Access to inputs in Zimbabwe

Changes since the
Fast Track Land Reform Programme

by

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Preface

This is my master's thesis, which shows the completion of my master education Human Geography. I am glad that it, finally, came to a good end and I am happy to present you the results of this research on access to inputs in Zimbabwe.

After I completed the courses present in the curriculum of the master Human Geography, unfortunately I had to take a break of a few of months because of personal reasons. When I felt ready to get on again, my supervisor Dr. Marcel Rutten advised me to the African Studies Centre (ASC) in Leiden that had possible studies to be done. The availability of the Zimbabwean Rural Households Dynamics Study (ZRHDS) - a large database with lots of information on Zimbabwean farmers - in combination with the ASC's interest in access to inputs were the base for this research. After a small literature study I became more and more interested in this subject as well, and in cooperation with the ASC we decided to start my master's research.
During the research I got stuck a couple of times, I took some small breaks again, but I stayed positive and now here is the result.

The first person I would like to thank is my supervisor Dr. Marcel Rutten. Despite his really busy scheme he extensively answered my questions and came with useful feedback. Next to that he understood my personal situation, which made me feel more comfortable in making certain choices. Also I would give my thanks to Dr. Marleen Dekker; her knowledge on the subject and on the ZRHDS-database made here a perfect second reader. Special thanks go to Dr. Bill Kinsey, for having time to have an extensive and nice meeting with me during his short period in the Netherlands. This meeting really helped me getting an idea of the complex background of the situation in Zimbabwe, but also it was very nice to exchange ideas with him. And I am thankful for his trust in me, using his ZRHDS-database.

Enjoy reading!

Florien Willems

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1. Introduction in 'Access to inputs'

In this chapter the subject of the research is introduced, as well as the importance of it. The research design is explained and the structure of the research outlined. Research goals and main questions are formulated, and also the societal and scientific relevance are discussed.

1.1 Introduction

The purpose of this study is to make clear how resettled and communal farmers have access to inputs for growing maize, tobacco and cotton in three different natural regions in Zimbabwe, and how much of these crops they grow. This is examined for two years, 2000 and 2012, to see whether and how the situation for farmers in Zimbabwe has changed over the last decade. The reasons for choosing the particular natural regions and the years 2000 and 2012 are explained later.

Agriculture is a very prominent sector in the Zimbabwean economy with respect to employment, livelihood of many Zimbabweans, food security, but also economic growth. Studying how inputs are available for Zimbabwean farmers, as conducted in this thesis, is therefore relevant and important. If agricultural production falls short the country will be confronted with serious troubles in several ways, as has been the case in Zimbabwe over the last decade (IFAD, 2010). It is important to find out why exactly the production falls short. Suggestions are that the key problem is the availability and distribution of inputs. It is known that Zimbabwe struggles with input-issues, but these struggles seem to vary for different crops, as well as for each group of farmers and the different natural regions alike.

Reasons for examining in this thesis the inputs for maize, tobacco and cotton are straightforward. Maize is not only the most important food crop for Zimbabwe but also the most grown crop; almost all Zimbabwean farmers grow maize. Tobacco and cotton are the two most important cash crops; both are export products and both are highly important for Zimbabwe's economy. These two crops are mainly grown under contract farming. Changes in access to inputs of these three crops will not only affect food security, employment and income for many households but the strength of the economy of Zimbabwe at large.

Zimbabwe has different groups of farmers. Two groups will be discussed in detail in this thesis: resettled farmers and communal farmers. These two groups have received various levels of government support. By making a comparison between these two farmer groups it can be examined whether differences in access to inputs between the farmer groups that existed in 2000 do still exist in 2012.

The comparison between the natural regions can also show differences in access to inputs. Examining a dependency between being a certain type of farmer and access to inputs, and living in a certain natural regions and access to inputs is important for an understanding of the seeds-issues in general. Knowing the problems in access to inputs can help to understand and clarify the shortfalls of agricultural production and output and is therefore necessary for solving problems in the agricultural sector.

Restrictions in time and space

As mentioned before this research covers three different natural regions (NR) in Zimbabwe, in years 2000 and 2012. It is explained here why these three natural regions examined and why the years 2000 and 2012 are chosen to compare.

The three regions investigated are NR2, NR3 and NR4. These are the tree regions included in the database that is used for this research (Zimbabwe Rural Households Dynamics Study). It does not include farmers from natural regions NR1 and NR5. NR1 is the best region to practice agriculture and has no real natural obstacle s to growth crops successfully, whereas NR5 at the other extreme is not suitable for cultivation.

Reasons for examining the years 2000 and 2012 have to do with the start of a new land reform programme around 2000. From the year 2000 a new land reform programme was started in Zimbabwe, the Fast Track Land Reform Programme (FTLRP), which changed a lot for many people. For example interference of the government in agricultural problems and seeds-issues and the start of different governmental support programmes and subsidies (Matondi, 2012, p. 147; Scoones e.a., 2010, p. 96). The year 2000 is chosen to see the situation before FTLRP and the governmental support programmes. The year 2012 is taken to show the changes after a decade of support programmes, interferences and subsidies. A timespan of a decade is sufficient for a longitudinal examination; the real effect of decisions taken in 2000 can now be measured. Information of both the years 2000 and 2012 is available in the ZRHDS database.

1.2 Argumentation of the research design

The topic of this research was suggested by the African Studies Centre in Leiden. Their interest in land, settlement and seeds-issues combined with the availability of data of the Zimbabwe Rural Households Dynamics Study resulted in the current topic for research. Data on land, settlement and seeds are part of the ZRHDS-dataset. It is a unique collection of longitudinal data coordinated by Dr. Bill Kinsey, a researcher based in Harare, who has been working together with ASC researchers. A new round of data collection was added in 2012. There was no fieldwork to be done by myself but the statistical analysis and final reporting had to be carried out by me. In cooperation with Dr. Bill Kinsey and the ASC a relevant research question was formulated that would fit the topic of interest, that would be suitable in the time and space of a master's thesis and that could be examined with the available data. The draft research question was subject to change during the writing of the theoretical framework and also during working with the data, as it turned out that not all questions could be analysed with the existing dataset. During the writing of this research I kept in touch with the ASC on regular base and important changes such as those in the research questions were made in close consultation with the ASC.

1.3 Scientific relevance

The *scientific relevance* of this research is to enlarge existing understanding about access to inputs, notably seeds, by comparing resettled and communal farmers in specific geographical areas in Zimbabwe. Seeds-issues become more and more a topic of research. For example the Access to Seeds Index of the Access to Seeds Foundation[1] (2013) that *"investigates the performance of leading companies in the seed industry"*, *"show positive actions that farmers benefit from"* and by doing this show *"differences between seed companies"*. Such researches show the importance of seeds-issues for African countries.

Another addition contribution to scientific literature is the focus on seeds-issues in combination with farmer groups and natural regions. Many existing studies that examine resettled and communal farmers focus on output, production and resettlement. This research combines the two interesting topics 'seeds-issues' and 'resettled and communal farmers' but also the differences

[1] The Access to Seeds Foundation focuses on countries where at least 20% of population lives below poverty line, according to the United Nations Development Program. Information to develop and update the index every two years is based on dialogue with all relevant stakeholders as farmers, government, NGO's, seed industry, academia, and others. Seed organisations are ranked and get feedback on their performance, and instead of blaming seed companies for not working well the foundation will motivate them with positive actions to improve access to high quality of seed.

between agro-ecological regions are taken into account, which is a unique combination so far.

Another distinction is the research method used. Most studies on farm inputs are qualitative studies, where, for example, farmers tell their personal story. This research, however, is a quantitative survey that provides hard data for a larger group of farmers. With the facts of this research the scientific literature will be valuable expanded, and this can be used in future for further research on *why* facts are as they are combined with respondents' opinions and personal stories.

For all aforementioned reasons this research is a useful addition to the existing literature on this topic; the comparison of facts of different natural regions and how different farmers in these regions have access to inputs is a unique study, which adds knowledge to understand the Zimbabwean economic and agricultural problems.

1.4 Societal relevance

The *societal relevance* of this research is to provide a better understanding of the problems the Zimbabwean agricultural sector, has to cope with, especially concerning farm inputs, today as compared to 2000. It is important to get a better idea how access to inputs is organized in Zimbabwe, specifically for the different farmer groups and in the different natural regions. Showing the difficulties faced by Zimbabwean farmers in getting inputs for farming in different natural regions and within different farmer groups is important for clarifying productivity problems in the agricultural sector in Zimbabwe..

The economy of Zimbabwe as well as the food security to a significant extent depends on the agricultural sector. The agricultural harvest is dependent on production, which coheres with inputs (The World Bank, 2014). Changing access to inputs has tremendous effects, for example, on the increasing involvement of farmers in contract farming. Insights in the organization of access to inputs can thus contribute to a better understanding of the productivity levels of the agricultural sector; when production falls short it is important to look at access to inputs, besides weather conditions and prices, as one of the key reasons explaining productivity levels..

By researching issues around access to inputs a key problem for shortfalls in agricultural production can be exposed, and this is important for seeking solutions. Also exposing the seeds-situation can open a new discussion for changes or improvements on this issue, as well as showing possible differences between the groups of farmers and different natural regions. Improvements in access to inputs can indirectly benefit the food security and the Zimbabwean economy that is in need for growth (IFAD, 2010).

1.5 Research questions and hypotheses

The research question is:

How has access to inputs for maize, tobacco and cotton changed for resettled and communal farmers in three different natural regions in Zimbabwe, from 2000 until 2012?

Sub-questions:

1. a. Which farmers grow maize (certified and non-certified), tobacco and cotton in 2012 (per farmer groups and natural regions)?
   b. How do they get inputs for these crops?
   c. How many hectares do they plant?
   d. What is the output?

2. a. What are the differences between the natural regions and between farmer groups for each of the three crops selected?
   b. What role plays contract farming in this?

3. a. Which farmers grow maize (certified and non-certified), tobacco and cotton in 2000?
   b. What is known about access to inputs?
   c. How many hectares were planted?
   d. What is the output?

4. What are differences between the years 2000 and 2012 for the three crops?

Hypotheses

The three natural regions examined in this research are classified by factors like annual rainfall, but also (infrastructural) accessibility differs for the natural regions because of uneven topography. Therefore it can be assumed that in one natural region with good infrastructure, inputs will be easier accessible than in another natural region with poor infrastructure. Also between the different farmer-groups, resettled and communal, the access to inputs is assumed to be different because of political reasons and governmental support for resettled farmers. Between the different crops it can be assumed that for cash crops the accessibility of inputs will be better than for food crops, because of economical reasons: international companies that invested in the Zimbabwean agriculture through contract farming in the last decade. For the same reasons it is assumed that contract farming plays a more important role since FTLRP. The FTLRP is assumed to have had an impact on accessibility on inputs because of the impact it had on economics and seed-distribution. With this in mind, the hypotheses of this research are:

1. Farmers' access to inputs is unequal in the different natural regions, whereby NR2 has better access than NR3, which has better access than NR4.
2. Resettled farmers have easier access to inputs than communal farmers.
3. Access to inputs has become better for cash crops (tobacco and cotton), while it worsened for the main food crop (maize).
4. Contract farming plays a more prominent role in the agricultural sector since FTRLP (2000 versus 2012).
5. Access to inputs for all farmers and in all natural regions has become different since FTLRP (2000 versus 2012).

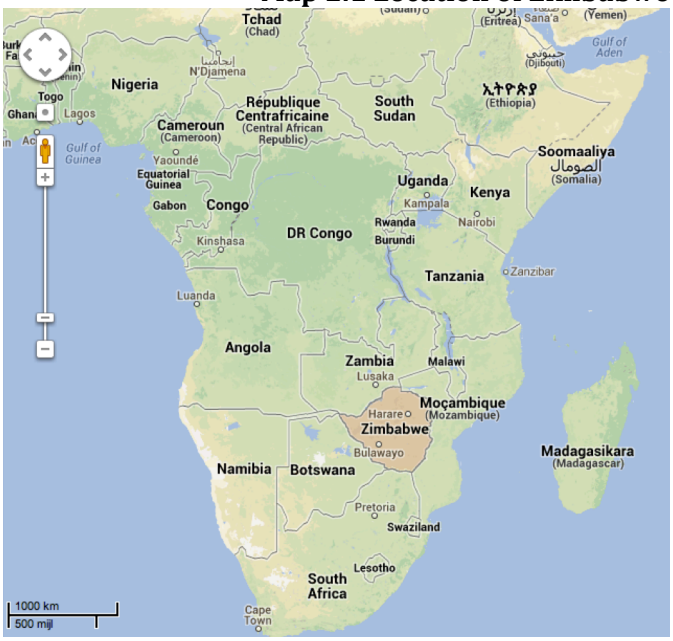
2. Zimbabwe: Background information

Zimbabwe officially gained independence is 1980, after having been a British self-governing colony since 1923. But British rule had been present in the region since 1888 when Cecil Rhodes obtained a concession for mining rights from the king of the Ndebele peoples. In 1898 'Southern Rhodesia' became the official name for the region that later became Zimbabwe. Since independence Robert Mugabe, a former freedom fighter who played a major role in overthrowing the White-majority government, has been dominating the political system of the country as the first prime minister of Zimbabwe. His land reform programme affected the whole country and created chaos in economic, social and political terms. This in combination with the legacy of the colonization has formed, and is still forming, the way Zimbabweans live their lives nowadays. This chapter gives background information about Zimbabwe in geographical, economical, political and historical terms. Because the current research focuses on agro-ecological regions (the aforementioned natural regions) in Zimbabwe, also the division into agro-ecological regions gets attention in this chapter. The land reform programme and the since then existing difference between resettled and communal farmers is extensively discussed. This background information is important to discuss because it comprises significant factors in order to understand the current situation in the country and the developments that the country has experienced.

2.1 Geography & population

Zimbabwe is situated in Southern Africa bordering South Africa to the south, Zambia to the north, Botswana to the west and Mozambique to the east (map 2.1). The river Zambezi is a natural border with Zambia, and also Lake Kariba and the Victoria Falls form a border between Zimbabwe and Zambia. Zimbabwe is divided into eight governmental provinces (map 2.2) and two cities have a provincial status: the capital Harare and Bulawayo.

Map 2.1 Location of Zimbabwe

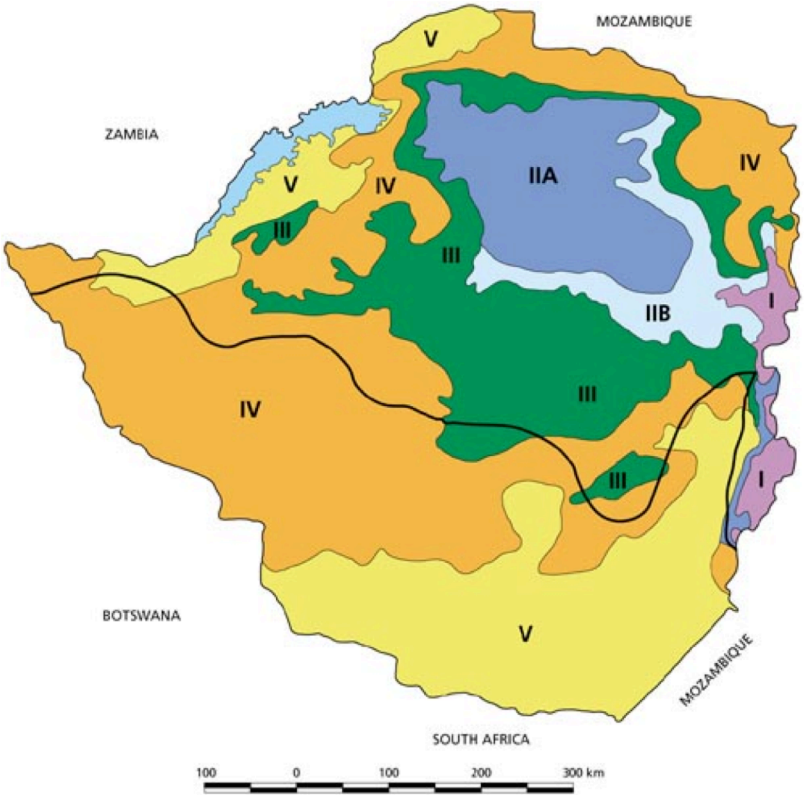


(Source: GoogleMaps, 2013)

Map 2.2 Provinces of Zimbabwe

(Source: Techno Revelation Centres, 2013)

Map 2.3 Natural regions of Zimbabwe (old)



(Source: FAO, 2006)

2.1.1 Natural regions

Next to the eight governmental provinces, Zimbabwe is divided into five agro-ecological regions, the so-called natural regions I until V (map 2.3), called NR1 up to NR5. This division is based on factors like rainfall, soil quality, topography and vegetation. Reasons for making this division have to do with agricultural systems, which are influenced by the above-mentioned factors. The number of the natural regions stands for the quality of land resources, whereby "NR1" is the best quality and "NR5" the least. In general Zimbabwe has a tropical climate that is moderated by altitude and there is a rainy season from November to March, but this rainfall is slightly different in each of the five natural regions (The World Bank, 2014; FAO, 2006). Table 2.1 shows rainfall and agricultural characteristics for the different natural regions in Zimbabwe. NR2, NR3 and NR4 are described more broadly below because this research focuses on those three natural regions.

Table 2.1 Description of the natural regions of Zimbabwe

Natural Region	Area (000 ha)	% of total land area (%)	Annual rainfall (mm)	Farming Systems
I	613	1.56	> 1 000. Rain in all months of the year, relatively low temperatures	Suitable for dairy farming forestry, tea, coffee, fruit, beef and maize production
II	7 343	18.68	700-1 050. Rainfall confined to summer	Suitable for intensive farming, based on maize, tobacco, cotton and livestock
III	6 855	17.43	500-800. Relatively high temperatures and infrequent, heavy falls of rain, and subject to seasonal droughts and severe mid-season dry spells	Semi-intensive farming region. Suitable for livestock production, together with production of fodder crops and cash crops under good farm management
IV	13 010 036	33.03	450-650. Rainfall subject to frequent seasonal droughts and severe dry spells during the rainy season	Semi-extensive region. Suitable for farm systems based on livestock and resistant fodder crops. Forestry, wildlife/tourism
V	10 288	26.2	< 450. Very erratic rainfall. Northern low veldt may have more rain but the topography and soils are poor	Extensive farming region. Suitable for extensive cattle ranching. Zambezi Valley is infested with tsetse fly. Forestry, wildlife/tourism

(Source: FAO, 2006)

- *Natural region 2*

The location of NR2 is foremost the centre-north region of Zimbabwe as can be seen on map 2.3. As described in table 2.1 the rains of 700 - 1050 mm per year are mostly falling in summer, spread from November until the end of March or the beginning of April. This is identical with the general rainy season of Zimbabwe. In this area the rains are reliable and the soils in this area are good. This makes NR2 a suitable region for intensive cropping which is visible in the statistics: the area contains 75-80% of all the crop-planting land in Zimbabwe (FAO, 2006). NR2 is a very important agricultural region for Zimbabwe.

Before the year 2000 large-scale farming, mostly by white commercial farmers, dominated this region. Owner-operated farms of about 1000-2000 hectares were the norm, on which the work was mainly mechanical driven. After the land reform programme in the year 2000 many of these large-scale farms were divided into smaller farms and new (black) farmers got access to these smaller farms under special lease restrictions (FAO, 2006). These restrictions are part of the land reform programme as will be described later.

- *Natural region 3*

NR3 is located around NR2 as shown on map 2.3. NR3 covers the mid-altitude area of the country. The rainfall in this region is less than in NR2: 500 - 800 mm per year, and rains only fall during the general rainy season. In the dry season the temperatures are high. Agricultural performance in this region is less than in NR2, and mainly drought-tolerant crops are grown here, this has to do with the soils that are less suitable for crop farming than in NR2. Cash crops are grown here, as also food crops for the own food security; but all only grow under good farm management and need more attention because of the lesser quality of the soil.

Small-scale farming is dominant in this region, only 15% of the farmland belongs to large-scale farmers and most of this land is not even used for crop planting but for livestock farming (FAO, 2006).

- *Natural region 4*

NR4 is located around NR3 and also covers the main part of the southwest of the country; this region is the low-lying area of Zimbabwe as is visible on map 2.3. The annual rainfall in NR4 is less than in NR3 and even during the rainy season there are periods of drought; sometimes there is no rain at all. On annual base about 450 - 650 mm rain will fall. Therefore this region is best suitable for livestock farming and cattle or wildlife production. Small-scale farmers do, however, grow some drought-tolerant crops in this region, despite the fact that this region is seen as unsuitable for crop growing. It is mainly for the own food security and if possible they try to grow some cash crops that are drought-tolerant, like cotton (FAO, 2006).

The natural regions are thus mainly important for Zimbabwe's agricultural system. According to The World Bank (2014) only 10% of Zimbabwe's land is arable, and most of this land is situated in NR1. Next to this low level of arable land, Zimbabwe struggles with different geographical and environmental factors that influence agriculture. One of the main important natural hazards is drought, which is highly affecting the harvest. Other issues are deforestation, soil erosion and land degradation: factors that are also affecting the harvest (Kinsey et al, 1998). All these factors are of different influence for the different natural regions, whereby NR5 is suffering the most and NR1 the least.

