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FOREWORD

Importance of Agriculture and the Agriculture Sector Survey

The annual Agricultural Sector Survey, initiated by the Zimbabwe Agricultural Society and the Financial Gazette, is meant to assist stakeholders in the sector by providing authenticatic, independent, up-to-date and in-depth analysis of the sector while highlighting the challenges and illuminating the opportunities and attempting to proffer solutions for a rapid, robust, inclusive and sustainable agricultural growth trajectory. Zimbabwe's agricultural sector is a primary pillar for the country's enhanced economic development. Because 70% of Zimbabwe's population is directly dependant on agriculture, and agriculture supplies the bulk of raw materials to the manufacturing sector, any sustained economic growth must address agricultural production and productivity.

As the major problems in agriculture are low productivity (low yields) and low production, (too much idle land), urgent and sustainable intensification and extensification interventions are required. The challenge of poor funding and the absence of appropriate agricultural lending institutions suited to the risk profile in agriculture, although recently, but only partially palliated by value chain financing interventions, and quasi-fiscal and fiscal interventions over the years, for the long term, a return to a Land Bank, as an institutionalised lending platform, could be the best way forward.

The survey highlights gaps in production against national requirements for various crops and livestock and the opportunities to direct policy in these areas. Generally, land availability remains the least impediment to increased production. Some of the limitations include inadequate resources and poor technologies, which present an opportunity for investment and requires a positive policy environment for financing smallholder agriculture. The use of modern technologies and best management practices to improve productivity in this sector is urgently required.

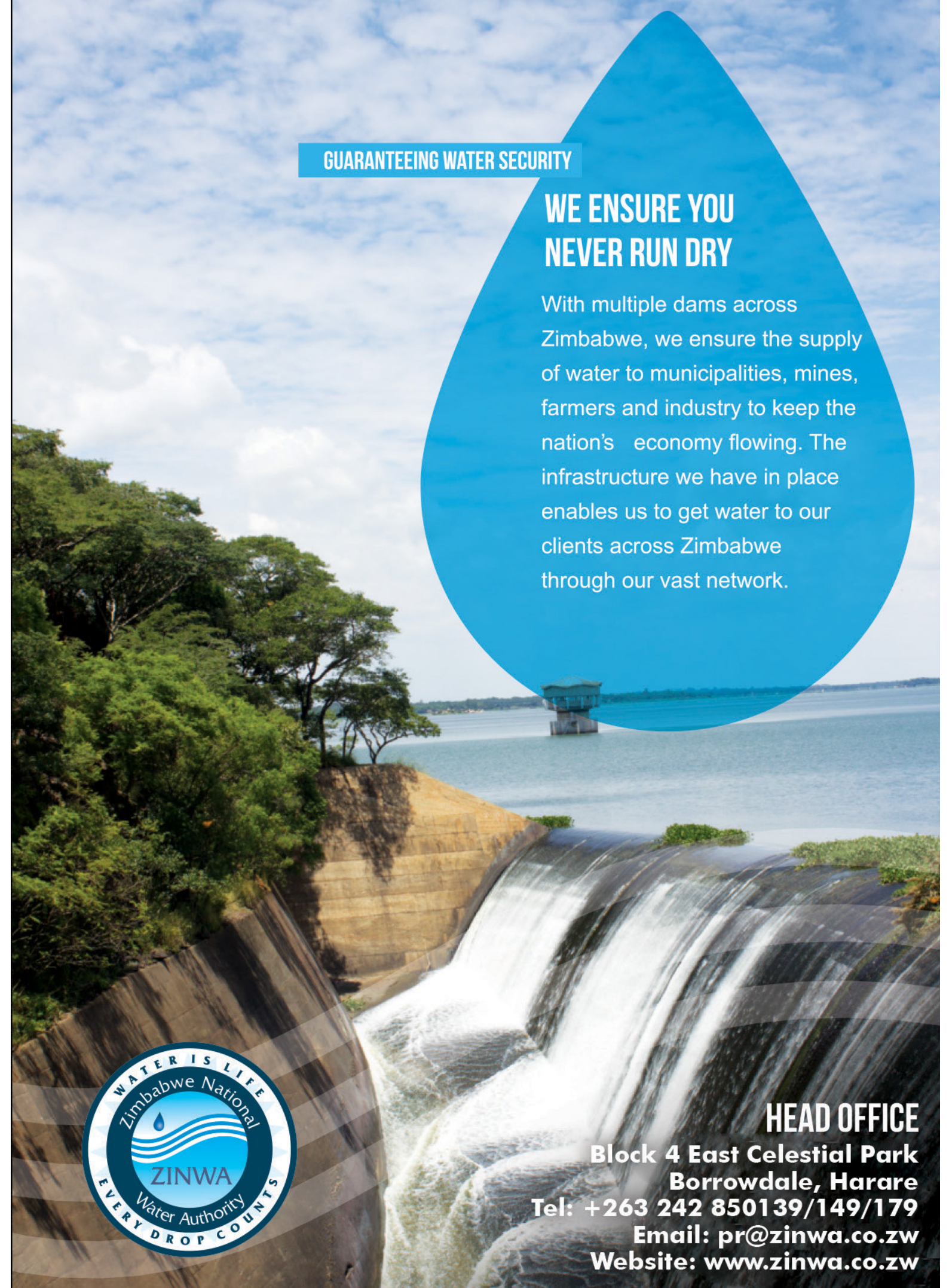
One of the outcomes of the survey is an objective measure of agriculture development progress "The Agriculture Productivity Index". Although some controversy around benchmark years will likely be generated, it is perhaps undeniably that a measure of progress or lack thereof is required, which stakeholders and the nation at large can use as a proxy for the level of activity in this vitally important sector of the economy.

Dr Anxious Masuka
Zimbabwe Agricultural Society
– **Chief Executive Officer**

The annual survey is based on responses from a broad range of stakeholders, including government and its various agencies, farmers, farmer unions and corporates. We thank them collectively for their generous support.

While there will be gaps in information, we have endeavoured to produce an authoritative analysis of the agricultural sector and so the consultants are to be thanked for this effort and forbearance with our pedantry. We could not fritter the opportunity to make a start and contribute to accelerated agricultural development.

Benchmarking and best practice "pit-stops" and "pain stops" in the survey should spur motivation among actors to accelerate activities to transform the sector. The survey and its outputs were generously sponsored by CBZ, the lead sponsor, and National Foods. The Zimbabwe Agricultural Society is pleased to be a part of this inaugural and historic survey. In the years ahead, we hope to further refine this survey, so that it can make an increasing contribution to Zimbabwe's agricultural development discourse.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No one can deny that agriculture is the backbone of Zimbabwe's economy. Agriculture contributes around 16 percent to the GDP and provides livelihoods to approximately 70 percent of Zimbabwe's population.

The sector accounts for around 40 percent of national exports and supplies 63 percent of agro-industrial raw materials. Within the financial services sector, CBZ Bank has been the biggest funder of agricultural activities in Zimbabwe since 2009 and commands 45 percent of the market share. It goes without saying therefore that CBZ Bank became the obvious partner in commissioning the running of the inaugural Agricultural Sector Survey in partnership with The Financial Gazette and the Zimbabwe Agricultural Society.

A survey of this nature is of paramount importance as it bridges the information gap that currently exists within the sector and it points a foot in a positive direction towards attaining national food sufficiency. Findings from the survey will help both the public and private sector in making guided decisions towards reviving the agricultural sector in both the short and the long term.

In addition to guiding policy and decision making, CBZ Bank believes that sponsoring such an initiative will also reveal some interesting business opportunities that can be exploited at both primary and secondary production levels.

Among other outcomes, the survey should bring out such invaluable information that includes inter alia: -

- Showing production trends of various crops and livestock.
- Establishing the state of agricultural infrastructure (irrigation, grain storage, etc)
- in Zimbabwe.
- Showing the link between finance and agriculture production; and bringing out
- any possible gaps.
- Establishing the impact of climate change on agriculture productivity.

May I take this opportunity to share with you, some of the product offering we have availed to the Agricultural sector over the years? These include loan facilities, overdrafts, lease finance, bank guarantees and advisory services.

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The same goes at agro-processing and manufacturing level, we are actively involved in assisting our valued clients in industrial retooling.

I further wish to take this opportunity to encourage key role players in the value chain who provide inputs, chemicals, tractive power and farming equipment, to join us, in devising structured products and solutions that can revive agriculture, grow exports and create the much needed employment.

Peter Zimunya

Managing Director

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EXECUTIVE SUMMARY

The Africa Economic Development Strategies (AEDS) was contracted by the Zimbabwe Agriculture Show Society (ZAS), the Financial Gazette and CBZ Bank to conduct a study on the state of the agriculture sector in Zimbabwe. The aim of the study was to unpack the conditions prevailing in the agriculture sector so as to develop clear, practical responses and proposals for implementation at government and private sector levels. As outlined in the National Agriculture Policy Framework (2018) the study recognised that the sector faces a host of challenges despite several interventions to improve and sustain increased production and productivity.

The study was therefore guided by six objectives which were developed in consultation with ZAS, Financial Gazette and CBZ Bank and these are to:

- Establish production trends of various crops and livestock;
- Establish the state of agricultural infrastructure (irrigation, grain storage, etc);
- Establish the role of agriculture sector produce markets in Zimbabwe;
- Establish the link between finance and agriculture production;
- Establish the impact of climate change on agriculture productivity;
- Estimate agricultural index; and
- Benchmark Zimbabwe's agriculture sector performance against countries in the region such as Botswana, Namibia, South Africa and Zambia;

In order to understand the state of the agriculture sector, an integrated triangulation approach was used for the collection and analysis of both qualitative and quantitative data. Key informant interviews to gather primary data were held as follows; parastatals (11), business membership organisations (7), industry (21), development partners (5), and banks (15). In addition to key informant interviews, 106 household interviews and 3 focus group discussions were held. In addition to the primary data gathering and analysis an extensive and through review of previous case studies and international experiences on agriculture was conducted to collect secondary data.

Evidence shows that agriculture continues to be the mainstay of the Zimbabwean economy contributing 15-18% of gross domestic product (GDP), 23% to total formal employment, sustains livelihoods to approximately 70% of rural population and supplies 63% of industrial raw materials.

Zimbabwe's agricultural sector is predominantly smallholder-led with over a million communal farmers relying on rain-fed agriculture, and close to 70% of them making a livelihood on less than 2 hectares of land. The majority of these small scale farmers are vulnerable to the vulnerability of climate change and drought of funding. These combined factors have resulted in low productivity across crops and livestock.

In the same vein, the study noted that many farmers are still using traditional and old fashioned agricultural technologies which leads to low productivity and production.

Overall, there is extensive evidence which shows that, inter alia, the following farmers are weighing down farmers' productivity: low skills and knowledge base of farmers; a weak research, farmer training and extension system as a source of technology and innovation; shortage of inputs and equipment; low levels of mechanisation; reliance on rain-fed agriculture; limited access to market information and marketing facilities; limited access to finance; limited security of tenure; pest and disease attacks including the Fall Army Worm; Tuta Absoluta and Theileriosis in cattle; low capacity to manage post-harvest losses; mismatch between production and domestic consumption as well as increased incidence and intensity of climate shocks such as El Niño.

With respect to livestock, the study noted that the proportion of cattle slaughters is 5% of the national cattle herd. This low slaughter rate was largely caused by the fact that the small scale subsistence farmers who own 69% of total head rarely slaughter their beasts as they keep them as a sign of treasure. The rate of slaughter is normally used as an indicator of commercialisation of livestock, that is, farmers with high slaughter rate are sweating the assets as opposed to those with low slaughter rate and as such their income levels rises.

With respect to crops, the study noted that commercial crops like macadamia and tobacco performed extremely well regardless of the fact that there is no security of tenure. The striking feature with these crops is that the general business environment is free from regulations as opposed to cereal crops which have price floors. This in itself became a catalyst for strengthening value chains around these crops.

In addressing low production and productivity, the following measures are proposed:

(a) In addressing infrastructure gaps, there is need to expedite implementation of joint venture act which is already being implemented by Agricultural Rural Development Authority (ARDA) with selected private sector. In the same vein, there is need to come up with fiscal incentives which will encourage banks to provide lease finance for movable infrastructures like tractors and combined harvesters.

(b) In order to unlock funding to agriculture as well as access to markets, Government must expedite the operationalisation of commodity exchange and provide tax incentives to companies supporting farmers through contract farming.

(c) In order to address distortions which comes with subsidies, there is need to come up with well structure subsidies, for example, ones which addresses market failure such as desilting and construction of farm infrastructures such as silos.

(d) There is need to equip farmers with both sound agronomic practices as well as business management training skills for farmers.

(e) In dealing with climate change, a multi – faceted approach which from climate smart agriculture, training, information dissemination and knowledge management must be implemented

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1 INTRODUCTION AND BACKGROUND TO RESEARCH

1.1 Introduction

Agriculture sector has traditionally and continues to be a very important sector for the Zimbabwean economy. Agriculture constitute the most significant part of Zimbabwean economy. In addition, agriculture plays an important role in rural development and employment and in the development and maintenance of external trade links. Agriculture is regarded as the use of land for production of food, fodder, fibre, energy, medicine, etc and for rearing of animals (Helcom, 2001). The sector has undergone rapid transformation in the past two decades due to change in policies, global trends and global warming. This has opened up new ways of doing business in the sector.

Due to the rapid transformations and importance of the sector, African Economic Development Strategies (AEDS) was assigned by the Zimbabwe Agricultural Society (ZAS), Financial Gazette and Commercial Bank of Zimbabwe to conduct a survey on the state of the agriculture sector in Zimbabwe. The study was carried out to unpack the state of the agriculture sector in Zimbabwe.

This report contains a description of the nature of the survey, objectives, review of literature, research methodology and data collection tools presentation of findings and recommendations for possible implementation. Understanding the status quo is key in designing appropriate governance and policy interventions in the agricultural sector that optimise benefits in backward and forward linkages within the sector's diversified value chains.

1.2 Background on Research Problem

The agriculture sector provides livelihoods to approximately 70% of the population, contributes 15% -20% of GDP and 40% of exports and supplies 63% of agro-industrial raw materials (Ministry of Agriculture, 2017). Women contribute about 70% of the agricultural labour and the bulk of them are subsistence farmers. There are more than 65 crops that the country can benefit from. Therefore, the sector is important in employment generation, economic growth, reduction of poverty as well as food and nutrition security.

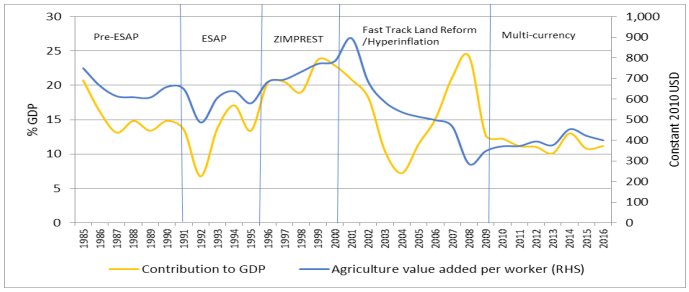
The manufacturing sector derives products inputs from agriculture and in turn provides services and inputs to the sector through backward and forward linkages. The sector produces various commodities which contribute to agricultural GDP as follows: maize 14%, tobacco 25%, cotton 12.5%, sugar and horticulture 7%, beef and fish 10%; at least 24% is devoted to the rest of livestock (cattle, sheep, goats, pigs, poultry and ostrich etc.), 0.5% is accounted by subsistence crops (Ministry of Agriculture, 2017). Of these commodities, tobacco, cotton, sugar, horticulture crops, tea, and bananas accounts for exports.

Despite emerging postulations that mining is overtaking agriculture as the mainstay of the economy Zimbabwe is predominantly an agro-based economy. The agriculture sector is a source of food, income and livelihoods to over 70 percent of the country's population and creates jobs to nearly 30 percent of the formally employed workforce (Ministry of Agriculture, 2013).

1.2.1 Contribution of Agricultural Sector to GDP and Value Addition

During the pre-ESAP phase agriculture sector's contribution to total GDP declined from 20.7% in 1985 to 6.8% in 1991. The contribution recovered during the ESAP and ZIMPREST period peaking at 23.7 percent in 1999, before declining in 2000 to 7.2 percent in 2004, following the FTLR program. Another decline in the contribution was registered from 2001 till 2003 when a low of 7% was recorded. The central bank responded by giving financial support to the agricultural sector through the Productive Sector Facility (PSF 2004) and Agriculture Sector Productivity Enhancement Facility (ASPEF 2005), the contribution of agriculture to GDP recovered again and registered a peak of 24.2 percent in 2008, before declining again between 2009 and 2013 with a marginal increase of 1.1 percent in 2016. The contribution to GDP oscillated between 10% and 15% during the multi-currency period between 2009 and 2016.

Figure 1.1.1: Agriculture Sector Contribution to GDP and Value Added per Worker



Source: Zimbabwe Agriculture National Policy Framework

The country's agriculture sector is diversified with various types of food and cash crops grown and a livestock sector comprising beef, small stock (goats, sheep and pigs), dairy and poultry among others. According to the Ministry of Agriculture (2012), tobacco, cotton, sugar, beef, horticultural produce, coffee and tea are the key agricultural exports from Zimbabwe. There is also a wide range of 'minor' crops such as sweet potatoes, round/bambara nuts, cowpeas among others that are grown and livestock species such as rabbits and donkeys that are reared in Zimbabwe.

1.2.2 Contribution to Employment

The agricultural sector employs 66% of the country's total labour force (FAO 2016). Most of the employed in the agriculture sector are women, youth and elderly males. They are predominantly employed in small farms and engaging in auxiliary non-agricultural activities seeking to ensure some additional source of income. The overall skill level in the sector is comparatively low, farmers are hardly encouraged to develop professionally, the employee training possibilities offered are very limited.

1.2.3 Zimbabwe Agrarian Reforms

Since the attainment of independence in 1980, the Zimbabwe has implemented a series of land and agrarian reforms to address the imbalance in land ownership that was skewed in favour of the white minority. The country's agricultural sector has therefore evolved under a series of economic phases and agrarian reforms. These reforms have had wider redistributive outcomes, including alteration of the agrarian structure and consequences on the backward and forward linkages of value chains of various crops and livestock.

According to Murisa and Mujeyi (2015), Zimbabwe has undergone three distinct phases of agrarian reforms since independence, particularly with reference to the reform of the agricultural policy. The first phase, which was characterised by widespread state involvement, entailed the promotion of a bimodal structure of agriculture and the revitalisation of the smallholder sector between 1980 and 1990. The heightened state support to the smallholder sector culminated in the green revolution of the 1980s (Rukuni et al., 2006).

The second phase of agrarian reforms witnessed the withdrawal of state support from agriculture resulting in liberalisation and deregulation of the economy during the economic structural adjustment programme (ESAP) from 1991 up to 2000. By the year 2000, following the redistribution of about 3.5 million ha since 1980, Zimbabwe's agriculture was characterized by a dualistic structure – a low-input-low-output smallholder sector comprising mainly black indigenous farmers and high-input-high-output, large scale commercial farmers (LSCF) sector comprising mainly white farmers.

The third phase, which is dubbed the Fast Track Land reform Programme (FTLRP) was characterised by the abandonment of market-based approaches to land reform in favour of revolutionary approaches and fast track to land distribution, witnessed the reinstatement of state controls and pronounced involvement of the central government in agriculture. During the FTLRP, over 10 million hectares of land were acquired and redistributed to a broad range of beneficiaries including landless peasants, war veterans, middle-class urbanites and farm workers.

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Table 1.1.1: Zimbabwe's Land Distribution following the FTLRP

Farm class	Farm category	Farm House hold		Area		
		Numbers	% of total	Hectors (Million)	% Total	Farm size
Small-holder/ Peas-antry	Communal	1,100,000	81.2	16.400	49.9	15
	Old reset-tlements	75,000	5.5	3.667	11.2	49
	A1	145,800	10.8	5.759	17.5	40
	Sub-total	1,321,800	97.5	25.286	78.6	
Me-dium scale Com-mercial	Old SSCF	8,500	0.6	1.400	4.3	165
	Small A2	22,700	1.7	3.000	9.1	133.9
	Sub-total	31,200	2.3	4.400	13.4	
Large scale Com-mercial	Medium-largeA2	217	0.03	0.509	1.6	2.345
	Black LSCF	956	0.07	0.531	1.6	555
	White LSCF	198	0.01	0.117	0.4	593
	Sub-total	1,371	0.11	1.157	3.6	
Agro-Estates	Corporates	20	0.001	0.806	2.5	40,320
	Conservan-cies	8	0.001	0.247	0.8	30,875
	Parastatals	106	0.01	0.296	0.9	2,788
	Institutions	113	0.01	0.146	0.4	1,289
	Sub-total	247	0.022	1.495	4.6	
Total		1,354,00	100	23.878	100.0	

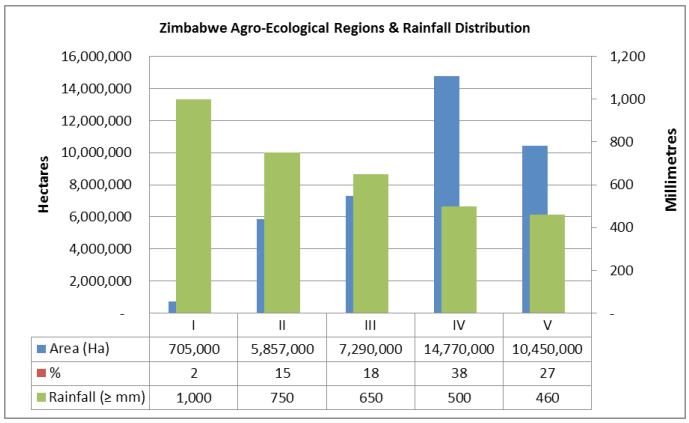
Source: Moyo (2013)

Of the three main phases of agrarian reforms in Zimbabwe the FTLRP is the most prominent one as it had wide and varied consequence on the performance of the agriculture production and the whole spectrum of value chains. The FTLRP entailed the redistribution of land from the minority white large scale farmers to mostly small and medium scale farms and also the introduction of new state based tenure regimes. Thus, the FTLRP has led to a significant reconfiguration of the agrarian landscape as shown in Table 1.1. Prior to the FTLRP, the large scale commercial farming sector comprised of about 4,500 farm owners and around 6,000 farms but these had been decimated to around 300 by 2010 (Moyo, 2013). The area covered by white-owned large scale commercial farms has decreased drastically from over 15 million ha in 1980 to just around 3.4 million ha in 2010 following the FTLRP (Moyo, 2011).

The FTLRP introduced two new land settlement/ownership categories/models; the A1 and the A2 resettlement schemes with average farm sizes of 37ha and 318 ha, respectively (Scoones, et al., 2010). The A1 resettlement model is largely an expansion of old communal areas which has witnessed the area under smallholder farming increase by about 16%. The new agrarian structure emerging from the FTLRP has 73% of the total agricultural land now falling under smallholder production while approximately 8% is now under small to medium scale commercial farming in which the majority of the A2 farms fall under. The balance of 19% comprise of remaining LSCFs, large A2 farms, state farms and large corporate estates. In place of the approximately 6,000 farms, the FTLRP has created close to 180,000 (over 160,000 A1 and about 20,000 A2) farms in the country (Moyo, 2011b; Scoones et al., 2010; Moyo, 2013). It is important to note that there are no studies that show that there are further changes to the land ownership structure in Zimbabwe after the publication done by Moyo (2013).

The emerging agrarian structure has wider implications for trends in the agriculture sector, state of agricultural infrastructure, agriculture market linkages, the link between finance and agriculture production. Given that the country's agricultural sector is predominantly smallholder-led with over a million communal farmers relying on rain-fed agriculture, and close to 70% of them making a livelihood on less than 2 hectares. The debate, however, should not be on whether to promote smallholder farmers or turn the focus on to the new medium/large-scale, but to find policy options that are suited to different farm categories. A 'one size fits all' strategy will likely leave many trapped in poverty due to stubbornly low productivity and resource constraints facing the different farmers.

Figure 1.1.2:Agro-Ecological Regions in Zimbabwe



Source: Ministry of Agriculture (2018)

Zimbabwe is divided into five natural farming regions based on agro-ecological factors that include rainfall regime, temperature, the quantity and variability of average rainfall, as well as soil quality and vegetation. The characteristics and major activities of each region are as follows:

- Region I is characterised by over 1,000 mm annual rainfall and relatively low temperatures. Agricultural activities suitable for the area are dairy farming, forestry, tea, coffee, fruit, beef and maize production. Region I is found in the eastern border of the country in Mutare, Manicaland Province.
- Region II receives rainfall that is between 700 – 1,050 mm and is suitable for intensive farming maize, tobacco, cotton and livestock production.
- Region III receives 500 – 800 mm of rainfall and experiences relatively high temperatures and is subject to seasonal droughts. The region is suitable for production of fodder crops and cash crops under good farm management.
- Region IV receives between 460 – 650 mm of rainfall and is subject to droughts. Region IV is suitable for farm systems based on resistant fodder crops, forestry and wildlife/tourism.
- Region V receives less than 450 mm of rainfall and is suitable for extensive cattle ranching, forestry and wildlife/tourism.

1.2.4 Agriculture Sector Rebound

Notwithstanding the importance of the agricultural sector to economic development, Zimbabwe witnessed massive decline in agricultural production since the turn of the new millennium. Zimbabwe, which used to be bread basket of Southern Africa became a net importer of various agricultural produce which inter alia include wheat, maize, soya bean, fruits, vegetables, meats and eggs among others.

The current crop production trends of various crops for 2016/17 and 2017/18 agriculture season, still confirms that the sector is still facing a host of challenges. Maize production for example dropped by 21% from 2,155,526 metric tonnes in 2016/17 season to 1,700,702 metric tonnes in 2017/18 season. The same trend was also witnessed in other crops such as sorghum, pearl millet, finger millet, groundnut, round nut, sweet potato and cowpeas. The country experienced an early-season dry spell from second week of December 2017 to end of January 2018 which reduced area planted to crops and this also negatively affected productivity of most crops (Ministry of agriculture, 2018).

Zimbabwe witnessed a rebound in the agricultural sector particularly in the areas of tobacco and maize. The rebound of these major crops was due to good rainfall coupled with improved financing under Command Agriculture programme which improved input access and tillage services. This resulted in improvement in productivity by beneficiary farmers. Even though Command Agriculture improved financing for farmers, access to finance particularly by smallholder farmers, however, remains a major blockage to agricultural performance.

