**Gender of Household Head**	**1 = Male 2 = Female**
B2.	**Marital Status of Household Head**	**1= married 2= divorced/separated 3= widowed 4= single/ never married**
B3.	**Age of Household Head**	**Years.**
B4.	**What is the highest level of education completed by the Household Head?**	**0 = No formal schooling 1 = Primary 2 = ZJC/Std 6 3= Secondary 4 = Tertiary 5 = Other (name)**
B5.	**What is the number of years in formal schooling for the Household Head?**	**Years.**
B6.	**What is the main source of income for the Household?**	**1=Agriculture 2=Mining 3=Trading/Informal sector 4=Formal employment 5=Pension/rent/dividend 6=Remittances 99= Others (name**
B7.	**Estimated total income for the household ($) per year**	
B8.	**Contribution of agriculture to total income (%)**	
B9.	**Total number of resident family members**	
B10.	**Total number of members providing family labour**	

	Type of Asset	**Number owned**	**Total estimated value($)**
	Farm Implements		
C1.	Ox drawn ploughs		
C2.	Ox drawn harrows		
C3.	Tractor drawn ploughs		
C4.	Tractor drawn harrows		
C5.	Cultivators		
C6.	Planters		
	Transport		
C7.	Tractor		

C8.	Scotch cart		
C9.	Bicycle		
C10.	Car/pickup/lorry		
C11.	Wheelbarrow		
	Livestock		
C12.	Cattle		
C13.	Donkeys		
C14.	Goats		
C15.	Pigs		
C16.	Poultry		

SECTION D: CROP PRODUCTION FOR 2015/16 SEASON (Complete the following)

	D1. Crop code	D2. Dry land area (ha)	D3. Irrigable area (ha)	D4. Land preparation costs($)	D5. Seed Qty (Kg)	D6. Seed cost ($)	D7. Basal Qty (Kg)	D8. Basal cost ($)	D9. Top dressing (Kg)	D10. Top dressing Cost ($)	D11. Cost of labour ($)	D12. Cost of chemicals ($)	D13. Harvesting costs ($)	D14. Transport and Marketing costs ($)	D15. Yield (kg)	D16. Selling Price/ Kg	D17. Markets codes
1																	
2																	
3																	
4																	
5																	
6																	
7																	

D1 Codes:*1= Commercial maize 2 = Maize Seed 3=Tobacco, 4=Wheat 5=Soyabeans, 6=Ground nuts, 7= Sugar Beans, 8=potatoes, 9=horticulture 99=other (name*)

D17codes: *1= Open Markets, 2= Retailers 3= Wholesalers 4= Middlemen 5= parastatal boards 6= Agro-processors 99=other (name)*

SECTION E: AGRICULTURAL LABOUR

		2015/16 Season		
	Labour Type	**E1. Number**	**E2. Ave daily payment rate ($)**	**E3. Average days worked per month**
1	Permanent			
2	Casual			
3	Total			
E4.	In general, is casual labour easily available in the area? 1=*Yes;* 2=*No*			

SECTION F: LIVESTOCK PRODUCTION (Over past one year)

F1.	Type of livestock sold (1=cattle, 2=goats, 3=poultry, 4=pigs, 5=sheep)			
F2.	Livestock Sold (number)			
F3.	Carcass Weight (kg)			
F4.	Gross Income ($)			
	Input	**F5. Input used? 0= No 1= Yes**	**F6. Quantity (state units)**	**F7. Total costs ($)**
1	Purchased feeds (stock feeds, concentrates, molasses)			
2	Fodder production (forage-seed, fertilizer, hay/silage)			
3	Veterinary consumables (drugs + vaccines)			
4	Hired and family labour			
5	Transport			

SECTION G: LAND HOLDING AND TENURE (Please complete the following Table for 2016/17 season)

	Land Holdings	**G1. Settlement Type (codes)**	**G2. Arable land (Ha)**	**G3. Cultivated area (Ha)**	**G4. Amount paid/received per Ha ($)**	**G5. From or to whom (codes)**
1	Total Owned (ha)					
2	Borrowed (for free) (ha)					

3	Rented out (for money) (ha)					
4	Rented in (for money) (ha)					
5	Lent out (for free) (ha)					

G1. Codes 1= *A1 villagised 2=A1 self-contained 3=A2 4=A2 peri-urban 5=remaining LSCF 6=communal areas*