Already in 1960 the division in natural regions (map 2.3) was made by two researchers, Vincent and Thomas (Vincent & Thomas, 1960). Some of the weaknesses of this division have become clear later, for example climate change. Climate change has caused that not all borders between the natural regions are right anymore. Rainfall has changed and is more variable in some regions and agricultural growing periods can be different within one natural region. In a 2012 article, Mugandani et al discuss a *"Re-classification of agro-ecological regions of Zimbabwe..."*. Which re-classifies on the changes in rainfall and soils, temperature and length of cropping period. Outcome of this research is that Zimbabwe still has five different agro-ecological regions but that the boundaries have changed; some regions have increased in area while others have declined (Mugandani et al, 2012). For the current research it is necessary to stick to the 'old' division of natural regions because the data that is used for the statistical research is based on that division.

2.1.2 Population

Zimbabwe has more than 13 million inhabitants. 98% of the Zimbabwean population has an African ethnic background, of which the majority is Shona, a smaller group is Ndebele and there are some other African ethnicities. Nowadays, only less than 1% of the population consists of whites compared to 4% before Mugabe took over, which can be seen as a result of the land reform programme that expelled many whites (Scoones et al, 2010).

About 38% of the Zimbabwean population lives in urban areas, of which 2 million in the capital Harare (The World Bank, 2014). With a population growth of 4.23% Zimbabwe has the second highest population growth rate in the world, after Libya. At the same time Zimbabwe is placed third of the world in terms of netto migration rate, many Zimbabweans move to South Africa or Botswana in order to find better economic opportunities (The World Bank, 2014). This high migration rate shows one of the negative results of the economic crisis Zimbabwe has to deal with (see section 2.2); people leave the country in search for a better economic life.

2.2 Economy: Collapse of agricultural sector & hyperinflation

In 2009 the unemployment rate was estimated at 95%, but it is an estimation because according to The World Bank (2014) *"...true unemployment is unknown and, under current economic conditions, unknowable."* However an estimation of 95% clearly shows one of the problems that Zimbabwe has to face. This is amplified by the fact that 68% of the Zimbabwean population lives below the poverty line.

As mentioned before 38% of Zimbabwe's population lives in urban areas. The majority of the Zimbabwean population lives in rural areas. It is therefore not striking that also a majority of the working population works in the

agricultural sector, about 66%. Despite the fact that two-third of the Zimbabwean population is economically dependent on the agricultural sector, only 20.3% of the gross domestic product (GDP) comes from the agricultural sector. Work in the agricultural sector often means physical hard work which is low paid, and it is uncertain because it depends on whether the harvest is good or not. Farmers and farmworkers have to work hard to maintain their lives, but most are living around or below the poverty line (The World Bank, 2014). One of the reasons for such a huge number of people living below the poverty line can be the collapse of the agricultural sector together with the enormous inflation that Zimbabwe had to deal with during the last decade. Amongst others these two happenings are at the heart of the economic decline in Zimbabwe that started in the beginning of the 2000s. Also other factors such as failed politics, involvement in the Congolese war and corruption have contributed to this economic decline.

An important cause for the beginning of the economic decline in Zimbabwe can be found in the last phase of Mugabe's land reform programme. Partly through this programme the commercial farming sector has almost totally collapsed, which means that an important source of export-products and a provider of about 400,000 jobs does not exist anymore the way it did before (Scoones et al, 2010). Where the first phase of the land reform programme went slowly and controlled, the last phase, Fast Track Land Reform Programme was a chaotic and violent way of expelling whites from their land. Native Zimbabweans without any agricultural experience took over the farms but did not have the correct skills and technology to work on it (section 2.3). This ignorance together with the droughts during that period resulted in dehydrated and wild fields that did not produce any acceptable harvest: start of the collapse of the agricultural sector. The collapse influenced the lives of many of Mugabe's supporters and therefore affected their trust in Mugabe. In order to get his supporters back Mugabe decided to repay them but he did not have the money for doing so. Therefore he started to print new money, which partly accounted for the start of hyperinflation in Zimbabwe. The hyperinflation in turn had an enormous impact on the collapse of the agricultural sector, so both happenings negatively influenced each other.

Estimates of the percentage of inflation lay between 10 million and 22 million percent (Volkskrant.nl, 2008). An extra worry that amplifies shortages of money is the fact that international support dramatically decreased as a result of the violent land reform. Western companies stopped sending big amounts of money in the form of support or investments to Zimbabwe because they lost their trust in the country, as will be mentioned in section 2.3. This decrease highly influenced the agricultural sector of Zimbabwe, with shortages of money for inputs such as fertilizer as a consequence. Because of the shortages the prices increased dramatically: which was another factor that contributed to the hyperinflation in the country. High rates of inflation make money almost

worthless, which affects all households in their everyday lives. Increasing prices, shortages of money and delayed payments; the hyperinflation affected the whole agricultural sector starting by the availability and distribution of inputs. *"...the "traditional" suppliers of agricultural inputs failed completely to meet demand since they were unable to cope with hyperinflation and since the supply chain had been broken by the consequences of economy-wide failures"* (Dekker & Kinsey, 2011, p. 11)

At the end of 2009 the hyperinflation came to an end by allowing other currencies locally, the so-called 'dollarization'. From this moment the inflation reduced to about 10%, which is acceptable but it still shows weaknesses that hinder the economy to grow stable. Despite the instability, the Zimbabwean economy has shown some growth since 2009 (CIA, 2013; Dekker & Kinsey, 2011, p. 8).

2.3 Political history: Land reform

As mentioned earlier Zimbabwe was known during colonial time as (Southern) Rhodesia, ruled by (British) settlers. In April 1980 it gained independence after the first attempt for independence in 1965 was not officially recognized. Mugabe's most important interest was well known long before he got in charge, namely the wish to put in place a land reform programme. The original population of Zimbabwe, 'the blacks', should get back land from 'the whites' that had taken land during the colonization (The World Bank, 2014; Scoones et al, 2010). Different phases of the land reform programme can be distinguished; here the so-called 'old resettlement' started in 1980 will be outlined in most detail because the households resettled during that time are the ones examined in this research. Another phase that started in 2000, the so called Fast Track Land Reform Programme, will also be discussed because this research focuses on the differences 'before' and 'since' this last phase of the land reform programme.

- *'LRRP1' (Old resettlement) and 'LRRP2' from 1980 on: 'Phase I' and 'Inception Phase'*

When he got in charge as first president of Zimbabwe, Mugabe immediately started with the organization of this Land Reform and Resettlement Programme phase 1 (LRRP1) (Chiremba & Masters, 2010). Britain was involved in the first phase of this programme and donated money to the Zimbabwean government to buy back land from the whites following a 'willing seller willing buyer' approach, as agreed in the Lancaster House Agreement. The land bought from white farmers should be divided amongst black Zimbabweans. Next to land, the government also provided infrastructure and support services, schools, health clinics, depots for inputs and clean water services if possible (Deininger et al, 2004, pp. 1697-1700). This first phase of the land reform programme was carefully planned; white farmers got compensated for their land and got a

certain kind of protection. To gain international confidence, the government acted a fair approach regarding the whites. The resettlement plans were very ambitious with respect to the amount of households to be resettled. Afterwards these ambitious plans were the reason that the resettlement programme was seen as a failure; the numbers of households to be resettled were too ambitious and could never be reached. In 1980 the goal was set that in 1984 162,000 households should have been resettled. In fact, even by 1996 only 71,000 households were resettled (Deininger et al, 2004, p. 1698; Scoones et al, 2010, pp. 14-16).

These 71,000 resettled families from communal areas got a piece of farmland and were resettled following 'model A', which means self-sustaining family farming. Model A existed of two different categories, A1 and A2. In A1 resettlement was organized in small farms of between 12 and 30 hectares, with self-sustaining farming and a surplus for selling. Most were villagised: three hectares of arable land and communal grazing was allocated to the settlers. The main purpose of this model was a decrease in land pressure in communal areas. Model A2 was slightly different, small-scale commercial farms were allocated to settlers with agricultural knowledge, experienced farmers (Chiremba & Masters, 2010; Matondi, 2012, pp. 8-9). Next to model A, which covered 90% of all resettled households, there were also models B, C and D. Model B enhanced a collective mode of production, model C was about individual farming centred on a core estate and model D about extensive ranching (Deininger et al, 2004, p. 1700; Matondi, 2012, p. 53). The models B, C and D are not examined further in this research, as the data to be used only contains farmers resettled following model A.

The families who were resettled were mostly farmers from other rural areas (49.9%), most of them came from communal lands close by. Others were coming from urban areas or were former farm workers (Scoones et al, 2010, p. 52-53). Resettlement happened on voluntary base, families could apply for resettlement. They were screened and randomly selected for resettlement. More information about resettled farmers is described in section 2.4.1. Advantages for the resettlers were that they were having their 'own' land after resettlement. Actually this land is still property of the state, but 'own' in terms of being the only one who is farming on that land, instead of using communal farmland where others are farming too. This fact makes the farmers more careful with the land, and it gives them an opportunity to invest in the land. A side note has to be made here of the fact that the land could be taken back by the government at any time, and the government is not responsible to compensate for costs that the settler has made for the land. Although settlers are having their own land since resettlement, they still have no certainty (Matondi, 2012, pp. 8-9). But despite this fact there were advantages for the farmers to get resettled. For example, the amount of arable land available per settler is more than they had available while being a communal farmer. This makes it possible to be self-sustaining, at least to

produce enough food for their household and sometimes even a surplus to sell. Another advantage is that the government, with provision of inputs, supported resettled farmers. After the first couple of seasons with a period of drought it seemed that the resettled farmers have not been able to get inputs by themselves, so the government started schemes for the provision of inputs. Also there was a Resettlement Credit Scheme that provides loans for resettled farmers if necessary (Chiremba & Masters, 2010).

The above-pictured phase of resettlement is later called the 'old resettlement'. This first phase is by many seen as a failure, because targets were not reached, but it did not mean that land reform disappeared from the political agenda. Not all is negative about the old resettlement, for example results of a long-term monitoring research about resettlement households have shown positive changes for resettled households in the last years. One of the positive results was that real income has doubled since 1983 (Scoones et al, 2010, pp. 18-20).

After this 'old resettlement' phase, the second phase of the Land Reform and Resettlement Programme (LRRP2) was in fact a continuation of the first phase and a slight transition to the Fast Track Land Reform Programme. Thus the LRRP2 did not differ much from LRRP1 and according to Matondi (2012, p. 56) it is even called the 'Inception Phase'. The government had set a new target after the first target was not achieved. The new target was to allocate 5 million hectares of land to new resettlers in the period between 1998 and 2004. The new resettlers would be landless poor, graduates of agricultural colleges, individuals with farming experience and disadvantaged groups, for example women. Support was necessary for this new resettlement plan, and therefore the government found a partner in the World Bank who agreed to support for a couple of years. For this support the government would try to resettle as many families as possible on an area of one million hectares. After the two years of World Bank-support only 4,697 families were resettled on an area of 145,000 hectares in total. This meant that, again, targets were not reached (Chiremba & Masters, 2010).

- *Fast Track Land Reform Programme from 2000 on: 'Phase II'*

In response to the unmet targets of earlier resettlement programmes a new programme started in 2000. The Fast Track Land Reform Programme (FTLRP), it was in fact a violent acceleration of LRRP1 and LRRP2. *"Methods of land acquisition, beneficiary selection and resettlement support were changed to a completely command-driven approach"* (Chiremba & Masters, 2010). According to authors such as Matondi (2012) the FTLRP is also known as Resettlement Phase II. 160,000 farmers of model A1 and 51,000 small to medium-scale commercial farmers should be resettled on 9 million hectares of former large-scale commercial farmland in different models, mainly A1 and A2. Due to this new approach this time the target was reached and already in November 2001

160,000 families were resettled on 7.3 million hectares of land (Chiremba & Masters, 2010). An important difference between the old resettlement and the FTLRP is the use of violence. The old resettlement was peacefully organized and structured, the FTLRP was a total chaos and many white farmers were in a rude and violent way moved from their land (Matondi, 2012, pp. 19-21).

The FTLRP had a major impact on various aspects of the Zimbabwe national economy, agriculture in particular, for example because of its influence on the inputs-situation of the country. Since the start of the FTLRP the inputs-situation in Zimbabwe has dramatically changed, which will be described more broadly in section 3.1.2. It also impacted on the ability for resettled farmers to provide to their children (sons) a piece of farmland to farm themselves (Kinsey, 2013; Matondi, 2012, p. 11):

The possibility for resettled farmers of getting their sons a piece of farmland was an important effect of FTLRP on Zimbabwe's agricultural sector. Before this possibility existed, all family-members had to farm on and live from the given size of land from the first resettlement programme. While families grew bigger, with several wives and grandchildren, the amount of land stayed the same thus the acreage per family-member relatively decreased. In the new programme it was possible to get farmland for sons of the old-resettlers; so the sons could farm for their own household and were thus able to produce enough food to fulfil the demand of their own household. This was a positive development for the food security of all family-members (Kinsey, 2013).

Other important effects of the FTLRP have to do with the decreasing support of the international community. The support of the international community decreased dramatically after the FTLRP. Because of the violent ways of moving white farmers from their land, the international community lost trust in Zimbabwe. White farmers from different nationalities have been held up and chased away from their land and their properties; the countries where these farmers originated from stopped their investments in Zimbabwe and their support for the agricultural sector. This negatively influenced the availability of money and support for example for inputs, and thus the amounts of inputs and the accessibility of it (Kinsey, 2013; Matondi, 2012, p. 11).

2.4 Resettled and communal farmers

Resettled and communal farmers are compared in this research; therefore the differences between the two farmer groups and the areas have to be clear. For each farmer group it is also explained how they usually get inputs for farming.

2.4.1 Resettled farmers in resettlement areas

The category of resettled farmers encompasses families who were resettled during the 'old resettlement' in the beginning of the 1980s, on voluntary base and randomly selected out of applicants. As mentioned before, the families

resettled were mostly farmers from other rural areas (49.9%), most of them came from communal lands close by. Others came from urban areas or were former farm workers (Dekker, 2004, p. 67; Scoones et al, 2010, p. 52-53).

The resettled families were allocated a piece of arable land, but one of the conditions to be met was that they had to leave their lands in the communal area. The new land would remain property of the state but was to be used by the resettled family only. As these new areas still had to be prepared for farming, as well as houses to be built and infrastructure to be fixed, the new settlers faced a lot of challenges (Dekker, 2004, p. 65). But the land allocated to them was bigger than they had available being a communal farmer, by the year 2000 it even seems that resettled households had access to more land than was officially allocated to them. However, the latter is striking and can be a result of illegal land extension or renting. Although there is more land available, the households in resettled areas are bigger than in communal areas because married sons stay on the land. So in fact per person less land is available in resettlement areas than in communal areas. Reasons why sons stay have to do with the land tenure rules in resettlement areas. As aforementioned, these rules changed after FTLRP when it became possible to get sons a piece of farmland (Dekker & Kinsey, 2011, p. 7; Kinsey, 2013). A striking point about land is that many of the resettled households did keep their old farmland in the communal area; partly because of insecurity feelings about the new farmland (Dekker, 2004, p. 92). Here it becomes clear that resettlement is a process, households almost never moved at once, but some family-members stayed a while at the old area before moving as well because of former mentioned reasons. The feelings of insecurity were correct for some, because in cases the new land seemed not sufficient for arable farming because of poor soils; it mainly seemed useful for cattle ranching. Some resettled farmers even decided to go back to the communal areas even though this was a difficult choice, and others were not even able to go back. Resettlement did for them not work out as positive as they were told and as they hoped (IRIN, 2003). On the other hand for many it did work out well, and they stayed on the new land and are still there.

For getting inputs for farming resettled farmers are mainly dependent on governmental support. Resettled farmers are often involved in governmental input supply schemes, especially since became clear that resettled farmers were not able to provide themselves inputs (Chiremba & Masters, 2010). However, it became clear that the provided inputs through these programmes were not sufficient to meet the demand. Resettled farmers felt the consequences of the hyperinflation and were not able to buy inputs by themselves because of the high prices, and the local seed production only covered about 50% of the demand. They complained about a lack of structured support and specifically a lack of subsidized agricultural inputs. These factors hindered the resettled farmers to be successful in farming (IRIN, 2003).

2.4.2 Communal areas and farmers

Most resettled farmers are former communal farmers, and the ones who did not apply or were not selected for resettlement are still communal farmers. According to IRIN (2008) 50% of Zimbabwe's land consists of communal farming areas and about 70% of the Zimbabwean population lives and works on small-scale plots. Only one-third of the communal lands is suitable for agriculture, the rest is used for livestock-farming. One-third seems little, but if it is supported properly the production can be sufficient. This seems from the fact that communal farming is important for Zimbabwe's food security. It is for example estimated that communal areas deliver 66% of the total maize production of the whole country (IRIN, 2008).

Communal lands are not farmers' own property; the land is communally owned and may be used for farming by a number of families. Most of the crops harvested is used for the own livelihood and a surplus can be sold if possible, just like in most resettlement model A areas. But striking about the land in communal areas is that since FTLRP it is easy to get sons a piece of land to farm for themselves, therefore households-sizes in communal areas that farm on the same land are smaller than in resettled areas (Dekker & Kinsey, 2011, p. 7).

For getting inputs for farming, communal farmers were dependent on the market or on the government. The economic decline had an influence on the fertilizer industry; communal farmers felt the consequences of this. Before, they had access to reliable seeds and fertilizer. The fertilizer industry was big and through competition the price and quality were good. Many commercial farmers were dependent on it; and because it was affordable it was also an advantage for communal farmers who became dependent on it as well. The collapse of the economic sector directly influenced the prices of seeds and fertilizer. Prices increased and the availability of qualitatively good seeds and fertilizers decreased. These factors indirectly influenced the productivity of communal farmers. From this moment on they had troubles in getting access to reliable inputs and fertilizer. According to the Zimbabwe Farmers Union (ZFU), the organization for communal farmers and their interests, *"…this season's poor harvest was a consequence of the late delivery of whatever is available [seed and fertilizer] by government, the lack of access to credit for farmers, the increased number of farmers as a result of land reform, and climate change."* (IRIN, 2008). Just like resettled farmers also communal farmers have troubles with getting inputs. However lately support programmes arise with as well resettled as communal farmers as target group, such as the e-voucher system of the FAO, see section 3.3 (IRIN, 2012).

3. Seed situation in Zimbabwe

This chapter discusses how seeds are being obtained in Zimbabwe. Already for a long time farmers in Zimbabwe experience serious obstacles acquiring access to inputs, foremost seeds. The framework of access to inputs as it existed in Zimbabwe before and exists after the introduction of the Fast Track Land Reform Programme will be described to see what important changes have occurred. The concept of contract farming is outlined to mention its relationship with seeds-issues. Agricultural performances will be determined with a focus on production-numbers and how they have changed in last years. Finally, some most recent developments are presented to illustrate that developments in Zimbabwe's seeds-situation are on going.

3.1 Seed issues and access to inputs

Access to inputs is an often-studied subject that can be defined in different ways. Often researches on access to inputs are specifically focussed on subsidy programmes for inputs opted by governments This research focuses on various ways farmers use to get inputs; official ways through the (formal) markets but also alternative ways as farmer-to-farmer and through donations. In the following a general view of access to farm inputs in Zimbabwe will be presented, but in subsequent chapters a more explicit look will take place at inputs for maize and its varieties as main food crop, and tobacco and cotton as main cash crops in Zimbabwe.

Since the beginning of the new millennium the Fast Track Land Reform Programme (FTLRP) has dramatically changed the way inputs and fertilizer are distributed (Mutonodzo-Davies, 2010, p. 1). As Scoones et al. (2010, p. 96) made clear: *"The agricultural policy environment has been highly erratic since 2000. Sudden switches in priorities, levels of support and axes of authority have dramatically affected the availability, affordability and distribution of inputs, notably seed and fertilizer."* Also Kapuya et al (2013) mention that the macroeconomic instability of Zimbabwe mainly after the implementation of land reform programmes had impact on the availability of inputs. To deepen our understanding of the developments after FTLRP the situation before the introduction of the FTLRP will be described in detail first.

3.1.1 Seed situation before FTLRP

Zimbabwe has for long been reputed to have put in place one of the best seed systems available in Africa. Different varieties of seed could be acquired through the national seed sector; hybrid maize foremost, but also cotton, tobacco, wheat, groundnut, vegetables and others. It started after Zimbabwe's independence in 1980, when seed producer associations such as Seed Co and the Zimbabwean

government joined hands and made an agreement to organize a vibrant seed sector. This continuation of the 'Green Revolution of Zimbabwe' which had started in the 1960s was *"...characterized by the widespread adoption of hybrid maize varieties and significant increases in yields..."* (Bourdillon et al, 2003, p. ii). Since independence agricultural policy focussed on the importance of the small-scale sector, however it seemed hard to give this sector the attention it deserved (Mutonodzo-Davies, 2010, p. 7). Different programmes were introduced by the government to support small-scale farmers for increasing their cash crop and food production. As a result the seed industry after a slow start, gained momentum from the early 1990s onwards. Due to changes in policy more (international) seed companies but also private-sector institutions entered the market, which raised competition to the benefit of the quality of the seed-market, although Seed Co (which cooperated with the government) remained the most important player (Bourdillon et al, 2003, p. 6; Rohrbach et al, 1997). Especially the production and distribution of *hybrid maize* (box 3.1) expanded, which allowed a further growth in maize yields of small-scale farmers.