Whilst there has been notable success in the growing of tobacco and maize coming on the back of contract farming and command agriculture, respectively, agricultural productivity in the rest of the crops which are close to 60 and livestock is still elusive. For example, cattle population declined marginally by 0.69% from 5.53 million head in 2016 to 5.49 million head in 2017, due to the effect of two successive drought seasons and shortage of foreign currency to import vaccines (RBZ, 2017 and Ministry of agriculture, 2018).

It is against this background that Zimbabwe Agricultural Society, Financial Gazette and Commercial Bank of Zimbabwe commissioned African Economic Development Strategies (AEDS) to carry out this survey whose thrust is to unpack the state of agriculture sector in Zimbabwe.

1.3 Objectives of the Study

The overall goal of the survey is to unpack the state of Zimbabwe agricultural sector. The specific objectives of the assignment are to:

- Establish production trends of various crops and livestock;
- Establish the state of agricultural infrastructure (irrigation, grain storage, etc);
- Establish the role of agriculture sector produce markets in Zimbabwe;
- Establish the link between finance and agriculture production;
- Establish the impact of climate change on agriculture productivity;
- Establish economic opportunities which the Zimbabwe agricultural sector presents;
- Estimate agricultural production index;
- Benchmark Zimbabwe's agriculture sector performance against countries in the region such as Botswana, Namibia, South Africa and Zambia;
- Develop clear, practical responses and proposals (solutions) to problems identified that affect Zimbabwe's agricultural sector in the following way:
  - (a) Specific recommendations targeting Government of Zimbabwe and its agencies; and
  - (b) Specific recommendations to the stakeholders in the agricultural sector on how they can sustainably support agricultural development.

1.4 Terms of Reference

AEDS as the consultants to this survey provided leadership and technical support to facilitate the development process for the survey to the state of the agricultural sector report. The consultants' responsibilities included taking overall responsibility for drafting final report. The Terms of References for undertaking the work at hand were as follows:

- Conducting literature review on the country's agriculture sector performance and identify critical factors impacting on production and marketing in agriculture
- Carry out Key Informant Interviews (KIIs) with key stakeholders in the public and private sectors;
- Prepare a synthesized paper or executive summary (max of two pages) focusing on key observations/findings;
- Prepare and present the draft to Zimbabwe Agriculture Society (ZAS), Financial Gazette (FINGAZ) and Commercial Bank of Zimbabwe (CBZ);
- Submit the final report; and
- Develop work plans and monitoring and evaluation plan for the implementation and evaluation of proposed policy reforms that are needed to transform it into a vibrant sector.

1.5 Scope of Study

This agriculture sector study covered all eight agriculture/rural provinces namely, Mashonaland Central, Mashonaland West, Mashonaland East, Masvingo, Manicaland, Midlands, Matabeleland North and Matabeleland South. Harare and Bulawayo were excluded as they are considered urban provinces (see research methodology and findings sections). Data was gathered from provinces, farming regions and districts throughout the country.

1.6 Justification of the Study

This study was carried out to produce findings that will serve as a mechanism to identify, prioritise agriculture improvement areas and provides a benchmark upon which future improvements in the sector will be measured. In addition, the study was undertaken with a view of identifying opportunities for further investment in the agricultural sector. It is also aimed at informing policy makers in terms of decision making.

1.7 Methodology

The study on state of agriculture sector in Zimbabwe was developed through extensive document reviews of previous case studies and international experiences on agriculture. In addition, an integrated triangulation approach that allows for the collection and analysis of both qualitative and quantitative data was also used. Approaches that were used are primary data collection through interviews using interview guides and questionnaires; and secondary data sources, through desk review of previous studies on agriculture sectors from other developing countries, relevant national policies such as Zimbabwe Agriculture Investment Policy, Zimbabwe National Agricultural Policy Framework, Comprehensive Africa Agricultural Development Policy and National Budget Statements. Key informant interviews, case studies and focus group discussions were employed to collect data. The key informant interviews to gather primary data were held as follows; parastatals (11), agricultural extension officers and veterinary officers (104), business membership organisations (7), industry (21), development partners (5), and banks (15). In addition to key informant interviews, 120 farmers were interviewed and 3 focus group discussions were held.

Survey questionnaires were used to complement key informant interviews and focus group discussions. The interview guides and questionnaires sought to collect data on production trends of various crops and livestock, agricultural infrastructure and its effect to agricultural production, the role of agriculture sector produce markets, the role between finance and agriculture production and the effect of climate change on agriculture productivity. Raw gathered by the survey cleaned by checking and eliminating data entry and other errors. Survey data was analysed with SPSS general version IBM 22 in respect to descriptive and inferential statistics.

2 REVIEW OF RELATED LITERATURE ON AGRICULTURE

2.1 Introduction

This chapter presents the theoretical underpinning of the agricultural sector, global trends on agricultural production and challenges faced by farmers. This review is undertaken with a view of building a solid theoretical underpinning for the research as this will be tied to the research objectives.

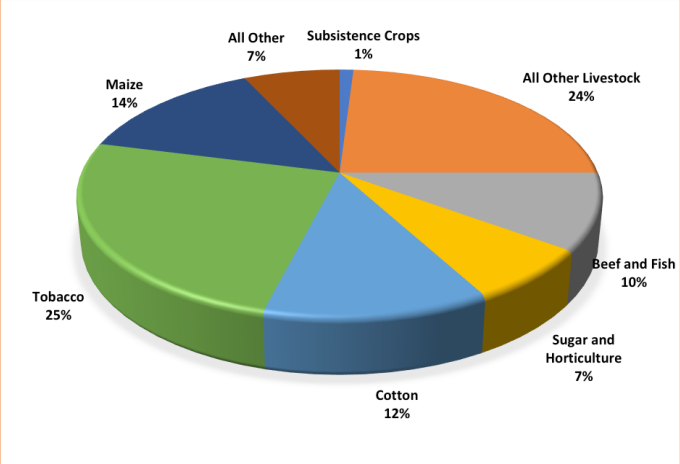
2.2 Profile of the agricultural sector

Agriculture is defined as the use of land for production of food, fodder, fibre, energy, medicine, etc and for grazing (landscape preservation) (Helcom, 2001). Of the four subsectors of agriculture (growing of crops, farming of animals, mixed farming, agricultural service activities), the first three subsectors share many characteristics, including in the structure of, and trends in, employment, and face similar opportunities and threats. The fourth subsector is primarily involved in service activities that are dependent on agriculture with landscape gardening involving direct links with the final customer. However, globally, this subsector is relatively small accounting for less than 10% of sectoral employment. In the same vein, market gardening activity is also relatively small accounting for less than 5% of activity. These two activities, market gardening and landscaping gardening represent niche opportunities for a small number of entrepreneurs but their impact is very small relative to the developments that are occurring in mainstream agricultural activities. Given the dependence of market gardening on agriculture and other external factors, trends in the subsector are similar to the other three sectors.

In Zimbabwe, Agriculture occupies a central place in the Zimbabwean economy for employment, incomes and poverty reduction. It contributes 15-18 percent of Gross Domestic Product (GDP), 23 percent to the total formal employment, and provides livelihoods to approximately 70 percent of the rural population (54 percent of which are women). It also supplies about 63 percent of industrial raw materials with the share of agriculture in manufacturing value added at 60 percent, and the share in export earnings at 30 percent. Ministry of Agriculture (2018) noted that 15 out of the 31 industry clusters in Zimbabwe depend on agriculture for feedstock. Agriculture-related employment supports a third of the formal labour force.

Figure 2.1 shows the contribution of various commodities to agricultural GDP. Maize, tobacco and cotton account for more than 50 percent of the agricultural GDP, with tobacco leading the pack with 25 percent, followed by maize at 14 percent, and cotton at 25 percent. Ten percent is accounted for by the beef and fisheries sectors, whilst about 24 percent is devoted to the rest of the livestock like sheep, goats, pigs, poultry and ostrich. Within the milieu of commodities; tobacco, cotton, sugar, horticulture, tea, and bananas collectively account for about 40 percent by value of national exports. The performance of the agricultural sector therefore has a direct bearing on overall national economic performance, and on human development especially with regard to national and household food and nutrition security.

Figure 2.1 Contribution of various agro sub-sectors to Agriculture GDP



Source: ZIMSTAT, 2017

2.3 Global Trends in Investments into Agriculture

Overall, agriculture remains much less capital intensive in low- and middle-income countries (FAO, 2017). FAO (2017) noted that to date low- and middle-income countries invest in agriculture almost as much, in absolute terms, as high-income countries, that is, around US$190 billion in both country groups. In the period 1991–2014, agricultural investment levels increased in all country groupings, although at different rates. In high-income countries, investment increased from around US$120 billion to US$190 billion, an annual average growth rate of around 2 percent. In China, investments into agriculture grew from less than US$10 billion to US$75 billion, a growth rate of around 9 percent, while investment in agriculture in the remaining low- and middle-income countries grew from US$45 billion to US$115 billion, a growth rate of around 4 percent.

The preponderance of low- and middle-income countries in global investments in agriculture does not imply the sector is seen as more important, relative to its size. A comparison between the shares of agricultural investment in total investment and the shares of agricultural value added in GDP reveals important structural differences across groups of countries, as well as different dynamics.

First, only in high-income countries is the agricultural investment share larger than agricultural value added share. In the last two decades, high-income countries have always devoted a larger share of investment to agriculture than the share of the sector in GDP. This is reflected in the fact that the 'agricultural investment orientation ratio' has remained consistently above 1. In low- and middle-income countries, in contrast, this ratio is much lower, at around 0.4 (FAO, 2017).

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Second, diverging patterns across regions have developed in the past two decades. While the investment orientation ratio is increasing in high-income countries, East Asia and the Pacific (including China), South Asia, Europe and Central Asia, it is decreasing in the Middle East, North Africa, sub-Saharan Africa and, to some extent, Latin America and the Caribbean.

Degrees of capital intensity in agriculture sectors also vary. FAO (2017) noted that agriculture in high income countries is significantly more capital- intensive than in low- and middle income countries – it requires 4 units of capital to generate one unit of value added, compared to around 1.5 in low- and middle-income countries. However, in East Asia and the Pacific (including China), South Asia, Europe and Central Asia, the capital-intensity of agricultural production is increasing. While this cannot be univocally interpreted as a signal of convergence towards the type of agriculture found in high-income countries, it may indicate that capital is progressively replacing other inputs and factors, particularly labour.

In fact, the share of labour employed in agriculture in these regions is decreasing. In contrast, in the Middle East and North Africa, sub-Saharan Africa, and Latin America and the Caribbean, capital-intensity has fallen. This study seeks therefore to review the state of play of investments into Zimbabwe's agricultural sector.

2.4 Trends in Food Prices

After peaking in 2008 and again in 2011, FAO's real food price index has fallen back to levels reached in the early 1980s, although it remains well above the low levels of the 1990s and early 2000s. The most recent joint report by FAO and the Organisation for Economic Co-operation and Development (OECD) provides a somewhat mixed picture of medium-term developments in real food commodity prices to 2025. FAO and OECD noted that while the prices of meat and cereals, with the exception of coarse grains, are projected to decline in real terms, prices for dairy products will tend to rise over the next 10 years.

FAO and OECD notes that future levels of food prices depend, among other factors, on how production will be able to accommodate tightening resource constraints and climate change. Climate change may jeopardize the possibility of expanding agricultural yields in some regions of the globe, which is required to meet growing demand; the result would be upward pressure on prices (FAO, 2016c). In addition, mitigation policies may require the internalisation of carbon-emission costs. Furthermore, prices in the long run may also rise, as long as there will be a need to reduce emissions of greenhouse gases (GHGs) emissions in order to comply with international agreements on climate change. However, adopting these mitigation measures would impose additional costs (at least in the short run), which would put upward pressure on output prices (Smith et al., 2014).

This observation is expected to affect the competitiveness and viability of farmers in developing countries which includes Zimbabwe. Going forward, in order to mitigate possible losses coming on the back of subdued prices, it is important Zimbabwe implement measures that aimed reducing the cost of doing business in the agriculture as well as raising productivity.

2.5 The Impact of Climate Change Vulnerability

According to the most recent assessment report of the Inter- governmental Panel on Climate Change (IPCC), published in 2014, levels of anthropogenic emissions of GHGs are now at their highest in history (Porter et al., 2014). Agricultural production and its effect on land use are major sources of these emissions. Charting environmentally sustainable pathways for agricultural development has a central role to play, therefore, in mitigating climate change.

The FAO (2017) observed that the impacts of climate change are expected to be most adverse in low- and middle-income countries, where millions of people depend on agriculture and are vulnerable to food insecurity. In 2015, world leaders, at the United Nations Framework Convention on Climate Change (UNFCCC) held in Paris, explicitly acknowledged the need to address this threat. The world leaders negotiated, under the aegis of the UNFCCC, the Paris Agreement on climate change, which recognises 'the fundamental priority of safeguarding food security and ending hunger, and the particular vulnerabilities of food production systems to the adverse effects of climate change' (UNFCCC, 2015).

In its latest assessment, the IPCC has stated with high confidence that in low-latitude countries crop production will be 'consistently and negatively affected by climate change'. In northern latitudes, the impacts on production are more uncertain; there may be positive or negative consequences (Porter et al., 2014). Increasing variability of precipitation and increases in the frequency of droughts and floods are likely to reduce yields in general. Although higher temperatures can improve crop growth, studies have documented that crop yields decline significantly when daytime temperatures exceed a certain crop-specific level (FAO, 2016e).

The IPCC assessment report has stated with medium confidence that climate change will increase the inter annual variability of crop yields in many regions. The use of climate models in conjunction with crop models is contributing valuable insights into the possible impacts of climate change on yields. For the main cereals, projected yields, due to climate change under the different representative concentration pathways show significant regional increases and decreases but mostly downward shifts globally (FAO, 2016e).

A meta-analysis of 1090 studies on yields (primarily wheat, maize, rice and soybeans) under different climate change conditions indicates that climate change may significantly reduce yields in the long run. Further analysis by FAO found quite distinct patterns for low- and middle-income countries in tropical areas, and high-income countries in temperate zones. For the former, most estimates for crop yield impacts are negative, with the share of negative estimates increasing the further into the future the study projects. Compared with those outcomes, estimates for high-income countries showed a much larger share of potentially positive changes (FAO, 2016e).

Higher temperatures and less reliable supplies of water are expected to create severe hardships for small-scale livestock producers, particularly in arid and semi-arid grassland and rangeland ecosystems at low latitudes (Hoffman and Vogel, 2008). In the same vein, heat and water scarcity will have a direct impact on animal health and will also reduce the quality and supply of feed and fodder (FAO, 2009). There is some evidence that global warming has already affected the distribution of some marine species, with warm-water species shifting towards the poles (FAO, 2013a). One modelling exercise has projected that the catch potential in tropical countries could decline by 40 percent, while in high-latitude waters the potential could increase by between 30 and 70 percent (Cheung et al., 2009). Changes in temperature and rainfall will also cause the distribution of inland species to shift.

The IPCC has projected that global warming between 1 and 2°C will have a moderate impact on the planet's biodiversity (Porter et al., 2014). For agricultural ecosystems, there is evidence that some crops species and varieties currently grown in a particular area may not be able to adapt quickly enough to the changes. Because different species will react differently, the complex interactions among species will be disrupted, potentially affecting ecosystem services such as pollination and the control of crop pests by natural predators. Plant and animal pests and diseases may spread into areas where they were unknown before, but important knowledge gaps remain in this area (Porter et al., 2014). For example, in Zimbabwe, the army worm has been noted as one of the menace of climate change. FAO (2017) noted that climate change will also contribute to existing long-term environmental problems, such as groundwater depletion and soil degradation, which will affect food and agriculture production systems.

2.6 Agricultural Productivity and Innovation

To meet demand, agriculture in 2050 when world population reaches 9.73 billion, as noted by the United Nations (UN), the world will need to produce almost 50 percent more food, feed and biofuel than it did in 2012 (FAO,

2017).

In sub-Saharan Africa and South Asia, agricultural output would need to more than double by 2050 to meet increased demand, while in the rest of the world the projected increase would be about one-third above current levels (FAO, 2017).

From a global perspective, meeting the increased demand is not expected to be a major challenge, if past achievements are a guide (FAO, 2017). Historically, much bigger increases in agricultural production have been recorded in comparable time frames. For example, between 1961 and 2011, global agricultural output more than tripled (FAO, 2017). In low-income countries, livestock production has been one of the fastest growing agricultural subsectors. Since the early 1970s, per capita consumption of milk, dairy products and vegetable oils has almost doubled, while meat consumption has almost tripled (Alexandratos and Bruinsma, 2012).

FAO (2017) notes that rapid technological development and innovation offers the prospect of meeting future food needs sustainably. However, this can only be achieved through discerning public policies, increased investments and public-private partnerships, which exploit the opportunities for maintaining current levels of productivity, sustainably raising yields, and reducing poverty and food insecurity.

The question as to whether Zimbabwe will be able to adopt the same strategies and policy measures with a view of coping with global demands of food will be an empirical one.

2.7 Trends in Yields and Agricultural Efficiency

One of the objectives of this study is to review the performance of the agricultural sector from productivity perspectives, that is, yields per hectare. In order to building a theoretical underpinning of agricultural productivity, this section reviews global experience on agricultural productivity.

At a global level, since the 1990s, average annual increases in the yields of maize, rice, and wheat at the global level have been slightly more than 1 percent, much lower than in the 1960s, while those of soybeans and sugarcane have been below 1 percent (FAO, 2017). Because the substantial additional amounts of food needed in coming decades will be produced mainly through yield increases, rather than major expansion of the cultivated area, cereal yield growth rates below 1 percent a year would be a worrying signal. There are also very large differences in crop yields between high-income and low-income countries (see table 2.1). Yields of wheat and rice in low-income countries are currently about half those in high-income countries.

Table 2.1:Annual Average Crop Yields [2001-2012] Tonnes/Hectare

Country Group	Wheat	Rice	Maize
Low income	1.82	3.3	1.54
Lower middle income	2.74	3.65	2.74
Upper middle income	2.67	5.28	4.41
High income	3.5	6.64	8.99
World	2.92	4.16	4.87

Source: FAO (2017)

Yields of major crops (cereals, roots and tubers, pulses, sugar crops, oil crops and vegetables) also vary substantially across regions. Estimated yield gaps, expressed as a percentage of potential yields, exceed 50 percent in most low-income countries. They are largest in sub-Saharan Africa (76 percent) and lowest in East Asia (11 percent). The gap between farm yields and potential yields reflects constraints, such as insufficient adoption of more productive technologies, a lack of market integration and gender inequalities in small-scale family farming (FAO, 2011b).

FAO noted that in recent decades increased use of land, irrigation and agro-chemicals played a major role in the growth of agricultural production during the Green Revolution. Sadly, gains in agricultural production were often accompanied by negative effects on agriculture's natural resource base, including land degradation, salinization of irrigated areas, over-extraction of groundwater, the build-up of pest resistance and the erosion of biodiversity. Agriculture has also damaged the wider environment through deforestation,

the emission of greenhouse gases and nitrate pollution of water bodies (FAO, 2011a).

This current study aims to review Zimbabwe's productivity trends and benchmark with its regional peers and to some extend compare with global productivity trends with a view of drawing lessons. In the same vein, the study also seeks to assess the extent to which agricultural productivity has impacted on the environment.

1.8 Global Trends on Agricultural financing

One of the objectives of this study is tom review the impact of finance on the state of agricultural sector in Zimbabwe. In providing theoretical underpinnings to this objective, this section reviews global trends on agricultural financing with a view of juxtaposing the observations with Zimbabwean experience.

Overall, the FAO (2017) noted that the public sector is not a major investor, but its role can be catalytic. Public investments in agriculture, related infrastructure, and research and development only represent a fraction of total investment in the sector in low-income countries. Most investments in agriculture tend to be made by private sector agents, especially by the farmers themselves. This is particularly so because more than 90 percent of the estimated 570 million farms worldwide are family farms (FAO, 2014).

In low-income countries, the vast majority of these farms are less than 5 hectares in size which is a similar situation to Zimbabwe where the majority are resettled under A1 as well in communal areas. Many smallholders tend to face major barriers accessing the finance needed for investment in improving productivity and adopting sustainable farming practices. FAO (2016) noted that most of the smallholders farmers have limited financial literacy, collateral and credit history, and few other sources of income.

FAO (2017) noted that governments can support and play a catalytic role in stimulating pro-poor investments, by securing producers' property and tenure rights, and developing rural infrastructure and public services. Public investment in public goods and services – such as institution building, agricultural extension, productivity-enhancing research, rural transport, health, education and social protection – will be fundamental to creating an environment favourable to pro-poor investment. A positive recent trend is the emergence of partnerships between the public sector, private sector and communities, which promote agriculture and rural development, poverty reduction, food security and improved nutrition.

Globally, agricultural investments generally are considered high-risk given the susceptibility of production to weather and other climatic hazards. This applies particularly to low-income countries, where infrastructure, processing capacity, and cold storage and transportation may be poorly developed. This limits farmers' options to reduce the impacts of seasonality and uncertain weather conditions on incomes and local price stability. Improving infrastructure, building resilience, and strengthening risk-coping mechanisms (e.g. through social protection and agricultural insurance) will be essential to help farmers and agricultural investors hedge against the risks inherent in agricultural production (FAO, 2017).

In order to reduce the risk involved in funding agriculture, FAO (2017) noted that provision of incentives to private banking institutions (including cooperatives) aimed increase their rural coverage has been effective in promoting access to finance to smallholder farmers. In the same vein, FAO noted that creation of employment opportunities in infrastructure development and the public procurement of agricultural products generated by smallholders can also help to stabilize incomes and provide opportunities for low-income rural people to acquire productive assets and inputs, such as land, equipment, fertilizers and seeds. This has been observed as one way in which government plays catalytic role in encouraging funding for the agricultural sector.

However, more in general, private investments in agriculture will be influenced through broader agricultural and food price policies. FAO (2017) noted that Governments around the world provide incentives to farmers and agribusinesses in order to increase agricultural production, influence input costs, supplement farm incomes and achieve other social, economic and environmental objectives, such as landscape preservation, water conservation, poverty reduction, and climate change mitigation and adaptation. Much of the existing production support, worldwide, involves subsidies on inputs, such as fertilizer and energy, particularly fossil fuels, or direct payments to farmers. The OECD countries spent US$211 billion in agricultural production support in 2015, while in the non-OECD countries for which data are available, this support reached US$352 billion in the same year (OECD, IEA, NEA and ITF, 2015).

From the perspective of sustainable development, such support measures may have unintended impacts on the environment. For example, input subsidies may induce inefficient use of synthetic fertilizers and pesticides and increase the emission intensity of production. Almost half of all agricultural subsidies provided by governments of OECD countries in 2010-2012 were classed as 'potentially most harmful to the environment' because they induced greater demand for chemical fertilizers and fossil fuels, which lead to more GHG emissions (OECD, IEA, NEA and ITF, 2015). Such policies influence the magnitude and the nature of investments in agricultural sectors and food systems. Making support conditional upon the adoption of practices that lower emissions and conserve natural resources would be one way of aligning agricultural development and climate goals. Policies in areas such as nutrition, food consumption, food price support, natural resources management, infrastructure development and energy, may similarly need to be reset (FAO, 2016).

This study seeks to evaluate the role of finance in Zimbabwe's agricultural sector as well as reviewing impediments faced by both the financiers and farmers with a view of coming up with policy measures.

Subsequent chapters presents findings of the study based on the objectives of the study.

3 PRODUCTION TRENDS IN CROPS

3.1 Introduction

This chapter reviews the state of the agricultural sector in Zimbabwe by analysing trends in crops focusing on area cultivated, annual production and productivity levels. The nature of crops whose trends were established are cereals which form the staple food for the country, cash crops, oil seeds, pulses, plantation crops and horticultural crops. A detailed analysis of production and yields by province highlighting the main producing districts in the province was carried out to guide policy interventions. The contributions to national production and productivity levels by land ownership structure was also analysed for major crops that are meant for food security in the country.

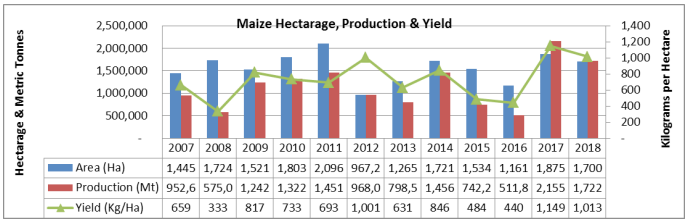
3.2 Trends in Cereals

In order to unpack the state of affairs in the production of cereals, this section discusses production trends of maize, sorghum, millet and wheat.

(a) Production Trends of Maize

Figure 3.1 (a) shows production trends of maize from 2007 to 2018. Maize is Zimbabwe's main staple crop grown in all areas of the country at both small scale and large scale. The crop is so central to people lives and as such because of competitiveness challenges, the Government provides farmer with price support policy incentive of $390 per metric tonnes which is higher than the average regional parity price of $200 per metric tonnes.