G5. Codes *1= father/son 2=relative/friend 3=squatters 4=former farm workers 5=former LSC farmer 99=other (name)*

SECTION G: LAND HOLDING AND TENURE

No	Question	Response
G6.	How did you first access this piece of land? *1= occupation 2= formally allocated 3=inheritance 4=traditional leader 5=family subdivision 6=bought it 7= renting 99=other(name)*	
G7.	When you were formally allocated this piece of land? (year)	
G8.	When did you start farming operations? (year)	
G9.	Do you have any documentation for this piece of land? *1=yes 2=no*	
G10.	If yes what kind of documentation do you have? *1=99 year lease 2=offer letter 3=permit 4= agreement with owner 99=other name*	
G11.	Have you ever paid rentals to government for the use of allocated land *1=yes 2=no*	
G12.	**If yes to G10, please complete the following Table that relate to government rentals payments**	

Year	Total ($)
2015	
2016	

G13.	If you have not made any payment, what is the reason? 1=regard land as free 2=No enforcement 3=No money 99=Other (name)	
G14.	Have you ever rented in or out land to raise rental payments to government?*1=yes 2=no*	

G15.	If you have entered into a renting agreement, how do you enforce the agreement? .....

SECTION H: LAND TENURE KNOWLEDGE, ATTITUDES AND PRACTICES (KAP)

H1.	Are you aware of the rental policy for A1 and A2 farmers?	**0**= No **1**= Yes
H2.	Rental policy is important for the farmer (circle one)	**1** = Strongly disagree **2** =Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree
H3.	The policy has been good for the farmer?	**0**= No **1**= Yes
H4.	Are you aware of rentals to government you should pay per year?	**0**= No **1**= Yes
H5.	The rental payment is affordable (circle one)	**1** = Strongly disagree **2** =Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree
H6.	I am paying the land rentals to government.	**1** = Never **2** = Rarely **3** = Sometimes **4** = Frequently **5** = Always
H7.	Are you aware that failure to pay rentals can lead to cancellation of permit/lease?	**0**= No **1**= Yes
H8.	Failure to pay rentals should lead to cancellation of permit/lease (circle one)	**1** = Strongly disagree **2** =Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree
H9.	There have been threats to cancel lease/permit due to failure to pay rentals	**1** = Never **2** = Rarely **3** = Sometimes **4** = Frequently **5** = Always
H10.	Are you aware that rentals are contributions towards lease payments?	**0**= No **1**= Yes
H11.	Rentals payments should be deducted from amount due for the lease (circle one)	**1** = Strongly disagree **2** =Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree
H12.	I am contributing towards the lease.	**1** = Never **2** = Rarely **3** = Sometimes **4** = Frequently **5** = Always
H13.	Are you aware that development levy is channelled towards development of respective rural councils?	**0**= No **1**= Yes

H14.	It is important to channel development levy towards respective rural district development (circle one)	**1** = Strongly disagree **2** =Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree
H15.	I have witnessed development projects/programs from the levy I am paying	**1** = Never **2** = Rarely **3** = Sometimes **4** = Frequently **5** = Always
H16.	Are you aware that no public finds are supposed to be allocated to farmers without full payment of rentals?	**0**= No **1**= Yes
H17.	Farmers without full payment of rentals should not be assisted from public funds (circle one)	**1** = Strongly disagree **2** =Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree
H18.	You have not been assisted with public funds due to arrears in rental payments	**1** = Never **2** = Rarely **3** = Sometimes **4** = Frequently **5** = Always
H19.	Are you aware that security of tenure enhances agricultural production?	**0**= No **1**= Yes
H20.	Security of tenure is important in agriculture (circle one)	**1** = Strongly disagree **2** =Disagree **3** = Neutral **4** = Agree **5** = Strongly Agree
H21.	Do you feel you have security of tenure?	**0**= No **1**= Yes

SECTION I: ACCESS TO CREDIT (Complete the following Table)

No	**Question**	**Response**
I1.	Have you accessed credit over the past 3 years? *1=yes 2=no*	
I2.	If yes, what activity?	
13.	Source of funding	
I4.	Total Amount (US$)	

I2 Codes 1=*tobacco 2= maize 3=wheat 4=horticultute 5=infrastructure 6= livestock 7= irrigation 99= Other (name)*

I3 codes *1= government scheme 2=private company 3=commercial bank 4=relatives and friends 5=cooperatives 6=savings clubs 7=Microfinance institutions 8=chimbadzo 99= other(name)*

THANK YOU FOR YOUR PARTICIPATION IN THIS SURVEY!!!!