Box 3.1 Varieties of maize-seed

It is clear that different varieties of maize exist, for instance hybrid maize. Here these varieties will be explained further. The varieties of maize seed can be divided in two categories: certified and non-certified seeds. Certified seed contains hybrid seed, which exists in different forms. Non-certified seed contains retained seed (p.e. farmer-saved seed) and open pollinated varieties (OPV). The difference between the two categories is important because it is experienced that certified seeds' harvests are bigger and of better quality, even in years of drought. Boland et al (2001, p. 1) explain: *"Certified seed from public varieties and private companies is defined as seed that has passed field inspection and seed testing standards for varietal purity, which is the absence of certain wheat and other crop seeds, and certain diseases. In addition, most certified seed has been treated with a fungicide to control seed- borne and seedling diseases. In most cases, certified seed must exceed 90 percent germination."* Non-certified seeds are not inspected and not treated with a fungicide. As a result they are more vulnerable to diseases and droughts and therefore have a smaller harvest in general. The distribution of certified seed in Zimbabwe started around 1990 (Bourdillon et al, 2003, p. 5). For the current research this difference is of importance, because certain sources where farmers get their inputs for farming (p.e. alternative sources, not the market) mainly distribute non-certified seed. This should logically lead to smaller harvests for the farmers using the non-certified seed, which can have diverse consequences as food-insecurity and financial problems.

In addition, more varieties of maize became available, which broadened farmers' options to buy the seed most suitable for their land (Rohrbach et al, 1997). In 1985 already more than 85% of all small-scale land used for maize was planted with hybrid maize. Around the 1990s the maize production has doubled compared to 1979 (Bourdillon et al, 2003, p. 1). Because of the easy access to

farm inputs most communal farmers and small-scale farmers mainly grew hybrid maize since the early 1990s.

Several times Zimbabwean authorities have tried to break this hybrid-maize-trend by promoting new and other seed varieties, for example by advertisements, field days and demonstration units, seed manuals written in Shona as well as in English or distributing free seed in relief programmes during droughts (Bourdillon et al, 2003, p. 6). However, this approach of free hand outs turned out to be not sustainable and farmers kept growing hybrid maize which influenced the demand at the market as well. Also, many farmers had their own stock of hybrid maize seed in reserve for being planted in periods of drought. However, seed from the previous year's harvest seems to be less profitable and resulted in a smaller harvest, farmers kept planting these maize-seeds instead of other varieties and this has a reason: it became clear that the Zimbabwean market lacked a diversity of seed. Many farmers had to go to urban retailers because local retailers were not supplied with the inputs that farmers needed. Seed Co claimed to provide local retailers with the inputs best suitable for the area, but according to farmers this did not happen or was not what farmers wanted. *"When you go to the shops to buy maize, you just get whatever seed is available or you risk planting late or not at all"* (a farmer interviewed in: Bourdillon et al, 2003, p. 15, 25). This absence of seeds in the shops was an issue for many households. At urban stores the situation was not much better, because of the high prices of seed and especially of fertilizer, but also the late arrival of the wanted inputs (Bourdillon et al, 2003, p. 19). So farmers mainly used the market to acquire one available variety: hybrid maize.

Table 3.1 Sources of seed for communal farmers in Zimbabwe (% of farmers using different sources), 1991

Source	Maize	Sorghum	Sunflower	Groundnut	Cotton
Farm-saved	2.1	56.1	50.4	71.5	3.0
Local farmer	-	8.8	19.5	11.1	1.5
Local trader	13.1	5.3	6.5	7.0	1.5
Local store	14.8	3.5	1.2	1.2	13.6
Cooperative Union	13.1	1.8	2.6	4.7	22.7
Urban store	25.9		1.2	0.6	7.6
Farmers' cooperative	25.9	5.3	2.6	1.7	13.6
GMB/CMB[1]					
Seed Co[1]		14.0		0.6	36.4
AFC loan	5.5	-	1.7	-	-
Drought relief	-	5.3	14.3	-	-

1. GMB/CMB = Grain Marketing Board/Crops Marketing Board, Seed Co = Seed Company of Zimbabwe, AFC = Agricultural Finance Corporation

(Source: Rohrbach et al, 1997, p. 12)

As shown in table 3.1, maize was almost the only seed (next to cotton) communal farmers bought either from urban or local stores or from local traders. For the other seed farmers had their own stock (farm-saved), went to a local farmer or got seed through friends, family or relatives (farmer-to-farmer).

This situation was not exceptional compared to other African countries. Attempts have been put in place to overcome this situation but it seems hard to succeed, as Rohrbach et al. (1997, p. 4) mention: *"Seed houses are pursuing a relatively more profitable hybrid seed market wherein farmers are likely to purchase new seed stocks every year. But farmers do not have access to improved seed of the less popular crops."* So it became clear that during the years the seed system had changed and not all aspects of the seed system in Zimbabwe were rosy anymore: easy access to inputs actually meant easy access to hybrid maize, but for other crops the access to inputs was very difficult. However, communal farmers did have access to other agricultural inputs, it was apparently not through the official market (table 3.2).

Table 3.2 Proportion of households obtaining seed from alternative market sources, southern Zimbabwe, 1995/96 [and expected seed source in 1996/97]

Source of seed	% of farmers obtaining sorghum seed from each source		% of fanners obtaining pearl millet seed from each source	
Local store	2.8	[3.4]	0	[2.3]
Distant town	4.0	[2.3]	1.5	[1.5]
NGO	4.0	[0]	3.8	[0]
Neighbor	6.8	[1.7]	10.0	[1.5]
Friend/relative	25.7	[2.3]	20.0	[1.5]
Drought relief	56.3	[11.4]	23.8	[2.3]
Own stock	43.8	[91.4]	65.4	[97.5]

(Source: Rohrbach et al., 1997, p. 173)

But then during the 1990s, the economics and mainly the financial aspects of seed-use changed. Even hybrid seed on the market became expensive, and unaffordable to many farmers. This problem was partly solved by the development of an informal (black) seed market and alternative sources for getting inputs which was reliable for many (Mutonodzo-Davies, 2010, p. 8).

As shown in tables 3.1 and 3.2, many farmers had a large range of alternative sources for obtaining seeds other than buying them at formal markets. The large number of farmers that were getting seed out of their own stock is striking (table 3.2). The reliance of farmers on their own stock in combination with free seed given by the government during problematic periods of droughts, made it less necessary for the seed market to develop in the way that all farmers could have access to inputs through the market (Rohrbach, 1997, p. 176). The market fulfilled the small demand that came from local farmers, but access to the market would for many farmers not become better as long as they had their alternative ways of getting inputs. Rohrbach et al (1997, p. 176) state

the following: "*The most valuable contribution to the development of rural seed trade may come from helping a wide cross-section of small-scale farmers become better at seed selection and storage for their own use. By improving the seed stocks of individual households, the stocks of each village community can be improved. Rather than promoting seed trade per se, such a strategy would improve the opportunity to trade when demand arises. Importantly, household investments would be primarily geared toward improving each farmer's own productivity. Such investments would not depend on the consistency of seed demand or the magnitude of the seed price premium.*"

In short, in the period before the introduction of the FTLRP the formal markets did not answer the demand and therefore many alternative ways of getting inputs were organized. Even though farmers were in need for other farm inputs, they were not using the market because of the existing alternatives, as own seed stock, which better answered their demand. A vicious circle existed that did not benefit the quality of farm inputs: because of low supply on the market farmers sought alternatives ways of getting farm inputs, and these alternative ways decreased the use of the market by farmers and resulted in a search for alternative ways of getting inputs (Rohrbach, 1997, p. 176). Overall, it is hard to say whether farmers had sufficient official access to inputs; it seems they did have access in certain ways but not mainly via the formal market. For the quality of farm inputs this is an important sign, as through many alternative ways the quality of farm inputs is not reliable and not controlled. For example own seed stocks were a often used source for farm inputs, but as mentioned before seed from the previous year's harvest seemed to be less profitable and resulted in a smaller harvest. For qualitatively good farm inputs farmers were still dependent on the market that did not fulfil their demand.

It must, however, be mentioned here that farmers in remote areas had difficulties to get farm inputs since the early days, as Rohrbach et al (1997, p. 142) state: *"Farmers in many remote areas and on marginal lands do not have access to good seed of improved varieties. Their needs have been so neglected in the past that they are ignorant of the potential benefits of new technology."* The above discussion about accessibility on the market does not count for farmers from all regions because accessibility is slightly different in all the natural regions.

3.1.2 Structure of access to inputs after FTLRP

The most important changes that followed the start of the FTLRP resulted from the fact that the government needed inputs and fertilizer for its own agricultural programmes. As a consequence they took over inputs and fertilizer that producers normally sell at formal markets. This take over has led to shortages of inputs and fertilizer on the formal market, and as a side effect it stimulated the growth of a black market where prices of inputs and fertilizer were more than double the formal market prices and where the quality of seed is not always reliable (Matondi, 2012, p. 147; Progressio Zimbabwe, 2009). This negatively

influenced farmers' access to inputs of good quality, because most of the farmers could not afford the high prices of seed at the black market and at the formal market there were shortages.

Next, the downward spiral of the Zimbabwean economy also had a negative effect on the way farmers have access to inputs. For example, the inflation that caused an introduction of price controls but also the decrease of investment in infrastructure caused higher transport costs exacerbating the problems around access to inputs. Partly because of these developments, it seemed that many farmers became more and more reliant on governmental seed supply schemes (see table 3.3) instead of the formal and/or informal markets for access to inputs and fertilizer of reliable quality (Matondi, 2012, p. 147; Scoones et al, 2010, p. 96). Former ways of getting inputs disappeared as *"...the 'traditional' suppliers of agricultural inputs failed completely to meet demand since they were unable to cope with hyperinflation and since the supply chain had been broken by the consequences of economy-wide failures"* (Dekker & Kinsey, 2011, p. 11). Another contribution to the lower access to inputs is the fact that the distribution of inputs within the country in general has decreased since the FTLRP. For example, due to aforementioned higher transportation costs, but also due to uncertainties considering governmental interventions, demand of farmers, size of markets, accessibility of working capital, risks around the exchange rate of money, increases in fertilizer- and oil-prices and the shortages of the latter two (Dorward et al, 2008, p. 23). It is obvious that farmers' access to inputs at the formal market decreased even more after FTLRP, and as seen in the former section 3.1.1 also before FTRLP farmers were not using it often. All of these factors negatively influenced the performance of the agricultural sector, and thus the economy of the country. The government kept trying to keep up the agricultural economy, by starting some support initiatives and supply schemes from 2000 on to meet the demands of the farmers. Through these governmental supply schemes and support initiatives farmers could access certain inputs. However, these initiatives did also have some weaknesses as is mentioned in table 3.3. A weakness that characterizes all of these efforts is the fact that they provided only limited varieties of inputs, so farmers had a very narrow choice which crop to grow. Mutonodzo-Davies (2010, p. 9) mentions that these governmental programmes had a rather poor impact, and most lacked a well-structured design to work out well. Next to these weaknesses there are different critiques about the support initiatives. One of these critiques, on the Presidential Well Wishers Support Scheme, is outlined in box 3.2.

As is clear, there were many alternative ways for farmers to get inputs before FTLRP, and afterwards this did not change partly due to a even less accessible market. Governmental support initiatives and supply schemes are examples of these alternatives after FTLRP, although these are not structural. Also, despite the high prices, the informal seed market still exists and has developed itself into a *"...resilient community seed source mechanism during stress*

periods when seed is not available or affordable" (Mutonodzo-Davies, 2010, p. 9). For many farmers this is a relatively secure way of getting inputs, and in 2010 more than 95% of the seed (except for maize) farmers use was supplied by the informal sector.

Table 3.3 Governmental support initiatives

Name	Starting year	Initiative	Weakness
Government Input Scheme	2000	Provide inputs and fuel for the coming six years	Failure in funding, programme ended in 2003.
Productive Sector Facility (PSF)	2004	Provide financial resources to productive sectors.	
Agricultural Sector Productivity Enhancement Facility (ASPEF)	2005	Meaningful source of affordable financing for farmers.	1) Limited fund: only a small number of farmers enable to benefit. 2) Preference for larger-scale farmers.
Operation Maguta	2005	Improve land utilisation and provide inputs.	Shortage of inputs, delay in distribution, incomplete input packages.
Champion Farmers Programme	2008	Improve land utilisation and provide inputs to targeted farmers, once with the best production.	Shortage of inputs, delay in distribution, incomplete input packages.
Presidential Well Wishers Support Scheme (Box 3.2)	2012	Provide inputs to households in need.	Seen as a way for ZANU (PF) to win votes for the coming elections.

(Source: Mugwagwa, 2012; Scoones et al., 2010, p. 98-99)

Box 3.2 Critical note on the Presidential Well Wishers Support Scheme

Also called the "Presidential Well-Wishers Special Agricultural Inputs Scheme" is critically discussed because it is seen as a programme of ZANU (PF) to win votes for the 2013 elections. This support scheme provides inputs to households in need. Herbert Mugwagwa (2012) gives a critical overview of this programme to show the other side of the coin, the side that is international less known. Mugwagwa states that the programme is, first of all, not so presidential because it is of one governmental party and not of the whole Zimbabwean government. Next to that he mentions that there is nothing special about helping households in need, as the programme is mentioned to do. According to Mugwagwa ZANU (PF) mainly benefits itself, because its agricultural inputs schemes are already running for twelve years but nothing permanently changed and there is still no food security in the country.

Despite this knowledge, Zimbabwean farmers still love election time because of the generosity of politicians and the feeling that it is Christmas every day.

Of big influence since FTLRP has been the concept of *contract farming*; companies provide farmers with inputs under the agreement that the harvest of these (mostly) cash crops has to be marketed through those companies. This mainly works for tobacco and cotton, the two cash crops examined in this research. Contract farming is a secure way for many farmers to get inputs because it enhances a two-sided contract (see box 3.3). Another upcoming distribution-channel consists of donors who provide inputs and fertilizer (Dekker & Kinsey, 2011, p. 11). Distribution by donors is a less secure way of getting inputs because farmers are still dependent on others to donate inputs and fertilizer, so this is also not a structural solution for the inputs-issue.

Box 3.3 Contract farming

FAO (2012) gives a concrete description of the concept contract farming: *"Contract farming can be defined as an agricultural production system carried out according to an agreement between a buyer and farmers, which establishes conditions for the production and marketing of a farm product or products."*

Farmer and buyer make an agreement about the product to be produced. Farmers responsibility is to make sure quality and quantity of the product are what the buyer is asking for, the buyers responsibility is to purchase the product for an agreed price. In some agreements between farmer and buyer it is also arranged that the buyer supports the farmer with inputs, fertilizer, materials or knowledge. For farmers this can be a reason to sign for contract farming because it can ensure them to get inputs, the buyer is ensured of a certain amount and quality of products to be sold, so the contract farming system can have benefits for both parties if they keep their agreements. If the contract is not respected by one of the two parties, a conflict can arise. For example the farmer can sell its products to other buyers (side-selling), or the buyer does in the end not buy the products for the on forehand-agreed price (FAO, 2012; FAO, 2013).

Critics say that contract farming is by nature an uneven relationship between the farmer and the buyer. The buyer is in fact more powerful and can misuse this position by making the farmers agree on (too) low prices. The fact that farmers commit themselves to buyers means they cannot sell their products on market-competition. These farmers miss the opportunity to benefit from this competition where there are possibilities for higher prices to sell. On the other hand, contract farming ensures them to sell their products at a certain price, which gives certainty. This is a risk and a choice the farmers have to make, but overall it seems that contract farming benefits both parties (FAO, 2013).

In summary, since FTLRP access to the formal market has decreased, or put differently, the market has become smaller. The seed problem is part of a vicious circle because low production leads to seed shortfalls, which subsequently causes lower production of crops at the household level, leaving less seed for the next year. From 2003 until 2006 this is what clearly happened in the agricultural sector. What has to be mentioned here is that in the

2006/2007 season some positive developments occurred. New seed producing farmers increased the production of seed and enough seed to plant became available. Unfortunately this only held one year: price controls and inflation made seed production unattractive which resulted in, again, a deficit for the season 2007/2008 (Scoones, et al, 2010, p. 97). As mentioned before, since the beginning of FTLRP the government and different donors tried to initiate the supply of inputs by coming up with subsidised schemes for the distribution of inputs. Most of these schemes did not have the expected effect and some failed on funding (Scoones, et al, 2010, p. 97). But the biggest trap is that those initiatives did not provide a structural solution. Next to the problematic seed market and the governmental initiatives alternative ways existed for farmers to get inputs, which meant that in general farmers still had access to inputs. Many of these alternatives have improved in organizational aspects, and therefore access to inputs through these ways might have become easier for farmers. *"Nevertheless, across the sample as a whole, there are indications that the provision of inputs through aid, together with the gradually improving economic climate, have led to improvements over the dismal performance in the decade following 2000"* (Dekker & Kinsey, 2011, p. 13). But even though farmers succeed in finding ways to get access to inputs, the general story is the existence of a major shortage on inputs of good quality. That is dramatically constraining farmers' ability to have sufficient productions and harvests. Getting inputs to farmers should be a main priority being one of the first steps in recovering the (agricultural) economy of Zimbabwe as crop income is the most important source (75%) of income of the average agricultural household (Bourdillon et al, 2003, p. 13; Mutonodzo-Davies, 2010, p. 10).

3.2 Agricultural performance

Consequences of the Fast Track Land Reform Programme were clearly felt in the agricultural environment: production numbers dramatically changed in a negative sense. The availability and accessibility of seed and fertilizer influenced the harvest and production of farmers. In table 3.4 this becomes visible especially for maize, when all years from 2000 until 2009 show a much lower production compared to the average of the 1990's. What is striking from this table is the enormous increase in the production of small grains since the 1990s. According to Mutonodzo-Davies (2010, p. 3) this positive trend together with the decrease in maize production reflects the collapse of large-scale commercial production of maize through land reform and the growth of the smallholder sector. IRIN (2012) also reports that since the land reform the position of large-scale (white) farmers has changed because for them the access to inputs for maize decreased as a result of the increasing price controls on maize seed. As a result the white large-scale farmers changed their focus to different cash crops. This altered the situation for other Zimbabwean farmers as well. Small-scale

farmers were left with the production of cereals, for example, small grains (IRIN, 2012). It has to be noted that an increase of 440.4% in small grains production seems enormous, but it is relative: in fact the production of small grains in the 1990s was so small that the absolute increase is not that big.

Table 3.4 Cereal production 2000-2009 compared to 1990s

Crop	1990s Average	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Maize	1668.6	1476. 2	1526. 3	929. 6	1058.8	1686.2	915.4	952.6	575.0	1242.6
	% Change	-11.5%	-8.5%	-44.3%	-36.5%	1.1%	-45.1%	-42.9%	-65.5%	-25.5%
Wheat	219.3	250	325	213. 0	122.4	135	134	150	75.0	38.0
	% Change	14.0%	48.2%	-2.9%	-44.2%	-38.4%	-38.9%	-31.6%	-65.8%	-82.7%
Small Grains	50.01	90.7	99.6	35.8	131.2	196.1	128.6	138.6	93.2	270.2
	% Change	81.4%	99.2%	-28.4%	162.3%	292.1%	157.1%	177.1%	86.4%	440.4%

(Source: Mutonodzo-Davies, 2010, p. 3)

Cereals are not the most important export crops for Zimbabwe, but tobacco and cotton are. This is illustrated in the total agricultural production: tobacco counted for 60% of the total agricultural production of Zimbabwe in 2003 and cotton counted for 10%. Since 1985 the production-share of cereals has declined compared to tobacco and in 2003 Zimbabwe counted number three of largest tobacco producers after Brazil and the United States (Tekere, 2003). However, FTLRP has also affected the tobacco production, which in 2010 is less than half it was in 2000. In recent years some little increase in production can be seen for cash crops such as tobacco, but it is totally not comparable to the production-numbers of before FTLRP (Matondi, 2012, p. 132).

Reasons why the production of some cash crops is increasing while almost all other agricultural production decreases or stagnates due to lack of inputs might be found in contract farming. Contract farming in Zimbabwe focuses on tobacco and cotton as two main cash crops, and in the agreements delivery of inputs is included. Contract farming can thus be of high importance for the accessibility and distribution of inputs for Zimbabwean farmers; this will be examined later in this research.

3.3 Recent developments

3.3.1 Still changing seed-situation

During the 2011/2012 agricultural season many farmers were still dependent on governmental support schemes such as the Presidential Well Wishers Support Scheme, or on donors and contracts. These alternative ways of accessing inputs are still necessary because inputs on the formal market are still limited or not affordable for many (Zimbabwe Minister of Agriculture, Mechanisation and Irrigation Development, 2012, p. 10-12). Table 3.5 shows how farmers got their seed for different crops. It varies for every crop, but it is clear that the donors, and to some minor extent gifts and the government are important sources to get access to inputs, second to farm-saved (retained) seed. For maize, though, the most important source is not retained seed but the market where over 60% of the farmers bought seed.