Figure 3.1 (a): Maize Production Trends



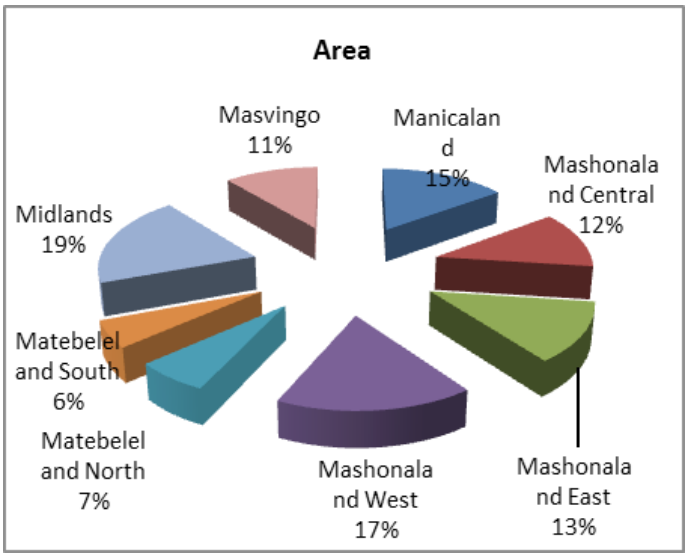
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Area (Ha)	1,445	1,724	1,521	1,803	2,096	967,2	1,265	1,721	1,534	1,161	1,875	1,700
Production (Mt)	952,6	575,0	1,242	1,322	1,451	968,0	798,5	1,456	742,2	511,8	2,155	1,722
Yield (Kg/Ha)	659	333	817	733	693	1,001	631	846	484	440	1,149	1,013

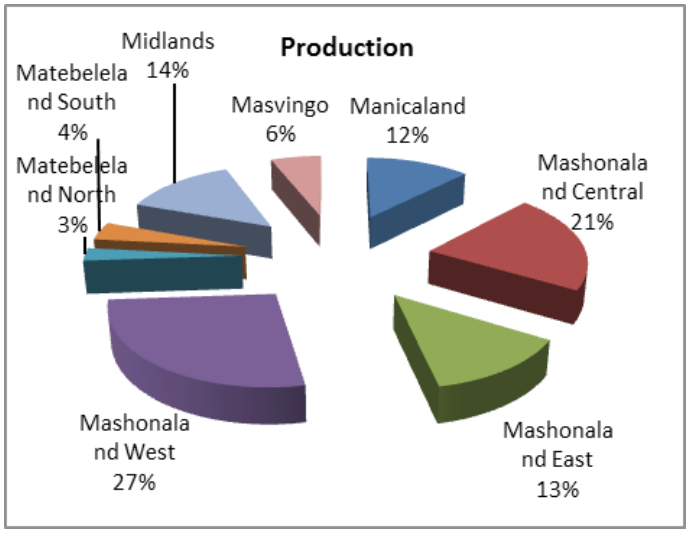
Source: Ministry of Agriculture (2018)

For the last decade production of maize was below the national optimal level. In a number of cases there was inconsistency in production. For example, in 2007 the country produced 952 600 metric tonnes and later fell sharply to 575 000 metric tonnes in 2008. For the subsequent years, that is, 2009, 2010 and 2011, maize output rose to 1.242 million metric tonnes, 1.322 million metric tonnes and 1.451 million metric tonnes, respectively. However, in 2012 and 2013 maize output fell down to 968 000 metric tonnes and 798 500 metric tonnes, respectively again resembling inconsistency in production. In 2014 maize output went up to 1.4 million metric tonnes and later fell to 742,200 metric tonnes and 511,800 metric tonnes in 2015 and 2016, respectively. In responding to this anomaly, Government responded by introducing Command Agriculture in 2017 and hectarage increased by 61% while production recovered by 321% to reach a record output of 2,155,526 metric tonnes. In 2018 season, due to effects of climate change, the trends were on a decreasing trend with hectarage reducing by 9% while production reduced by 20%.

One of the striking features which was linked to low production, was reduced hectarage and low yield each and year maize output plummeted. For example, in 2008 and 2016, which were marked by the lowest maize output, realized 0.333 metric tonnes and 0.4 metric tonnes per hectare, respectively. In years where the country realized good harvest for example, in 2017 and 2018, the yield per hectare averaged at 1 metric tonnes. In both years, the country witnessed increase in hectarage under maize production.

A review of provincial contribution to national output shows that in 2018 Midlands province had the highest area under maize contributing 19% of the total area under the crop followed by Mashonaland West province which had 17% while on third and fourth positions were Manicaland and Mashonaland East provinces with 15% and 13% respectively (see figure 4.1 (b)). Owing to semi-arid conditions, Matabeleland South province at 6% had the least contribution to area under maize while Matabeleland North was second last with 7%. In Midlands most of the hectarage came from Gokwe North and Gokwe South which both had a combined area of 173,147 hectares or 51% of the provincial area under maize which is also 10% of maize area at national level. The prevalence of smallholder resettled farmers in Gokwe North and Gokwe South provinces accounts for the significant amount area under maize.





Source: Ministry of Agriculture (2018)

The study noted that Mashonaland West which was third in area (ha) has highest maize production with high average yield of 1.55 metric tonnes per hectare which is 2.3 times higher than the 0.68 metric tonnes per hectare for Midlands. The differences in yield in these two provinces could be attributed to the rainfall pattern, effects of climate change and agronomic practices. In Mashonaland West, the yield is high because there is a significant number of A1, A2 and small scale commercial farmers who grow maize for commercial purposes and not for subsistence.

The research showed that smallholder farmers both newly resettled and communal farmers do not invest much in crop production and their yields are low compared to commercial farmers. The Respondents interviewed showed underscored that some of the smallholder farmers in natural regions IV and V have a perception that fertiliser burn their crops while others said it destroys soil fertility in their fields. It is also important to note that the country's maize average maize yield at 0.99 tonnes per hectare low when compared to what is achieved in the region where South Africa has an average yield of 5 tonnes per hectare.

A review of sectoral contribution to maize production shows that communal areas (CA) contributes a significant share of maize output of 32% in 2017/18 farming season. The commercial farmers, that is, A2, like the CA, made a significant contribution of the maize output with a share of 31% of total maize output in 2017/18 farming season (see table 3.1).

Table 3.1: Sectoral Contribution to Maize Production (Metric Tonnes)

Sector	Production (Metric tonnes)		%	Contribution (%)	
	2017/18	2016/17		2017/18	2016/17
CA (Communal Area)	540 939	770 862	-30	32	35
OR (old resettlement 1980 -91/2)	136 973	147 068	-7	8	7
SSCA (small scale commercial area)	46 852	64 538	-27	3	3
A1	434 949	521 588	-17	26	24
A2	527 556	643 790	- 18	31	30
Peri-urban	13 433	7 680	75	1	1
Total	1 700 702	2 155 526	-21	100	100

Source: Ministry of Agriculture (2018)

Farmers who were resettled under A1 also made a significant contribution of maize output with a share of 26% of the share of maize output in 2017/18.

From a policy perspective, Government must always provide policy incentives or policy framework aimed at stimulating production in CA, A1 and A2.

Table 3.2: Average Maize Yields by Farming Sector (METRIC TONNES/HA)

Sector	2017/18	2016/17	%
CA	0.54	0.68	-20
OR	0.84	0.95	-12
SSCFA	0.88	1.12	-21
A1	1.30	1.46	- 11
A2	3.82	3.78	1
Peri-Urban	1.54	1.93	-20

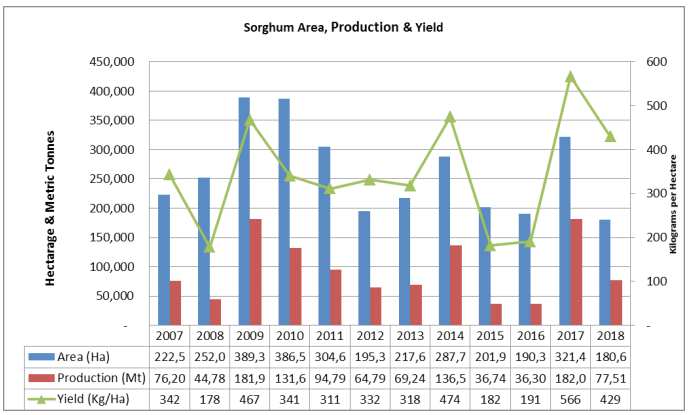
Source: Ministry of Agriculture (2018)

One major take away from the analysis of maize production over the last ten years including recent years when Command Agriculture was launched, the country had, low productivity trends. The maximum maize output per hectare witnessed was one (1) metric tonne which is significantly lower than regional counterparts of five (5) metric tonnes per hectare. While the yields by commercial farmers are modest at an average of two (2) tonnes per hectare the yields by small scale farmers who own 78% of the land are significantly very low at 0.68 tonnes per hectare for communal areas and 0.95 tonnes per hectare for old resettlements. Small scale farmers lack the necessary resources and proper agronomic practices to boost their yields. A robust production and productivity enhancement programme driven by the government targeting low yielding small holder farmers will go a long way in securing the nation's food security while at the same time increasing small holder farmer earnings since they will be able to produce a surplus.

(b) Production Trends of Sorghum

Figure 3.2 (a) illustrate trends in sorghum production. Sorghum is one of the minor staple crops that is also cultivated for beer brewing purposes under contracting farming.

Figure 3.3: Sorghum Trends

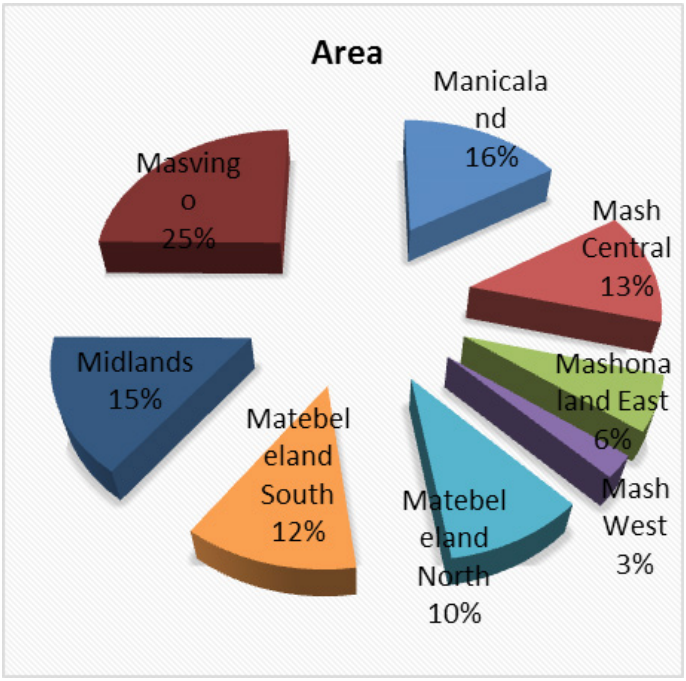


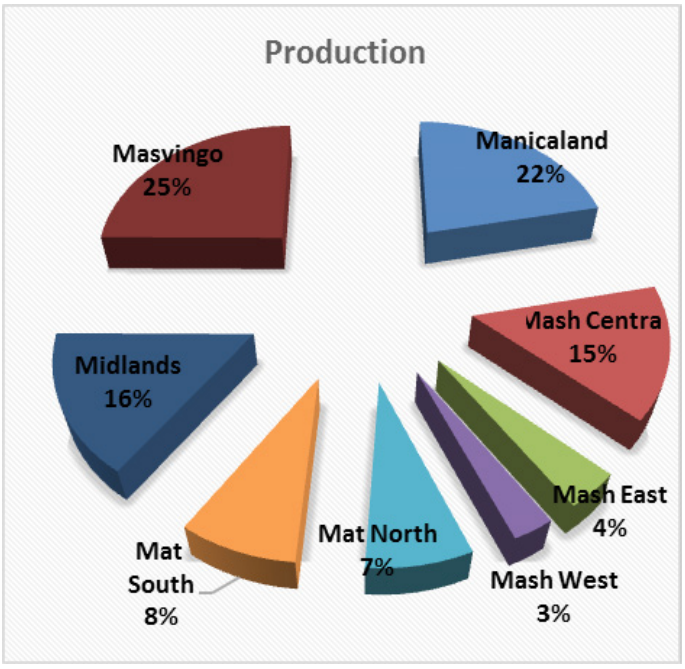
Source: Ministry of Agriculture (2018)

The crop's trends sharply declined in 2015, hectarage reduced 30% while production and yields reduced by 73% and 49% respectively. In 2016 the trend stagnated before increasing in 2017 when 69%, 401% and 197% growth in area, production and yield was respectively recorded. The increase in sound contract farming schemes and favourable weather could be attributed to the increase in production and yield levels. Stakeholders interviewed explained that the dry spell that was experienced from the second week of December 2017 to the end of January in 2018 as noted by respondents contributed to the 57% reduction in 2018 production level to 77,514 metric tonnes and reduced productivity from 0.566 metric tonnes per hectare in 2017 to 0.429 metric tonnes per hectare in 2018. One stakeholder indicated that the reduction in production levels in 2018 whilst the hectage is a slight higher been as a result of increase in production cost as inputs prices flactuated.

The study noted that a provincial level, Masvingo, Manicaland, Midlands and Mashonaland Central provinces were the top four provinces that had the highest area under sorghum in 2018 contributing 25%, 16%, 15% and 12%, respectively to national area under sorghum. Provinces with the lowest area under sorghum production are Mashonaland West contributing 3%, Mashonaland East with 6%, Matabeleland North 10% and Matabeleland South with 12%. The same ranking in area cultivated are maintained in production whereby Masvingo tops the list with 25% followed by Manicaland province with 22% while Mashonaland West ranks last with 3%. Sorghum is a small grain crop that is drought resistant and is grown in region IV and V where temperatures are high and rainfall is low. In Masvingo the main sorghum producing districts are Chiredzi district contributing 50% and Mwenezi contributing 33% of provincial output while at national level these two districts combined produce 21% of national output. In Manicaland province the major sorghum producing districts are Chipinge, Buhera and Mutasa with each contributing 46%, 25% and 13%, respectively.

Figure 3.4: Provincial Contribution to Sorghum Production



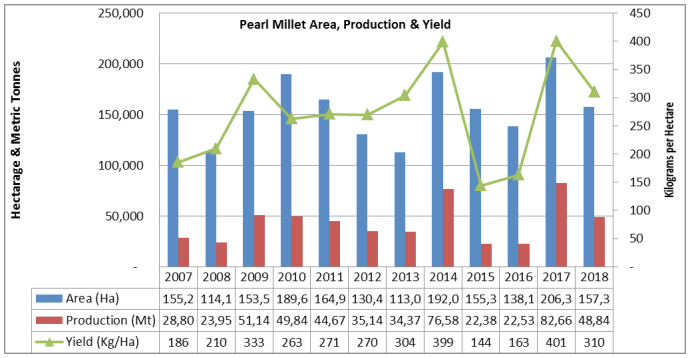


Whilst the highest producing districts have a yield of less than 0.5 metric tonnes per hectare Chipinge district is the only exception producing 1 tonne per hectare. Other high yielding districts though their contribution to national output is small are Bindura with a yield of 2.6 metric tonnes per hectare, Mazowe with 1.6 metric tonnes per hectare and Zvimba with 1.2 metric tonnes per hectare. Government and other stakeholders need to come up with strategies that improve sorghum yields so that the potential of low yielding districts is optimized. As noted above there is an inverse relationship in terms of capabilities between sorghum producing districts and maize producing districts hence it will be prudent for districts to specialize with each focusing on crops that it has comparative advantage.

(c) Trends in Pearl Millet Production

Overall, the production of pearl millet over the last ten years was below optimal level. Like other cereal crops pearl millet trends oscillate with notable peaks and troughs in hectarage, production and yield.

Figure 3.5: Pearl Millet Trends



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Area (Ha)	155,2	114,1	153,5	189,6	164,9	130,4	113,0	192,0	155,3	138,1	206,3	157,3
Production (Mt)	28,80	23,95	51,14	49,84	44,67	35,14	34,37	76,58	22,38	22,53	82,66	48,84
Yield (Kg/Ha)	186	210	333	263	271	270	304	399	144	163	401	310

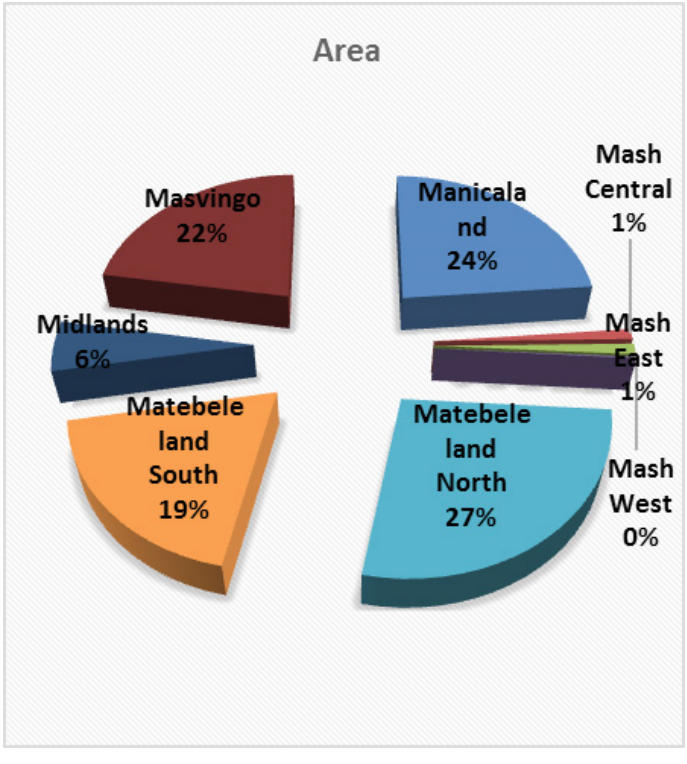
Source: Ministry of Agriculture (2018)

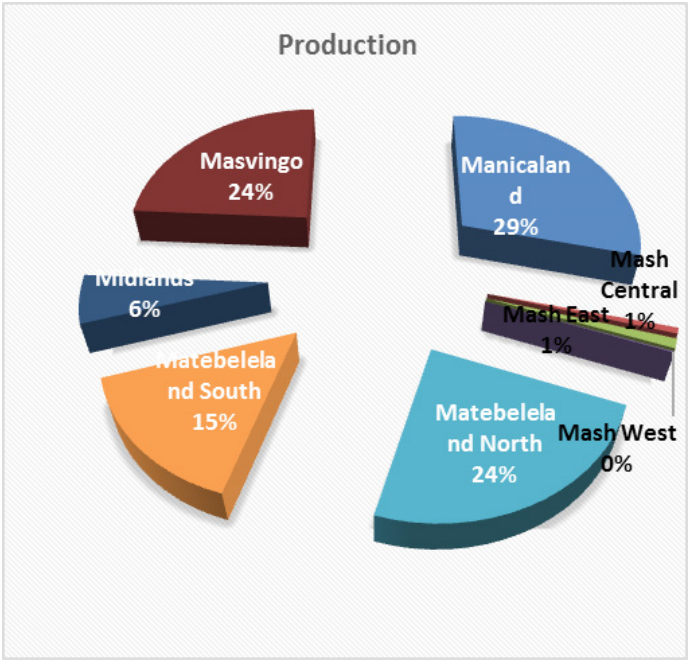
The country recorded total output of pearl millet in 2007 of 28,800 metric tonnes and went down to 23,953 metric tonnes in 2008. However, in 2009, 2010 and 2011, pearl millet output was 51,142 metric tonnes, 49,840 metric tonnes and 44,670 metric tonnes, respectively. Of concerns are sudden falls in output in 2015 where the country recorded output of 22,387 metric tonnes down from 76,587 metric tonnes in 2014. Ironically, the country went on to record 22,539 metric tonnes in 2016 which was a marginal increase from 2015 and went on to jump by almost four times to 82,663 metric tonnes in 2017 (see figure 3.3).

With respect to area under production, in 2015 area declined by 19% while comparably production and yield significantly reduced by 71% and 64% respectively. Farmers interviewed noted that the level of hectarage under pearl millet is higher than the production levels, in the sense that the proportion growing on a small scale is larger at about 77 percent, with only about 6 percent growing on a larger scale. Hence, pearl millet in Zimbabwe is grown almost entirely on a small scale among the interviewed farmers, constituting about 97 percent of the farmers. A marginal recovery in trends was registered in 2016 before a major recovery of 49% in area, 267% in production and 146% in yield was recorded in 2017.

A review of the contribution of pearl millet production by area in shows that this is traditionally dominated by was dominated by Matabeleland North province which contributed 27%, followed by Manicaland, Masvingo and Matabeleland South province with a share to national area under pearl millet was 24%, 22% and 19%, respectively. On production Manicaland surpassed Matabeleland North province which was highest on hectarage to contribute 29% of national output while Matabeleland North and Masvingo provinces had 24% each. Matabeleland South was the fourth largest pearl millet producer contributing 15% to national output. The main producing districts in Manicaland are Buhera and Mutare while in Matabeleland North province Gwanda, Bulilima and Beitbridge are the major producers. In Masvingo province main pearl millet producing districts are Mwenezi, Gutu and Chiredzi. Strategies that focus on producing a crop that a district has comparative advantage in unlocks the most value out of each district and optimizes contribution to national food security. Market linkages programmes will become crucial in distributing the crops to non-producing districts and provinces.

Figure 3.6: Provincial Contribution to Pearl Millet Production



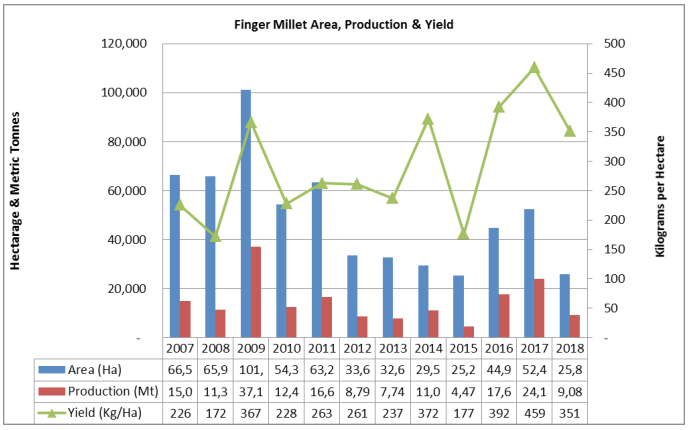


Pearl millet yields in Zimbabwe are less than 0.5 tonnes and there is huge scope to increase the yields to higher levels.

(d) Production Trends in Finger Millet

Like other cereals, the performance of finger millet is not pleasing. In 2007 and 2008 the country recorded 15,000 metric tonnes and 11,350 metric tonnes of finger millet, respectively (see figure 4.4). In 2009 finger millet production rose to 37,100 metric tonnes before plummeting to 12,400 in 2010. Thereafter, the country witnessed paltry production output of 8,792 metric tonnes, 7,748 metric tonnes, 11,000 metric tonnes and 4,470 metric tonnes in 2011, 2012, 2013, 2014, and 2015, respectively. In 2016 and 2017, finger millet production went up to 17,610 metric tonnes and 24,100 metric tonnes, respectively before it receded to 9,085 metric tonnes in 2018.

Figure 3.7: Finger Millet Trends



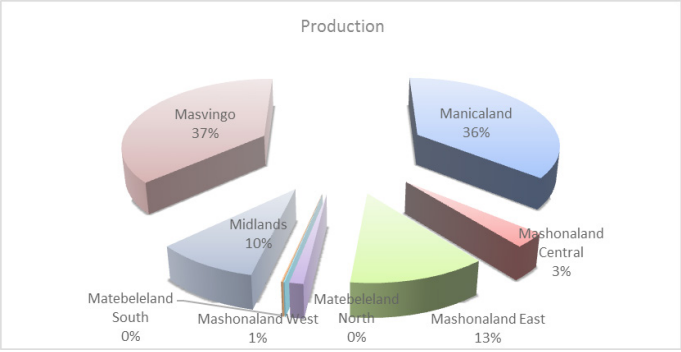
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Area (Ha)	66,5	65,9	101,	54,3	63,2	33,6	32,6	29,5	25,2	44,9	52,4	25,8
Production (Mt)	15,0	11,3	37,1	12,4	16,6	8,79	7,74	11,0	4,47	17,6	24,1	9,08
Yield (Kg/Ha)	226	172	367	228	263	261	237	372	177	392	459	351

Source: Ministry of Agriculture (2018)

With respect to area under production, in 2015 area reduced by 15%, production by 59% while yield reduced by 52%. Unlike other cereal crops that had marginal increase in trends in 2016, finger millet trends significantly increased as follows; area by 78%, production by 294% and yield by 122%. 2017 season registered a further increase in trends while in 2018 just like in other cereal crops trends declined by 51% in hectarage, 62% in production and 23% in yield.

The study noted that provinces that were leading in finger millet production in 2018 were Masvingo with 37% of total output, closely followed by Manicaland with 36% while Mashonaland East was on number 3 with 13% production and Midlands province was at number 4 contributing 10%. Mashonaland West which topped in maize production had a paltry 1% while Mashonaland Central contributed 3% and nothing came from Matabeleland North and Matabeleland South (see figure 3.4).

Figure 3.8: Provincial Contribution of Finger Millet Production

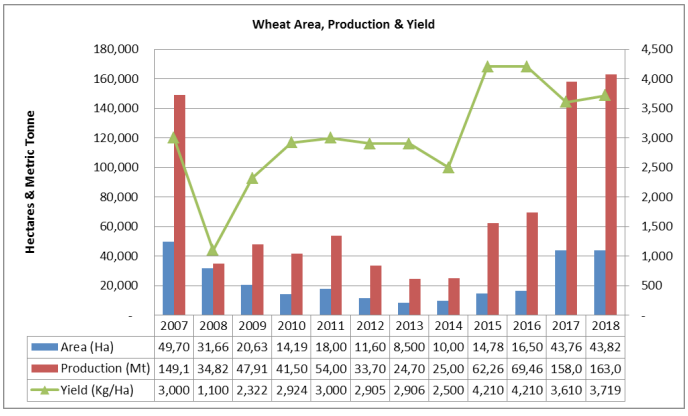


Finger Millet production should be strengthened in high producing districts such as Gutu in Masvingo and Buhera in Manicaland. Programs that incentivize production of the crop such as subsidized inputs and awards to best producing farmers can be introduced to boost production of the crop.

(e) Wheat Production Trends

Wheat is a strategic cereal crop that forms the major raw material used in the baking industry in the country. Over the years wheat production of wheat in terms of output has been largely disappointing. For example, the country recorded a total of 149,110 metric tonnes in 2007 but plummeted to 34,829 metric tonnes in 2009 and went on to produce an average output of 41,800 metric tonnes in for eight years. However, in 2017, the country recorded a massive jump in wheat production which saw it harvesting 158,000 metric tonnes of wheat.

Figure 3.9: Wheat Trends



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Area (Ha)	49,70	31,66	20,63	14,19	18,00	11,60	8,500	10,00	14,78	16,50	43,76	43,82
Production (Mt)	149,1	34,82	47,91	41,50	54,00	33,70	24,70	25,00	62,26	69,46	158,0	163,0
Yield (Kg/Ha)	3,000	1,100	2,322	2,924	3,000	2,905	2,906	2,500	4,210	4,210	3,610	3,719

Source: Ministry of Agriculture (2018)

The hectarage under wheat production for the period 2013 to 2016 recorded a steady increase with 2015 recording the highest growth of 48% in area, 149% in production and 68% in yield. Another respondent noted that due to Zimbabwean Government special import substitution wheat loan scheme to fund wheat production inputs such as wheat seed, fertilizers, chemicals and tillage services for producers with irrigation facilities an increase in wheat production and yield was witnessed. Despite hectarage and output increasing by 167% and 127% respectively the 2017 yield reduced by 14%. In 2018 season, a slight increase in area under wheat of 0.1% was realized while both production and yield marginally increased by 3% to estimates of 163,000 metric tonnes and 3,719 metric tonnes per hectare respectively. Harvesting of wheat is still underway and the final output is expected to be between 160,000 and 165,000 metric tonnes.

3.3 Trends in Cash Crops

This section discusses production trends of cotton seed, tobacco and oil seeds.