Key Informant Interview/Focus Group Discussion Guide

1. Household Production Assets

a. Level of agricultural assets and how that impacts on agricultural efficiency

b. Markets of agricultural implements

2. Crop and Livestock Production

a. Level of productivity for the various crops and livestock

b. Markets for products and inputs and how that affects efficiency

3. Agricultural Labour

a. Markets for labour

4. Land Holding and Tenure

a. Understanding and interpretation of the current Acts regarding land rentals

b. Level of compliance with the Land Rental policy

c. Decision to rent-in or rent-out land

d. Level of participation in land rental markets

e. Transaction costs in entering and exiting land rental markets

f. Potential implications of engaging in land rental markets

5. Access to Credit

a. Access to credit markets

b. State of credit markets in encouraging efficiency

c. Credit markets and decision to rent-in or rent-out land

APPENDIX 2: ANALYSIS OUTPUTS

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.
. ****Bivariate Tobit model***
. bitobit estimate, y1(Land_rented_IN) x1(Gender Married Age Num_Edu_yrs total_Hh_incom Total_F_members Permanent_labo
> r Cultivated_area TenureCertainity Irrigable_landsze Crop_Dive_Index) y2(Land_rented_OUT) x2(Gender Married Age Num_
> Edu_yrs total_Hh_incom Total_F_members Permanent_labor Cultivated_area TenureCertainity Irrigable_landsze Crop_Dive_
> Index) censor1(Farmer_in_landMkts) censor2(Farmer_in_landMkts)

initial:       log likelihood =     -<inf>  (could not be evaluated)
feasible:      log likelihood = -4667.0311
rescale:       log likelihood =  -4090.167
rescale eq:    log likelihood =  -1832.435
Iteration 0:   log likelihood =  -1832.435  (not concave)
Iteration 1:   log likelihood = -1759.5154  (not concave)
Iteration 2:   log likelihood =  -1698.058  (not concave)
Iteration 3:   log likelihood = -1617.6892
Iteration 4:   log likelihood = -1582.9785
Iteration 5:   log likelihood = -1572.9661
Iteration 6:   log likelihood = -1572.4928
Iteration 7:   log likelihood = -1572.4923