Table 3.5 Crop Input Sources

Sources of Inputs	Proportion of farmers accessing inputs from different sources (%)			
	Maize seed	Sorghum	Pearl millet	Finger Millet
Presidential	19.3	0.6	0.5	0.5
Government	15.6	2.5	2.5	1.1
Donor	16.4	34.9	34.9	23.5
Farmer Unions	0.4	0.1	0.1	0.2
Purchases (Open and Bank)	60.2	10.1	10.1	3.0
Retained (Yemudura/ Eyesiphaleni)	20.6	46.0	46.0	64.5
Gifts and Remittances	5.7	7.0	7.0	5.1
Contract farming	0.6	1.2	1.2	0.0
Carry over	8.3	6.4	6.4	5.9

(Source: Zimbabwe Minister of Agriculture, Mechanisation and Irrigation Development, 2012, p. 12)

Recently, the FAO embarked on trying to help farmers in accessing agricultural inputs by implementing an e-voucher system. This is striking because instead of just donating as most organisations do, the FAO tries a more structural solution. This e-voucher system *"...will ensure that rural agro-dealers are revitalized and will lead to an improved organization of the markets, which will benefit farmers as they access inputs close to their areas"* (IRIN, 2012). The system focuses on market-based farming, which is a challenge in Zimbabwe, but if it succeeds it can be a long-term solution for the seed market and for the access of farmers to this market. The seed-producing farmers in this programme are very positive

because they notice an increase in their sales of seed while before they had fewer buyers because of high prices. This programme provides access to inputs for small-scale farmers and *"...aims to resuscitate the fragile rural agricultural input supply chain through re-engagement of market, provision of subsidized inputs and farmers' timely access to inputs"* (IRIN, 2012). As mentioned before this e-voucher system works for resettled as well as communal farmers, so changes in the way different farmer groups are supported become smaller.

The former examples show that the seed situation in Zimbabwe is still changing and new forms of distribution show up, new programmes are implemented, new strategies applied by the government. The situation is still developing and different actors are trying to make it a success and to see what works best for farmers, producers, the government, the economy and others involved. However, this research focuses on the farmers as main actor in this situation, and how their situation changes.

3.3.2 Current food crisis

According to the United Nations Zimbabwe now has a food crisis with around 2.2 million people in need for help, but following IRIN's (2014) outcomes of own investigation these numbers need a more nuanced interpretation. However, truth is that there is a real food problem in Zimbabwe. The World Food Programme (WFP) also claims that at the worst period in time 25% of all rural households in the country are insecure of enough food (IRIN, 2014). A striking fact is that Zimbabwe's Minister for Agriculture tells a different story, namely, that there is no crisis at all and that the country has one of the best harvests in years. Another source reports that the availability of food is good, but there is not enough money to buy it (IRIN, 2014).

Because of the good rains this season, the coming harvest is expected to be good, which can ensure food for the coming period. However, not for everyone the harvest will be that good: many farmers did not have access to the best quality inputs and fertilizer so harvest will be less for them. Therefore the coming harvest does not solve the food problem at this time. Through various food relief programmes such as from the WFP support is provided for the hardest hit but it is not easy to reach all of the needy. The government has also started a support programme donating money to households every month, for investment in assets. In practice households use the money for food and other needs. This programme of cash transfer cannot continue forever, because the government also faces money deficits. They are in search for development partners for the continuation of this programme in the near future (IRIN, 2014).

The current 'food crisis' shows that Zimbabwe still has a long way to go in order to have a sustainable solution for the many problems found in the agrarian sector. Availability and affordability of inputs for farming are important points of improvement: better inputs can provide better harvests which will ensure more food and decrease the number of households in need for food assistance.

4. Research design/Methodology

This chapter explains the research methodology used, the dataset collected and analysed and how the research is conducted. It is explained why certain choices are made and which tests are used in the statistical analysis. Also the conceptual model is presented, and important concepts are described. This chapter ends with the difficulties and challenges that were experienced during this research.

4.1 Research philosophy

The topic of this research should be best examined using a combination of quantitative and qualitative methods, in order to get a full understanding of how access to inputs is organised. Qualitative methods can add useful information that goes deeper into the subject; case studies can be drawn from individual stories. However, due to a lack of time and resources, this study only used a quantitative method, because the availability of the ZRHDS-data allows for quantitative analyses. Conducting this quantitative study allows for providing detailed information that can also be generalized for a wider population. Moreover, it enables testing of potential causalities that may explain the certain trends within the research population. But for this research it means that mainly facts and statistical analyses can be provided, and that the deeper reasoning for certain outcomes will be missing. That might be a follow up step to get a better understanding of the findings of this study.

Quantitative research is used for a larger number of cases that represent a population, whereby respondents are randomly selected and subject of a questionnaire or interview. This is the case in this research (section 4.2 gives more understanding of the data used, the Zimbabwe Rural Households Dynamics Study as introduced in section 2.1). With this quantitative research method facts such as percentages, means, and proportions of a population's activity are measured; therefore causality, dependency and reliability of the latter can be calculated. An advantage is that results cannot be subject to discussion: facts are static and not dynamic like opinions. Another advantage is the possibility to do longitudinal research and look for trends and changes. A disadvantage of this quantitative method is already mentioned: the deeper reasoning for certain trends is missing. The 'why'-part of the facts can be partly checked using already existing knowledge, but the data used does not provide the deeper reasoning for certain outcomes. Further research can be conducted if this is desirable to know.

The goal of this research, examining the access to inputs and check who grows what crop and how much, can be reached with the quantitative method using the ZRHDS-database because it is all about measurable facts for which the quantitative method allows, as is clarified in this section.

4.2 Quantitative research; ZRHDS database

This research is a-typical in that other scholars collected of the data, the ZRHDS-database as described next. This dataset offers an enormous range of topics to be studied through analysis of the data, but for the current research only specific variables are selected from the database.

The Zimbabwe Rural Households Dynamics Study (ZRHDS, or sometimes called 'Kinsey data'), led by Bill Kinsey, has data collected since 1983 among a large group of farmers. The ZRHDS is a long-term monitoring of resettled households, every few years the same households are re-visited and the same questions asked concerning amongst others contract farming and agricultural production. A 'household' stands for a family with access to 5 hectares of arable land in the model A scheme. From 1983 on, about 400 resettled households have been studied, all resettled between 1981 and 1984 thus so-called 'old resettlement' farmers. In 1997 another 150 households are added to the study, this time communal households. All households included in the survey live in agro-ecological zones NR2, NR3 or NR4. In these three natural regions a selection was made randomly for a certain scheme. In NR2 Mfurudzi in Mashonaland Central, in NR3 Sengezi in Mashonaland East and in NR4 Mutanda in Manicaland. In 1997 the study added 150 households living in the communal areas the resettled households originated from (Deininger et al, 2004). As explained before the ZRHDS repeat studies, and a latest addition of 2012 is available for a statistical analysis here as well as the 2000 survey.

Some key survey questions of importance for the current research are: *"During the previous season, what inputs were you able to obtain and from where?"* or *"Can you give us some details about the inputs you have used or have access to this season?"*. Next to these questions this study contains questions on many other topics like household composition, mortality, mobility, health, employment, capital. For every household the village and natural region they reside in is known. The answers provided to the survey questions are recoded by using codes, explained on a 'Master Code Sheet'. For example, questions about the source of the input can be answered with for example 'Trader/trading company' (code 18), 'NGO' (code 24), 'Self' (code 00). All questions and answers are in this coded-format added to the ZRHDS-database (Excel) and the database is extended after every new survey-year. The part of this ZRHDS-database to be used in this study is converted into an SPSS-file for statistical analyses. The data includes topics such as access to inputs and contract farming.

4.2.1 Research population and respondents

The research population for this study encompasses resettled and communal farmers in the natural regions 2, 3 and 4 in Zimbabwe. The database contains information about a sample of 400 resettled households and 150 communal households. For a significant result with 95% validity a sample of minimal 377

respondents should be sufficient for research populations bigger than 20,000. This means in general the amount of respondents in this research is sufficient for significant results. However, for the comparison between resettled and communal households only 150 respondents are available for representing the communal households population; in this case the results will be of 92% reliability if the research population is bigger than 20,000 people, which is the case for communal farmers in the three natural regions. Also for comparisons between the natural regions the amount of 377 respondents will not be reached (Baarda & de Goede, 2006). For a general idea about this topic 92% reliability will be enough: if striking or unexpected results come out, a recommendation can be given for further research. For comparisons between the different farmer groups or the different natural regions a relative way of comparing will be used in tests for equal measurement.

4.3 Methods & analysis

4.3.1 Literature study & finding the gap

Searching and reading literature about Zimbabwe and the topic of this research was the first step in order to gather background information. The story of Zimbabwe's history, political and economic situation shows how the country developed, and how to place certain issues in the right context. It showed the interconnectedness of the above characteristics with the topic of current research, and therefore helped me to place the topic in the context of all above-mentioned. Literature on access to inputs in Zimbabwe was useful to read in order to broaden my knowledge and expand my view about the topic. All information gave me a clear view on what was already researched and where the 'gap' in literature was. Also it helped me to develop my theory on the current topic and to develop the conceptual model for this research.

During this first phase of the research I found it difficult to make a distinction between reliable and less-reliable literature on this topic. Certain sources, such as governmental articles show way different stories than facts out of the field. Therefore two different stories about the current topic became clear for me: a positive story that the government wants to tell and a less-positive story out of the field. Also certain authors are linked to the government and tell alike stories. Bill Kinsey helped me to make the distinction in reliability of the different sources of knowledge. This helped me to make clear the real story and thus the real problems of the country and therefore it helped me to 'find the gap' in literature.

4.3.2 Statistical research

After developing the theoretical framework and the conceptual model the statistical analysis was carried out. This concentrated foremost on descriptive analysis and the tests on significance.

Descriptive analysis
This option gives information on the amount, count, percentage and division but in certain cases also the mean of variables. Divisions as 'Respondents per farmer group', 'Respondents per natural region', 'Farmer groups per natural region', 'Contract farming per natural region', ' Reasons for contract farming per natural region' and 'Contract farming per farmer group' are checked with a descriptive analysis. It gives a first impression of the respondents and where they live, what they do and for some topics even why they do it.

Test for significance
When differences between groups appear in the descriptive analyses, they are checked on significant dependency before stating them as real differences. For most of them a Chi-Square test is conducted. This test checks on coincidence or dependency between two or more factors that differentiate groups, how to interpret the outcomes of a Chi-Square test is explained in section 4.3.3. However, the Chi-Square test is only reliable if a maximum of 20% of the cells have an expected count less than 5, and if the minimum expected count is 1. If these conditions are not met, another test is conducted; in this research it is the Fisher-Freeman-Halton exact test. This test also checks on coincidence or dependency between the different groups and it is reliable for smaller groups. How the outcomes of this test should be interpreted is explained in section 4.3.3

4.3.3 Interpretation of test-outcomes; conclusion
The descriptive analysis does not need a broad explanation: percentages, means, numbers are clear. In the results-chapter they are explained in a textual way.

When using a statistical test for dependency, the text only mentions whether there is a significant dependency or not. The outcome of the specific test is added as appendix at the end of this research. How the outcome of the different tests should be interpreted is explained here.

- Explaining a Chi-Square test example:

Chi-Square test for dependency contract farming and natural region

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.012[a]	2	.000
N of Valid Cases	476		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 27,55.

There are two ways for interpreting this Chi-Square test, both will show a dependency between living in a certain natural region and involvement in contract farming:

1. The Chi-Square of 32,012 has 0% change to be coincidence, which means that there is a dependency between living in a certain natural region and involving in contract farming which is 100% reliable.
2. The critical value of the Chi-Square is 10.6 for a significance of 99.5% and a degree of freedom of 2. Here the Chi-Square is 32.012, which is way higher than the critical value of a Chi-Square division[2]. Also using this interpretation the dependency between living in a certain natural region and involving in contract farming is reliable, however for 99.5% reliability.

- Explaining a Fisher-Freeman-Halton exact test example:

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	19.538[a]	4	.001	,000		
Likelihood Ratio	23.305	4	.000	,000		
Fisher's Exact Test	20.282			1.000		
Linear-by-Linear Association	3.301[b]	1	.069	,074	.044	.015
N of Valid Cases	124					

a. 3 cells (33,3%) have expected count less than 5. The minimum expected count is 1,98.
b. The standardized statistic is 1,817.

The exact significance shows the chance of coincidence, or for no dependency. In this example where p=1.000 (Fisher's Exact Test, Exact Significance 2-sided) there is 100% chance for coincidence, thus there is no dependency between the two variables.

Results of as well the descriptive as the statistical tests are the most important pillars on which the conclusion is built. The results are used for answering the sub-questions and at the end the main question of this research. Of course most findings will be supported or illustrated by knowledge from the theoretical framework in order to place them in the right context. Next to answering the questions, the results are used for checking the hypotheses that are formed out of knowledge of the theoretical framework. With this it is checked if facts are similar to expectations; if not, further research can show why things have developed in another way.

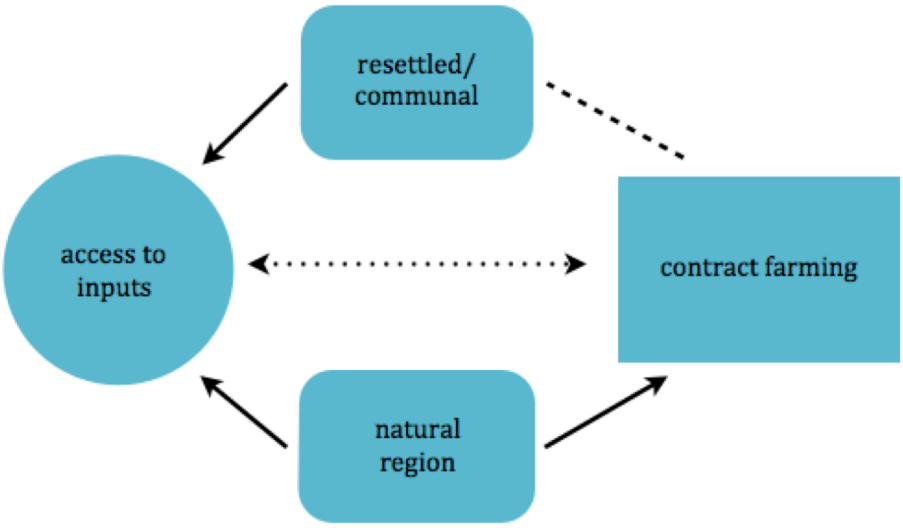
[2] The critical value is a static value based on the degrees of freedom and the level of significance.

4.4 Concepts & theories

Based on the theoretical knowledge on access to inputs in Zimbabwe, the developed conceptual model seems applicable in general (figure 4.1). This conceptual model is tested in this research: the assumption is that factors as in which natural region one lives and which type of farmer one is (resettled or communal) influences the way one has access to inputs. Next, contract farming and access to inputs have an assumed reciprocal relationship: farmers involve in contract farming because else they have no inputs and contract farming ensures the necessary inputs. The relation between resettled/communal farmers and contract farming is still unclear; this might become clear in this research. First some concepts need to be clarified: the concepts of 'inputs' and 'access'.

What is in this research meant by *inputs*? Diverse inputs are to be distinguished. Next to different varieties of seeds also inputs as pesticides, fertilizers, water, tools, labour are necessary for crop growing. The current research focused only on seeds, including the different varieties for maize (as explained in box 3.1). For cotton and tobacco there are no different varieties of seeds to obtain because those two crops are mainly grown under contract farming, where farmers have no 'choice' in which seeds to plant. Pesticides, fertilizers and so on were left out to get a proper idea of the access to seeds.

Fig. 4.1 Conceptual model



(Source: own work, 2013)

How is *access* measured in this research? For access to inputs the source of the available inputs is of importance. Different sources of inputs are mentioned in the ZRHDS-data; for this research they have been divided in three categories. Two reasons for making this division in three categories are outlined:

First, the different options farmers can give are not all relevant for this research, and such a big amount of options can be unclear in results. Therefore it seems easier and more relevant to distinguish categories of sources of inputs. Taking into account the situation of seed-provision in Zimbabwe, the following three categories seemed relevant: (1) the market, (2) gifts/donors/contract farming and (3) alternative ways. Second, this categorization separates the official ways of getting inputs (market and gifts/donor/contract) from the unofficial way, and together it separates the bought inputs from the given ones (market on the one hand, and gift/donor/contract and alternative on the other hand). By making this distinction it can become clear where farmers have officially access to inputs and where they need to organize their own access or where they are dependent on others, for example by involving in contract farming or for gifts of NGOs. The three categories under which all sources of inputs can be divided are (1) the market, (2) gifts/donors/contract farming and (3) alternative ways. All possible answers to be given in the survey were divided amongst the three categories (see table 4.1).

Table 4.1 Sources of input per category

Market (1)	**Gift/donor/contract (2)**	**Alternative (3)**
Trader/trading company	AFC	Self
Local shop	CMB/Cottco/Cargill	Parents
Shop in regional town/area	Bank	Parent(s)-in-law
Shop in Harare	Government/social welfare	Child/Children
	Pension fund or former employer	Brother/Sister
	NGO	Brother/Siter-in-law
	GMB	Son-in-law
	ZLT	Daughter-in-law
	Veterinary services	Grandparents
		Grandchildren
		Other relative by blood
		Other relative by marriage
		Neighbours/Friends
		Church or club member
		Business associate
		Foster parent
		Fostered child
		Niece/Nephew
		Spouse
		Other

(Source: own work, 2013)

4.5 Difficulties & challenges

During this research I had some difficulties and challenges to cope and to work with, which are explained here.

The most important challenge was working with data that was collected by someone else. During the research a couple of times I found out the data did not contain what I had hoped or what I thought it should contain. Because of this I could not examine what initially was the idea; and therefore the research problem had to be rephrased a few times. Working with someone else's data can therefore work as a restriction; I had to deal with whatever is available. On the other hand, there is a possibility to add themes to the research that I would probably not have added when collecting data myself. The combination of leaving things out that I wanted to put in, and putting things in that I did not think of, was a challenge and forced me to be flexible and look for new linkages in the data. It is not the easiest way of doing research, but it gave me a broader vision of the different themes this research contains.

Another difficulty was already mentioned in section 4.3.1; the uncertainty about reliability of literature. I do not have the background and knowledge to make the distinction between reliable and less-reliable articles. In this I felt I was dependent on others to tell me whether which literature was best to use to expand my own knowledge on the topic. This is still a difficult issue for me, because the others that I had to trust on their word, are not objective either in their choice for specific literature that I used for the background information. However the dataset used is unique and tells the story of the farmers, therefore the outcomes are not influenced by subjective opinions.

5. Results

In this chapter the results of the statistical research are presented. This research analyses and compares data about communal and resettled households in Zimbabwe concerning their access to farm inputs in the years 2000 and 2012. We compare the two farmer groups on their access to inputs for three different crops (maize, tobacco and cotton), and in three different natural regions. Results of significant tests are described in a textual way, but comparisons or division within groups are presented in a visual way with pie charts, bar charts or tables. Some raw tables are added as appendixes when necessary for a complete view.

5.1 Who are the respondents in 2011/2012?

To know who the respondents are, first some general information of the database is presented. We show the proportion of the different natural regions and the different farmer groups in the database. Also the proportion of the respondents of the database that involves in contract farming and their reasons for doing so are presented. This in order to make clear who the respondents are and what they do.

Figure 5.1 Respondents per natural region

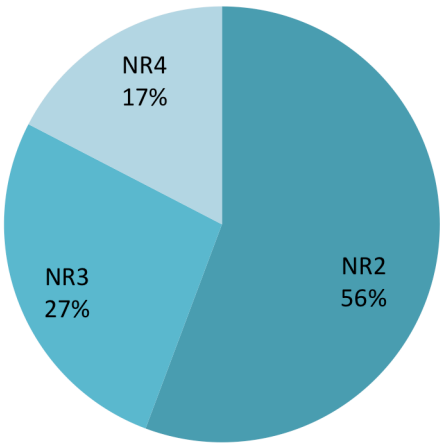
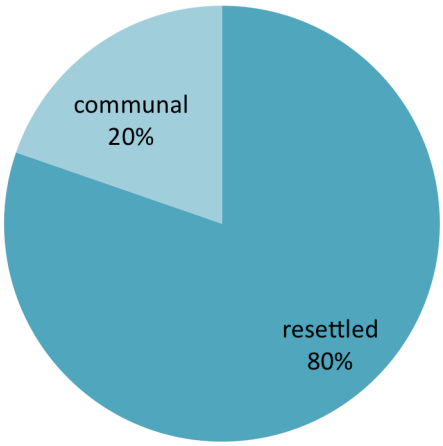


Figure 5.2 Respondents per farmer group



5.1.1 Natural regions and farmer groups

Excluding the missing values and insignificant information out of the database there are 476 of the 550 respondents left. The division of farmers over natural regions in 2012 is shown in figure 5.1, the majority of respondents lives in NR2, a smaller number lives in NR3 and the smallest

number lives in NR4. For this reason when comparing regions we will correct for this difference and conduct the comparison, in a relative way. For already mentioned reasons (section 4.2) the number of communal farmers in de database is much smaller than the number of resettled farmers, as can be seen in figure 5.2. This proportion of 20% versus 80% is however not representative for the current division resettled-communal farmers in Zimbabwe, where in fact the majority is communal farmer. Here the same counts as for the division among natural regions: comparing the different farmer groups is done in a relative way.

The proportion resettled and communal farmers are slightly different for the three natural regions, but no immense differences are visible (appendix A1).