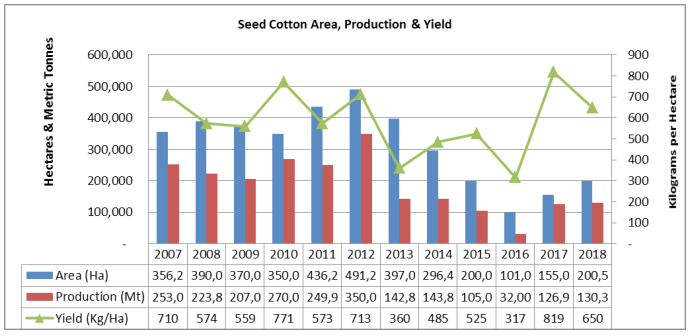
(a) Seed Cotton Production Trend

Seed cotton is one of the major cash crops grown by more than 300,000 small scale communal and resettled farmers under contract farming scheme with cotton merchants. The crop has been affected by side marketing of contracted crop, inadequate input support and poor agronomic practices. Depressed international market prices of lint directly affect local prices of seed cotton since more than 70% of local production is exported.

Prior 2012 season seed cotton area and production averaged 356,000 hectares and 259,000 metric tonnes respectively while the yield ranged from a minimum of 559 kg per ha and a maximum of 771 kg per ha. From 2013 to 2016 season, seed cotton area and production has been on a downward trend. In 2013 there was a sharp decrease in area cultivated by 19% from 491,207 ha to 397,000 ha and production fell by 59% from 350,000 metric tonnes to 142,848 metric tonnes. In 2016 seed cotton production reduced to a record low of 32,000 metric tonnes and Government intervened by injecting working capital.

Trends in seed cotton recovered in 2017 season when hectarage increased by 53% from 101,000 hectares in 2016 to 155,000 hectares while production increased by 297% from 32,000 metric tonnes to 126,995 metric tonnes.

Figure 3.10: Seed Cotton Trends



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Area (Ha)	356,2	390,0	370,0	350,0	436,2	491,2	397,0	296,4	200,0	101,0	155,0	200,5
Production (Mt)	253,0	223,8	207,0	270,0	249,9	350,0	142,8	143,8	105,0	32,00	126,9	130,3
Yield (Kg/Ha)	710	574	559	771	573	713	360	485	525	317	819	650

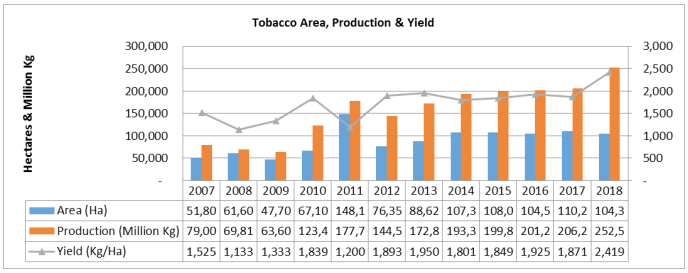
Source: Ministry of Agriculture (2018)

The 2017 season yield increased by 159% from 317 kg per ha to 819 kg per ha. To improve competitiveness of the crop, strategies to address production and productivity issues need to be implemented. In addition, the price issue is one of the factors negatively affecting cotton production. The study noted that the current seed cotton varieties have potential to produce more than 2 metric tonnes per hectare under rain fed production. The study also recommended that the government should set a minimum price that is conducive to guarantee minimum return to farmers.

(b) Tobacco Production Trends

Zimbabwe is the biggest producer of flue-cured tobacco in Africa and the fifth largest in the world after China, Brazil, India and the United States of America (USA). Following the recent shift in the agrarian structure and demographics since early 2000, 62% of tobacco production is by small and medium scale farmers.

Figure 3.11: Tobacco Trends



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Area (Ha)	51,80	61,60	47,70	67,10	148,1	76,35	88,62	107,3	108,0	104,5	110,2	104,3
Production (Million Kg)	79,00	69,81	63,60	123,4	177,7	144,5	172,8	193,3	199,8	201,2	206,2	252,5
Yield (Kg/Ha)	1,525	1,133	1,333	1,839	1,200	1,893	1,950	1,801	1,849	1,925	1,871	2,419

Source: TIMB (2018)

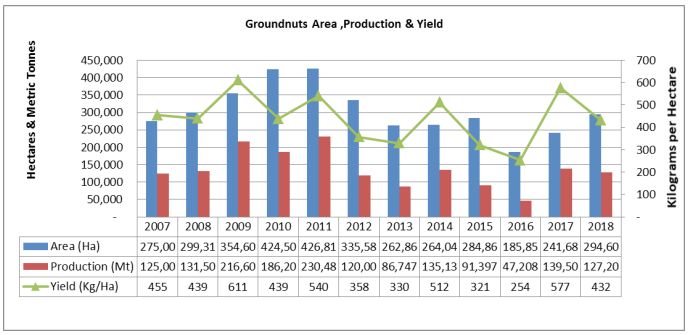
Tobacco trends overs the past 5 years were steady at the following averages; hectarage 106,910 ha, production at 198,997 metric tonnes and yield at 1,862 kg per hectare. Trends notably increased in 2018 when production increased by 22% while the yield also increased by 29%. Study findings observed that the sustained high area cultivated and production in tobacco can be attributed to the competitive producer price and the contract farming scheme arrangement.

3.4 Trends of Oilseeds

(a) Groundnuts Production Trends

Groundnuts have over the past centuries been a celebrated favorite legume in Zimbabwe which generally can be grown in most soil types. In terms of production, the country recorded an average output of 177,600 metric tonnes of groundnuts between 2007 and 2011 with the highest output of 230,480 metric tonnes recorded in 2011. However, from 2012 and onwards groundnuts production an averaged output of 106,000 metric tonnes per year which is significantly lower than previous years (see figure 3.8 (a)).

Figure 3.12: Groundnuts



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Area (Ha)	275,00	299,31	354,60	424,50	426,81	335,58	262,86	264,04	284,86	185,85	241,68	294,60
Production (Mt)	125,00	131,50	216,60	186,20	230,48	120,00	86,747	135,13	91,397	47,208	139,50	127,20
Yield (Kg/Ha)	455	439	611	439	540	358	330	512	321	254	577	432

Source: Ministry of Agriculture (2018)

The area of production started increasing in 2017 at a noticeable rate, which resulted in the increase in production as well as an increase in the yield by 66% and 55.98% respectively. Partly because of efforts in contract farming promotion by some actors in the industry. This shows that with a ready market and supported production, smallholder farmers can take up groundnut production to a semi-commercial level. Large scale commercial farmers are not necessarily active in groundnuts production in Zimbabwe. One reason given by some key informants is that the crop is labour intensive especially at harvesting. However, examples of experiences in other countries like Ghana show there have been growth in large scale commercial farmer activity too. This shows that large scale commercial groundnut production can be explored in Zimbabwe at least for seeds initially. Nevertheless in 2018, the area under production increase by 17.9% but both national output and yield per hectare declined by 9.67% and 33.57%, respectively.

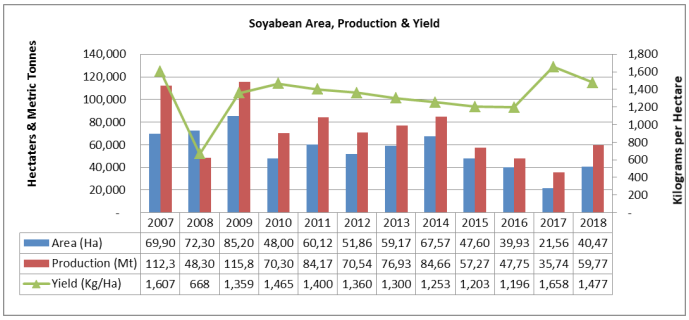
A review of the provincial contribution to national output show that Midlands province was leading in groundnuts production and in 2018 it produced 22% of national production and most of it came from Gokwe North, Gweru Urban, Mberengwa and Zvishavane. Manicaland and Mashonaland East contributed 21% each to national groundnut output. In Manicaland 78% of the production come from Makoni, Buhera and Mutare districts while in Mashonaland East much of the output came from Marondera, Seke and Chikomba districts.

(b) Soya Beans Production Trends

Soya bean is used in the production of oil in the Zimbabwe. In terms of production, between 2010 and 2014, production fluctuated between 70,000 and 85,000 metric tonnes (see figure 3.9). However, for the subsequent years, soya output fell to 57,270 metric tonnes, 47,750 metric tonnes and 35,740 metric tonnes for 2015, 2016 and 2017, respectively. Farmers interviewed explained that the fall in production of soya bean is as a result of limited support given to the crop by both Government and private sector. Also the farmers indicated that the hectarage/ area decreased due to the land reform programme as land redistribution affected the production level. At the same time with the drop on production level and area level it created 60% - 70% output gap which increased the soya beans imports.

However, in 2018, Government placed soya bean under Command Agriculture. This saw the country increasing the hectarage under soya bean from 21,560 hectares to 40,470 hectares, that is, 87.7%. This resulted in marginal recovery of soya output as rose to 59,770 metric tonnes in 2018 from 35,740 metric tonnes of 2017 (see figure 3.9).

Figure 3.13: Soya beans



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Area (Ha)	69,90	72,30	85,20	48,00	60,12	51,86	59,17	67,57	47,60	39,93	21,56	40,47
Production (Mt)	112,3	48,30	115,8	70,30	84,17	70,54	76,93	84,66	57,27	47,75	35,74	59,77
Yield (Kg/Ha)	1,607	668	1,359	1,465	1,400	1,360	1,300	1,253	1,203	1,196	1,658	1,477

Source: Ministry of Agriculture (2018)

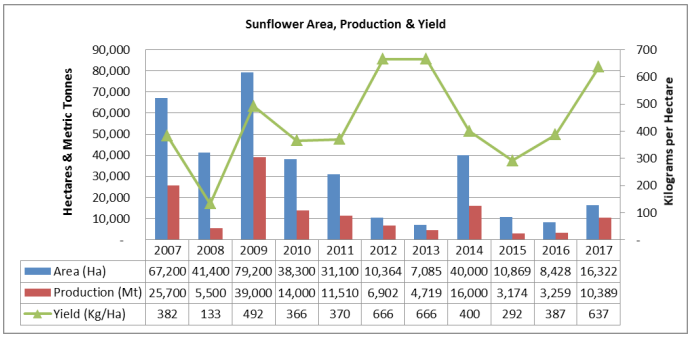
With respect to yield per hectare, on average, the country produced an average yield of 1.3 metric tonnes per hectare which is quite low to compensate costs which are involved in the production of soya bean. A review of the provincial contribution to national output showed that 92% of the country's soya beans production in 2018 came from Mashonaland Central, Mashonaland West and Mashonaland East provinces with each contributing 47%, 37% and 8% respectively. In Mashonaland East, the leading districts were Goromonzi, Seke, Murehwa and Marondera with 63%, 14%, 10% and 10%, respectively. The study also noted that in Mashonaland West province the districts with much of the production are Makonde, Zvimba, Hurungwe and Chegutu with contribution of 76%, 16%, 10%and 6%, respectively.

Finally, the study noted that Manicaland and Midlands provinces produced 4% each while no soyabean was produced in Matabeleland North and Matabeleland South.

(c) Sunflower Production Trends

Sunflower production in Zimbabwe is directed mainly towards oil extraction. It is largely produced in Natural Regions II, III and IV by the smallholder farmers, who include communal (CA), Small Scale Commercial Farmers (SSCF) and Resettlement Farmers (RF).

Figure 3.14: Sunflower



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Area (Ha)	67,200	41,400	79,200	38,300	31,100	10,364	7,085	40,000	10,869	8,428	16,322
Production (Mt)	25,700	5,500	39,000	14,000	11,510	6,902	4,719	16,000	3,174	3,259	10,389
Yield (Kg/Ha)	382	133	492	366	370	666	666	400	292	387	637

Source: Ministry of Agriculture (2018)

Between 2007 and 2009, the country witnessed large tracks of land put under sunflower production. To be specific, in 2007, 2008 and 2009, 67,200 hectares, 41,400 hectares and 79,200 hectares respectively were put under sunflower production. Sadly, there was no causal link between sunflower production and area covered. In actual fact, sunflower output remained sub optimally low.

However, notwithstanding this observation, the country still witnessed better production levels between 2007 and 2009. In subsequent years, the country recorded low sunflower output with the lowest yield being recorded in 2015 and 2016, that is, 3,174 metric tonnes and 3,259 metric tonnes, respectively. In 2017, the country recorded a significant recovery of sunflower production as output trebled to 10,380 metric tonnes (see figure 4.10).

One of the most striking feature in sunflower production noted in the study is the fact that yield per hectare remain consistently low, that is, it ranged from 0.133 metric tonnes per hectare to 0.666 metric tonnes per hectare.

A review of provincial contribution to national sunflower output shows that Manicaland province tops sunflower production contributing 36% to national production. The main producing districts in Manicaland were Makoni, Nyanga and Chimanimani contributing 42%, 17% and 13% respectively to provincial output. Matabeleland South and Mashonaland East were second and third with 23% and 15%, respectively. Mashonaland Central contributed 10%, Mashonaland West 9% and Midlands 6% while Matabeleland North and Masvingo had 1% and nil contribution, respectively.

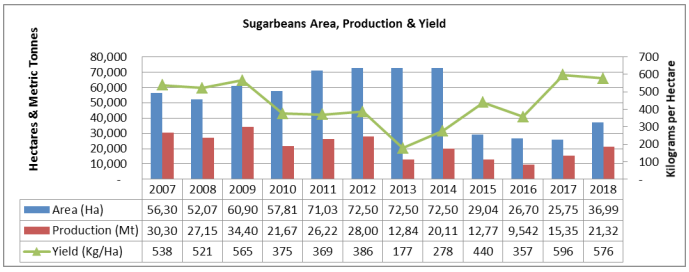
3.5 Trends in Pulses

(a) Sugar Beans Production Trends

Overall, the production of sugar beans in the last ten years has not been impressive. In 2007, 2008 and 2009, the country witnessed sugar beans output of 30,300 metric tonnes, 27,150 metric tonnes and 34,400 metric tonnes, respectively. In the same vein, area under sugar beans production was 56,300 hectares, 52, 070 hectares and 60,900 hectares in 2007, 2008 and 2009, respectively.

Ironically, area under sugar beans production shot up to an average are of 72,500 hectares for the years between 2011 and 2014 (inclusive) but production levels fell to 26,220 metric tonnes, 28,000 metric tonnes, 12,840 metric tonnes and 20,110 metric tonnes in 2011, 2012, 2013 and 2014, respectively. Of interest is the sudden fall which was noted in 2013 where the country recorded 12,840 metric tonnes of sugar beans at an average yield per hectare of 0.177 metric tonnes.

Figure 3.15: Sugar beans



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Area (Ha)	56,30	52,07	60,90	57,81	71,03	72,50	72,50	72,50	29,04	26,70	25,75	36,99
Production (Mt)	30,30	27,15	34,40	21,67	26,22	28,00	12,84	20,11	12,77	9,542	15,35	21,32
Yield (Kg/Ha)	538	521	565	375	369	386	177	278	440	357	596	576

Source: Ministry of Agriculture (2018)

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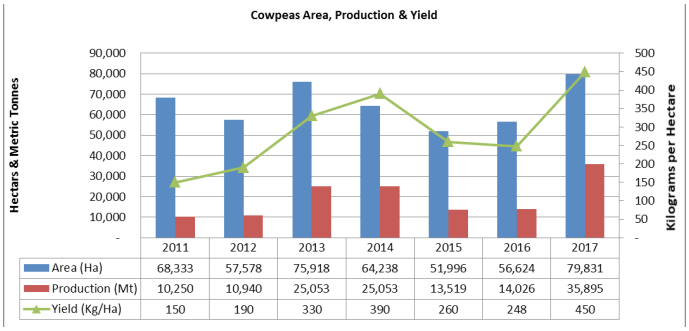
In the same vein, from this analysis, it is clear that a number of farmers somehow abandoned sugar beans production as noted by reduction in area under sugar bean production from 2015 – 2018. To be specific, area under sugar beans production fell by 148% between 2014 and 2015, that is, from 72,500 hectares to 29,040 hectares (see figure 3.11).

A review of the provincial contribution to national output shows that Manicaland province accounted for 36% of the sugar beans produced in 2018, Mashonaland Central and Mashonaland West both contributed 19% each. Leading producing districts in Manicaland were Nyanga, Mutasa, Mutare and Makoni. In Mashonaland Central province Mazowe, Guruve and Centenary were the main producing districts while on the other hand in Mashonaland West the leading districts are Kadoma, Hurungwe, Chegutu and Kadoma.

(b) Cowpeas Production Trends

Cowpea is grown as a low input pulse by many smallholder farmers in Zimbabwe. It is an important vegetable (leaves) and grain in the diets of smallholder households. The grain is an important source of protein. The study noted that Cowpeas can be grown in the marginal areas (agro-ecological zones III, IV & V) of Zimbabwe.

Figure 3.16: Cowpeas



	2011	2012	2013	2014	2015	2016	2017
Area (Ha)	68,333	57,578	75,918	64,238	51,996	56,624	79,831
Production (Mt)	10,250	10,940	25,053	25,053	13,519	14,026	35,895
Yield (Kg/Ha)	150	190	330	390	260	248	450

Source: Ministry of Agriculture (2018)

Overall, the country recorded lower output of cowpeas. The lowest output were recorded in 2011 and 2012, that is, 10,250 metric tonnes and 10,940 metric tonnes, respectively (see figure 3.12). Although output picked up in 2013 and 2014 with a flat figure of 25,053 metric tonnes, production fell by almost 50% to 13,519 metric tonnes and 14,026 metric tonnes in 2015 and 2016, respectively. Interestingly, area under cowpeas production remained stable with a range of 51,996 hectares to 79,831 hectares but because of low yield per hectare which ranged from 0.15 metric tonnes to 0.45 metric tonnes, the higher land usage could not transform into higher output.

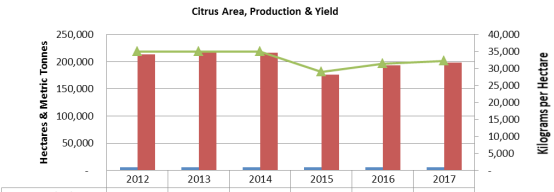
Farmers and AGRITEX extension officers interviewed explained that the low output was as a result of poor husbandry practices, diseases and pests.

3.6 Trends in Plantation Crops

(a) Citrus Production Trends

Unlike cereals crops, production output of citrus was consistent and averaged 202,280 metric tonnes per year. However, significant outputs were recorded in 2012, 2013 and 2014 with output of 213,920 metric tonnes, 216,020 metric tonnes and 216,020 metric tonnes, respectively (see figure 3.13). In 2015, output went down to 176,146 metric tonnes and recovered to 193,760 metric tonnes and 198,058 metric tonnes for the years 2016 and 2017, respectively.

Figure 3.17: Citrus



	2012	2013	2014	2015	2016	2017
Area (Ha)	6,112	6,172	6,172	6,074	6,165	6,135
Production (Mt)	213,920	216,020	216,020	176,146	193,760	198,058
Yield (Kg/Ha)	35,000	35,000	35,000	29,000	31,429	32,283

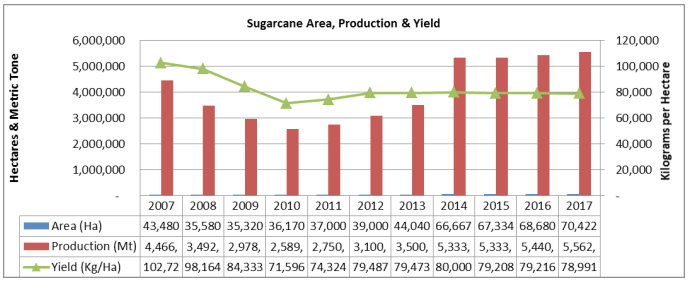
Source: Ministry of Agriculture (2018)

With respect to area under production, the country consistently maintained same area under citrus production (see figure 3.13). This is mainly because this crop suffers from industrial inertia, that is, it cannot be changed over a season like cereal crops. Interestingly, yield per hectare was also consistent (see figure 3.13).

(b) Sugarcane Production Trends

Earlier years from 2007-2009 Sugarcane production experienced an average production decrease of 16.5% which was adversely affected by the poor economic environment prevalent in 2008.The economy was characterised by shortages of foreign currency and hyperinflation which adversely affected crop inputs that resulted in limited and delayed application for herbicides and fertilizers.

Figure 3.18: Sugarcane



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Area (Ha)	43,480	35,580	35,320	36,170	37,000	39,000	44,040	66,667	67,334	68,680	70,422
Production (Mt)	4,466,	3,492,	2,978,	2,589,	2,750,	3,100,	3,500,	5,333,	5,333,	5,440,	5,562,
Yield (Kg/Ha)	102,72	98,164	84,333	71,596	74,324	79,487	79,473	80,000	79,208	79,216	78,991

Source: Ministry of Agriculture (2018)

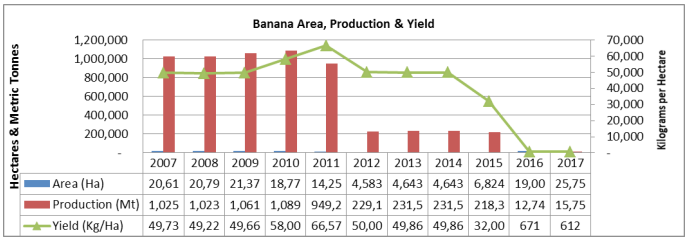
In 2011 there was an increase in both production and yield by 6,2% and 4% respectively this might have been because of the advent of dollarization domestic prices was now US dollar denominated and currently more competitive than prices in the regional export markets. This boosted the export of sugar production on the other hand the improvement in sugarcane yield was through timely application of required inputs.

The sugarcane production in Zimbabwe is mainly grown under full irrigation in the low-yield areas this is through the supply of irrigation water by the dams. The supply of water is not consistent hence this explains the consisted production from the period of 2012-2017.

(c) Banana Production Trends

Banana production between 2007 and 2011, averaged an annual output of about 1 million metric tonnes per year. However, in 2012, banana output took a sharp dive to 229,150 metric tonnes per year and maintained a steady output of 231,500 metric tonnes, 231,500 metric tonnes and 218,360 metric tonnes in 2013, 2014 and 2015, respectively. Sadly, in 2016 and 2017, Zimbabwe recorded a paltry 12,742 metric tonnes and 15,751 metric tonnes, respectively.

Figure 3.19: Banana



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Area (Ha)	20,61	20,79	21,37	18,77	14,25	4,583	4,643	4,643	6,824	19,00	25,75
Production (Mt)	1,025	1,023	1,061	1,089	949,2	229,1	231,5	231,5	218,3	12,74	15,75
Yield (Kg/Ha)	49,73	49,22	49,66	58,00	66,57	50,00	49,86	49,86	32,00	671	612

Source: Ministry of Agriculture (2018)

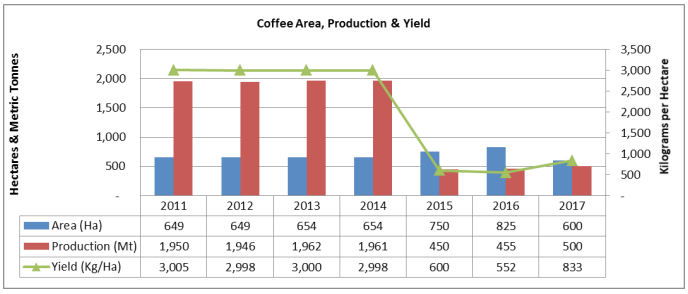
Interestingly, area under production in averaged around 20,000 hectares between 2007 and 2011. Between 2012 and 2015 the land under banana production plummeted by about 15,000 hectares to an annual average of 5,000 hectares. This decline corresponded with the decline in annual production of bananas as explained earlier. However, in 2016 and 2017, land under banana production shot to 19,002 metric tonnes and 25,751 metric tonnes, respectively. Ironically, there was no corresponding causal - link between increase in banana output and land under production. Rather, the country witnessed extraordinary fall in yield per hectare from an average rate of about 50 metric tonnes per hectare to 0.6 metric tonnes per hectare.

Farmers interviewed from Rusitu Valley underscored that the most contributing factor of this decrease was the plant-parasitic nematodes which compromised productivity. Results from a survey carried out in Rusitu Valley indicated that 61,9% farmers grew bananas as a monoculture and 38,1% intercrop bananas with other crops. About 82,9% of the farmers that grow bananas had little or no knowledge of nematodes that damage bananas.

(d) Coffee Production Trends

Zimbabwe has a long history of producing beautiful coffees, it used to produce about 15000 metric tonnes of the best quality coffee (Coffee Arabica) alongside coffee producing giants such as Brazil, Kenya and Vietnam. The sector used to employ more than 20000 people, contributing more than 2% to the GDP and ranking in about $54 million in foreign earnings.

Figure 3.20: Coffee



	2011	2012	2013	2014	2015	2016	2017
Area (Ha)	649	649	654	654	750	825	600
Production (Mt)	1,950	1,946	1,962	1,961	450	455	500
Yield (Kg/Ha)	3,005	2,998	3,000	2,998	600	552	833

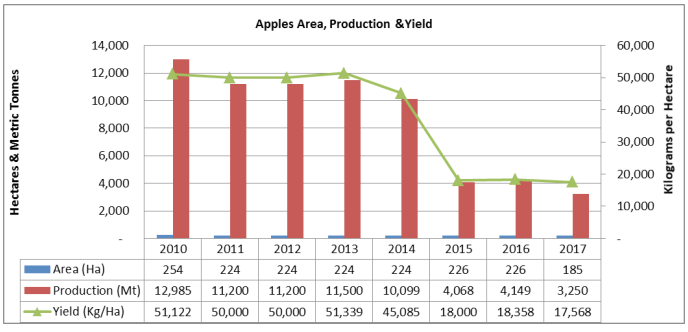
Source: Ministry of Agriculture (2018)

Production of coffee has been constant over the years at an average production of 18% from 2011 to 2014. However, despite the increase in hectarage by 15% from 2014 to 2015, a significant decrease in production and yield was 77% and 80% respectively. Farmers interviewed explained that the significant decrease was due to the proliferation of alternative and competing crops. Farmers in strategic regions such as the Eastern Highlands abandoned coffee in preference of other plantations. The influx of cheap processed coffee and increasing incidences of pests and diseases such as the white stem borer, coffee leaf minor and coffee berry borer was the major contributing factor. Respondents indicated that Zimbabwe is only left with two commercial coffee farmers cultivating 300 hectares, down from 145 who were cultivating over 7600 hectares before 2004. In addition to that, the sector is struggling to attract investment due to land tenure issues emanating from land redistribution programme. However, regardless of low commercial farmers numbers, a slight increase of 1% was experienced in production in 2016 this was due to an interest in the coffee production by international companies like Nespesso who are investing in coffee farming.