                                                Number of obs   =        339
                                                Wald chi2(11)   =     218.26
Log likelihood = -1572.4923                     Prob > chi2     =     0.0000
```

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
eq1						
Gender	5.973569	2.780568	2.15	0.032	.5237556	11.42338
Married	-2.99233	2.927208	-1.02	0.307	-8.729552	2.744893
Age	.0311632	.0721528	0.43	0.666	-.1102537	.17258
Num_Edu_yrs	.1827493	.1857671	0.98	0.325	-.1813476	.5468462
total_Hh_incom	-.0000113	2.97e-06	-3.79	0.000	-.0000171	-5.43e-06
Total_F_members	-.0130961	.3966725	-0.03	0.974	-.79056	.7643678
Permanent_labor	-1.417875	.2685964	-5.28	0.000	-1.944315	-.8914361
Cultivated_area	.4145445	.0458161	9.05	0.000	.3247466	.5043424
TenureCertainity	3.52103	1.953291	1.80	0.071	-.3073503	7.34941
Irrigable_landsze	.1167846	.0634147	1.84	0.066	-.007506	.2410751
Crop_Dive_Index	7.203767	3.844115	1.87	0.061	-.3305597	14.73809
_cons	-3.040066	6.545423	-0.46	0.642	-15.86886	9.788728
eq2						
Gender	-6.504639	4.535554	-1.43	0.152	-15.39416	2.384883
Married	3.300594	4.655192	0.71	0.478	-5.823415	12.4246
Age	-.2392767	.115065	-2.08	0.038	-.4648	-.0137533
Num_Edu_yrs	.1433316	.2944646	0.49	0.626	-.4338083	.7204716
total_Hh_incom	2.16e-06	4.73e-06	0.46	0.647	-7.11e-06	.0000114
Total_F_members	-.8242808	.6332973	-1.30	0.193	-2.065521	.4169591
Permanent_labor	3.155503	.4330094	7.29	0.000	2.30682	4.004186
Cultivated_area	-.0143788	.0730641	-0.20	0.844	-.1575817	.1288242
TenureCertainity	1.877351	3.098862	0.61	0.545	-4.196307	7.951009
Irrigable_landsze	-.2390486	.1012417	-2.36	0.018	-.4374787	-.0406186
Crop_Dive_Index	17.61566	6.070233	2.90	0.004	5.718225	29.5131
_cons	16.85643	10.46687	1.61	0.107	-3.65826	37.37112
sigma1						
_cons	14.22529	.7577742	18.77	0.000	12.74008	15.7105
sigma2						
_cons	22.61349	1.206497	18.74	0.000	20.2488	24.97818
atan_rho						
_cons	-.2530983	.114917	-2.20	0.028	-.4783315	-.0278651

APPENDIX 3: RESEARCH RELATED CERTIFICATION

University of Fort Hare
Together in Excellence

ETHICAL CLEARANCE CERTIFICATE
REC-270710-028-RA Level 01

Certificate Reference Number:	MUS261STAT01
Project title:	**Farming land rental policy in Mashonaland East Province, Zimbabwe: Implications on land use efficiency, equity, and farmer decision making under A1 and A2 resettlement models.**
Nature of Project	PhD in Agricultural Economics
Principal Researcher:	Simbarashe Tatsvari
Supervisor:	Prof A Mushunje
Co-supervisor:	N/A

On behalf of the University of Fort Hare's Research Ethics Committee (UREC) I hereby give ethical approval in respect of the undertakings contained in the above-mentioned project and research instrument(s). Should any other instruments be used, these require separate authorization. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above.

Please note that the UREC must be informed immediately of

- Any material change in the conditions or undertakings mentioned in the document
- Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research

The Principal Researcher must report to the UREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

Special conditions: Research that includes children as per the official regulations of the act must take the following into account:

Note: The UREC is aware of the provisions of s71 of the National Health Act 61 of 2003 and that matters pertaining to obtaining the Minister's consent are under discussion and remain unresolved. Nonetheless, as was decided at a meeting between the National Health Research Ethics Committee and stakeholders on 6 June 2013, university ethics committees may continue to grant ethical clearance for research involving children without the Minister's consent, provided that the prescripts of the previous rules have been met. This certificate is granted in terms of this agreement.

The UREC retains the right to

- Withdraw or amend this Ethical Clearance Certificate if
  - Any unethical principal or practices are revealed or suspected
  - Relevant information has been withheld or misrepresented
  - Regulatory changes of whatsoever nature so require
  - The conditions contained in the Certificate have not been adhered to
- Request access to any information or data at any time during the course or after completion of the project.
- In addition to the need to comply with the highest level of ethical conduct principle investigators must report back annually as an evaluation and monitoring mechanism on the progress being made by the research. Such a report must be sent to the Dean of Research's office

The Ethics Committee wished you well in your research.

Yours sincerely

Professor Lindelwa Majova-Songca
Acting Dean of Research

16 November 2017

English Editing Certificate

Certificate of Professional Editing

This thesis, titled "**Land rental policy and markets in Mashonaland East province, Zimbabwe: implications on farmer decisions, efficiency and equity under a1 and a2 models**" authored by **SIMBARASHE TATSVAREI** has been edited by **CHIKARA TENDAI OWEN**, a Communication Skills Lecturer at BINDURA UNIVERSITY OF SCIENCE EDUCATION on this 8th day of July, 2018

As proof of having edited this thesis I hereby append my signature and the date of completion of the said editing.

Signature.....

Editor's Qualifications

M.A APPLIED ENGLISH LINGUISTICS (M.S.U, 2014)
B.A (HONS) ENGLISH & COMMUNICATION (M.S.U, 2009)
POST GRADUATE DIPLOMA MEDIA & SOCIETY STUDIES (M.S.U, 2013)

Date 08 | 07 | 2018