The representation of different farmer groups and different natural regions in the database is clear, and because of unequal representation a relative way of comparing is applied in this research.

5.1.2 Contract farming

Information about involvement in contract farming is necessary for answering sub-question 2b, on the role of contract farming for the different natural regions and farmer groups. For this topic differences are visible between the different natural regions, as presented in figure 5.3. Striking is that natural region 3 has a very small percentage of farmers involved in contract farming compared to the other two natural regions. To test whether this striking fact is a coincidence or is because of a dependency between natural regions and involvement in contract farming, a Chi-Square test is conducted with this data (appendix A2). The test shows a dependency between living in a certain natural region and involvement in contract farming, whereby respondents of NR3 have the least change to involve in contract farming.

Figure 5.3 Contract farming per natural region 2011/2012 (%)

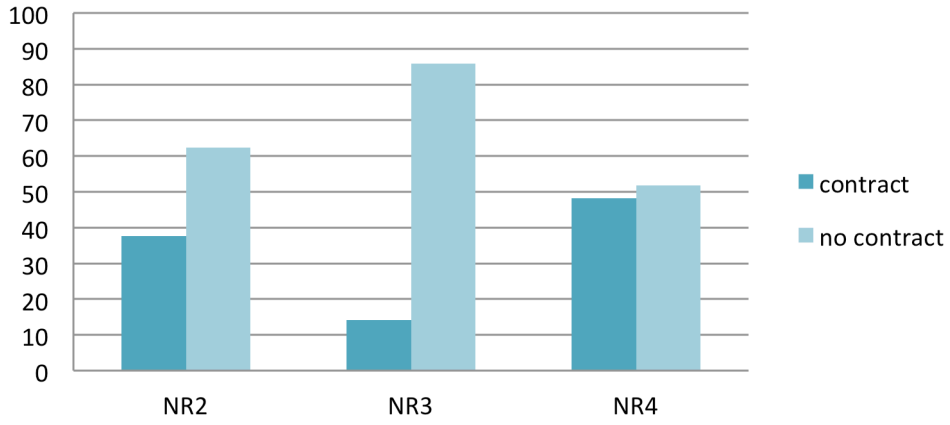
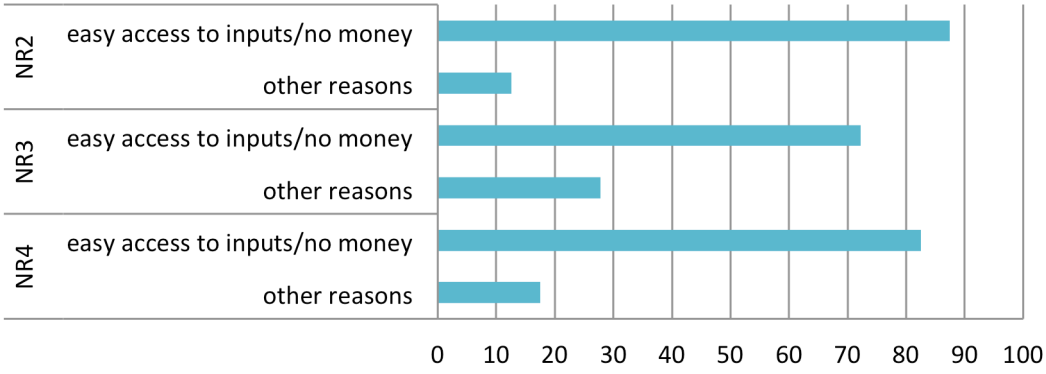


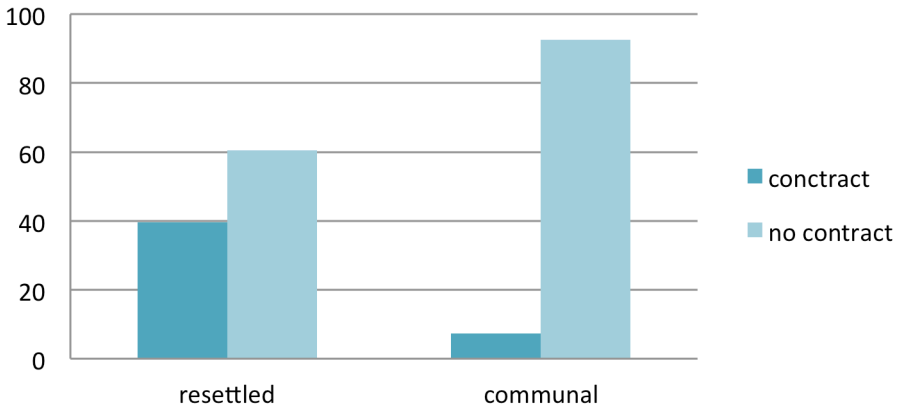
Figure 5.4 Reasons for contract farming per natural region 2011/2012 (%)



The fact that in NR3 contract farming is less than in the other two natural regions can possibly be explained because of the fact that the soils in NR3 are not sufficiently good enough for the purpose of contract farming, namely cotton and tobacco growing. In NR3 no cotton is grown, as is mentioned in section 5.2.3. The small number of farmers who are involved in contract farming in NR3 grow tobacco.

Farmers involved in contract farming in the different natural regions are asked what their reasons are for their involvement in contract farming, answers are shown in figure 5.4. It is clear that for all natural regions the single most important reason to sign for contract farming is 'easy access to inputs / no money to buy / we need help'. This corresponds to the assumed reciprocal relationship between contract farming and access to inputs.

Figure 5.5 Contract farming per farmer group 2011/2012 (%)

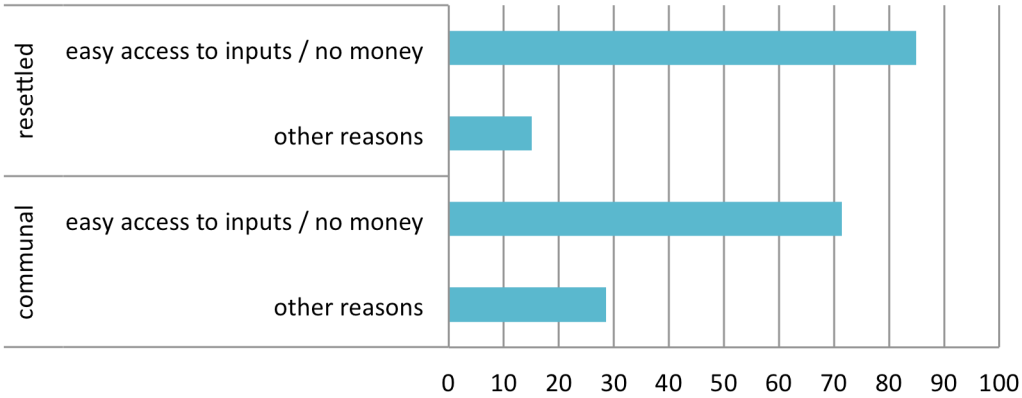


Next to examining the difference in contract farming between the three natural regions, contract-farming involvement is also examined per farmer group, as presented in figure 5.5. Many more resettled farmers than communal farmers involve in contract farming, 39.5% compared to 7.4%. To check on coincidence of these differences on contract farming in the farmer groups a Chi-Square test is conducted (appendix A3). The test shows a dependency between being a certain type of farmer and involvement in contract farming, whereby

resettled farmers involve more often in contract farming than communal farmers.

Again farmers involved in contract farming were asked what their reasons are for involvement in contract farming. Also this time there are no striking differences are visible in reasons for contract farming between the two farmer groups. Again the most important reason to sign for contract farming is 'easy access to inputs / no money to buy / we need help', both for communal and resettled farmers (figure 5.6).

Figure 5.6 Reasons for contract farming per farmer group 2011/2012 (% of respondents)



5.2 Farming in 2011/2012: examining the crops

Now we know what kind of farmers we have in the database, the next thing to research is the crops they grow. For answering sub-question 1 here the crops maize (certified and non-certified), tobacco and cotton are examined. Sub-question 1 is about how many respondents do grow these crops, how do they get inputs and what is the hectares planted and output produced? In which natural regions do they live and what type of farmer are they? These information is gathered in the next sections.

5.2.1 Maize 2012

We start with the examination of the crop maize. Two types of maize seed can be planted: certified and non-certified, as outlined in box 3.1 in section 3.1. The two types are both examined in this section. Of all the respondents 96.2% have intended to plant maize in the season 2011/2012. In fact 94.7% have really planted because they had access to seed for maize (certified plus non-certified seed). Per natural region and per farmer group the percentages of farmers growing maize are calculated (figure 5.7 and 5.8, appendices A4 and A5). The percentage of farmers growing maize between NR2 and NR3 is not very different. In NR4 less farmers grow maize compared to the other two natural regions. This might have to do with quality of soil and suitability for growing maize. The division maize versus no maize is slightly different between the farmer groups, as 11.7% of the communal farmers does not grow maize, compared to only 3.7% of the resettled farmers.

Figure 5.7 Certified and non-certified maize per natural region 2011/2012

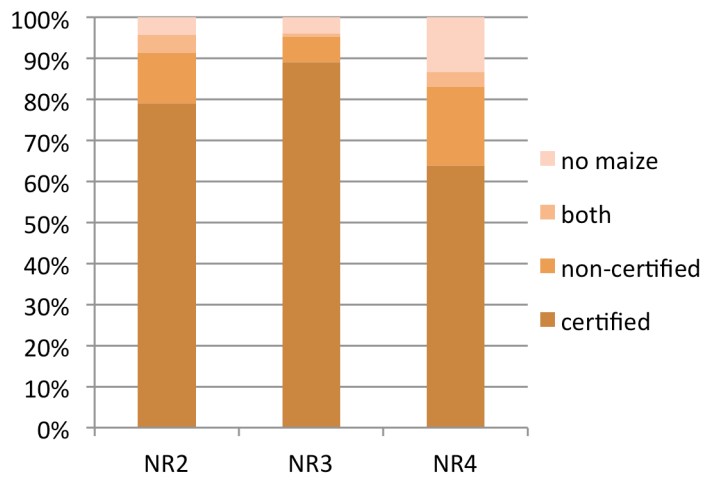
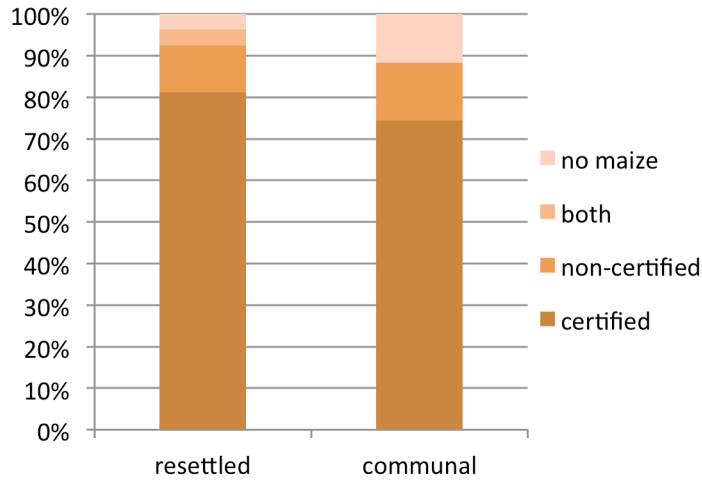


Figure 5.8 Certified and non-certified maize per farmer group 2011/2012



83.0% of the respondents uses certified seed and 15.0% uses non-certified seed. Of these only less than 5% uses both, thus the majority uses only one of the two types. Overall, in the different farmer groups and in the different natural regions the majority uses certified-seed. In NR3 a smaller percentage of the farmers who grow maize use non-certified maize compared to the other regions.

The sources (per category 1 (market), 2 (gift/donor/contract) and 3 (alternative) as outlined in table 4.1 in section 4.4) farmers use for getting maize-seed are different. For non-certified seed all farmers get seed via alternative ways, category 3, because official ways like the market and gifts/donors/contracts do not provide non-certified seed. Therefore non-certified seed is not added in the figures. Figures 5.9 and 5.10 show the sources that farmers of different natural regions and different farmer groups use for

Figure 5.9 Use sources for non-certified maize inputs per category per natural region in %

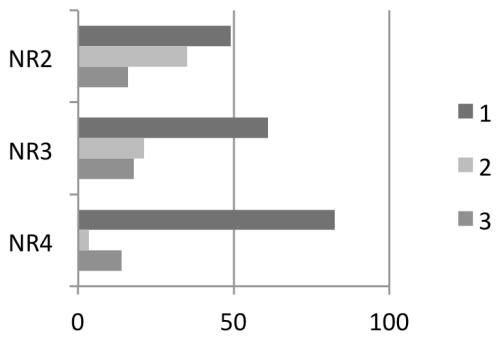
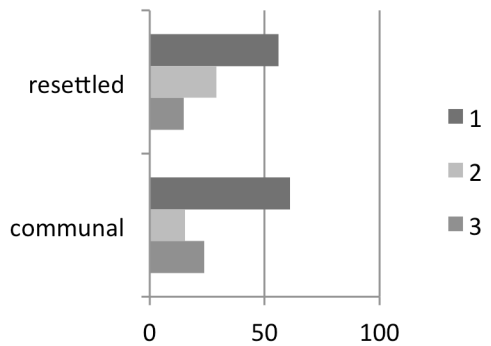


Figure 5.10 Use sources for non-certified maize inputs per category per farmer group in %



getting inputs. In appendix A6 an extensive table shows the exact numbers. Overall, the sources of inputs for certified seed differ slightly per natural region and per farmer group. Apart from the small differences between all groups, it is clear that the majority of the farmers in all regions and for both farmer groups buys certified seed for maize on the market (category 1), which can suggest a quite well-organized formal way of getting certified seed. However, still a large part of the farmers of both the farmer groups and in all natural regions gets certified seed at other sources. No access to the formal market, or not enough money to buy certified seed and dependency on gifts/donors/contract farming or alternatives ways can explain this. A striking outcome that is visible in appendix A6 shows that of the communal farmers in NR4 no one gets certified maize seed via gifts/donors/contract farming (category 2). A reason for this follows below.

To check on a dependency between farmer groups and the use of sources for inputs, and natural regions and the use of sources for inputs, two Chi-Square tests are conducted. Both tests show a dependency (appendices A7 and A8). There is a dependency between living in a certain natural region and the access

to seed for certified maize. Concluding, in the case of certified maize, the natural region one lives in and the type of farmer one is are determining factors for the access to maize-seed. Reasons for this could be found in the differences in infrastructure and mobility between the natural regions, as well as for suitability for farming. In figure 5.9 it is visible that the better the natural region, less respondents get seeds at the market and more get seeds via donor/gift/contract. The latter might have a focus on the best natural regions in order to have the biggest results. Therefore respondents of NR3 and NR4 are more dependent on the market. A reason for the dependency between being a certain type of farmer and having access to maize-seed can also be found in category 2 (donor/gift/contract); resettled farmers do more often get seed via this category. This might be because still many (governmental) support schemes focus on resettled farmers. The aforementioned fact that in NR4 no communal farmer gets inputs via category 2 might be explained by the above-mentioned reasoning.

Maize in numbers in 2011/2012 and 2010/2011

The average area planted per household in 2011 is 1.25 hectares on dry land; nothing is planted on irrigated land. The average amount of kilograms certified seed farmers got or bought is 40.5 kg, which is higher compared to the average amount of kilograms non-certified seed farmers got or bought: 20.5 kg.

Table 5.1 Average area planted with maize and average output per household, natural region 2011

natural region		Mean
NR2	area (ha)	1.58
	output (kg)	1915.04
NR3	area (ha)	1.54
	output (kg)	1200.83
NR4	area (ha)	1.70
	output (kg)	889.61

Table. 5.2 Average area planted with maize and average output per household, farmer group 2011

farmer group		Mean
resettled	area (ha)	1.61
	output (kg)	1728.34
communal	area (ha)	1.33
	output (kg)	751.87

For output, the numbers of the season 2010/2011 are taken into account because for 2011/2012 these numbers were not yet available at the moment of interviewing the respondents, therefore also the average area planted is calculated for 2010/2011. The average area planted with maize (certified and non-certified) in 2010/2011 is 1.59 hectares per household. For production the average amount of output is 1554.79 kilograms maize per household.

Per natural region and per farmer group the means per household are different, as can be seen in tables 5.1 and 5.2. The areas planted with maize in the different natural regions does not differ that much, but the output is seriously different. NR2 households have on average more than two times the amount of output compared to households in NR4. NR3 lays in between these two, which

probably has to do with the suitability of the land for growing maize. Between the farmer groups there is also a big distinction in output per household with for resettled farmers almost a tonne (1000kg) more output than for communal farmers while the average area planted for resettled farmers is only 0.3 hectares more than for communal farmers. The enormous difference in output has no examined reason; but a reason might be found in the fact that resettled farmers more often get inputs via gifts/donors/contract farming and these inputs are probably of better quality than the inputs other farmers get on the market of via alternative ways.

5.2.2 Tobacco 2012

The next crop we examine is tobacco. Tobacco is an important cash crop nowadays, and is mainly grown under contract farming. 27.1% of the respondents have planted or intended to plant tobacco in the season 2011/2012. In fact all of them have planted tobacco, thus had access to seed for tobacco. The relative differences between the farmer groups and the natural regions are shown here, per natural region and per farmer group the percentage of farmers that grow tobacco are calculated, which can be seen in figures 5.11 and 5.12. Between the natural regions there are differences in tobacco growing. This possibly has to do with the quality of soil in the natural regions that is not in all regions most suitable for tobacco growing. Also other characteristics that make up the division of natural regions (see section 2.1.1), like annual rainfall and temperature, can contribute to this. In NR2 the land and weather pattern seem more suitable for tobacco growing than in NR4, with NR3 placed between the other two. The differences between the farmer groups are clear, as communal farmers in general do not grow tobacco. A reason for this might again be found in

Figure 5.11 Tobacco per natural region 2011/2012

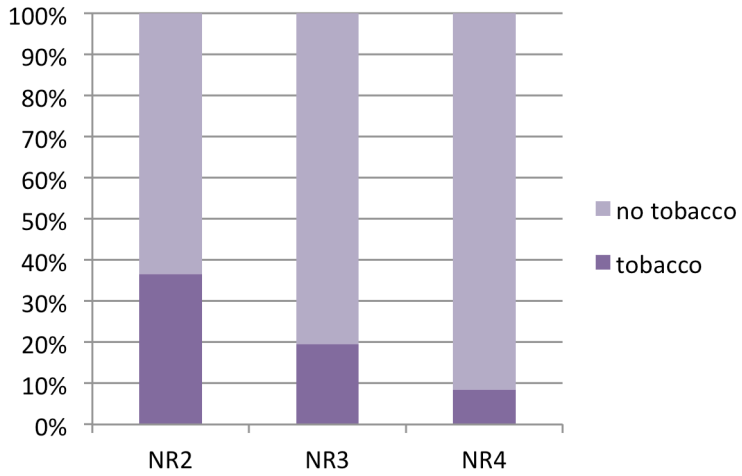
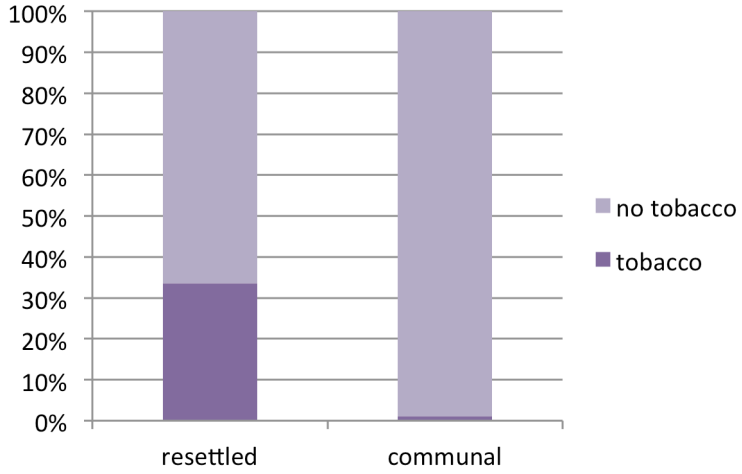


Figure 5.12 Tobacco per farmer group 2011/2012



the fact that communal farmers do in a less way use category 2, donor/gift/contract (see figure 5.14) for getting inputs, while tobacco is mainly grown under contract farming which falls under category 2.

The sources (per category) farmers use for getting tobacco-seed are different for the natural regions and the farmer groups as can be seen in figures 5.13 and 5.14. Appendix A9 shows a more extensive table with the exact numbers. The use of the formal market for tobacco-inputs is about the same for the three natural regions, around 40% of the respondents buys tobacco-inputs at the market. This means that the majority of respondents in all natural regions use other sources than the market for getting inputs, which can suggest that the formal market for tobacco inputs is not well-organized, too expensive or does not fulfil the demand of the farmers. Overall for the three natural regions there is a difference in the number of farmers that gets seed through alternative ways (category 3); in NR2 this is 'only' 19.6% while the other two natural regions both show percentages of more than 50%. Another striking fact is that in NR2 many more farmers get seed via gifts / donors / contract farming than in the other two natural regions. A reason for this might be, same as for maize, that donor/gifts/contract as input-providers focus on the best natural regions in order to get the best results. NR2 is seen as the 'best' natural region as mentioned in section 2.1.1.