(e) Apples Production Trends

From the period of 2010 to 2013 there was a constant increase in the production of apples of 4% and this was due to the ideal weather which has immensely contributed to the fine production of various fruits.

Figure 3.21: Apples



	2010	2011	2012	2013	2014	2015	2016	2017
Area (Ha)	254	224	224	224	224	226	226	185
Production (Mt)	12,985	11,200	11,200	11,500	10,099	4,068	4,149	3,250
Yield (Kg/Ha)	51,122	50,000	50,000	51,339	45,085	18,000	18,358	17,568

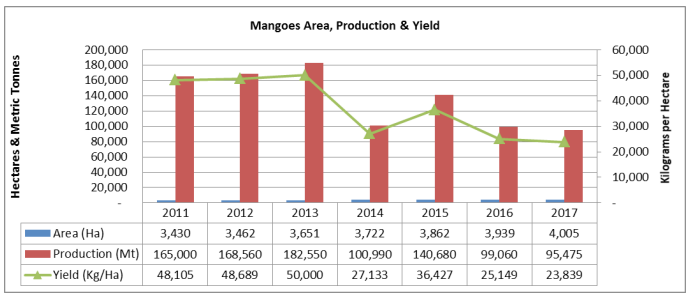
Source: Ministry of Agriculture (2018)

Zimbabwe's apple production and yield both declined significantly in 2015 by 60% despite an increase in hectarage by 1%. From an annual output of 10099 metric tonnes in 2014 to an annual output of 4068 in 2015. Farmers interviewed explained that the decline was mainly due to the replanting of old fruit trees which up to date is still underway. The other factor which affected the production was competition by import which were coming from South Africa.

(f) Mangoes Production Trends

Mangoes production from the period of 2011 to 2013 have been increasing at a constant rate. In 2014 an increase in hectarage of 2% was realised however this did not bring an advantage to production and yield as both declined by 45% and 46%, respectively.

Figure 3.22: Mangoes



	2011	2012	2013	2014	2015	2016	2017
Area (Ha)	3,430	3,462	3,651	3,722	3,862	3,939	4,005
Production (Mt)	165,000	168,560	182,550	100,990	140,680	99,060	95,475
Yield (Kg/Ha)	48,105	48,689	50,000	27,133	36,427	25,149	23,839

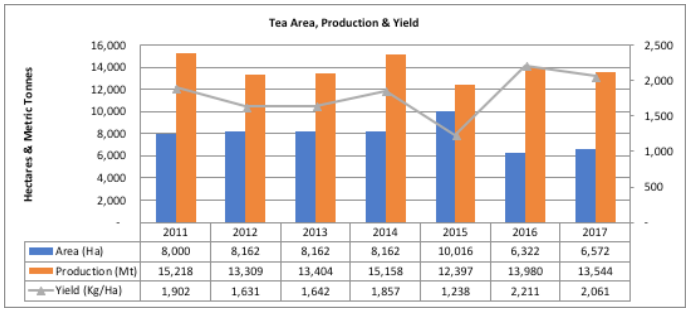
Source: Ministry of Agriculture (2018)

In 2015 Mango production experienced a boom the area for plantation for mango seedlings grew by 4% and this resulted in an increase in production and yield of 39% and 34% respectively.

(g) Tea Production Trends

Tea trends for the period 2011 to 2014 maintained a steady trajectory with the area cultivated 8,162 hectares while production and hectarage stagnated at 24,486 metric tonnes and 3 metric tonnes respectively.

Figure 3.23: Tea



	2011	2012	2013	2014	2015	2016	2017
Area (Ha)	8,000	8,162	8,162	8,162	10,016	6,322	6,572
Production (Mt)	15,218	13,309	13,404	15,158	12,397	13,980	13,544
Yield (Kg/Ha)	1,902	1,631	1,642	1,857	1,238	2,211	2,061

Source: Zimbabwe Tea Growers Association (2018)

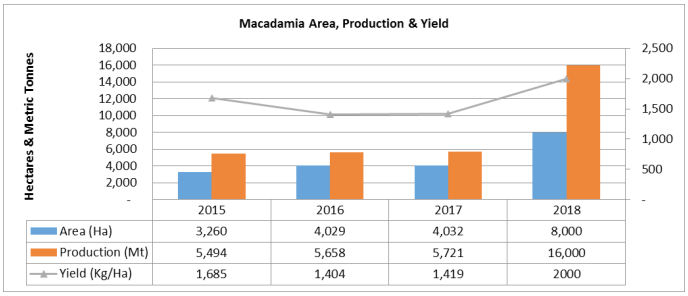
In 2015 production and yield trends sharply declined by 18.21% and 67% respectively despite the increase in hectarage by 23% to reach 10,016 hectares. A farmer respondent indicated that the decrease in tea production was due to the poor quality resulting in low market value and high production cost.

In 2016 there was a temporary recovery of 12.77% in production and 61% in yield while hectarage slipped by 37%. The inverse relationship between hectarage and the other two trends repeated in 2017 when production and yield reduced by 3% and 26% respectively while hectarage gained by 4%.

(h) Macadamia Production Trends

Over the period from 2011 to 2014 the production of Macadamia nuts has been increasing at a steady rate of 27% with a decline in yield of an average of 21%.

Figure 3.24: Macadamia



Source: Chipinge Macadamia Association (2018)

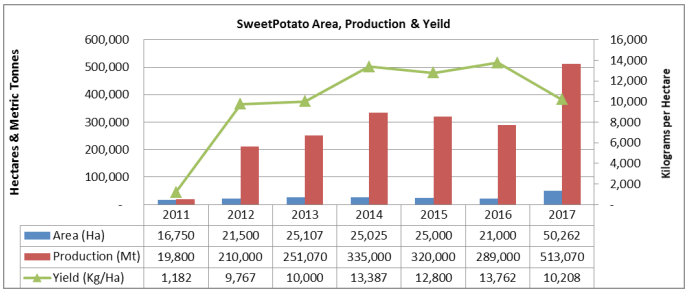
Hectarage under macadamia nuts slightly increased for the period 2015 to 2017 however, in 2018 it significantly increased by 75% to reach a high of 8 000 hectares. Production also followed the hectarage trend whereby it marginally increased between 2015 and 2017 while in 2018 it increased by 182.79% to reach an annual output of 16,000 tonnes. Study respondents attributed the huge increase in area and production in 2018 to the increased production from commercial farmers who contributed 7,000 tonnes. The firming local and international prices of macadamia nuts are the major driver to the huge leap in area and production. Prices in the local market surged from a range of $0.77 to $1.50 in prior years to a range of $1.80 to $3.20 per kilogram. A total of16 00 tons were produced in 2018, 7000 tons were contributed by commercial farmers. Study findings also showed that international market prices range from $12 to $16 per kilogram.

3.7 Trends in Horticulture

(a) Sweet Potato Production Trends

The Sweet potato production and yield experienced a sharp increase from 2011 to 2012 of 960% and 726% respectively and also hectarage increased by 28%. Over the years from 2012 to 2017 the production of sweet potatoes continued to increase on an average of 23,26% with also an average yield of 3,23% increase.

Figure 3.25: Sweet Potato



Source: Ministry of Agriculture (2018)

A review of provincial contribution to national output show that the top four provinces leading in the production of sweet potatoes are Mashonaland East, Midlands, Manicaland and Matabeleland South with 27%, 26%, 19% and 12% of national output, respectively. In Mashonaland East the districts that drive most of the production are Mudzi, Seke, Chikomba, Murehwa and Goromonzi while in Midlands much of the output comes from Gweru, Mberengwa, Kwekwe Zvishavane and Shurugwi.

Respondents interviewed noted that the increase was due to advantages that the crop has which include the crop having minimal input requirement, storing well and the crop being a famine reserve crop. The crop requires minimal level of water. With all these advantages the government of Zimbabwe and some local NGO's are therefore promoting the production of root and tuber crops especially sweet potatoes. The government also established training programs to farmers so as to continuously increase the crop.

3.8 Summary

The main food and cash crops in Zimbabwe include maize, wheat, small grains (millets and sorghum), tobacco, cotton, sugar, horticulture (food and non-food), and groundnuts. The research noted that over the years crop production in Zimbabwe is highly variable due to the heavy reliance on rain-fed agriculture. The stakeholders interviewed underscored that changing climatic conditions and frequent droughts contribute heavily to the volatility in crop production. With the exception of tobacco and macadamia, production of maize, sorghum, millet and other cash crops has continued to trend downwards compared to 1985 production. At the centre of this reduced production is very low productivity. Average productivity of both food and cash crops across all farm types has been declining between 1985 and 2016. For example, maize yields declined from an average 1.2 metric tonnes per hectare between the period 1990 to 1995 to an average of 0.749 metric tonnes between the period 2010 to 2016. These yields have lagged behind those of neighbouring countries such as Malawi, Zambia, Mozambique and South Africa as well as global averages. This observation is the same across most food and cash crops, a situation requiring urgent attention. Tobacco and macadamia have well integrated value chains that with strong backward and forward linkages to sustain and improve high production and productivity levels.

The study noted that the national average yield of 0.749 metric tonnes per hectare was significantly weighed down by small scale farmers, which represent 78% of land under maize production, whose output per hectare is around 0.68 metric tonnes per hectare while the yields by commercial farmers are modest at an average of 2 tonnes per hectare.

The study noted small scale farmers lack the necessary resources, infrastructures and proper agronomic practices to boost their yields. A robust production and productivity enhancement programme driven by the government targeting low yielding small holder farmers will go a long way in securing the nation's food security while at the same time increasing small holder farmer earnings since they will be able to produce a surplus.

Climate change vulnerabilities as well as price volatilities especially in cotton were noted as major impediments to sustainable agricultural production in Zimbabwe.

In the same vein, strong value chains as witnessed in the tobacco sector, contributed to massive production regardless of the fact that the same communal farmers who are growing tobacco doesn't have security of tenure. In the tobacco sector, the contracting companies are playing the role of an aggregator which uses its strong balance sheet and borrow money from the banks on behalf of the poor farmers thereby acting as farmers 'collateral'. The striking feature of the tobacco sector is that it is a liberalized sector whose product is sold at the auction. This situation provides an efficient price recovery system and enhancement of derivatives which is totally the opposite of crops like grains which have price floors which in a number of cases more than twice regional prices thereby discouraging companies to finance agricultural production.

In order to unlock funding into agricultural sector and even attracting international lines of credits as noted in the tobacco sector, Government must liberalise the agricultural sector and one such mechanism is through the operationalization of the commodity (see Box 3 in chapter 6).

4 PRODUCTION TRENDS IN LIVESTOCK

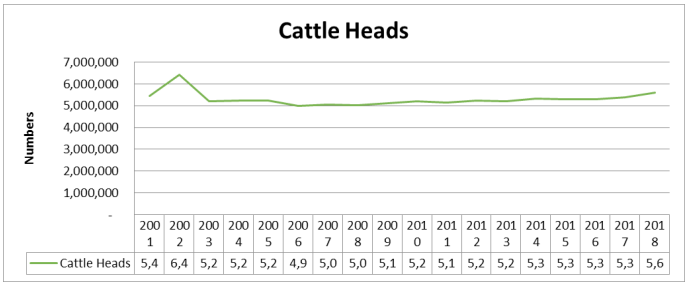
4.1 Introduction

In Zimbabwe, there are a number of livestock species ranging from beef cattle, dairy cattle, small livestock (pigs, goats and sheep) as well as poultry that provide meat and eggs. This chapter analyse trends of each livestock specie and reviewing current performance against potential or national requirements. Overall the main challenge faced by farmers across all livestock species is the high cost of production that adversely effects on farm viability and competitiveness locally and in the region.

4.2 Cattle Herd

Cattle are the most important livestock species, which is a source of milk as well as beef meat for the country. From 2003 to 2018, the number of cattle that have been herd could slightly differ per year which resulted in a curve being uniform for that period. The findings showed that commercial farmers and A2 farmers are failing to grow their herds due to lack of medium to long term finance.

Figure 4.1: Cattle



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cattle Heads	5,4	6,4	5,2	5,2	5,2	4,9	5,0	5,0	5,1	5,2	5,1	5,2	5,2	5,3	5,3	5,3	5,3	5,6

Source: Ministry of Agriculture (2018

Evidence from research shows that cattle production remained flat around 5 million herds since 2001, this could be partly attributed to the outbreaks of foot and mouth disease (FMD) and other disease that was identified as a serious to threat to the complete recovery of the cattle herd. Table 5 shows the distribution of cattle ownership by farmer group indicating that 69% of the cattle in Zimbabwe are owned by small scale rural farmers, 11% by A1 farmers, A2 and large scale commercial farmers own a combined 10%, old resettled farmers own 6% while small scale commercial farmers own 4%.

Table 4.1: Cattle Ownership by Farmer Group

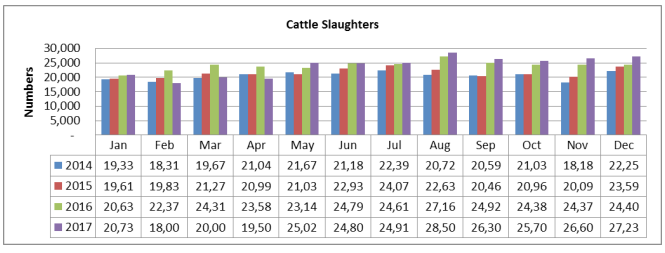
Farmer Group	Percentage of Cattle Owned
A2 and Large Scale Commercial Farming Area	10%
Communal Areas	69%
A1	11%
Small Scale Commercial Farming Area	4%
Old Resettlement	6%

Source: Zimbabwe Agriculture Society (2017)

4.3 Cattle Slaughters Trends

Cattle is slaughtered for beef in Zimbabwe. The number of slaughtered cattle is determined by the number of cattle being herd since some have to provide milk.

Figure 4.2: Cattle Slaughters



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	19,33	18,31	19,67	21,04	21,67	21,18	22,39	20,72	20,59	21,03	18,18	22,25
2015	19,61	19,83	21,27	20,99	21,03	22,93	24,07	22,63	20,46	20,96	20,09	23,59
2016	20,63	22,37	24,31	23,58	23,14	24,79	24,61	27,16	24,92	24,38	24,37	24,40
2017	20,73	18,00	20,00	19,50	25,02	24,80	24,91	28,50	26,30	25,70	26,60	27,23

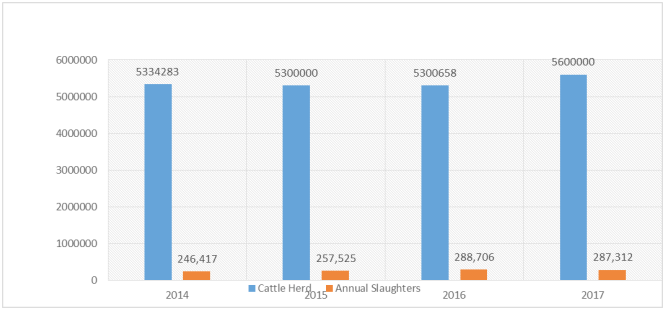
Source: Ministry of Agriculture (2018)

On a monthly basis, in 2014, lesser cattle were slaughtered since the herds were also less and the highest slaughter was in August which was 22,393. In 2015, the slaughter rate was low, with the highest number which is 24,075 slaughtered in July. The highest numbers of cattle were slaughtered in 2017 since there was an increase in the herds. The highest number of cattle was slaughtered in august which was 28,500.

4.4 Cattle Herd and Slaughters

Of the total amount of cattle herds, some are slaughtered and others are re-served for some other services which include production of milk. Statistics show that the proportion of annual slaughters to total number of cattle is 5% and this could be attributed to the 69% cattle ownership by small scale farmers who keep cattle as a sign of wealth with no commercial mind.

Figure 4.3: Cattle Herd and Slaughters

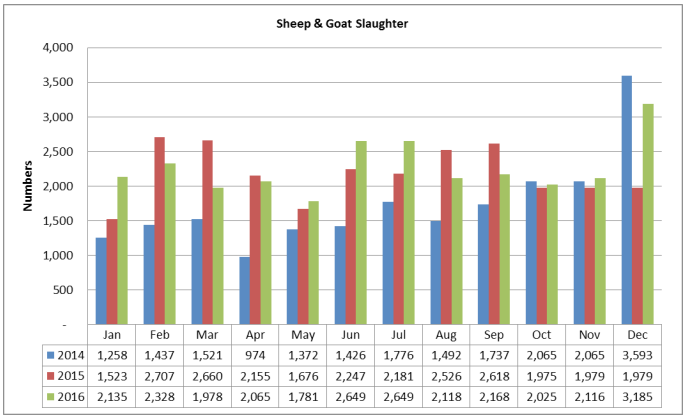


Source: Ministry of Agriculture (2018)

4.5 Sheep & Goat Slaughter

Apart from reared for subsistence purposes sheep and goats are a source of income to many rural households since they can be easily converted into cash unlike cattle which require wide consultation before selling or slaughtering them. In 2014, the highest slaughters of both sheep and goats were in December when a total of 3,593 animals were slaughtered while the lowest was in April when 974 slaughters were undertaken. In 2015 the average monthly slaughters was 2,186 which is 27% higher than the average monthly slaughters of 1,726 recorded in 2014. In 2016 the average monthly slaughters marginally increased by 4% to reach to 2,266 slaughters.

Figure 4.4: Sheep and Goat Slaughters



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	1,258	1,437	1,521	974	1,372	1,426	1,776	1,492	1,737	2,065	2,065	3,593
2015	1,523	2,707	2,660	2,155	1,676	2,247	2,181	2,526	2,618	1,975	1,979	1,979
2016	2,135	2,328	1,978	2,065	1,781	2,649	2,649	2,118	2,168	2,025	2,116	3,185

Source: Ministry of Agriculture (2018)

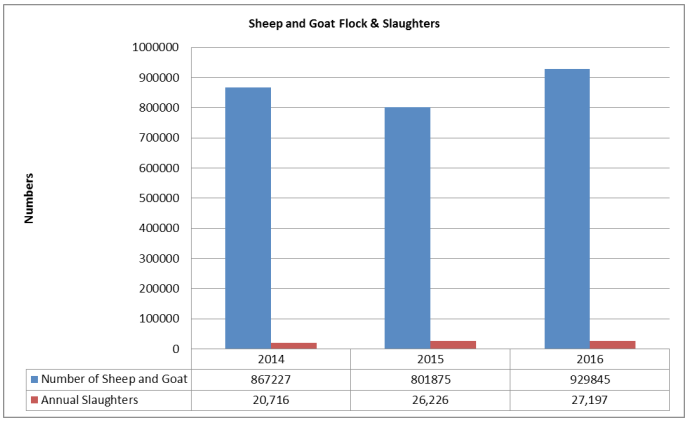
Trends show that December is the month with the highest slaughters and this was attributed to increased meat consumption during the festive period as noted by respondents.

4.6 Sheep and Goat Flocks and Slaughter

There is a huge gap between the available flock of sheep and goats and the number of annual slaughters recorded. In 2015 and 2016 the total slaughters recorded of 26,226 and 27,197 respectively constitute 3% of the available animals, implying that 97% of the sheep and goats are not slaughtered in each year. Programs that promote consumption of sheep and goat meat in urban areas need to be pursued.

In addition to this market linkage programs between producers of this type of meat and consumers can work towards increasing consumption of sheep and goat meat.

Figure 4.5: Sheep and Goat Flocks and Slaughter



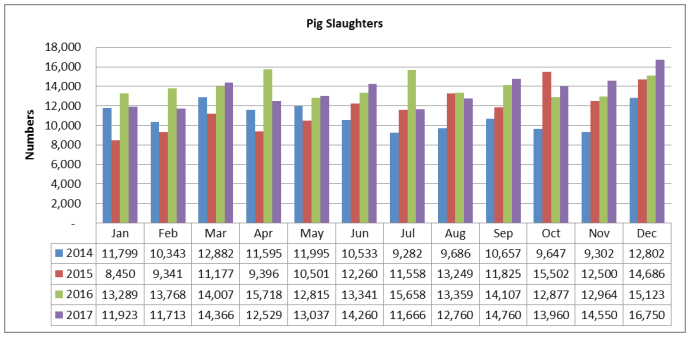
	2014	2015	2016
Number of Sheep and Goat	867227	801875	929845
Annual Slaughters	20,716	26,226	27,197

Source: Ministry of Agriculture (2018)

4.7 Pig Slaughters

Pigs is one of the animals that farmers keep as a source of income. 2014 had the lowest number of slaughters compared to other years with an annual average of pig slaughters 10,877 pigs. The annual average of pig slaughters increased in 2015 to 11,704 pigs this might have been because farmers were now aware of the benefits accrued from pig herding and the consumers demand also increased. 2016 recorded the highest number of annual average pig slaughters of 13,918 pigs.

Figure 4.6: Pig Slaughters



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	11,799	10,343	12,882	11,595	11,995	10,533	9,282	9,686	10,657	9,647	9,302	12,802
2015	8,450	9,341	11,177	9,396	10,501	12,260	11,558	13,249	11,825	15,502	12,500	14,686
2016	13,289	13,768	14,007	15,718	12,815	13,341	15,658	13,359	14,107	12,877	12,964	15,123
2017	11,923	11,713	14,366	12,529	13,037	14,260	11,666	12,760	14,760	13,960	14,550	16,750

Source: Ministry of Agriculture (2018)

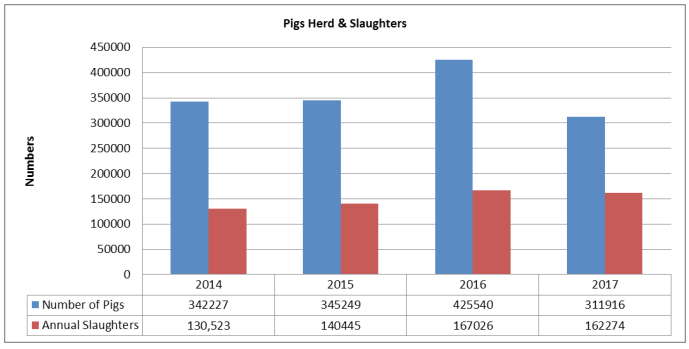
In 2016 so many farmers took the business of pig herding because of increase in incentives given to farmers. This on another hand meant the increase in the number of pork meat available on the market which means variety for consumers to choose from among other type of meats like chicken and beef. The increase in the pork meat increased competition on other meats hence prices of other meats went down in 2016.

Information gathered in the survey indicated that collaborative effort between Government, private stakeholders and development partners have managed to halt the spread of FMD, African Swine Fever and New Castle Disease (NCD) in pigs and since 2015 no outbreaks were recorded.

4.8 Pig Herd and Slaughters

On average graph indicates huge difference between the available pig herds and the number of annual slaughters recorded. In the year 2014 and 2015 the slaughters the annual slaughters recorded were 130,523 and 140,445 respectively this implies that in as much as the number of pigs being herded is increasing, farmers are not recognising the benefit of selling their pigs. In order to eradicate this Government can introduce market linkages programs between producers of pigs and consumers so as to increase consumption.

Figure 4.7: Pigs Herd and Slaughters



	2014	2015	2016	2017
Number of Pigs	342227	345249	425540	311916
Annual Slaughters	130,523	140445	167026	162274

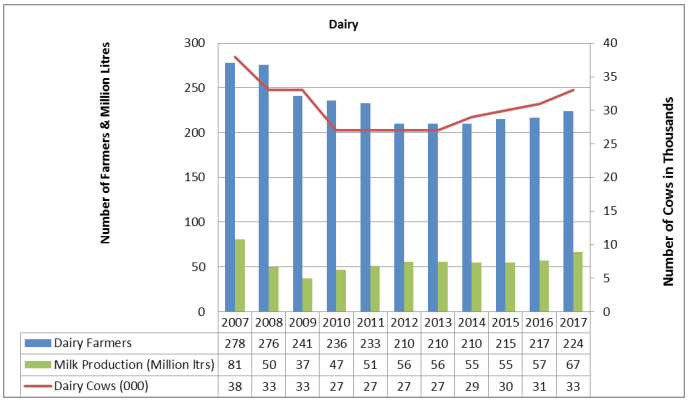
Source: Ministry of Agriculture (2018)

4.9 Dairy

Milk production took a nose dive from 81 million litres in 2007 to 37 million litres in 2009. From 2010, milk production grew steadily from 47 million litres to 67 million litres in 2017 (see figure 4.8). With respect to dairy farmers, number of dairy farmers plummeted from 278 in 2007 to 2010 in 2014. Farmers interviewed noted that the decrease in the number of farmers was influenced by high costs of production (feed, energy and labour), lack of competiveness within the region, out-dated production technology systems

and lack of dairy support services (independent laboratory). Key stakeholders interviewed noted that, in the early 1990s the national head size was 122 000, however the head size decreased to 33 000 with 14 000 currently used for milk production. Over the past five years the production in milk has been increasing at steady rate of 3.9% and this indicates that farmers have not been considering cattle rearing for milk production a lucrative business.

Figure 4.8: Dairy Production Trends



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Dairy Farmers	278	276	241	236	233	210	210	210	215	217	224
Milk Production (Million ltrs)	81	50	37	47	51	56	56	55	55	57	67
Dairy Cows (000)	38	33	33	27	27	27	27	29	30	31	33

Source: Ministry of Agriculture (2018) & Zimbabwe Association of Dairy Farmers (2018)

Respondents from the dairy sector who were interviewed by researchers underscored that the dairy sector has come up with strategic plan for the resuscitation of the dairy industry (Zimbabwe Association of Dairy Farmers' Strategic Plan 2018 to 2022).

The strategic plan was developed by the industry with a view of working towards self-sufficiency in milk production. In this regard, the industry is working on mobilising US$46 million which will be used in local content support programmes which must yield 131 million litres of milk in 2022.

The dairy industry strategy was mooted when key dairy processors were already working on key local content enhancement programmes which inter alia include:

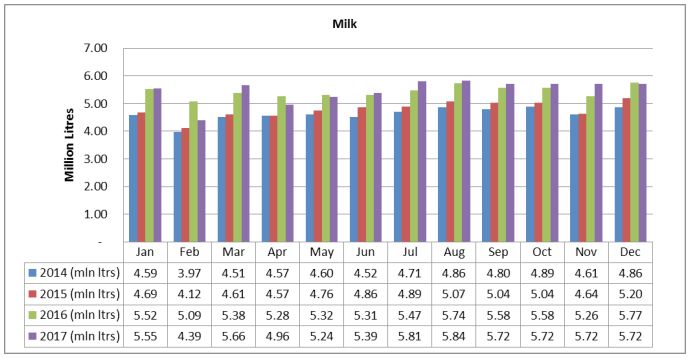
- Some companies came up with Dairy Empowerment Schemes where an excess of $20 million was invested in national herd building since 2011;
- Technical and extension support to farmers. The dairy processors have invested in veterinary doctors who are assisting cattle farmers with extension services;
- The dairy processors have used their strong balance sheet to borrow money on behalf of the farmers who have no capacity to do so in the absence of collateral;
- Provision of key cattle farming inputs such as feed and drugs through various value chain finance models;
- The dairy industry came up with a number of supplier development programmes outside the cattle rearing to packing industry;
- Provided a ready market for the milk.