A reasonable number of resettled farmers gets inputs for tobacco via the formal market (category 1), but the majority of the farmers gets inputs from the other two categories of sources (category 2 and 3). No access to the formal market, or not enough money to buy seed and dependency on gifts/donors/contract farming or alternatives ways can explain this. The source for inputs of the only one communal farmer that grows tobacco, the market, is added in the figure for a complete overview.

Figure 5.13 Use sources for tobacco inputs per category per natural region in %

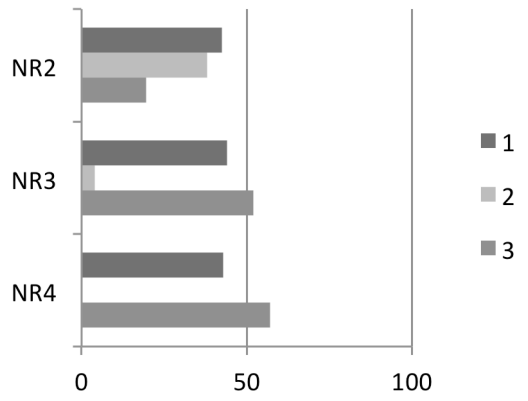
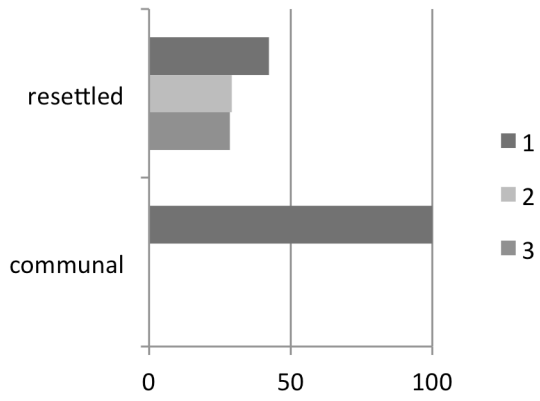


Figure 5.14 Use sources for tobacco inputs per category per farmer group in %



To check on coincidence or a dependency between the different natural regions and the ways of getting seed a significance-test is conducted (appendix A10). The Chi-Square test is not reliable in this case, because 33.3% (>20%)of the cells have an expected count less than 5, which means the requirements for a reliable test are not met. Therefore the Fisher-Freeman-Halton test is conducted; which is suitable in this case. This test shows that there is no dependency between living in a certain natural region and using a certain source for getting inputs (appendix A10). For tobacco the natural region one lives in does not determine the source one uses for getting inputs.

Tobacco in numbers in 2011/2012 and 2010/2011

The average area planted per household is 1.09 hectares on dry land; nothing is planted on irrigated land. The average amount of kilograms seed farmers got or bought is 200.6 kg.

Table 5.3 Average area planted with tobacco and average output per household, natural region 2011

natural region		Mean
NR2	area (ha)	0.91
	output (kg)	2081.20
NR3	area (ha)	0.93
	output (kg)	2351.67
NR4	area (ha)	0.60
	output (kg)	1583.33

For output, the numbers of the season 2010/2011 are taken into account because for 2011/2012 these numbers were not yet available at the moment of interviewing the respondents, therefore also the average area planted is calculated for 2010/2011. The average area planted with tobacco in 2010/2011 is 0.91 hectares per household. The average amount of kilograms output of tobacco is 2109.10 kilogram per household in 2010/2011.

Per natural region differences are visible. Households in NR2 and NR3 have about the similar numbers (table 5.3), with some more output for households in NR3. NR4 households have on average less area planted with tobacco and has by far the least output of the three natural regions. The latter has probably to do with suitability of the land for tobacco growing and weather patterns, as mentioned before.

5.2.3 Cotton 2012

Next to tobacco, also cotton is an important cash crop in Zimbabwe. Just like tobacco, cotton is mainly grown under contract farming. 31.3% of the respondents have planted or intended to plant cotton in the season 2011/2012. In fact 30.9% respondents have planted cotton. In the figures 5.15 and 5.16 the percentages of farmers growing cotton per natural region and per farmer group are visible. No cotton is grown in NR3, as NR3 is not suitable for cotton growing as mentioned before. In NR2 and NR4 the percentage of farmers growing cotton is about the same. Per farmer group also differences become clear. Relatively more resettled than communal farmers have planted cotton, a reason for this can

be that maize is mainly grown under contract farming. As known, contract farming is in general more done by resettled farmers. The sources (per category) farmers use for getting cotton-seed are different for the natural regions and the farmer groups, as seen figures 5.17 and 5.18 (appendix A11 shows the extensive table). Differences between the natural regions are not enormous, only for the farmers using alternative ways (category 3) of getting cotton-seed. In NR2 20.2% of the farmers uses this way, compared to only 7.9% in NR4. There is no straightforward reason for this.

Between the farmer groups there is a striking difference in the use of category 2, gifts / donor / contract farming. About 70% of the resettled farmers uses this category for getting seeds, compared to about 20% of the communal farmers. Many more communal farmers use the other two categories. The aforementioned reason of resettled farmers more often involved in contract farming might also be the reason here.

Figure 5.15 Cotton per natural region 2011/2012

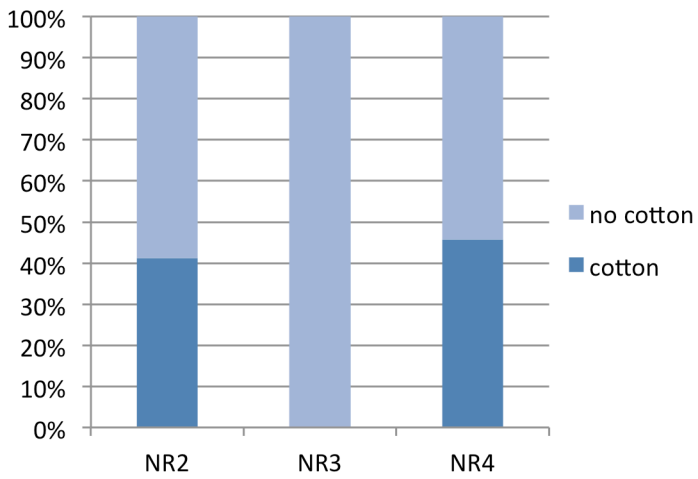


Figure 5.16 Cotton per farmer group 2011/2012

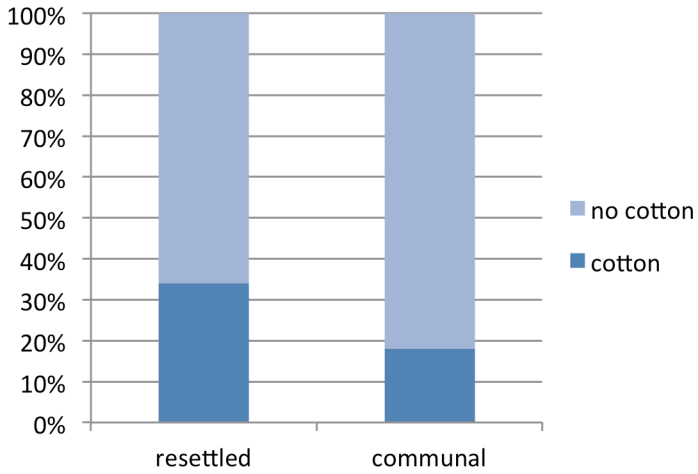


Figure 5.17 Use sources for cotton inputs per category per natural region in %

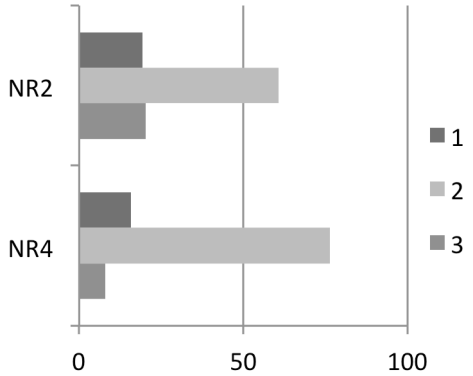
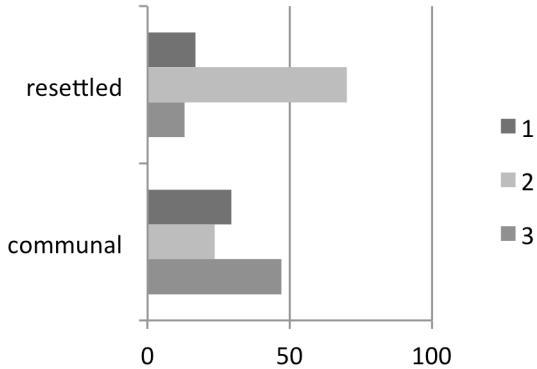


Figure 5.18 Use sources for cotton inputs per category per farmer group in %



To check on a dependency between living in a certain natural region and the use of certain sources for getting seed, a Chi-Square test is conducted (appendix A12). The test shows *p=0,152* which means there is no dependency between the two factors.

For the test on dependency between farmer group and source of input a Chi-Square test cannot be conducted because more than 20% of the cells has an expected count of less than 5, which means the Chi-Square test is not reliable because requirements for conducting the test are not met. Therefore the Fisher-Freeman-Halton test is conducted (appendix A13), which suits here. The Fisher-Freeman-Halton test shows 100% reliability there is no dependency between the two factors. For cottonseed the category of inputs farmers use or have access to are not determined by the natural region they live or by the type of farmer they are.

Cotton in numbers in 2011/2012 and 2010/2011

Table 5.4 Average area planted with cotton and average output per household, natural region 2011

natural region		Mean
NR2	area (ha)	1.27
	output (kg)	1215.86
NR4	area (ha)	1.33
	output (kg)	925.00

Table 5.5 Average area planted with cotton and average output per household, farmer group 2011

farmer group		Mean
resettled	area (ha)	1.33
	output (kg)	1204.71
communal	area (ha)	.56
	output (kg)	646.25

The average area planted is 1.18 hectares on dry land; nothing is planted on irrigated land. The average amount of kilograms seed farmers got or bought is 79.0 kg.

For output, the numbers of the season 2010/2011 are taken into account because for 2011/2012 these numbers were not yet available at the moment of interviewing the respondents, therefore also the average area planted is calculated for 2010/2011. The average area planted with cotton in 2010/2011 is 1.28 hectares per household. The average amount of kilograms output of cotton is 1157.68 kilogram per household in 2010/2011.

Per natural region there is a small difference in area planted, households in NR4 have on average 0.6 hectares more planted with cotton than households in NR2. However in the amount of output the difference is bigger, with NR4 households with the most output (table 5.4) For the farmer groups there is also a big difference, the area planted by resettled farmers is more than twice the area planted by communal farmers. Also in output this is visible: for resettled farmers the output is almost twice that of communal farmers (table 5.5).

5.3 Who are the respondents in 2000: differences with 2012

The description of the Zimbabwe Rural Households Dynamics Study, in section 4.2, has explained that the same households are interviewed every couple of years with about the same questions. However during the years some household have changed their composition, have moved, or are not involved in the survey anymore for different reasons. The respondents will be more or less the same as in 2012, but for a complete view here again will be shown what the population looks like, but for the year 2000.

The data of 2000 contained 544 respondents left over of 550 interviewed. Excluding the missing values and insignificant information for this research out of the database there are 533 of the 544 respondents left. The division of farmers among natural regions in 2000 (appendix A14), varies slightly from that of 2012 (figure 5.1). In 2000 51% of the respondents lived in NR2 compared to 56% in 2012; and in 2000 22% of the respondents lived in NR4 compared to 17% in 2012. The proportion respondents in NR3 has remained. Just as in 2012, NR2 is over-represented in the data of 2000, which will be corrected for in the analysis.

For the same reasons as in 2012, the number of communal farmers is much smaller than the number of resettled farmers. 390 of the respondents (73.2%) are resettled farmers and 143 are communal farmers (26.8%). Comparing the different farmer groups will also be done in a relative way.

For the natural regions the division between resettled and communal farmers is more or less the same, but overall the number of communal farmers is much smaller compared to resettled farmers because of their underrepresentation in the database. The representation of different farmer groups and different natural regions is thus clear, and because of unequal representation a relative way of comparing is applied in this research (appendix A15 shows the division of farmer groups per natural region).

In the 2000 data there is no information on contract farming, therefore a statistical comparison on contract farming cannot be made. Also the literature does not provide information on contract farming for that period, it is therefore assumed that contact farming did not play an important role in the agricultural sector by that time.

5.4 Farming in 2000

For sub-question 3 we sought information regarding the crops maize (certified and non-certified), tobacco and cotton. Sub-question 3 contains different questions, namely on how many respondents do grow these crops, what is known about their access to inputs and what are the numbers of area planted and output? In which natural regions do they live and what type of farmer are they?

5.4.1 Maize 2000

All respondents mentioned to have planted maize in 2000. The divisions for the use of certified and non-certified maize seed per natural region and per farmer group are shown in figures 5.19 and 5.20. In all the natural regions the majority of the farmers used certified seed. Only a very small percentage of farmers used only non-certified seed, and a slightly bigger percentage used both certified and non-certified seed. There are no big differences between the three natural regions. For the different farmer groups there are also no big differences. The big majority of both farmer groups used only certified seed and a minority used only non-certified seed.

Figure 5.19 Certified and non-certified maize per natural region 2000

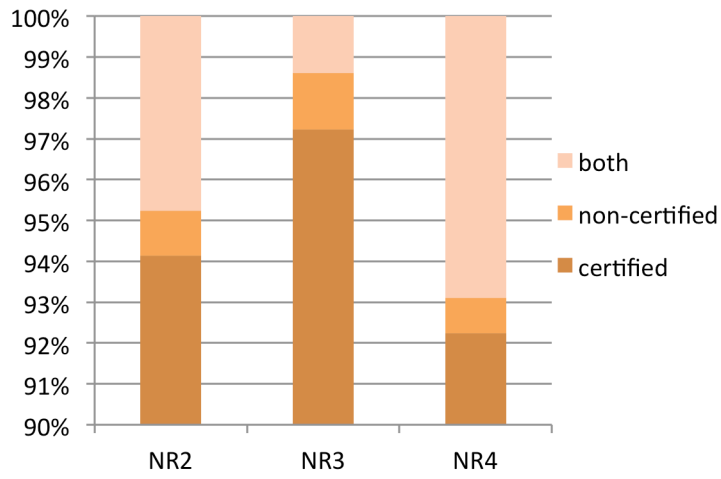


Figure 5.20 Certified and non-certified maize per farmer group 2000

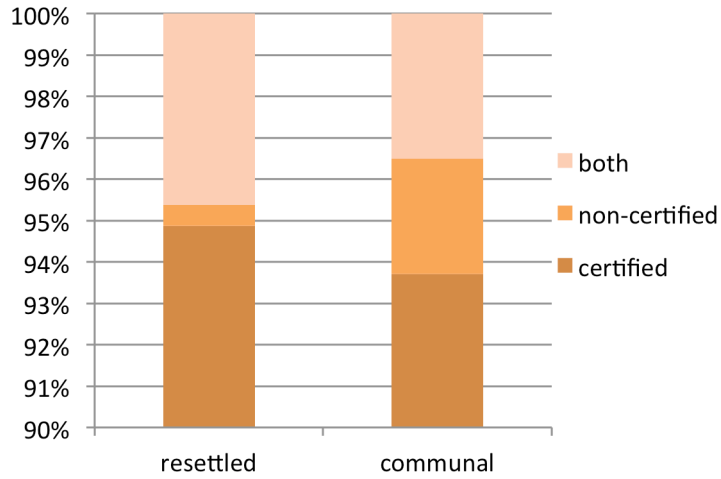


Table 5.6 Average area planted with maize and average output per household, natural region 2000

natural region		Mean
NR2	area (ha)	1.41
	output (kg)	2069.35
NR3	area (ha)	1.34
	output (kg)	1167.90
NR4	area (ha)	1.30
	output (kg)	1631.55

Table 5.7 Average area planted with maize and average output per household, farmer group 2000

farmer group		Mean
resettled	area (ha)	1.50
	output (kg)	1970.43
communal	area (ha)	0.94
	output (kg)	1138.61

Maize in numbers 2000

In 2000 the average area planted with maize was 1.37 hectares per household. The average area planted with certified maize seed stood at 1.76 hectares compared to the average area planted with non-certified maize seed of 0.95 hectares per household. Production is also measured, the average amount of kilograms output of maize, both certified and non-certified maize, reached 1730.52 kg per household.

Per natural region big differences are visible in output, whereby NR2 performs the best. In area planted the differences are not that big between the natural regions (table 5.6). Between the farmer groups differences are visible in the area planted, whereby resettled farmers have on average a bigger area planted than communal farmers. Also in output differences are visible: resettled famers have more output than communal farmers which is not striking as they also have a bigger area planted (table 5.7).

5.4.2 Tobacco 2000

Of the 533 respondents, 28 say to have planted tobacco in 2000, which is 5.3% of all the respondents. The differences in tobacco-growing between the natural regions and between the farmer groups are seen in figures 5.21 and 5.22. Between the three natural regions differences are not really striking, the area where relatively most farmers grow tobacco is NR2, which shows a higher proportion tobacco-growers than NR3 that shows a higher proportion than NR4. This small difference might have to do with quality of soil and suitability for growing tobacco. Between the different farmer groups there is, however, a difference, as 9.7% of the resettled farmers grows tobacco compared to 0% of the communal farmers. This is a striking fact; further research is necessary to examine the actual reasoning for this. However, something to keep in mind is again contract farming, despite the fact that literature did not provide information on contract farming for this period. For as well the small difference between the natural regions, as the striking difference between the farmer groups this might be a reason.

Tobacco in numbers 2000

In 2000, the average area planted with tobacco is 0.74 hectares per household. The average amount of output is 292.54 kg tobacco per household. Table 5.8 shows the distinctions between the different natural regions and farmer groups.

Per natural region differences are visible: NR2 households have on average the smallest area planted with tobacco, while they have the biggest output. NR3 households have the least output and NR4 households have the biggest area planted. These striking differences are probably caused by the suitability of the land for tobacco growing. NR2 seems best suitable for tobacco growing, but based on this small number of respondents growing tobacco there is no reliability in stating this.

It is, however, obvious that tobacco growing was not yet that popular in 2000. It might have to do with the fact that contract farming was not yet common, together with the fact that inputs for tobacco were difficult to get.

Figure 5.21 Tobacco per natural region 2000

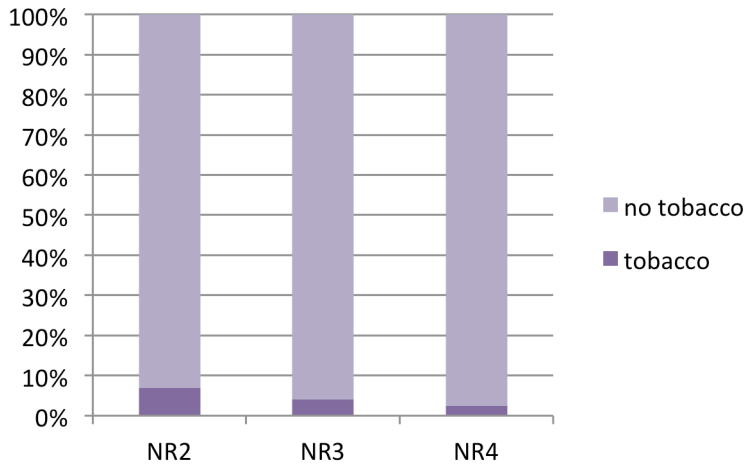


Figure 5.22 Tobacco per farmer group 2000

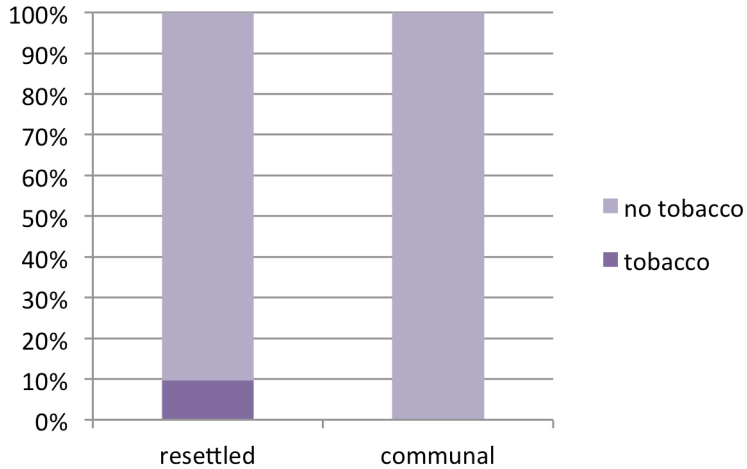


Table 5.8 Average area planted with tobacco and average output per household, natural region 2000

natural region		Mean
NR2	area (ha)	0.61
	output (kg)	332.11
NR3	area (ha)	0.81
	output (kg)	171.00
NR4	area (ha)	1.41
	output (kg)	285.00

5.4.3 Cotton 2000

Of the respondents 39.8% say to have grown cotton in 2000. There are big differences between the natural regions with respect to proportion of the respondents that grow cotton. The most striking is that in NR3 there is no cotton grown at all. In NR2, however, a majority says to grow cotton, while in NR4 there is only a small minority that grows cotton. These differences probably have to do with the quality of soil and suitability for cotton growing. Also between the different farmer groups there are differences visible. Almost half of the resettled farmers grow cotton, compared to about one-fifth of the communal farmers. The differences between cotton growing in the different natural regions and for the two farmer groups are shown in figures 5.23 and 5.34.