In addition to private sector initiatives, Government is also supporting the sector through the implementation of the Dairy Revitalisation Programme that seeks to develop the dairy value chain using tax proceeds from dairy imports.

4.10 Milk

On average the amount of milk increased over the years. The study established that Zimbabwe used to produce 260 million litres of milk per year. However, due to the land reform and harsh economic environment which ensued between 1998-2008, milk production plummeted to 39 million litres in 2009.

Figure 4.9: Milk Production Trends



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014 (mln ltrs)	4.59	3.97	4.51	4.57	4.60	4.52	4.71	4.86	4.80	4.89	4.61	4.86
2015 (mln ltrs)	4.69	4.12	4.61	4.57	4.76	4.86	4.89	5.07	5.04	5.04	4.64	5.20
2016 (mln ltrs)	5.52	5.09	5.38	5.28	5.32	5.31	5.47	5.74	5.58	5.58	5.26	5.77
2017 (mln ltrs)	5.55	4.39	5.66	4.96	5.24	5.39	5.81	5.84	5.72	5.72	5.72	5.72

Source: Ministry of Agriculture (2018)

However, as a result of local content enhancement programmes, Zimbabwe witnessed milk production rising from 39 million litres recorded in 2009 to 65 million litres in 2017.

Although the current output is still below the annual national demand of 120 million litres, the country has progressively reduced milk imports from South Africa by about 45%. Specifically, in 2017, the country produced 65.72 million litres thereby leaving a deficit of 54.28 million litres.

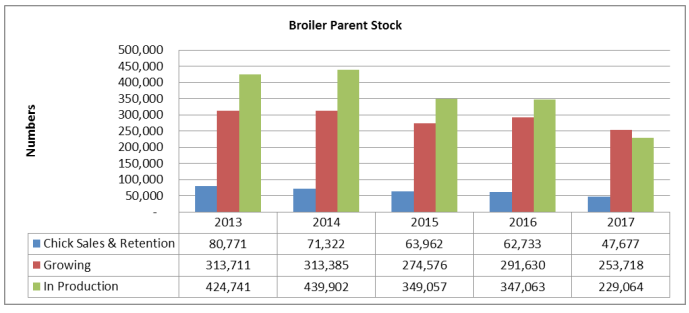
4.11 Poultry

The study noted that the poultry sector registered steady growth since 2009 till 2017 when it was seriously affected by the outbreak of Avian Influenza Virus at one of the major chicken breeders. Despite containment of the AI virus outbreak full recovery of the sector is yet to be achieved as demand continues to outweigh supply. The gap between demand and supply in the poultry sector is augmented by imports of fertilised eggs which are hatched locally.

(a) Broiler Parent Stock

Overall, the graph indicates a decrease in the broiler parent stock. In the year 2013 and 2014 the number of broilers in production was a high and recorded 424,741 and 439,902 respectively.

Figure 4.10: Broiler Parent Stock Production Trends



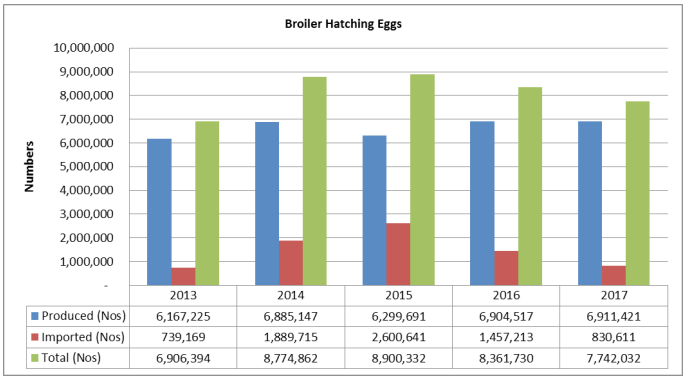
	2013	2014	2015	2016	2017
Chick Sales & Retention	80,771	71,322	63,962	62,733	47,677
Growing	313,711	313,385	274,576	291,630	253,718
In Production	424,741	439,902	349,057	347,063	229,064

Source: Ministry of Agriculture (2018)

However, the amount of broiler parent stock was decreasing even in growing at an average rate of 289,404 annually. Chick sales and retention decreased drastically in the year 2017 by 24% this was affected by the decrease in growing of 13% from the previous year. Respondents interviewed underscored that the decrease was caused by the Avian Influenza Virus outbreak which induced depopulation, average monthly stocks of broiler breeder chick retentions, growing and in-lay birds plummeted and in the last quarter of 2017, average breeder stockholdings were lower than the same period in 2016 and the lowest since 2013.

(b) Broiler Hatching Eggs

Figure 4.11: Broiler Hatching Eggs



	2013	2014	2015	2016	2017
Produced (Nos)	6,167,225	6,885,147	6,299,691	6,904,517	6,911,421
Imported (Nos)	739,169	1,889,715	2,600,641	1,457,213	830,611
Total (Nos)	6,906,394	8,774,862	8,900,332	8,361,730	7,742,032

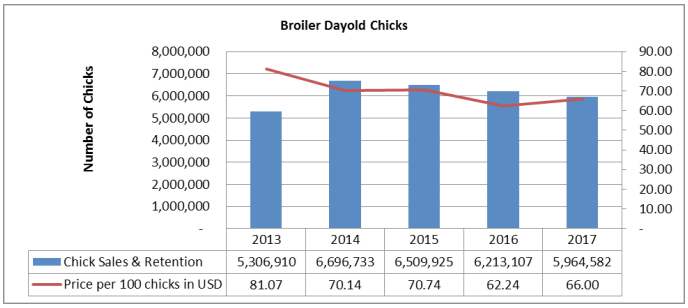
Source: Ministry of Agriculture (2018)

The number of broiler hatching eggs being produced over the years is increasing compared to the number that is being imported. This implies an increasing trend in the business for Broiler Hatching eggs and this encourages farmers to venture into broiler hatchings eggs. The production of Broiler Hatching eggs is increasing at 3.24% compared to the imported eggs hence an increase in the number of eggs. To continue to boost the production of broilers Government should engage in activities that support broiler production. A stakeholder respondent mentioned that, total production of hatching eggs in 2017 was 68.9 million, being 8% lower than 2016. Prices of day old chicks (DoCs) rose sharply from 65c in May to 96c in December 2017 mainly due to the effect of the Avian Influenza. The study noted that local production of hatching eggs declined by 35% from a peak of 7.1 million in May to 4.6 million in July and had recovered to 7.4 million in December. Imports of hatching eggs over the period January to July, which averaged 1.0 million per month, increased to 2.0 million per month for the period August to December. Total hatching egg imports over the latter period was 10.1 million, equating to 460,000 eggs per week. This contrasts with the ring-fenced duty-free allocation of 852,000 hatching eggs per week. Total hatching eggs declined by 31% from a peak of 8.5 million in May to 5.9 million in July and recovered to a new peak of 9.5 million in December.

(c) Broiler Day Old Chicks

Information deduced from the above graph indicates that Broilers Day old Chicks are decreasing at a decreasing rate. Stakeholders in the poultry industry noted that DoCs and retentions declined by 35% from 6.4 million in May to 4.2 million in July and recovered to a new peak of 7.1 million in December 2017.

Figure 4.12: Broiler Day Old Chicks



	2013	2014	2015	2016	2017
Chick Sales & Retention	5,306,910	6,696,733	6,509,925	6,213,107	5,964,582
Price per 100 chicks in USD	81.07	70.14	70.74	62.24	66.00

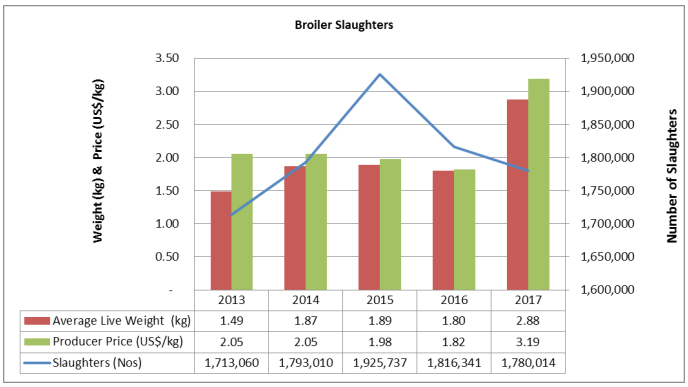
Source: Ministry of Agriculture (2018

The highest number of day old chicks was recorded in the year 2014 with 6,696,733 at a price of $70.14 per 100 chicks. After the period of 2014 the price per 100chicks went down with the lowest recorded at $66 in 2017 together with the chick sales of 5,964,582. This implies the sales of the Broiler day old chicks is decreasing hence affecting the production of broilers.

(d) Broiler Slaughters

Despite the fact that Broilers are reared for subsistence purposes broilers are a source of income to many rural households since they can be easily converted into cash unlike other animals which require wide consultation before selling or slaughtering them. From the period of 2013 to 2014 the number of broilers slaughter was less compared to 2015 this was because the average weight of a bird contributed to the price charged by the producer. In 2015 when the price reduced by 3.4% the number of slaughters increased by 7.4%. Respondents interviewed explained that there was a slight decrease of broiler slaughters not only due to average weight requirements but also due to the 2017 outbreak of the avian influenza (AI) which induced serious depopulation of the parent stock.

Figure 4.13: Broiler Slaughters Trends



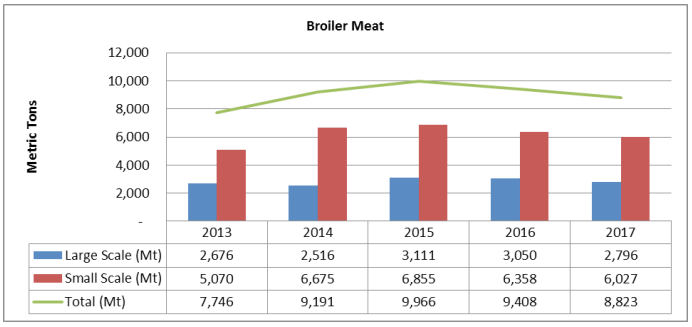
	2013	2014	2015	2016	2017
Average Live Weight (kg)	1.49	1.87	1.89	1.80	2.88
Producer Price (US$/kg)	2.05	2.05	1.98	1.82	3.19
Slaughters (Nos)	1,713,060	1,793,010	1,925,737	1,816,341	1,780,014

Source: Ministry of Agriculture (2018)

If the price is low more people are able consumers are able to buy more and slaughter more compared to when its high. In 2017 the price charged by the producer increased by 75% from 1.82per kg to 3.19 per kg and this caused the number of slaughters to decrease by 2% from 1,816,341 slaughters to 1,780,014 slaughters.

(e) Broiler Meat

Figure 4.14: Broiler Meat Production Trend



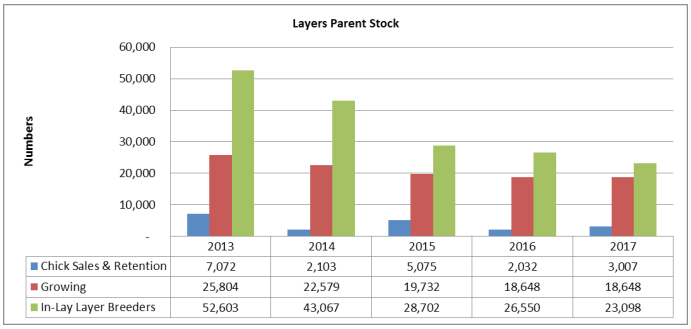
	2013	2014	2015	2016	2017
Large Scale (Mt)	2,676	2,516	3,111	3,050	2,796
Small Scale (Mt)	5,070	6,675	6,855	6,358	6,027
Total (Mt)	7,746	9,191	9,966	9,408	8,823

Source: Ministry of Agriculture (2018)

Overall Broiler meat is being sold more in small scale compared to large scale. On average annually on small scale 6,197 metric tonnes are being sold compared to 2,829 metric tonnes in large scale. More Broiler meat is being produced in small scale farming compared to large scale. Stakeholder interviewed indicated that broiler meat production decreased in the years 2016 and 2017 due to the reduction in chick supply and the influence of production prices. Therefore, this implies that Government should constantly support the production of broilers to unlock the full potential of the poultry sector to contribute to the national economy through the development of strong, inclusive value chains, incorporating both on large scale and small scale broiler meat producers.

(f) Layers Parent Stock

Figure 4.15: Layers Parent Stock Production Trends



	2013	2014	2015	2016	2017
Chick Sales & Retention	7,072	2,103	5,075	2,032	3,007
Growing	25,804	22,579	19,732	18,648	18,648
In-Lay Layer Breeders	52,603	43,067	28,702	26,550	23,098

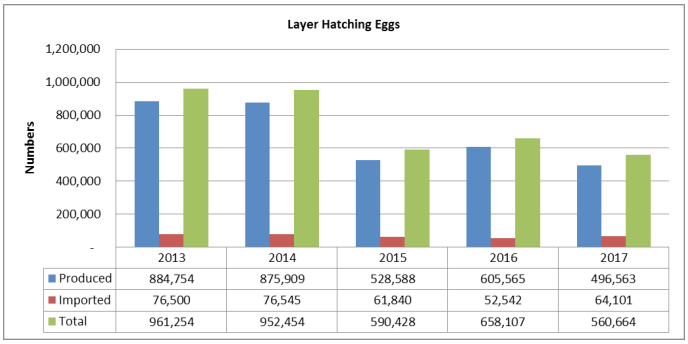
Source: Ministry of Agriculture (2018)

Overall Layers Parent Stock has been decreasing over the past five years. The chick sales and retention has been decreasing with an average annual sale of 3858 chick sales and the lowest being recorded in 2016 with 2032 chick sales. The decrease in sales in 2016 was also affected by a 5% decrease in Layers Parent Stock growing from 19,732 to 18,648. The 2016 decrease in sales was also affected by the 7% decrease in in-Layer Layer Breeders that went from 28,702 in 2015 to 26,550 in 2016 as noted by the respondents.

(g) Layer Hatching Eggs

From the given information overall the number of Layer Hatching eggs has been decreasing over the past five years, having experienced high amounts produced in the year 2013 and 2014 with total number produced amounting to 884,754 and 875,909 respectively. The annual average number of Layers Hatching Eggs produced for the last three years is 543,574 compared to the annual average for the past five years of 678,276.

Figure 4.16: Layer Hatching Eggs



	2013	2014	2015	2016	2017
Produced	884,754	875,909	528,588	605,565	496,563
Imported	76,500	76,545	61,840	52,542	64,101
Total	961,254	952,454	590,428	658,107	560,664

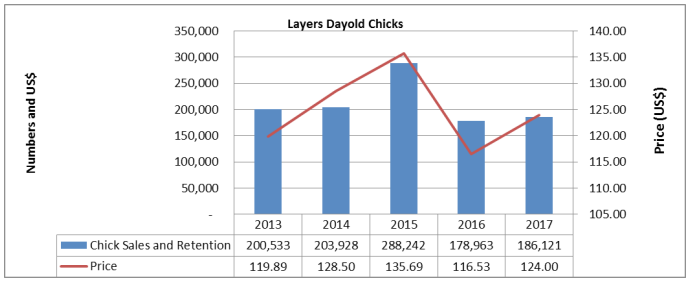
Source: Ministry of Agriculture (2018)

Analysing this given information, it implies that if the annual average rate continues to decrease Zimbabwe will now be forced to increase the imports of the eggs. Importing of the Layer Hatching Eggs will affect the market here in terms of quality of the product as well cause trade imbalances.

(h) Layers Day Old Chicks

From the given information in figure 4.17 shows that over the years there has been a positive relation between the chick sales and retention as well as the price. In the year 2015 when the price increased by 5.6% from 2014, the chick sales also increased by 41% from 203,928 to 288,242.

Figure 4.17: Layers Day Old Chicks



	2013	2014	2015	2016	2017
Chick Sales and Retention	200,533	203,928	288,242	178,963	186,121
Price	119.89	128.50	135.69	116.53	124.00

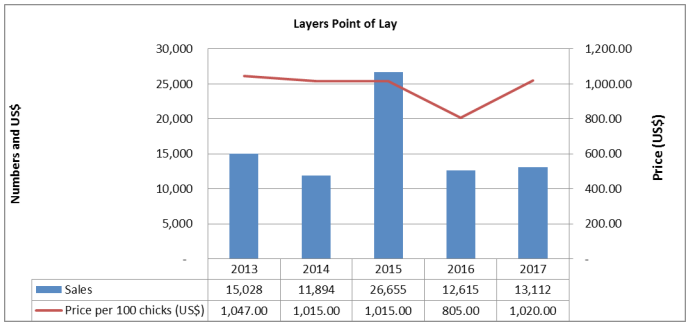
Source: Ministry of Agriculture (2018)

This implies that producers and consumers were both very price sensitive. In the 2016 when the price decreased by 14% from 135.69 to 116.53 the chick sales and retention also decreased by 38% from 288,242 to 178,963. An increase in sales was realised in the 2017 when the price increased by 6.4% the sales also increased by 3.4%.

(i) Point of Lays

From the given information in figure 4.37 it shows that over the years there has been a positive relation between the sales and the price per 100 chicks. In the year 2014 when the price decreased by 3% from 2013, the sales also decreased by 20% from 15,028 to 11,894.

Figure 4.18: Layers Point of Lay



	2013	2014	2015	2016	2017
Sales	15,028	11,894	26,655	12,615	13,112
Price per 100 chicks (US$)	1,047.00	1,015.00	1,015.00	805.00	1,020.00

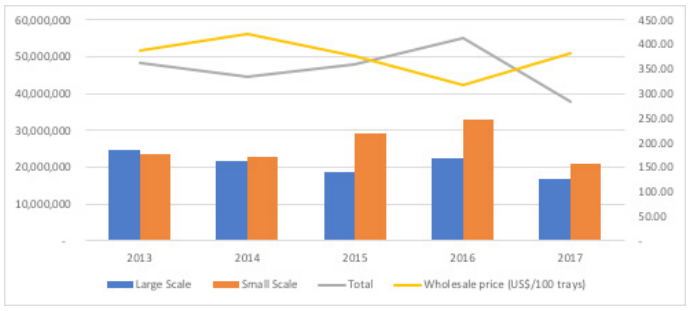
Source: Ministry of Agriculture (2018)

This implies that producers and consumers were both very price sensitive. In the 2016 when the price decreased by 20% from 1015 per 100 chicks to 805 per 100 chicks, the sales and also decreased by 52% from 26,655 to 12,615. An increase in sales was realised in the 2017 when the price increased by 26% the sales also increased by 4%.

(j) Table Eggs

Overall Table eggs are being sold more in small scale compared to large scale contributing more than 50% to the total. On average annually on small scale 2,140,000eggs are being sold compared to 1,806,205 in large scale.

Figure 4.19: Table Eggs Production Trends



Source: Ministry of Agriculture (2018)

More eggs are being produced in small scale hatchers compared to large scale (see figure 4.19). This implies that Government should constantly support table eggs on small scale hatchers as there is more production coming from it, at the same time not neglecting the large scale hatchers as well. On the hand consumers seems to be not very sensitive to the wholesale price.

4.12 Summary

The livestock sub-sector is an important and integral part of the agricultural sector with beef, dairy, small ruminants, pigs, poultry, apiculture, aquaculture and other small and emerging stock making up the livestock industry. The sub-sector contributes about 19 percent to the agricultural GDP (Ministry of Agriculture, 2018). The introduction of FTLR, combined with significant fluctuations in the macro-economic conditions, and a transformed agricultural sector post 2000 influenced major changes within the livestock sector. The land redistribution exercise has increased the participation of more than 300,000 newly resettled farmers with varied skills and resources in livestock farming. This transformation of the livestock sector has led to substantial shifts in ownership, use, and livestock management; and associated effects on animal disease management, production and marketing.

Challenges faced in the sector due to the transformation were identified as outbreak of diseases, lack of access to affordable funding, expensive inputs when compared to the region and depressed cereal production.

The study noted that on one hand, livestock herd sizes nationally declined by about 20 percent for beef, over 83 percent for dairy, and 26 and 25 percent for pigs and small ruminants, respectively. While the other livestock species did not recover, the dairy sector is noted to have defied the declining trends due to the presence of an integrated value chain. On the other hand, the productivity of smallholder cattle herds remains very low, with average calving rates of about 45 percent against a potential of 60 percent, and offtake rates of about 6 percent against a recommended 20 percent.

From the study, it was crystal clear that the average slaughter rate was around 5% of total head. The low slaughter rate was largely contributed by the fact that small scale farmers who controlled 69% of the total head keeps cattle as a store of wealth and as a sign of wealth and hence sees slaughtering as wastage. With this observation, it therefore means that small scale farmers are not sweating value in their cows something which could happen if they were slaughtering and restocking. This observation saw similar in other ranges of animals such as goats, sheep and pigs.

Against this background, there is need to train farmers with a view of building their capacity to run cattle and animal rearing as a serious business. In addition, there is need to create strong value chains linkages between farmers, the Cold Storage Company, meat processors and abattoirs.

Given that livestock producing districts are in semi-arid conditions key informants noted that Government should incorporate drought mitigation measures in the Command Livestock programme for example through setting up community livestock centres with access to supplementary feeding. The livestock centres which can be operated by the private sector or farmer groups will be designed to provide attendant services to small scale farmers such as cattle buying points, livestock input selling points and farmer training points. Furthermore, the community livestock centres can also be used as artificial insemination and bulling points in a bid to improve rural livestock genetics and quality of beef herds.

Department of Veterinary Services was urged to put in place measures that completely eradicate the continuous outbreak of diseases such as FMD and Avian Influenza Virus. Furthermore, enforcement and review of statutes on animal health ought to be timeously carried out to avoid unnecessary disease outbreaks. Effective management of the FMD problem can be achieved by moving towards a more decentralised marketing and slaughter system. This development would require the construction of abattoirs in strategic locations with a complementary marketing system that minimises transportation of live animals from high risk areas to low risk areas.

Stakeholders advocated for the implementation of a value chain focused livestock policy whose traits are; enhancement of efficiencies along the livestock value chains, security of livestock resources against natural and man-made disasters, equitable development of livestock value chain stakeholders and protecting consumers against risks arising from livestock development.

5 STATE OF AGRICULTURAL INFRASTRUCTURE

5.1 Introduction

One of the objectives of the study was to review the state of agricultural infrastructure. Against this background, this section focuses on road networks, irrigation facilities, dams, boreholes, storage facilities, pen fattening pens, dip tanks and abattoirs. In formation gathered in the study showed that robust agriculture infrastructure is key in anchoring future production and productivity.

5.2 Boreholes and Dams

According to the Water Act a dam is a body of water with a capacity of at least 5,000 cubic metres. Table 6 shows the estimated number of dams and boreholes in Zimbabwe which can be used for irrigation purposes and water for livestock. According to the data collected from Zimbabwe National Water Water Authority (ZINWA) the estimated number of boreholes in the country stands at 70,000 boreholes including non-functional ones. The 70,000 boreholes indicated in Table 5.1 includes aquafers and the major ones in Zimbabwe are the Nyamandhlovu, Middle Sabi and Lomagundi Dolomite acquafers which support farming activities. -The study noted that the majority of the boreholes are private owned or farm owned. Manicalnd and Masvingo provinces have the highest number of boreholes in the country due to the semi-arid conditions and prevalence of irrigation projects.

Table 5.1: Number of Dams and Boreholes in the Country

Type of Water Infrastructure	Quantity
Dam	7 500
Boreholes	70 000

Source: Zimbabwe National Water Authority (2018)

Study noted that the estimated total number of dams in the country is 7,500 registered and unregistered dams. Out of the 7500 dams, 4229 are registered with ZINWA while the remainder are unregistered with ZINWA but are managed by the District Development Fund (DDF) (these are small earth dams are estimated to be 3271). Despite Mashonaland East having the highest number of registered dams, Masvingo leads in terms of dam water holding capacity since it hosts some of the largest inland dams in the country such as Tugwi-Mukosi, Mutirikwe and Manyuchi dams. Table 5.2 shows the breakdown of registered dams in Zimbabwe by province. It is important to note that the numbers of dams shown in Table 5.2 do not include Kariba Dam.

Table 5.2: Zimbabwe Dams by Province

Province	Number of Registered Dams
Harare	75
Manicaland	513
Mashonaland East	1,020
Mashonaland Central	799
Mashonaland West	740
Matabeleland North	302
Matabeleland South	232
Midlands	365
Masvingo	181
Bulalwayo	2
Total	4,229

Source: Zimbabwe National Water Authority (2018)

5.3 Irrigation Infrastructure

Overall, the survey noted that the country's irrigation infrastructure is in a poor state manifested through the use of antiquated irrigation equipment and lack of maintenance by farmers. Table 5.3 shows the types of irrigation used by farmers interviewed.

Table 5.3: Type of Irrigation use in Zimbabwe

Irrigation Infrastructure	2015	2016	2017	2018
Flooding/Canal	27%	23%	24%	25%
Centre Pivot	20%	24%	25%	26%
Sprinklers	38%	35%	35%	33%
Drip	7%	10%	12%	13%
Other (siphoned pipes)	8%	8%	4%	3%

Source: Researchers' Own Observations

Table 5.3 shows that the country used diversified irrigation systems. Based on the frequency of responses from farmers, the majority of farmers uses centre pivot, flood irrigation and sprinklers while a paltry uses drip irrigation system. On average the study noted that both flooding irrigation and sprinklers, combined, has an average frequency of about 60% (see table 5.3 and table 5.4) which results in massive wastage of water through evaporation something which must be avoided through the use of drip irrigation if the country is to mitigate the effects of climate change which comes with low water levels. This frequency is closely linked to the hectarage under flooding and sprinklers. Using 2015 figures, 50.6% of hectarage was under flooding and sprinklers irrigation.

Table 5.4: Average Hectarage Under Each Irrigation Type

Hectarage Under Irrigation Infrastructure	2015 (000)	2016 (000)	2017 (000)	2018 (000)
Flooding/Canal (Ha)	22.71	25.19	28.29	33.56
Centre Pivot (Ha)	20.3	35.91	48.49	54.87
Sprinklers (Ha)	56.68	59.37	79.86	94.73
Drip (Ha)	10.45	11.46	13.72	15.25
Other (siphoned pipes) (Ha)	1.23	1.42	1.57	1.64

Source: Ministry of Agriculture (2018) and ZINWA (2018)

The average hectarage under centre pivot system and drip system have been increasing significantly from 2015 while that of flooding and sprinklers have been declining.

5.4 Other Infrastructure

Key infrastructures discussed in this section includes grain storage facilities, dip tanks, abattoirs etc.

5.4.1 Grain Storage Facilities

Zimbabwe has 87 Grain Millers Board (GMB) depots with commercial storage capacity of 4,782,500 metric tonnes (bulk and bags). These depots provide contract farming services, grain fumigation and grain storage. Some of the depots such as Spindale have an agro-processing plant which provides milling services. GMB depots are classified into four different categories which are Class 1, Class 2, Class 3 and Class 4 as shown in Table 10 below.

Table 5.5: Classification of GMB Depots

Depot Class	Number
Class One	15
Class Two	20
Class Three	29
Class Four	23
Total	87

Source: Grain Marketing Board (2018)

Class One depots those which are operational though-out the year, have silos and in others instances a milling plant, for example, Lion's Den, Spindale, Chegutu and Masvingo. Class Two depots are those that are used for grain storage and also open all year round such as Chinhoyi, Gokwe and Marondera. Class Three and Class Four depots fall in the category of collection, transit and mobile depots that normally open during intake. The study noted that in order to reduce post-harvest losses, GMB had to come up with mobile depots because of the policy position for farmers to deliver their produce within a distance of 5km.

With respect to the state of the storage facilities, the study noted that a number of the GMB silos are in bad state and as such requires facelift.

5.4.2 The State of the Dip Tanks

The study noted that there are 3 851 dip-tanks in the country and the highest number was in Masvingo province where a figure of 701 dip-tanks was recorded. Table 11 shows the breakdown of dip-tanks in the country by province.

Table 5.6:Number of Dip tanks by Province

Province	Number of Dip-tanks
Manicaland	543
Mashonaland Central	324
Mashonaland East	474
Mashonaland West	416
Matabeleland North	390
Matabeleland South	460
Midlands	543
Masvingo	701
Total	3 851

Source: ZIMSTAT (2014)

The study noted that whilst dip tanks are key infrastructure which is aimed at controlling ticks and tick-borne diseases, it was noted that farmers have lost a significant number of their cattle due to tick related diseases in Mashonaland East, Mashonaland West, Mashonaland Central and other parts of the country. This has been mainly due to lack of implementation of policies that ensure that cattle are dipped often as outlined in the regulations.

With respect to abattoirs, the study noted that there are 165 abattoirs in the country and of these 145 have renewed their registration to operate in 2018.

5.5 Overall Assessment of the State of Infrastructure

Interviews and focus group discussions with key stakeholders reveals that the country's agricultural infrastructure is in a poor state, poor road networks and abundant unutilized water bodies for irrigation. It was also evident that smallholder farmers who own 73% of the productive land have not been able to invest in infrastructure and farm equipment thus confirming observations made by the Ministry of Agriculture that agricultural investment sharply declined over the past 18 years. As a result, lack of appropriate infrastructure and technologies in the agriculture sector has adversely affected overall production and productivity outlined in the section on production trends. Some of the key informants pointed out that investment in agricultural infrastructure has been on the decline because of the nature of the new agrarian stakeholders who do not prioritise in reinvestment of proceeds to develop farms, farming areas and the community at large.

Investment in irrigation infrastructure has not been realised over the past years and some of the infrastructure availed through government programmes lies idle at farms. Poor schedules for repairs and maintenance has left the sector with little functional irrigation equipment. According to the Ministry of Agriculture (2018), of the 39.6 million hectares of land in the country, about 42.1% is utilized for agriculture, with about 365,000 Ha of land suitable for irrigation. However, less than 50 percent of this is currently equipped for irrigation out of which about 123,000 hectares is currently irrigated mostly by commercial farmers and smallholder irrigation projects.

The study noted that poor agricultural infrastructure has adverse effects on the farm activities which increases the cost of production thereby reducing the farmers' competitiveness. For example, transport costs depend on the

state of the road, in tarred road transporters charge $0.13 per metric tonnes per kilometre while in gravel roads the cost goes up to $0.21 per metric tonnes per kilometre. Most roads in Zimbabwe are in a bad state and the once existing network of strip roads in farming areas has been reduced to dusty roads which are impassable in other areas.

Information gathered during the survey indicated that for the agriculture sector to prosper there should be an established road network to easy the transportation of inputs and produce. In that regard, respondents suggested that a road fund be established for rehabilitation and maintenance of farm strip roads and communal roads and construction of new roads in newly resettled areas.

5.6 Summary

The study noted that there is inadequate development, rehabilitation and modernisation of agricultural infrastructure across all categories has been a large contributor to low productivity and production, and ultimately competitiveness. It is important for stakeholders in the sector to prioritise investment in infrastructure to provide a stable foundation for the future growth of the sector.

Infrastructure gaps which ranges from deficits of irrigation equipment, combined harvesters, tractors, roads, silos, rehabilitation of dams, etc can be financed through government own initiatives and public private partnerships.

On average the study noted that both flooding irrigation and sprinklers, combined, has an average frequency of about 60% (see table 5.3 and table 5.4) which results in massive wastage of water through evaporation something which must be avoided through the use of drip irrigation if the country is to mitigate the effects of climate change which comes with low water levels. This frequency is closely linked to the hectarage under flooding and sprinklers. Using 2015 figures, 50.6% of hectarage was under flooding and sprinklers irrigation.

On this basis, it is important that the Government works on a comprehensive approach to revamp infrastructures in the agricultural sector in Zimbabwe. In this approach, it is important that Government create an enabling environment for private sector to invest into agriculture through tax incentives.

In addition, Government of Zimbabwe, as part of its capital expenditure should consider investing in physical infrastructure in the farms by putting more emphasis on communal farmers who were found to be unproductive. Funds used in Command Agriculture can be earmarked for this exercise. This view was supported by a number of respondents who were interviewed. The respondents whilst they appreciated the impact of Command Agriculture in addressing structural rigidities in the agricultural sector, they argued that if the same funds are channelled towards infrastructure development, there are high chances that this will create an enabling environment for investment to come into the sector through value chain financing models.

6 ROLE OF FINANCE IN THE AGRICULTURAL SECTOR

6.1 Introduction

Agriculture production need to be supported by a robust financing model that empowers farmers to increase their production and productivity levels. Farmers require capital for equipment and working capital expenditures to optimise their operations. The country requires over $1.2 billion dollars to effectively fund the agriculture sector yearly. This could come in different forms which include command agriculture, contract farming, bank loans, self-funding and donor assistance. Getting the agriculture sector financed is critical for the success of the sector.

6.2 State of Budgetary allocation to Agriculture

Table 6.1 illustrates national budget allocations to agriculture since 2009. The share of agriculture in the national budget allocations has remained low, less than African Union's Maputo declaration target of at least 10% except in 2010 when it reached 14%.

Table 6.1: National Budget and Allocations to Agriculture

Year	National Budget (US$m)	Allocation to agriculture (US$m)	Agriculture as a % of the national budget
2009	1,391.00	343.00	2.47
2010	2,250.00	448.00	14.00
2011	2,746.00	122.00	4.40
2012	3,640.00	184.00	8.43
2013	3,860.00	147.00	3.83
2014	4,120.00	155.00	3.76
2015	4,578.00	161.00	3.71
2016	4,434.00	173.00	3.70
2017	4,100.00	291.60	7.11

Source: Ministry of Finance

However, the share increased from an average of 5.5% between 2009 and 2016 to about 7.1% in the 2017 national budget. The highest share of agriculture in national budget allocation was 14% in 2010 which was mainly a result of drought financing. Similarly, in 2012 the share was 8.43% due to drought financing. However, the share decreased to 3.7% in 2016 and then increased in 2017 mainly due to the government's programmes; Presidential input scheme and command agriculture. Command agriculture and the accompanying growth in budget allocation to agriculture had some positive implications on competitiveness of the agricultural sector.

From this analysis, it is clear that the country has failed to meet the regional benchmark set by the Comprehensive Africa Agricultural Development Programme (CAADP) of a minimum 10% of total budget set aside for support in the agricultural sector. Globally, Zimbabwe's budget allocation to the agricultural sector is far below the European contribution of 38% which is provided under the Common Agricultural Policy (CAP).

6.3 Form of Funding Available for Agriculture

Command agriculture sector funding has attracted a lot of farmers to consider it due to its success in the past two seasons. Stakeholder respondents raised interesting debate on their diverse views on the role of subsidies and how they should be implemented.

- Key stakeholders noted that subsidies should target food crops to secure food security while industrial or cash crops should benefit from integrated value chains that have robust backward and forward linkages. Lessons on the importance of strong value chains in spurring production and productivity could be taken from the dairy and tobacco sub-sectors.
- There is evidence to the effect that subsidies bring distortions in the value chain especially on grains that receive two subsidies with the first one being an inputs subsidy during production and the second one in the form of a price support during marketing.
- The emergence of middlemen in the marketing of subsidised crops especially grains transfers the benefits of the subsidy from the intended beneficiary (farmer) to an opportunist (middlemen) who does not grow the crop in the ensuing season.

A new model of funding that is contract farming was observed as the most common form funding. Bank loans funding is a challenge due to non-bankability of the 99-year lease agreement and most banks are hesitant to fund the current crop of farmers.

Table 6.2: Forms of Agriculture Funding in Zimbabwe

Form of Funding	2017	2018
Command Agriculture	18%	19%
Contract Farming	20%	22%
Bank Loans	10%	8%
Self – funding	24%	25%
Presidential Input Scheme	12%	12%
Donor Funding	7%	7%
Other (Joint Ventures, PPP)	9%	7%

AGRICULTURAL MARKETING AUTHORITY

The Agricultural Marketing Authority (AMA) is a statutory body established in terms of the Agricultural Marketing Authority Act [Chapter 18:24] and is mandated with overall regulation of the production and marketing of agricultural products in Zimbabwe. The Authority's vision is a sustainable and prosperous agricultural sector driven by effective marketing regulatory services.

AMA endeavours to provide a conducive regulatory environment for sustainable marketing and production of agricultural products. The Authority's key functional roles are as follows:

- Regulation.
- Promoting production and marketing of agricultural products and fair trade practices.
- Raising funds for production and marketing of agricultural products through agro bills and levy collection.
- Provision of standards of quality for agricultural products.
- Maintaining a comprehensive information system for the agricultural sector.
- Policy advice, including making recommendations to Government on agricultural producer pricing of strategic crops.

AMA administers a number of statutory instruments (S.I) in an effort to provide a regulatory framework for efficient production, marketing and processing of agricultural products. The regulations provide for standards of quality, maintenance of order in the sector, establishing a level playing field, compliance and enforcement. AMA currently administers the following key instruments in the agricultural sector:

(i) S.I. 142 (2009) and S.I. 63 (2011) for the cotton sector.
(ii) S.I. 147 (2012) for registration of all merchants of agricultural products and submission of periodic returns to the Authority for compilation of vital statistics relating to the agricultural sector.
(iii) S.I. 140 (2013) for grain and oilseed products.
(iv) S.I. 129 (2017) for collection of the Livestock Development Levy for surveillance, prevention and control of animal diseases in accordance with the Animal Health Act, research on appropriate technologies in livestock production, grading of livestock and livestock products, orderly marketing of livestock and investment in livestock infrastructure.
(v) S.I. 247 (2018) for the Command Agriculture Scheme for Domestic Crop, Livestock and Fisheries Production.

All institutions and individuals intending to buy, process or trade in agricultural products are required to register and/or renew their licences with the Agricultural Marketing Authority each season. Institutions or individuals in the following subsectors are required to register with the Authority:

- Grains and Oilseeds
- Cotton
- Horticulture and Plantation Products
- Livestock and Livestock Products
- Industry Stakeholder Associations
- Contractors and Input Suppliers.

Farmers should also register in order for them to be put onto the national database of producers.
Registration forms can be collected from the Agricultural Marketing Authority at the following address:

8 Leman Road
Off Second Street Extension
Mt Pleasant
Harare

Or can be sent by email on request to: Marketing Department, telephone (0242) 308 662- 4
Ext. 111/112 or e-mail to info@ama.co.zw or rchakuvinga@ama.co.zw.

Or can be collected from AMA regional offices listed below:
CHINHOYI – 0772621390; BINDURA – 0712559700; MARONDERA - 0712047840 ; MUTARE – 0773490225; BULAWAYO – 0774004865; LOWVELD – 0774882548; GOKWE – 0775710493; BEITBRIDGE - 0713895606; CHIRUNDU – 0774065938.

Source: Researchers' Own Observations

Joint Venture and partnership finance is increasingly seen as a route for rehabilitating and investing in state farms for example Chisumbanje sugar mill and plantation. Self-funding through employment income is relatively small and is not sufficient for major take-offs especially in farm operations that require rehabilitation and capitalisation. Development aid organisations also provide finance by way of subsidised loans and grants. The Credit for Agricultural Trade and Expansion (CREATE) fund was established by SNV Netherlands Development Organisation and HIVOS (also from Netherlands) to facilitate the raising of capital for lending to commercial agriculture value chain actors in Zimbabwe. The CREATE provide loans ranging fromUS$5 000 to US$200 000.

(a) How Agriculture Funding is Instituted

Table 6.3 shows that the greater part of half or more of the agriculture funding go towards acquisition of inputs mainly seeds, chemicals and fertilisers. This reflects that funders are concerned about funding the core aspects of agriculture.

Table 6.3: Forms of Expenditure paid for the Funding

	2018
Agriculture inputs (chemicals, seeds and fertilisers)	50%
Farming equipment and land preparation	5%
Labour	8%
Building infrastructure	7%
Irrigation infrastructure	15%
Harvesting, packaging, curing and transport	10%
Other (training, workshops etc)	5%

Source: Researchers' Own Observations

Some of the funders provide the actual inputs (chemicals, seeds and fertilisers) instead of giving the farmer the money. Due to high demand for irrigation, some funders are funding irrigation infrastructure in the form of Centre Pivots.

(b) Crops being Funded

Table 6.4: Crops funding

Command Agriculture Funding	Contract Funding Model	Donor Funding
Maize	Maize	Small grains – Finger millet, Pearl millet
Soyabeans	Soyabeans	Ground nuts
Wheat	Tobacco	Soya beans
Cotton	Wheat	
Small grains – finger, millet, pearl millet	Sorghum	
	Cotton	

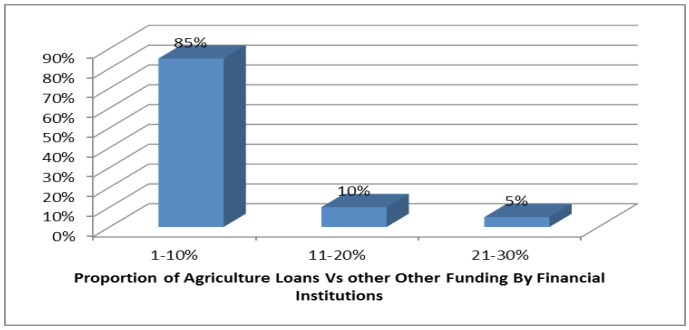
Source: Researchers' Own Observations

Command agriculture is funding maize, soya bean and wheat production. The funding have also been extended to livestock mainly cattle. Contract funding focuses mainly on tobacco, soya bean, sorghum but has since been extended to maize, and wheat.

(c) Banks Loans

Finance is available from commercial banks and the interest rates charged by banks average 5% per month for short term loans with 1 year repayment period while medium and long term loans are charged 12% per annum. In order to access funding, in addition to the requirement for a viable business proposal, collateral is required.

Figure 6.1: Proportion of Bank Loans for Agriculture by Funding Institutions



Source: Researchers' Own Observations

Figure 48 shows that the majority of financial institutions interviewed, that is, 85%, are spending less than 10% of their funding on agriculture. The study established that despite banks having agriculture sector funding facilities most small scale farmers are not able to access loans from banks and only 10% of total loans issued goes towards agriculture. Notable agriculture infrastructure projects funded by banks irrigation equipment, grain storage facilities, tobacco bans, green houses, pen fattening, poultry as well as working capital for inputs and transport logistics.

As measure to mitigate risk banks screen farmers for funding and the general requirements are title deeds, stock orders, notarial general covering bonds (NGCBs) over farm machinery and equipment, mortgage bonds and crop stop orders.

Ironically, banks are not willing to lend to small scale farmers who are growing cereals due to lack of collateral but are funding seed growers, tobacco farmers and dairy farmers on the back of a strong value chain which exist in these sub sectors. The 99 year leases should be bankable to allow for long term investment on the farm and capacitate borrowing when using them as collateral.

(d) Government Facilities and Initiatives

The government is funding agriculture through Command Agriculture that covers crops and livestock. Recovery in the production levels of the maize crop in 2017 is attributed to the command agriculture initiative which has also significantly improved yields. The command livestock programme is gathering momentum in cattle ranching provinces where farmers have benefited heifers under a revolving fund facility. The Command Agriculture initiative has traits that researchers attributed to the increase in productivity in both crops and livestock and these are:

- Timeous distribution of inputs
- Provision of adequate inputs
- Inputs are availed at affordable prices
- Availability of extension services through ward AGRITEX extension officers

Government provide regulations that facilitate contract farming when it evaluates contracts between farmers and buyer firms to ensure fairness in the implementation of input credit schemes. Government charges statutory fees on farmers and firms to raise funds for research and development as well as extension services. Government is grappling with challenges of climate change and the underutilisation of mechanisation equipment.

The government assisting farmers by raising short term funds for irrigation through issuance of bonds for example the Agricultural Marketing Authority (AMA) bonds. Government is also partnering non-governmental organisations to fund agriculture infrastructure such as crop handling structures, post-harvest and grain storage structures.

The government is playing a pivotal role in providing funding for the livestock sector and qualifying farmers have received heifers and steers through the

livestock scheme. The livestock selection criteria require farmers to farmers to have land, infrastructure and chemicals. Government also provide extension services so reduce the risk of unnecessarily losing livestock through diseases and pests.

Most banks indicated that the main challenge in agriculture financing is high default rate. Factors that contribute to non-payment of loans are low returns as farmers make little or no profit from their farming activities. Furthermore, high cost of production, climate changes, diversion of loans, middlemen activities and side marketing are some of the factors militating against the ability of the farmers to pay back loans.

Box 1: The Role of ARDA in Zimbabwe's Agricultural Sector

Agricultural and Rural Development Authority (ARDA) is a state owned enterprise under the Ministry of Agriculture Mechanization and Irrigation Development that is responsible for spearheading the advancement of agricultural production and rural development. ARDA derives its mandate from the ARDA Act that seeks to promote development through implementation of vibrant schemes in the agricultural sector with a view of reducing poverty especially in rural areas. The authority has substantial land holding across the country comprising of 21 estates with a total of 98,000 hectares of arable land of which 19.4% is irrigable.

The authority's interventions in the agriculture sector are divided into two main categories, namely commercial/business operations and rural development. Commercial operations involve production of various crops and livestock at the 21 estates which operate as strategic business units (SBUs). In that regard each SBU maintains separate accounts that it can use to secure funding. However, in the last decade financing of all the SBUs became a serious challenge despite the floating of the Agriculture Marketing Authority bonds as a source of funding. Production plummeted to less than 30% of capacity because of lack of funding and the authority responded by adopting strategic public private partnerships (PPPs) financing models to resuscitate operations and to date 18 of its SBUs have entered into partnership with private companies under the public private partnership (PPP) scheme. Under the PPP arrangements, ARDA has used a number of frameworks which ranges from joint ventures (JVs), build operate and transfer (BOT), rehabilitate operate and transfer (ROT), management contracts, leasing and share farming arrangements for its SBUs in sugar cane, ethanol, horticulture, maize, wheat, tea, safaris and gaming and livestock production.

The most famous PPP entered into by ARDA is the Chisumbanje Estate where a businessman Billy Rautenbach provided working capital and invested US$300 million in a sugar cane processing plant under a BOT arrangement. The resuscitation of the Chisumbanje Estates created direct and indirect employment to thousands of people and has increased the production of ethanol used in the blending of fuel. Furthermore, ARDA joined hands with private players in its Antelope Estate to produce cereals. This investment saw 320 direct jobs being created.

In addition to PPPs, ARDA is implementing the Agricultural Based Socio-Economic programmes to improve the livelihoods of rural communities throughout-grower schemes and smallholder irrigation schemes. In this scheme, ARDA provides a ready market to contracted farmers as well as extension services in an effort to boost production and productivity. In the same vein, ARDA is funding infrastructures such as centre pivots and water infrastructures.

With respect livestock, ARDA partnered with private sector in the production of cattle in Matabeleland In this project, ARDA partnered with Kalimba Investments in the production of livestock and pecan nuts in its Balu Estate in Umguza District. Pecan nuts are being produced for export market while the cattled production is earmarked for local market.

Source: Researcher's Own Observation Based on the Interaction with ARDA

(e) Private Sector Credit Schemes

Private sector companies that are interested in getting uninterrupted supply of raw materials from farmers enter into contract farming arrangements or out grower schemes with farmers. Crops such as tobacco, seed cotton, maize and sorghum as well as dairy and chicken rearing projects are anchored by contract farming schemes.

Contract farming schemes benefit sustain millions of livelihoods in Zimbabwe, for example in cotton alone more than 300,000 households are contracted to grow the crop. The main challenges in contract farming are to do with side marketing, poor loan recovery and poor quality output.

The study noted that the seed industry is supporting seed out growers with an average land size of 15,000 hectares. In support of the out growers' schemes through contract farming, the study observed that companies are applying the following local content enhancement or support programmes:

- Provision of an extension officer for every 400 hectares of land under seed production;
- Provision of working capital and input support. The working capital includes provision of cash for the payment of wages during harvesting;
- Financial support in the establishment of centre pivots, seed drying units, seed graders, on farm weather station, tractors and planters, grading sheds and silos. Since 2015, the seed industry has invested about $7 million into these key farm infrastructures;
- Provision of a ready market for the seed;
- Overall, the seed industry has played a role of an aggregator where they provide a market for the seed growers whilst at the same time the sector plays a significant role in funding farmers which if left alone have no capacity to access funding from the bank since they have no collateral.

(f) Development Partners

The study noted that development partners plays a critical role in agriculture as they establish a link between farmers donor funds. The funds are provided under pure grants, match making grants, revolving funds and concessionary loans to individuals and farmer groups. They provide funding for incentives to reinvest in agriculture, increase production and in the long run, contribute to food security and income generation. Development partners provide financial assistance to agriculture sector and private companies with the aim of coming up with innovative solutions to challenges being faced by farmers. Whilst they work with banks for farmers to get financial assistance thus through financial linkage/financial inclusion programmes. Development Partners establishes a link between agriculture and finance as they source funds from donors. Box 1 provide a comprehensive illustration of how development partners participate in agricultural sector.

Box 2: The Role of DFID in Zimbabwe's Agricultural Sector

The United Kingdom through the Department for International Development (DFID) has supported agriculture sector in Zimbabwe with a view of reducing poverty in rural areas. The DFID's perspective is grounded in the recognition that agricultural production depends on and is driven by demand from buyers, processers and ultimately consumers along the supply chain, and that agro-industry plays a critical role in value addition, job creation and in shaping diets. In Zimbabwe DFID implements programs that cover 3 thematic areas namely; agriculture productivity and nutrition, market development and climate change mitigation. DFID's programs seek to capacitate smallholder farmers to produce for sustenance and for sale if there is a surplus. DFID operates in 8 districts found in Mashonaland Central, Midlands and Manicaland provinces. The districts covered in Mashonaland Central are Guruve and Mount Darwin while in Midlands province it supports farmers in Gokwe South, Kwekwe and Shurugwi. In Manicaland province the districts covered are Mutasa, Makoni and Mutare. The districts were selected based on poverty levels, food insecurity, the prevalence of stunting and potential for market development.

According to DFID, the agriculture productivity and nutrition programme which is managed by the Food and Agriculture Organisation (FAO), seeks to support the enhancement of productive and technical knowledge of farmers through production technology, bio-fortified and high yielding varieties, rural market financing for training of smallholder farmers. Given that maize is a staple crop for Zimbabwe DFID prioritized its bio-fortification and fortification for the crop to become more nutritious and accessible to poor households in sufficient quantities. In that regard, DFID supports bio-fortification and fortification at various stages of the production and supply chain and through strategic social marketing to ensure wide adoption and competitive pricing. Other crops supported in the bio-fortification and fortification programme are beans and groundnuts.

Furthermore, DFID also support livestock production to improve on quality through pen fattening projects and improvement of breeds for small livestock such as goats.

With respect to market development DFID explained that it is helping farmers to access markets since markets are an part of an integral production plan. In that regard, DFID is working with the private sector to finance livelihoods and food security programme (LFSP) that promote aggregation at national and community levels, promote market linkages at farmer group level and development of commodity associations. In market aggregation the programme is implemented in partnership with private companies such as Super Seeds, Seed Co-op and MC Meats. The development partner indicated that it also support livestock projects and also provides funding to micro-finance institutions under the Zimbabwe Market Finance Fund facility. DFID underscored that it has received a GBP20 million LFSP facility which will run for the next 2.5 years following the expiry of another GBP 70 million 4 year LFSP in August 2018 that was financed by UK and AusAID.

The climate change mitigation programme is carried out in partnership with United Nations Development Programme (UNDP) and AGRITEX officers in the Ministry of Agriculture to promote climate smart agriculture. A Zimbabwe Resilience Building Fund (ZRBF) worth GBP21.5 million supported by the UK government and the European Union (EU) has been put in place to that effect. The ZRBF seeks to contribute to increased capacities of vulnerable rural farmers to withstand shocks and stress, ultimately leading to a reduced need for humanitarian responses and welfare improvement. The fund supports farmers in natural regions 4 and 5 to grow small grain crops suitable for their areas. In addition to that it also mitigates effects of climate change through drilling of boreholes and providing finance for irrigation kits. Other programs that DFID finances are post-harvest loss and storage issues and taking the product to the market before it loses quality.

Source: Researcher's Own Observation Based on the Interaction with DFID

6.4 Unlocking Funding into Agriculture

From government perspective, as noted by FAO (2017), government must provide catalytic role in creating an environment for mobilising funding into the agricultural sector. This catalytic role can be through the provision of incentives to banks and companies funding farmers, provision of funding into key infrastructures such as irrigation, road rehabilitation and other infrastructures such as provision of electricity. In order to finance this, government must allocate at least 10% of its budget into agriculture in line with the CAADP. This is expected to attract financiers to participate in funding agriculture.

International experience as noted by the United Nation Conference for Trade and Development (UNCTAD) (2014) showed that commodity exchanges provide an effective platform for funding agricultural sector as well as an effective market for farmer produce (see box 2).