Figure 5.23 Cotton per natural region 2000

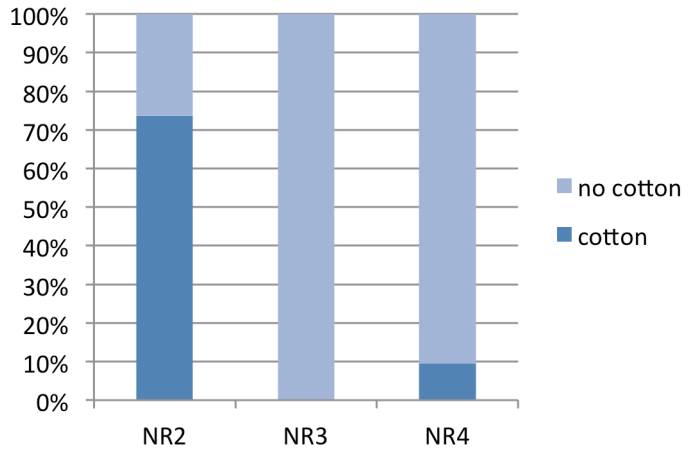


Figure 5.24 Cotton per farmer group 2000

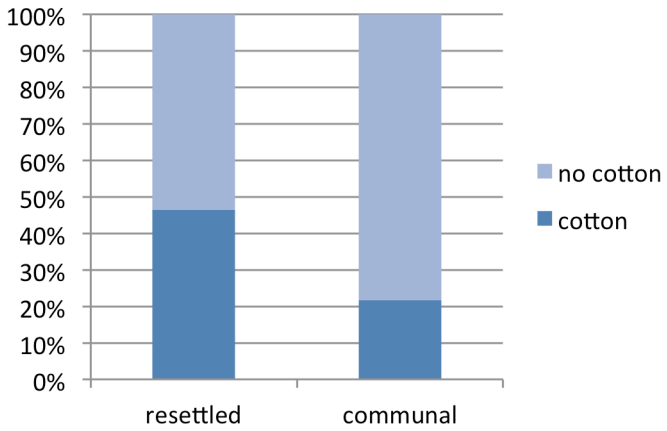


Table 5.9 Average area planted with cotton and average output per household, natural region 2000

natural region		Mean
NR2	area (ha)	1.26
	output (kg)	129.47
NR4	area (ha)	0.81
	output (kg)	60.02

Table 5.10 Average area planted with cotton and average output per household, farmer group 2000

farmer group		Mean
resettled	area (ha)	1.31
	output (kg)	133.34
communal	area (ha)	0.73
	output (kg)	77.48

Cotton in numbers 2000

The average area planted with cotton in 2000 is 1.24 hectares per household. The average amount of output is 126.59 kg per household.

Between the natural regions there is a big difference: in NR2 the area planted as well as the output per household is far above that of NR4 households, which might

have to do with suitability of the land for growing cotton (table 5.9). Between the farmer groups also a big difference is visible, with resettled farmers having almost twice the averages in area planted and in output compared to communal farmers (table 5.10). Further research is needed to clarify this finding.

5.5 Comparing 2012 and 2000

For answering the last sub-question 4, the years 2000 and 2012 are compared to see what the important changes since FTLRP have taken place. In the previous sub-sections we presented detailed information of the years 2000 and 2012 for three crops: maize, tobacco and cotton. This information contained who grew these crops and how farmers got access to inputs for these crops. Hereby we differentiated over households in three natural regions (NR2, NR3 and NR4) and two groups of farmers (resettled and communal farmers). Also how many hectares per household were planted with these crops and what was the output per household was examined in the previous sections. In the following we will compare the findings for the years 2000 and 2012 and try to discover changes between these years. As mentioned in section 1.1 the reason for choosing the years 2000 and 2012 is because the situation of before and after the start of the Fast Track Land Reform Programme is compared in this research. When comparing the before (2000) and after (2012) situation we hope to discover and explain effects of the FTLRP. For example changes in crop growing, in access to inputs, in areas planted and in output. But also changes within the natural regions and farmer groups.

Table 5.11: Respondents using certified and non-certified maize per natural region (%)

natural regions		2000	2012
NR2	certified	94.1	82.4
	non-certified	1.1	12.9
	both	4.8	4.7
	total	100.0	100.0
NR3	certified	97.2	92.7
	non-certified	1.4	6.5
	both	1.4	0.8
	total	100.0	100.0
NR4	certified	92.2	73.4
	non-certified	0.9	21.8
	both	6.9	4.8
	total	100.0	100.0

Table 5.12: Respondents using certified and non-certified maize per farmer group (%)

farmer group		2000	2012
resettled farmer	certified	94.9	84.3
	non-certified	0.5	11.7
	both	4.6	4.0
	total	100.0	100.0
communal farmer	certified	93.7	84.3
	non-certified	2.8	15.7
	both	3.5	0.0
	total	100.0	100.0

Changes will be structured for the three crops examined: maize (certified plus non-certified), tobacco and cotton. Some changes can be explained by knowledge from the theoretical framework, for other changes explanations will need further research.

5.5.1 Maize

Comparing maize in the two years shows many differences. In 2000 100% of the respondents said to grow maize, compared to 96.2% in 2012; it shows a small decrease. For certified and non-certified maize seed there is also a difference visible. In all natural regions the percentage of respondents using only certified seed has decreased, in NR4 even from 92.2% to 73.4%. And in all the natural regions the percentage of respondents only using non-certified seed has increased, with the most striking increase in NR4: 0.9% to 21.8%. The percentage using both certified and non-certified maize seed has remained about the same (table 5.11). For the different farmer groups the trend is about the same, in 2012 less respondents grow only certified maize seed and more grow only non-certified maize seed (table 5.12). This trend can be caused by the changes in access to the formal market since FTLRP; because of this more farmers use alternative ways of getting inputs nowadays. This shows that the FTLRP has in negative sense influenced the organization of the formal market for maize seed, resulting in more farmers using non-certified seed. The formal market only provides certified seed, but alternatives ways do provide both. If farmers use more alternative ways of getting inputs, they have more access to non-certified seed; probably better than to certified seed. This might clarify the switch to the use of more non-certified seed since FTRLP. However it has to be mentioned that differences between natural regions are big; as is clearly seen for NR4. This region is less easy to reach, that might be a reason that the formal access to inputs is worse organized compared to the other two natural regions. Therefore farmers in NR4 have less choice for certified seed.

Figure 5.25 Area planted per household (ha) with maize 2000 and 2011

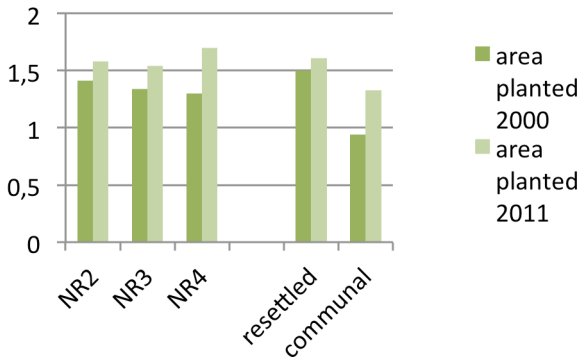
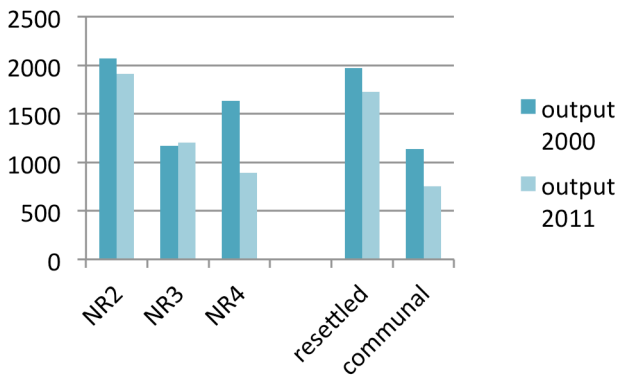


Figure 5.26 Maize output per household (kg) 2000 and 2011



In 2000 the average area planted with maize was 1.37

hectares (1.76 certified and 0.95 non-certified), compared to 1.59 hectares in 2011. It seems that the area planted with maize is slightly increasing for the population in general (figure 5.25). This looks a positive sign, but probably has to do with the increasing use of non-certified seeds in 2011, as mentioned in section 5.5.1. Non-certified seed in general shows smaller harvests, which is seen in figure 5.26: the output per households has decreased in almost all regions and for both types of farmers. In 2000 the total output of maize was 1730.52 kilogram per household, this is certified and non-certified maize. In 2012 the total output was only 1554.79 kilograms maize per household. Despite the more hectares planted with maize per household, the output per household has decreased.

5.5.2 Tobacco

Also in tobacco growing big differences are visible between the years 2000 and 2012. Tobacco growing has increased enormously, probably due to the increasing importance of contract farming, of which tobacco is a main crop. In 2000 only 5.3% of the respondents said to grow tobacco, while in 2012 27.1% grows tobacco. Especially in NR2 the percentage has increased, with almost 30%. In NR4 the percentage shows also an increase but smaller, this has to do with suitability for tobacco growing. A big difference is seen for the different farmer groups where as well in 2000 as in 2012 only resettled farmers seem to grow tobacco (tables 5.13 and 5.14). The increase in tobacco growers is only made of by resettled farmers. As aforementioned, a reason for the enormous increase in tobacco can be the increase of involvement in contract farming, which indirectly is a result of a lack of inputs of other crops. Tobacco is almost always grown under contract farming. Farmers involve in contract farming mainly because 'easy access to inputs', this is a reason that since FTLRP many farmers have chosen to involve in contract farming.

Table 5.13: Tobacco per natural region (%)

natural regions		2000	2012
NR2	tobacco	7.0	36.6
	no tobacco	93.0	63.4
	total	100.0	100.0
NR3	tobacco	4.2	19.5
	no tobacco	95.8	80.5
	total	100.0	100.0
NR4	tobacco	2.6	8.4
	no tobacco	97.4	91.6
	total	100.0	100.0

Table 5.14: Tobacco per farmer group (%)

farmer group		2000	2012
resettled farmer	tobacco	32.8	33.5
	no tobacco	67.2	66.5
	total	100.0	100.0
communal farmer	tobacco	0.0	1.1
	no tobacco	100.0	98.9
	total	100.0	100.0

Figure 5.27 Area planted per household (ha) with tobacco 2000 and 2011

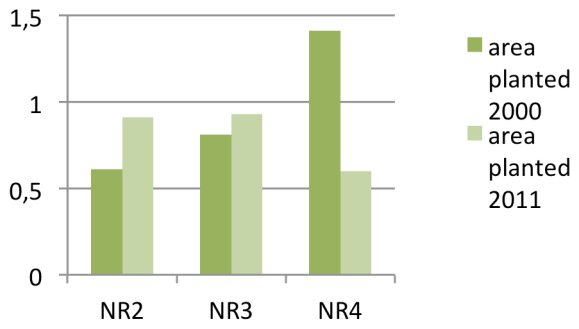
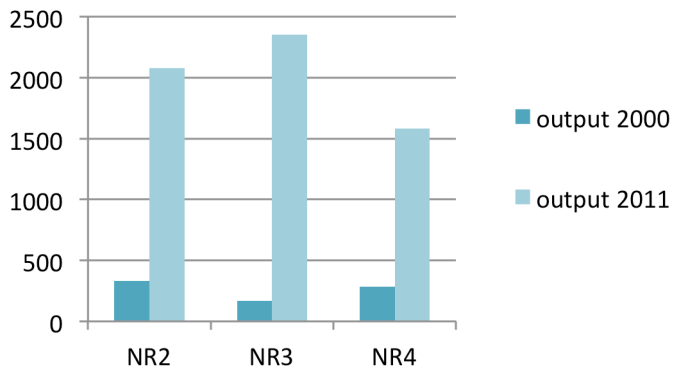


Figure 5.28 Tobacco output per household (kg) 2000 and 2011



The reason only resettled farmers grow tobacco has to do with the aforementioned dependency between resettled farmers and contract farming, see section 5.1.2.

In 2000 the average area planted with tobacco was 0.74 hectares per household and in 2012 it was 1.09 hectares, 2011 showed 0.91 hectares. The average area planted with tobacco is increasing slowly except for NR4. The small growth might be assigned to contract farming, as well as to the fact that tobacco is in 2011 also available through the market, instead of only via alternative ways so farmers are not only dependent on others but can also chose to buy seed for tobacco themselves. The reason that NR4 shows a decline in area planted needs further research (figure 5.27), but reasons might be found in contract farming here as well, because companies might be less willing to have contract farming in NR4 because of lower suitability for cotton; and also in the possible lesser reachable seed market in NR4.

In 2000 the production of tobacco was 292.54 kg tobacco per household, and in 2012 it was 2109.10 kg per household. This shows a dramatic sevenfold increase (figure 5.28). A reason for this increase can be the increasing area planted per household in general; but the main reason for such increase in production can be the easier way of getting more and better inputs for tobacco: namely via contract farming.

5.5.3 Cotton

Just like maize and tobacco, also cotton shows differences between the years 2000 and 2012. In 2000 39.8% of the respondents grew cotton, while in 2012 it was 31.3%. There is a small decline visible in general, while cotton growing enormously increased in NR4, from 9.5% to 45.8% of the respondents. Reason for the increase of cotton growing in NR4 can be more involvement in contract farming because of a lack of inputs for other crops. NR4 seems very suitable for cotton, therefore companies are willing to have contract farming for cotton in that particular natural region. Inputs for cotton are only provided by donors, gifts or through contract farming, which on the other hand can be the same reason for the decline in cotton growing in the other natural regions, were companies seem less willing to do contract farming. Within the farmer groups there is small change visible, proportion of the respondents that grow cotton decreased for both resettled and communal farmers but the decline is bigger for resettled farmers (tables

Table 5.15: Cotton per natural region (%)

natural regions		2000	2012
NR2	cotton	73.6	41.1
	no cotton	26.4	59.9
	total	100.0	100.0
NR3	cotton	0.0	0
	no cotton	100.0	100.0
	total	100.0	100.0
NR4	cotton	9.5	45.8
	no cotton	90.5	54.2
	total	100.0	100.0

Table 5.16: Cotton per farmer group (%)

farmer group		2000	2012
resettled farmer	cotton	46.4	34.0
	no cotton	53.6	76.0
	total	100.0	100.0
communal farmer	cotton	21.7	18.1
	no cotton	78.3	81.9
	total	100.0	100.0

Figure 5.29 Area planted per household (ha) with cotton 2000 and 2011

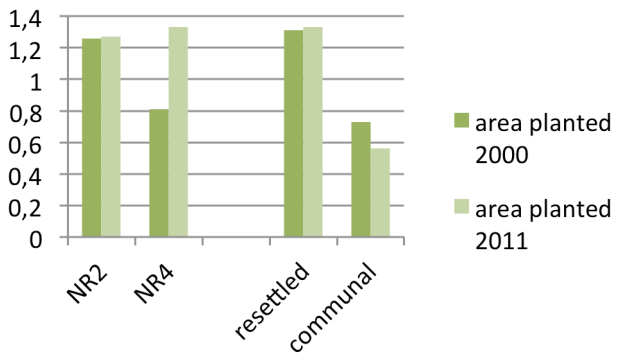
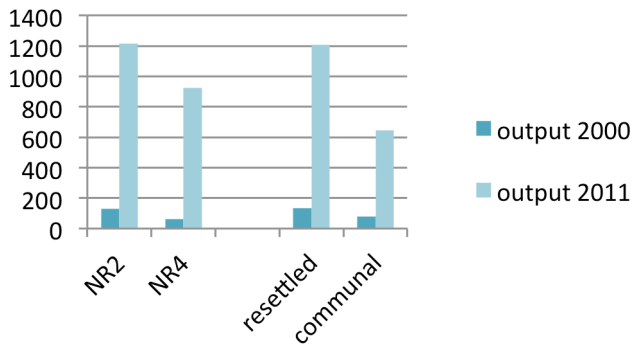


Figure 5.30 Cotton output per household (kg) 2000 and 2011



5.15 and 5.16). This is a striking fact because resettled farmers are more likely to involve in contract farming than communal, under which cotton is grown. To examine what exactly is the reason for this further research is necessary.

The average area planted with cotton in 2000 was 1.24 hectares per household, while in 2012 it was 1.18 hectares and in 2011 1.28 hectares. Except for communal farmers all groups show an increase, with NR4 the most (figure 5.29). The average output was 158.24 kg per household in 2000 and 1157.68 kg in 2012. Here an enormous increase in output per household is visible. A reason for this change can have to do with quality of inputs, which probably comes from contract farming as it is known that most tobacco is grown under contract farming. This can, however, not be stated as also other reasons for a low output in 2000 could exist, for example weather conditions.

5.5.4 Access to inputs

Overall, changes in access to inputs are visible between 2000 and 2012. Around 2000 farmers had good access to hybrid maize inputs via the formal market. But for cotton and tobacco alternative ways of getting inputs were used mainly. In 2012 the situation is very different. For maize still, and now also for tobacco the market is an important source for inputs. But a majority of farmers gets inputs for maize and tobacco nowadays from sources of the other two categories (donor/gift/contract and alternative). For tobacco this is not a new thing, but for maize it is a striking fact, which can be accounted to the increasing use of non-certified seed, which is only available via alternative ways. Cotton inputs in 2012 are almost exclusively available via donor/gift/contract.

Per crop the access to inputs is different, but also per natural region and per farmer group. For maize there is a dependency between access to inputs and living in a certain natural region or being a certain type of farmer. For tobacco and cotton there is no dependency between these. This might be explained by the fact that tobacco and cotton are cash crops and are only grown by the ones that have good access to inputs for these crops, although this is by contract farming. They all have access to the inputs so dependency with natural regions or farmer groups is not relevant. Maize, however, is grown by almost everyone because it is a food crop. Everyone, wherever they live or what kind of farmer they are, needs in one way or another access to maize inputs. In this case difficulties for certain natural regions and farmer groups become clear, which shows the dependency between natural regions of farmer groups and access to inputs.

For 2000 there is, as mentioned before, little information on contract farming. This suggests that it was not a well-known phenomenon by that time, contract farming played no role by then. Nowadays contract farming plays an important role for access to inputs, by a lack of other ways to get inputs. A big majority of the respondents says to involve in contract farming because of 'easy access to inputs'.

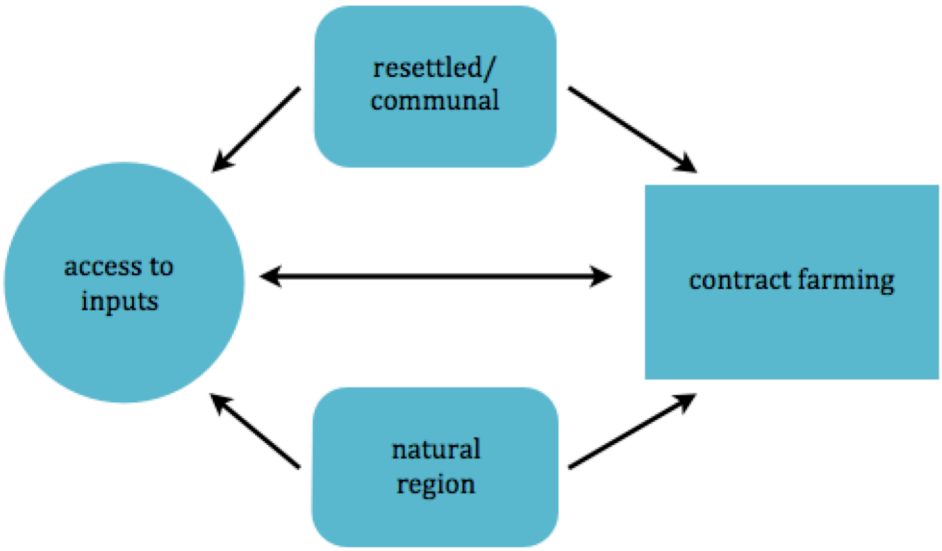
6. Conclusion

In this chapter the research question is answered by first answering the sub-questions, resulting in a conclusion of this research. First the conceptual model is revised and the hypotheses are checked. Thereafter the research questions are answered in section 6.2. This chapter ends with recommendations for further research.

6.1 Revising the conceptual model and hypotheses

The results presented in chapter 5 have shown that the conceptual model developed for this research seems explaining: factors as in which natural region one lives and what type of farmer one is do indeed influence the access to inputs, and both are determining factors for involvement in contract farming. Also contract farming and access to inputs have indeed a reciprocal relationship. The conceptual model is slightly revised based on the findings and now is applicable for access to inputs in Zimbabwe. The revised conceptual model looks as follows, figure 6.1.

Fig. 6.1 Revised conceptual model



(Source: own work, 2014)

What has changed is the before unknown relationship between 'resettled/communal' and 'contract farming, which is now known as a dependency of contract farming on resettled/communal; also changed is the relation between 'access to inputs' and 'contract farming', which is now known as both influencing each other.

The assumed results of this research, the hypotheses, have been stated in the introduction. The results presented in chapter 5 show that all hypotheses are true:

1. Farmers' access to inputs is unequal in the different natural regions, whereby NR2 has better access than NR3, which has better access than NR4.
2. Resettled farmers have easier access to inputs than communal farmers.
3. Access to inputs is has become better for cash crops (tobacco and cotton), while it worsened for the main food crop (maize).
4. Contract farming plays a more prominent role in the agricultural sector since FTRLP (2000 versus 2012).
5. Access to inputs for all farmers and in all natural regions has become different since FTLRP (2000 versus 2012).

The explanations of the hypotheses are used in formulating an answer on the research questions in the following section 6.2

6.2 Changes in access to inputs since FTLRP

The Zimbabwean agricultural sector has struggled with seed-issues in the last years. Problems with access to seeds do have diverse causes, found in amongst others the political and economic situation of the country. In return, problems with access to seed do also affect the economic situation, for example in the form of decreasing numbers of agricultural export products as a result of smaller harvests. This research focused on a smaller scale: the rural household. Many farmers suffer among the problems with access to inputs: not enough seed to plant means a small harvest which can result in food insecurity but also decreasing income for the household.

Since the Fast Track Land Reform Programme at the beginning of this century, the agricultural sector has totally changed. Also access to inputs has changed, because of diverse political and economic reasons. It seemed that for various farmer groups, and for diverse natural regions in Zimbabwe, the access to inputs is different. This research has examined how this access has changed since the FTLRP for specific crops, therefore the main question was:

How has access to inputs for maize, tobacco and cotton changed for resettled and communal farmers in three different natural regions in Zimbabwe, from 2000 until 2012?

To answer this question it was divided into sub-questions. These examined who grows what crops, how much, and how they got inputs for growing these crops in both the years 2000 and 2012. Also differences between the natural regions

and farmer groups in growing the different crops were examined. The sub-questions are answered below, resulting at the end in an answer on the research question.

Maize growing has showed important changes in the last decade. Maize was in 2000 grown by all the respondents, but in 2012 not everyone grows maize anymore; this already shows an important change because maize is a food crop. For all natural regions and both farmer groups there is a decrease in use of certified maize seed, and an increasing use of non-certified maize seed since FTRLP. As known, non-certified maize seed is of lesser quality than certified maize seed, therefore this is an alarming sign that shows serious problems in access to seed for certified maize. Other changes since FTLRP have to do with the area planted per households and the output per household. All natural regions and both farmer groups show an increase in area planted with maize per household, but because of the changed 'certified versus non-certified seed' proportion the maize-output per household has decreased almost in all natural regions and in both farmer groups. As the changes in use of certified and non-certified maize seed have shown: the accessibility of maize seed has changed, which resulted in the declining percentage of farmers growing maize in the last decade. The increasing use of non-certified seed in 2012 compared to 2000 also shows the decreasing accessibility of certified maize seed. 3-8% of the respondents used non-certified maize seed in 2000 while 15% did so in 2012.

Next to these general changes in maize growing since FTRLP, also differences between the natural regions and farmer groups have become visible. In natural region 4 the differences in use of non-certified and certified seeds between 2000 and 2012 are the biggest; also for communal farmers there are big differences visible. For NR4 and communal farmers it seems that certified seed is even harder to get than for the other natural regions and for resettled farmers; reasons for this can be the lesser accessibility of NR4 (infrastructural) and the fact that communal areas are in a lesser way involved in governmental input support programmes (political). Also differences between natural regions in access to inputs are visible: in NR4 80% uses the formal market compared to only 50% in NR2. Of the communal farmers in NR4 no one gets seed through gifts / donors / contract farming.

In performance based on output also differences are clear. In both years NR2 performs the best; this has to do with suitability of the land for growing maize and thus has no political or economic reasons. In both years, however, resettled farmers perform better than communal farmers, this is striking and might have to do with political reasons: input schemes or donor programmes that distribute higher quality of inputs to resettled farmers.

Last important finding to mention here is that there is an examined dependency between living in a natural region and using a certain source for getting certified inputs. Non-certified seed is only available via alternative ways

anyway. Also a dependency is found between what type of farmer one is and what source for getting certified inputs one uses.

In the case of certified maize, in 2012 the natural region one lives in and the type of farmer one is are determining factors for the access to maize seed; NR2 has hereby the best access to certified maize seed and NR4 the least; resettled farmers have better access to certified maize seed than communal farmers.

Tobacco growing was not yet popular in 2000, but has increased enormously in the last decade. A reason for the increase in tobacco growing can be found in the increasing involvement in contract farming. Only 5.3% of all respondents grew tobacco in 2000, almost equally divided amongst the natural regions. Nowadays, 27.1% grow tobacco but mostly in NR2, followed by NR3 and a few in NR4. In both years communal farmers do not grow tobacco. Between the natural regions there is thus a big difference in tobacco growing, also in area planted and output. In 2000 NR4 had the biggest area planted, NR2 had the smallest area planted but the biggest output. In 2012 NR4 has the smallest area planted and the smallest output, due to suitability of the land for tobacco growing. Overall the area planted with tobacco is slightly increasing, except for NR4. The output is increasing enormously, probably because of the increase in contract farming which cares for better quality of inputs.

The formal market for tobacco seed is not well organized; a minority of respondents in all of the natural regions gets seed from the market. The majority gets seed through alternative ways, while in NR2 also gifts / donor / contract farming is an important source for inputs.

For tobacco there is no dependency between the source for getting seed and the natural region one lives in. Contract farming, however, has played a big role in the increase in tobacco growing because of easy access to inputs through contract farming. With a lack of inputs at the formal market, it is attractive to involve in contract farming.

Since FTRLP the access to inputs for tobacco has become much easier due to the increase of contract farming.

Cotton growing has experienced a small decline in the last decade. Cotton is in 2000 grown by a majority of the respondents of NR2, and a small minority of NR4. In NR3 no one grew cotton. In 2012 the proportion farmers in NR2 that grows cotton is decreased compared to 2000, while the proportion farmers in NR4 that grows cotton has increased. A reason for this can be found in contract farming, farmers involve in contract farming because of a lack of inputs for other crops. Contract farming can also be the reason that in 2012 still more resettled than communal farmers grow cotton, although in both groups a decrease is visible compared to 2000.

Next to the changes with respect to proportion of farmers growing cotton, there are big changes between the natural regions with respect to area planted per household and output per household. In 2000 NR2 had the biggest area planted per household with cotton and the biggest output per household, but in 2012 NR4 households have the biggest area planted however still NR2 households have the biggest output. The area planted with cotton is increasing in general, but mainly for NR4. In both years resettled farmers planted bigger areas with cotton and had higher output than communal farmers; probably due to contact farming as aforementioned. Next to the differences between the natural regions, also big differences are visible within the natural regions: in both natural regions and in both farmer groups the output has enormously increased. This might be because the quality of inputs has increased as well, because of contract farming; contract farming companies want a good output and therefore take care for good quality of inputs.

Getting inputs for cotton is difficult apart from contract farming, this is a reason for the decline in cotton growing in general. It is almost only available through gifts / donor / contract farming and alternative ways and there is only a small formal market for cottonseed. In NR2 alternative ways of getting cotton seed are used twice as much as in NR4, which mainly gets seed via contract farming. Also between resettled and communal farmers big differences are visible in this, way more resettled farmers seed via gifts / donors / contract farming than communal farmers. This corresponds to the earlier mentioned facts that resettled farmers involve more in contract farming.

There is no dependency between living in a certain natural region or being a certain type of farmer and using a certain source for inputs. But also here, contract farming plays a big role in cotton growing in general, and specially in the increasing output.

Contract farming is already mentioned many times because of its increasing importance for access to inputs for tobacco and cotton. Contract farming might be the most important concrete thing that has influenced access to inputs since FTRLP. There is a dependency between involvement in contract farming and living in a certain natural region, whereby NR3 has the least contract farming. Also a dependency exists between involvement in contract farming and being a certain type of farmer, whereby resettled farmers involve more in contract farming. In general the main reason for involvement in contract farming is 'easy access to inputs'.

Access to inputs is different for the three natural regions examined, and for the two farmer groups. It differs per crop how the accessibility is organized per natural region, which has to do with suitability of the land. With respect to farmer groups it seems that resettled farmers have better access to inputs for any crop, in any natural region and in both the years. This can have political

reasons, as the government still supports resettled farmers more than communal farmers.

For all natural regions and for both the farmer groups access to inputs has indeed changed since FTLRP; however for the one crop more than for the other and as well in an negative as positive way. For maize, the access has negatively changed, as is also seen in the decreasing output.

For maize the formal market was good (certified seed) before FTLRP. It is still well organized now, but compared to a decade earlier the quality has decreased. An increasing use of other sources for certified maize seed is a result of this decreasing access at the formal market. This is an important message, because of the influence on food security. FTLRP has thus had a negative impact on the accessibility of maize seed, this is an important result because maize is the main food crop and changes in maize harvests affect the food security of the country.

For tobacco, however, the access to inputs is improved due to contract farming which is also seen in the increasing output. Also tobacco seed is better accessible through the formal market. For cotton the access to and the quality of seed has improved due to more contract farming, but it was and is still mainly available through gifts/donors/contract farming. Tobacco and cotton are important export products, thus increasing accessibility to inputs can indirectly support the economy of the country. As is clear now, contract farming has started to play an important role in the agricultural sector, mainly as distributor of inputs for tobacco and cotton.

6.3 Recommendations for further research

A few times in this report it is mentioned that further research is necessary for a deeper understanding of certain results. In most cases it has to do with differences between resettled and communal farmers: distinctions between the two groups in area planted and output for maize and cotton, but also distinctions between the sources they use for getting inputs for these crops. It is assumed that these distinctions have to do with political reasoning in, for example, the form of input schemes or loan for resettled farmers, but this is not examined yet. Follow-up research, using a qualitative approach, should focus on the differences between these groups, specifically for the crops maize and cotton. It is striking that for tobacco such differences do not exists between the farmer groups, which is something to keep in mind for further research as well. For tobacco, however, there is the striking outcome that in natural region 4 the area planted is decreasing while there is no straightforward reason for that.

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Appendix A

1. Farmer groups per natural region

		Count	%
NR2	Resettled farmer	225	84.9
	Communal farmer	40	15.1
	Total	265	100.0
NR	Resettled farmer	90	70.3
	Communal farmer	38	29.7
	Total	128	100.0
NR4	Resettled farmer	67	80.7
	Communal farmer	16	19.3
	Total	83	100.0

2. Chi-Square Tests for dependency contract farming and natural region

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.012[a]	2	.000
N of Valid Cases	476		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 27,55.

3. Chi-Square Tests for dependency contract farming and farmer group

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	35.014[a]	1	.000		
N of Valid Cases	476				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 31.20.
b. Computed only for a 2x2 table

4. Maize per natural region 2011/2012

Natural regions		Count	%
NR2	Certified	211	79.0
	Non-certified	33	12.4
	Both	12	4.5
	No maize	11	4.1
	Total	267	100.0
NR	Certified	114	89.1
	Non-certified	8	6.2
	Both	1	0.8
	No maize	5	3.9
	Total	128	100.0
NR4	Certified	53	63.9
	Non-certified	16	19.3
	Both	3	3.6
	No maize	11	13.2
	Total	83	100.0

5. Maize per farmer group 2011/2012

Farmer group		Count	%
Resettled farmer	Certified	310	81.1
	Non-certified	43	11.3
	Both	15	3.9
	No maize	14	3.7
	Total	382	100.0
Communal farmer	Certified	70	74.5
	Non-certified	13	13.8
	Both	0	0.0
	No maize	11	11.7
	Total	94	100.0

6. Sources per category for inputs certified maize seed per natural region per farmer group 2011/2012

	natural regions																	
	NR2						NR3						NR4					
	Farmer group						Farmer group						Farmer group					
	resettled		comm		Total		resettled		com		Total		resettled		com		Total	
	ct	%	ct	%	ct	%	ct	%	ct	%	ct	%	ct	%	ct	%	ct	%
1	102	48.8	17	50.0	119	49.0	53	58.2	22	68.8	75	61.0	42	82.4	5	83.3	47	82.5
2	76	36.4	9	26.5	85	35.0	24	26.4	2	6.3	26	21.1	2	3.9	0	.0	2	3.5
3	31	14.8	8	23.5	39	16.0	14	15.4	8	25.0	22	17.9	7	13.7	1	16.7	8	14.0

7. Chi-Square Tests for dependency natural regions and source certified seed

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29,087[a]	4	,000
Likelihood Ratio	34,823	4	,000
Linear-by-Linear Association	9,662	1	,002
N of Valid Cases	423		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 9,30.

8. Chi-Square Tests for dependency farmer group en source certified seed

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7,343[a]	2	,025
Likelihood Ratio	7,694	2	,021
Linear-by-Linear Association	,152	1	,696
N of Valid Cases	423		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 11,74.

9. Sources per category for inputs tobacco seed per natural region per farmer group 2011/2012

	natural regions																	
	NR2						NR3						NR4					
	Farmer group						Farmer group						Farmer group					
	resettled		communal		Total		resettled		communal		Total		resettled		communal		Total	
	ct	%	ct	%	ct	%	ct	%	ct	%	ct	%	ct	%	ct	%	ct	%
1	39	42.4	0	,0	39	42.4	10	41.7	1	100.0	11	44.0	3	42.9	0	.0	3	42.9
2	35	38.0	0	,0	35	38.0	1	4.2	0	.0	1	4.0	0	.0	0	.0	0	.0
3	18	19.6	0	,0	18	19.6	13	54.2	0	.0	13	52.0	4	57.1	0	.0	4	57.1

10. Chi-Square Tests for dependency natural regions and source input tobacco

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	19,538[a]	4	,001	,000		
Likelihood Ratio	23,305	4	,000	,000		
Fisher's Exact Test	20,282			1,000		
Linear-by-Linear Association	3,301[b]	1	,069	,074	,044	,015
N of Valid Cases	124					

a. 3 cells (33,3%) have expected count less than 5. The minimum expected count is 1,98.
b. The standardized statistic is 1,817.

11. Sources per category for inputs cotton seed per natural region per farmer group 2011/2012

	natural regions											
	NR2							NR4				
	Farmer group							Farmer group				
	resettled		communal		Total			resettled		communal		Total	
	Count	%	Count	%	Count	%		Count	%	Count	%	Count	%
1	16	17.4	5	29.4	21	19.3		6	15.8	0	.0	6	15.8
2	62	67.4	4	23.5	66	60.6		29	76.3	0	.0	29	76.3
3	14	15.2	8	47.1	22	20.2		3	7.9	0	.0	3	7.9

12. Chi-Square Tests for dependency natural region and source input cotton

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3,771[a]	2	,152
Likelihood Ratio	4,167	2	,124
Linear-by-Linear Association	,615	1	,433
N of Valid Cases	147		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 6,46.

13. Chi-Square Tests for dependency farmer group and source input cotton

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	16,508[a]	2	,000	,000		
Likelihood Ratio	14,911	2	,001	,001		
Fisher's Exact Test	15,215			1,000		
Linear-by-Linear Association	1,951[b]	1	,162	,195	,118	,066
N of Valid Cases	147					

a. 2 cells (33,3%) have expected count less than 5. The minimum expected count is 2,89.
b. The standardized statistic is 1,397.

14. Respondents per natural region 2000

	Count	%
NR2	273	51.2
NR3	144	27.0
NR4	116	21.8
Total	533	100.0

15. Farmer groups per natural region 2000

		Count	%
NR2	Resettled farmer	224	82.1
	Communal farmer	49	17.9
	Total	273	100.0
NR3	Resettled farmer	97	67.4
	Communal farmer	47	32.6
	Total	144	100.0
NR4	Resettled farmer	69	59.5
	Communal farmer	47	40.5
	Total	116	100.0

Summary

This study answers the question how access to inputs for maize, tobacco and cotton has changed for resettled and communal farmers in three different natural regions in Zimbabwe, since the implementation of the Fast Track Land Reform Programme?

Zimbabwe has a history of land reform programmes. The old resettlement of the 1980's, carefully planned and carried out in clear and honest way; the second phase at the end of the 1990's, a continuation of the first phase; and the Fast Track Land Reform Programme (FTLRP), a violent acceleration of the former land reform programmes in order to finally reach set targets of numbers of families to resettle. Land reform programmes have impact on society as a whole, but especially the FTLRP did. FTLRP turned out to be a chaotic and unstructured programme that has affected the whole Zimbabwean economy. Specifically the agricultural part of the economy was affected, for example because of FTLRP's influence on the inputs-situation of the country. Since the start of the FTLRP the inputs-situation in Zimbabwe has dramatically changed. For instance the government needed inputs for their own input support programmes for supporting the new resettled farmers, which left fewer inputs for other farmers.

Access to inputs before the FTLRP (2000) and a decade after the start of FTRLP (2012) is examined to show major changes in access to inputs since FTRLP. Next to differences between communal and resettled farmers, also differences between three natural regions (NR2, NR3 and NR4) are examined. Zimbabwe is divided into five natural regions, ranking 1 until 5 with 1 as 'best' and 5 as 'worst' in terms of agricultural possibilities. These have to do with quality of soil, weather conditions, droughts/rainfall. The crops examined are maize, tobacco and cotton. Maize is the number one food crop in Zimbabwe, tobacco and cotton are important cash crops.

To carry out this research we used data of the Zimbabwean Rural Households Dynamics Study, made up by Dr. Bill Kinsey. This data contains information of resettled (old resettlement) and communal households out of NR2, NR3 and NR4 of different years since 1984; interested for this research was information on agriculture, crops, inputs, contract farming of the years 2000 and 2012. This data is analysed statistically in order to find differences between the years, but also to find dependencies between the farmer groups and access to inputs, and between the natural regions and access to inputs.

In 2012 not all respondents grow maize anymore, while in 2000 all did grow maize. There has been an increase in the use of non-certified *maize*, which is of lower quality than certified maize. Less accessibility of certified maize drives farmers to use non-certified maize or to stop growing maize at all, which results in decreasing amounts of maize output per household. This is an important and alarming sign for the food security of Zimbabwe, as maize is the main food crop. This counts for all natural regions and both farmer groups, however the decrease is biggest in NR4 and for communal farmers.

The percentage of farmers growing *tobacco* has increased since FTLRP; a cause for this is the upcoming importance of contract farming in Zimbabwe. Many farmers say to involve in contract farming because of 'easy access to inputs'; companies deliver

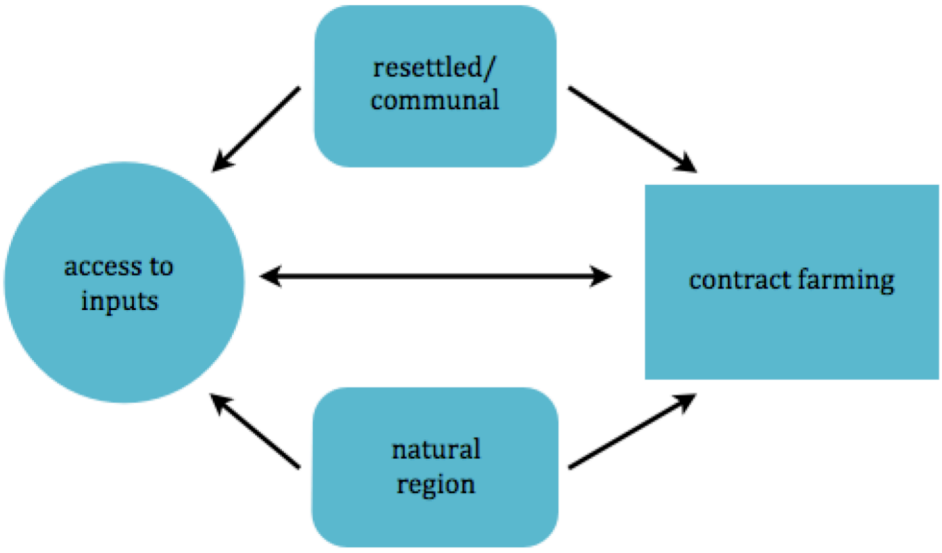
inputs to farmers and in return farmers market their harvest through these companies. In all natural regions the output per households has increased, probably due to better quality of seeds through contract farming.

The percentage of farmers growing *cotton* only increased in natural region 4; in all other natural regions and for both farmer groups it decreased or remained. Despite this decrease, the area planted with cotton as well as the output has increased on average per household in all natural regions and for both farmer groups. This suggests a better quality of seed in 2012 than in 2000, which can be because cotton is also grown under contract farming. A reason for the increase in cotton growing in NR4 might also lay in contract farming; NR4 seems most suitable for cotton and therefore companies invest in that region.

Results of the significance tests show dependencies between type of farmer and access to inputs, natural region and access to inputs and a reciprocal relationship between access to inputs and contract farming, as all shown in the conceptual model below.

Results have shown that indeed a lot has changed in access to inputs for the three crops maize, tobacco and cotton since FTLRP. For maize, the access to inputs has become more difficult in all natural regions and for both farmer groups. For tobacco and cotton contract farming plays an important role in access to inputs nowadays and cares for good quality of inputs. This seems positive, but most farmers are out of necessity involved in contract farming because of a lack of other ways of getting inputs. Differences between the natural regions and the two farmer groups are striking: access to inputs depends on what kind of farmer one is, and on in which natural region one lives. The following conceptual model is examined to be applicable for access to inputs in Zimbabwe.

Conceptual model 'Access to inputs in Zimbabwe'



(Source: own work, 2014)