Box 3: Unlocking Finance Through Commodity Exchange

Africa's smallholder farmers have long been victim to fragmented, disorganised markets where they have had to sell their products for lower than the market price. Commodity exchanges offer more stable, more ethical trading platforms whereby farmers can benefit from fairer transactions and learn how to make wiser marketing and investment decisions. There has never been a better time to increase the number of commodity exchanges in Africa and ensure fledgling farmers have every chance of survival. Africa's poor tend to be its smallholder farmers. They remain poor because they have no money to buy good quality seeds and fertiliser and no money to invest in machines or techniques that can optimise their farming (e.g. irrigation). With little infrastructure to connect their villages to the markets where agri-products are bought and sold, they are left cut off from a stable and profitable supply chain. This type of market fragmentation means that many African smallholder farmers are caught in a cycle of poverty. UNCTAD noted that the fragmentation of farmers led them to exploitation of farmers. In a pattern established over decades, various intermediaries, from private traders to public marketing boards, have taken advantage of the disorganised markets. Typically, such intermediaries can enjoy being the only purchaser a farmer has contact with. This lack of competition means they can ensure that a farmer has no choice but to take whatever price is offered. This is sometimes as low as 10 per cent of the on-going market price (UNCTAD, 2014). Organised and regulated commodity exchanges were noted as effective platforms for the provision of revolutionary changes to the way African smallholder farmers fare.

UNCTAD (2014) explained the benefits of commodity and derivatives exchanges as well as a concise explanation of why they are important:

> "***Commodity Exchanges are highly efficient platforms for buyers and sellers to meet; primarily to manage their price risks better, but also to improve the marketing of their physical products. They [make] economies more inclusive, boosting the links between agriculture and finance, and making the commodity sector more efficient and competitive.***"

A study conducted under the auspices of UNCTAD identified a total of 69 positive impacts that commodity and derivatives exchanges offer. The most important can be summarised as follows: **Quick and easy dissemination of market price and other information** which farmers would not otherwise have access to. This can be achieved without any dramatic technological advances: in India, for example, the national post office delivers daily price information to villages, which is then displayed on blackboards in prominent places. Once farmers know what the market price is, they can enjoy fairer negotiations with purchasers and can make more informed judgements on what to invest in the future and how to market it. **A free and open auction system** which ensures farmers can sell their goods close to the market price, or even above it. This is another feature that can help farmers make more informed decisions on their future farming activities such as what to invest in and how to diversify their sources of income. **The opportunity to 'hedge' against volatile prices,** meaning farmers can 'lock in' their sales price at the time of planting particular crops. This way farmers can enjoy an element of certainty about the price they will receive at harvest and can budget accordingly. They can choose which crops to grow and judge when is the best time to sell them on the market, minimising the risk of losing revenues as prices fluctuate. **Fewer risks to financiers,** who can use warehouse receipts as collateral ready to liquidate in an event of default. Traditionally, financiers have considered agriculture as a high risk and low profit business for standard modes of bank-lending. As a consequence, farmers and others in the commodity value chain pay disproportionately high levels of interest. Through commodity exchange 'eco systems' (such as warehouses) forms of financing have been developed that can reduce financiers' risk and costs of delivery by linking traditional financial tools with commodity exchange services. A stimulus for infrastructure development, as an exchange, by definition, can only truly flourish with as many participants as possible. More commodity exchanges would provide African governmental bodies and investors with an impetus to create better roads to connect farmers to markets and reduce fragmentation.

Source: UNCTAD (2014)

As Zimbabwe is working on establishing the commodity exchange, it is important that policy environment; rules relating to ownership of exchanges; rules and regulations to underpin a successful exchange; better product development; as well as the creation of clearing guarantee structures are put in place.

6.5 Summary

International experience as noted by FAO (2017) shows that there is a positive causal relationship between access to finance in the agricultural sector and agricultural productivity. In Zimbabwe, evidence shows that commercial farmers who have access to funding are getting yields averaging 3.5 metric tonnes per hectare while communal farmers who rarely get funding produces around 0.75 metric tonnes per hectare. However, what was striking to note is the fact that 85% of the banks interviewed are lending less than 10% of their total loans. Outside the traditional loans from the banks, the study noted that the major source of funding which was made available to farmers was through contract farming and presidential input support.

The study noted that where contract farming was used, the contracting company became the aggregator and on the back of the strength of its balance sheet has been able to access fund the farmers who have no collateral. This has resulted in the elimination of the challenges related to security of tenure. This observation was largely noted in the tobacco, food and beverages sectors. However, one key feature which enabled the enhancement of these value chain financing models relates to the business environment in these sectors. For example, in the tobacco sector, the crop is sold under an auction system which allows for efficient price recovery as opposed to cereals such as soya bean, maize and wheat which are under price control regime.

Based on this foregoing, it is important that Government liberalise the agricultural sector and operationalize the commodity exchange which will come with effective financial instruments such as warehouse receipts and derivatives which were noted to be effective in funding agricultural sector globally. In the same vein, fiscal incentives aimed at supporting companies who are funding agricultural sector under contract farming should be considered with a view of encouraging the practice.

7 ROLE OF AGRICULTURE SECTOR PRODUCE MARKETS IN ZIMBABWE

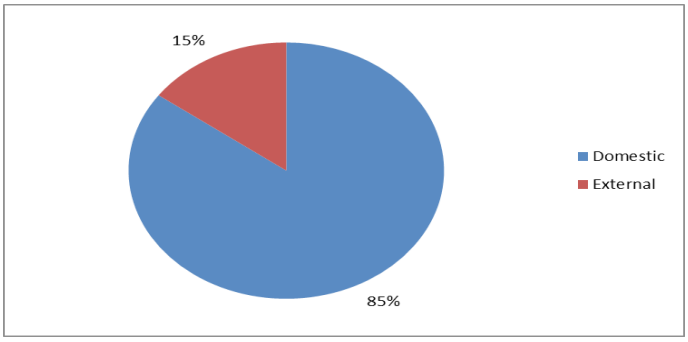
7.1 Introduction

Agriculture marketing is considered to cover the services involved in moving an agriculture product from the farm to consumer. That is it involves the planning, organizing, directing and handling of agriculture produce in such a way as to satisfy the farmer, producer and the consumer.

7.2 Nature of Markets Available

Figure 7.1 shows that 85% of agriculture produce are sold in the local market and 15% are exported to other countries. This is mainly due to retailers and fresh produce markets sourcing their products from small and large scale producers.

Figure 7.1: Source Market for Agriculture Produce

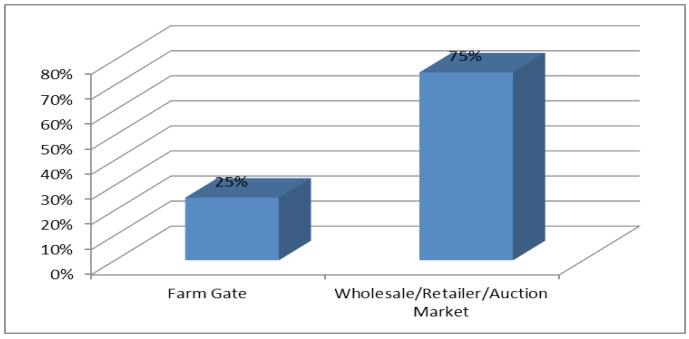


Source: Researchers' Own Observations

7.3 Nature of Domestic Markets

In Zimbabwe, on average about 75% of t farmers interviewed supply their produce to official wholesale markets such as GMB, Dairibord, fresh produce markets such as Mbare Musika. About 25% is sold at farm gate or at farm where wholesalers, retailers and other agents buy directly from the farmer.

Figure 7.2: Actual Domestic Markets Available



Source: Researchers' Own Observations

7.4 Role Played by the Markets to Farmers

Table 7.1 shows that markets play a critical role to farmers in Zimbabwe. They provide market linkages between farmers and consumers, they provide timely payment to farmers and finance farming activities in some instances. In terms of availability of markets, the most cited were GMB, Dairibord, Mbare Musika, Cottco, Quton and tobacco auction floors among others.

Table 7.1: Role Played by the Markets to Farmers

Role	Yes (%)	No (%)
The availability of markets for farm produce	84.3%	15.7%
Market linkages	86.3%	13.7%
Timely payment for farmers	60.8%	39.2%
Accessibility of farm produce information	49%	51%
Financing of farming activities	35%	65%

Source: Researchers' Own Observations

Some farmers acknowledged the timely payment by the markets especially auction floors and GMB. Some of the farmers appreciated the financing being provided by markets through contract farming which both provided the inputs and act as market for the produce. This was more pronounced in the tobacco, soya bean and sorghum.

Key stakeholders reveals that suppliers of produce markets are failing to meet national demand, farmers lack competitiveness due to high cost of production, value chains are under-developed, limited market access due to information asymmetry and competition from cheap imports are some of the factors affecting the sector. Retailers impress upon high quality and failure to meet required quality products are returned to the farmer or are bought at very low prices. Quality is rated on with due considerations on standard, size, presentation and packaging and failure to meet the minimum expectations the farmer makes a loss. In an effort to improve on quality agronomy agencies and field agronomists are engaged mainly by retailers and those contracting farmers to educate farmers on soil, quality, seasonal products and market conditions. Despite the efforts made by retailers and contractors in educating farmers more training is required for their produce to meet specific quality standards.

The study noted that the Market Linkage Group Association working with development partners is spearheading a crop development programme focusing on small scale farmers to enhance food security, nutrition and hygiene and poverty reduction. The programme targets irrigation schemes and households practicing dryland farming and the program focuses on creating linkages to markets and capacity building on aspects of crop agronomy, farming as a business, health and nutrition.

7.5 The main challenges in the supply of products

Unstable macroeconomic environment in the country that poses a serious challenge on planning and retention of value on transactions.

The high cost of production in the country affect farmers' competitiveness in the export market.

Farmers lack the basic business acumen and the gap can be closed through training in farm management and agronomic modules.

Information gathered in the survey indicated that government is making initiatives to provide market linkages to the farmers and some of the markets are the Grain Marketing Board and private companies such as National Foods, Profeeds, Irvines, Delta Baverages among others.

Late payment for grain delivery is the major challenge faced by farmers selling their produce to GMB and some of them responded by shifting to grow other crops while others end up selling to middlemen who do not pay the full value of the grain.

The study noted that there are no platforms that facilitate amicable resolution of disputes between farmers and buyers/firms.

7.6 Summary

Evidence derived from this research shows that 85% of the outputs from the agricultural sector is channeled towards local market whilst 15% of the produce is exported. The study noted that 25% of the is sold at farm gate whilst 75% of the output is marketed via various wholesale and retail markets. Farmers interviewed bemoaned postharvest losses at the farm and loss of margins as a result of the middlemen. It was also observed that farmers, in many cases, failed to meet the market needs in time.

One way to improve access to markets for grains is to establish the commodity exchange (see Box 2 under 6). Further, enactment of the backward integrated policy in line with local content policy as noted in Nigeria by World Bank (2017) was seen as an effective tool of creating market linkages. An integrated value chain comprised of active out grower schemes and synergies with retailers and processing companies guarantees a market to farmers thereby reducing post-harvest losses.

8 IMPACT OF CLIMATE CHANGE ON AGRICULTURE PRODUCTIVITY

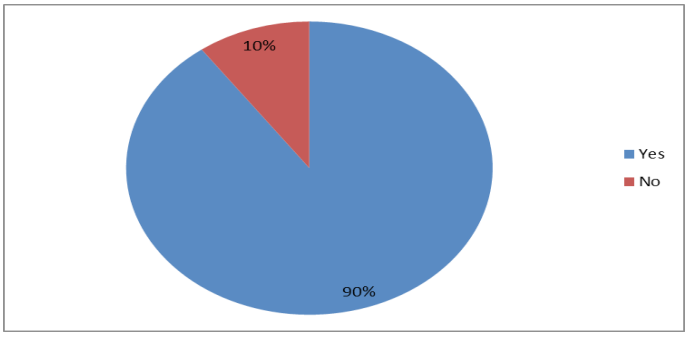
8.1 Introduction

Climate change has adverse effects on the country, mainly due to an increase in the intensities and/or frequency of natural events, increased drought and floods occurrence in Zimbabwe. The effects of adverse natural events are already being felt. Extreme climate events are having a strong impact on agricultural production in the country and, in turn, on GDP. The agricultural sector is particularly prone to crop yield loss and damage to livestock, fishery and aquaculture infrastructures, and irrigation structures. Two critical impacts of climate change not only on agriculture but also rural livelihoods are reduced water availability, especially for small-scale agriculture, and variability of rainfall.

8.2 Impact of Climate Change

Figure 8.1 shows that 90% of survey respondents indicated that climate change has a significant impact on agricultural productivity. Extreme weather patterns affect crop productivity as high temperatures or excessive rainfall have an adverse effect on both crop and livestock production and productivity.

Figure 8.1: Impact of Climate Change



Source: Researcher's Own Observation

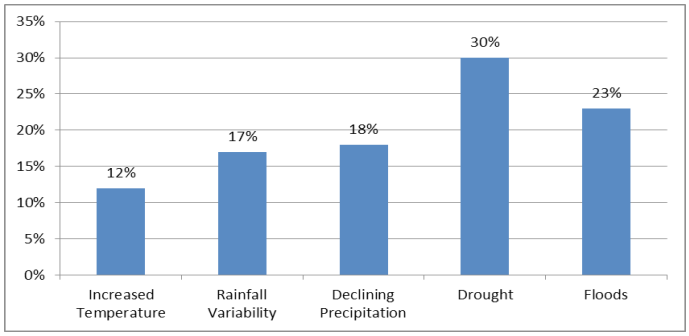
Respondents interviewed highlighted that the rain season in Zimbabwe is no longer falling in the gazetted months and that affects the farmers' planning calendar as the actual planting and stalk destruction dates for crops such as tobacco and cotton no longer match with government's legislated dates.

A development partner DFID indicated that it is working with the Ministry of Lands Agriculture and Rural Resettlement to promote climate smart agriculture. In the climate smart agriculture programme DFID introduced the Zimbabwe Resilience Fund that focus on natural regions 4 and 5 farmers for them to grow small grain crops that are resistant to drought. In addition, DFID underscored that it provide finance for irrigation kits and drilling of boreholes.

8.3 Forms of Climatic Change Experienced in Zimbabwe

Figure 8.2 shows that droughts, floods, increased temperature, increased rainfall variability and declining precipitation affected negatively agriculture in Zimbabwe, with other districts recording almost nothing in terms of output.

Figure 8.2: Forms of Climatic Change Experienced in Zimbabwe



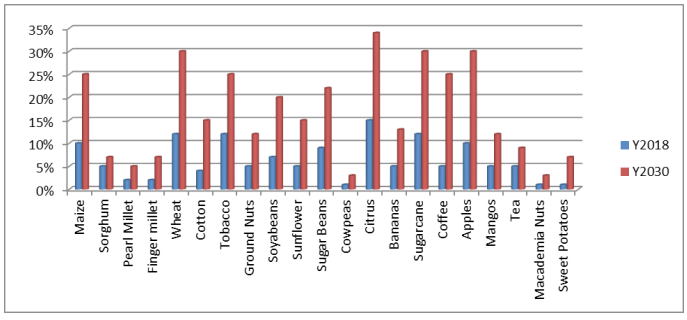
Source: Researchers' Own Observations

Respondents noted that droughts, floods, declining precipitation and rainfall variability were major mechanism which affected agricultural productivity cause by climate change vulnerability (see figure 52).

8.4 Estimated Percentage loss in Terms of Specified Crops (2018 and 2030)

Figure 53 shows that the crops which were negatively influenced by climate change were maize, wheat, tobacco, citrus, sugarcane, coffee and apples. The effects of climate change are expected to increase by 2030. This calls for urgent action by government and private stakeholders to take up some measures to reduce the negative effects of climate change.

Figure 8.3: Estimated Percentage loss in terms of specified crops (2018 and 2030)



Source: Ministry of Agriculture (2018

A review of secondary data from NAPF 2018 statistics reveals that climate change have triggered yield reductions for Southern Africa. These have been estimated to decline by averages of between 11% and 30% by 2030. The NAPF further states that climate projections up to 2070 for Zimbabwe show a 2.5 degrees Celsius increase in temperature. On the other hand, rainfall will decrease by 4.1 percent and 5.9 percent by 2030 and 2070 respectively. The effects of temperature changes on agricultural production will be more pronounced in the south-western parts of the country where temperatures will increase by 2.2 degrees celsius; while those triggered

SERVICES OFFERED BY TIMB

The functions and powers of the Tobacco Industry & Marketing Board, which are derived from the Tobacco Industry & Marketing Act (Chapter 18:20) are: -

- Administration and control of the tobacco delivery system
- Arbitration and sales supervision at auction floors in order to maintain orderly marketing
- Classification of tobacco from which statistical information is derived and reports published, our website is **www.timb.co.zw**
- Collate statistics relating to the provision, marketing, manufacture and consumption of tobacco;
- Conducting crop assessment surveys to determine crop yield potential and quality composition of the crop in advance of the selling season
- to register tobacco growers
- Granting of exports permit
- Licensing of tobacco buyers, auction floors and commercial graders
- Monitoring and ensuring timeous and efficient shipment of tobacco exports
- Monitoring the control of pests to ensure exportation of tobacco free from pesticide residues
- to provide inputs to growers through our Tobacco Inputs Credit Scheme and
- Advise the Minister of Agriculture on all matters relating to the marketing of tobacco.

PROCEDURE ON HOW TO REGISTER AS A TOBACCO GROWER

i. Completed Application form must be rubber stamped and signed by the grower's local AREX OFFICER to confirm that the grower is a *bonafide* tobacco farmer Or a separate recommendation letter stamped and signed by the grower's local officer.
ii. Proof of land availability i.e. permit/land offer letter Or a recommendation letter from the growers local Councilor/Chief if in communal area
iii. National Identification(original/certified copy)
iv. Registration fee payable on submission of the form(in terms of Section 26 of the Act). A late registration fee will be charged for registrations done after the deadline date **(31 October of every year)**

Regional offices now open in

BINDURA, MVURWI, CHINHOYI, MARONDERA, KAROI and RUSAPE

by rainfall reductions will be highest in Mashonaland Central, Mashonaland East, Manicaland, and Masvingo provinces.

Key respondents interviewed highlighted that Zimbabwean Government has recognized the importance of dealing with climate change, numerous programmes and projects have been designed and implemented, but there are still many shortfalls. Respondents revealed that at the government level, arrangements for climate change adaptation are mostly weak and lack an appropriate legislative framework. Donors and NGOs also complimented government efforts, but the resulting efforts related to climate change in agriculture are highly fragmented and ad hoc. Vision 2030 does not deal explicitly with the effects of climate change. In fact, climate change is normally placed under the theme of environmental management in hazard risk reduction.

8.5 Summary

The research shows that climate change vulnerability negatively impacted on productivity in the agricultural sector. Against this background, there is need to come up with practical measures aimed at mitigating and adapting to the effects of climate change.

One effective way which has been adopted by the United Nations Framework Convention on Climate Change to compact climate change is the adoption of climate-smart agriculture which aims at sustainably increasing food security and incomes, and adapting and building resilience to climate change. Climate – smart agriculture connects other innovations, such as conservation agriculture, agroecology, agroforestry and the development of crop varieties that are more tolerant to pests, diseases, drought, waterlogging and salinity (FAO, 2013). FAO (2017) noted that climate-smart agriculture has promoted mixed crop-livestock systems and sustainable livestock production, which integrate environmental and production objectives through, for example, the rotation of pasture and forage crops to enhance soil quality and reduce erosion, and the use of livestock manure to maintain soil fertility.

In climate-smart agriculture, agroforestry systems are an important means of sustainably producing food while conserving ecosystems, especially in marginal areas prone to environmental degradation. Zimbabwe can work with development partners such as the DFID who are already working with farmers in Zimbabwe in compacting climate change through climate smart agriculture.

9 REGIONAL BENCHMARKING, GAPS AND OPPORTUNITIES ZIMBABWE AGRICULTURE SECTOR

9.1 Introduction

Benchmarking involves comparing with other players or countries. The performance of Zimbabwe's agriculture sector is compared to other countries in the region. In the same vein gaps and opportunities that are available in the agriculture sector in Zimbabwe are identified. These are identified on the basis of need, demand, the potential, risk and relevance on the value chain.

9.2 Juxtaposing Zimbabwe with Comparator Countries

Yield per hectare which has for a long time averaged less than one metric tonnes has increased from 0.44 metric tonnes per hectare in 2016 to 1.15 metric tonnes per hectare in 2017. However, on average, as noted by World Bank, Zimbabwe produced an average national yield of 0.64 metric tonnes per hectare. This is way below regional comparator countries like South Africa, Zambia, Malawi and Kenya who produced 5.3 metric tonnes, 2.8 metric tonnes, 1.67 metric tonnes and 1.66 metric tonnes per hectare, respectively (see table 9.1).

Table 9.1: Regional Benchmarking Zimbabwe Agriculture Sector Performance (Metric tonnes)

Output per Hectare/Country	Zimbabwe	South Africa	Zambia	Malawi	Kenya
Maize	0.64	5.3	2.8	1.67	1.66
Wheat	2.2	3.7	7.2	1.3	2.2
Soya beans	1.3	1.9	1.9	0.8 7	1.4
Apples	9	37.8	-	-	9.8

Source: World Bank (2017)

With respect to wheat production, Zimbabwe compares well with Malawi and Kenya. However, Zambia performed exceptionally well as well as South Africa with an average yield of 7.2 metric tonnes and 3.7 metric tonnes per hectare which is well above Zimbabwe's 2.2 metric tonnes per hectare. With respect to soya beans, Zimbabwe compares favourably well with Kenya and outperformed Malawi whose national average yield is 0.87 metric tonnes per hectare. However, World Bank noted that both South Africa and Zambia, although they witnessed low production output per hectare by international standards, they still performed better than Zimbabwe.

With regards to production of apples, Zimbabwe's yield was nine (9) metric tonnes per hectare which compared well with Kenya's 9.8 metric tonnes per hectare. However, Zimbabwe's yield per hectare was four times lower than South Africa's yield of 37.8 metric tonnes per hectare. This explains why South Africa is competitive when it comes to production of apples therefore explaining the reason why South African apples are displacing Zimbabwean apples.

Finally, Zimbabwe is the least performer on the production of cucumbers with a national average yield of 1.7 metric tonnes per hectare which is way below South Africa and Kenya's output of 15 metric tonnes and 10 metric tonnes per hectare, respectively.

Table 9.2: Zimbabwe's Ranking on the World Bank Enabling the Business of Agriculture (EBA) Indicators with comparator countries out of 62 countries (2017)

Country	Seed	Fertilizer	Machinery	Finance	Markets	Transport	Water	ICT
Zimbabwe	15	29	20	49	42	29	31	52
Malawi	50	44	23	20	33	41	19	50
Kenya	7	43	29	10	59	16	4	12
Zambia	16	39	46	14	50	23	16	22
Rwanda	60	38	41	7	47	27	32	50
Uganda	31	40	31	31	45	18	26	22

Table 9.2 shows Zimbabwe's rankings on the indicators, out of 62 economies which were surveyed in the 2017 EBA report. The distance from frontier score (DTF), benchmarks countries with respect to regulatory best practices, showing the absolute distance to the best performance. Zimbabwe is ranked favourably in terms of fertilizer, machinery, transport and seed compared to other comparator countries because it was ranked at number 29, 20, 29 and 15, respectively.

However, the country was poorly ranked with regards to the cost of ICT and access to markets. Ironically, Rwanda was ranked on position 7 on access to Finance and Kenya was ranked on position 12 on the cost of ICT to the agricultural sector.

9.2.1 Comparing Budget Allocations in Zimbabwe with Other Countries

In other SADC countries, budget allocations to agriculture have also remained below the recommended 10% of the national budget except in Malawi. For the 2017 national budgets, these shares were 6.8%, less than 1% and 15% in Zambia, South Africa and Malawi, respectively. Malawi has maintained its budget allocations to agriculture above the 10% target for AU members. For instance, since 2005 allocations to agriculture as a percentage of the national budget have been rising in Malawi, reaching 25% in 2008 and 18.7% in 2015.

9.2.2 Benchmarking Livestock Efficiency in Zimbabwe with comparator Countries

Table 9.3 shows that Zimbabwe lag behind regional comparator countries

in cattle productivity as witnessed by low calving ratios both in commercial and communal farming.

Table 9.3: Benchmarking calving ratios of Zimbabwe and comparator Countries

Country	Commercial Farming Ratio	Traditional/ Communal Farming Ratio	Average Calving Ratio
Zimbabwe	64-68%	16-24%	40-46%
Botswana	69-82%	36.2-51.9%	
Tanzania	53-73%	-	-
Zambia	54-69.1%	-	-
Malawi	-	52-69%	-
Uganda	79%	-	-
South Africa	67-82%	23-34%	45-53%
Sudan	65-77%	40%	52.5-58.5%

Source: FAO (2018)

With respect to commercial calving ratio, Zimbabwe recorded a ratio of 64-68% while comparator countries such as Botswana, Tanzania, Uganda and South Africa had calving ratios of 69-82%, 53-73%, 79% and 67-82%, respectively.

In the same vein, with respect to communal farming, Zimbabwe recorded a calving ratio of 16-24% while country like Botswana, Malawi and South Africa recorded ratios of 36.2 – 51.9%, 52 – 69% and 23 – 34%, respectively.

8.3 Gaps and Opportunities in Agricultural Sector

8.3.1 Crops

Zimbabwe, as noted by the International Trade Centre, imports annually cereals worth $510 million and a further $250 million on oil seeds. These cereals and oil seeds include wheat and soya bean which has reported serious deficits as shown in table 4.14 and table 4.15. This therefore presents investment opportunities for both agro-processors and financial sector (see annexures 1, 2, 3 and 4 for risk analysis of each sub sector).

Table 9.4: Crop Production Compared to National Requirements

Crop	Requirements (METRIC TONNES)	Available Food Production (METRIC TONNES)	Surplus/Deficits (METRIC TONNES)
Cereal (Maize, sorghum, pearl and finger millet)	1 735 145	1 836 145	101 000
Groundnut	101 217	127 202	25 985
Roundnut	130 136	47 594	-82 542
Soya bean	500,000	27,000	-473,000
Wheat	450,000	120,000	-330,000
Sugar beans	101 217	21 320	-79 897
Cowpeas	86 757	16 380	-70 377
Sweet Potato	303 651	321 662	18 011
Total	2 458 124	2 370 303	-87 820

Source: Ministry of Agriculture (2018) and Researcher's Own Observation

Crop and livestock production and productivity has significantly declined and remains too low to sustain agricultural growth. The survey noted that several factors combine to engender low productivity and low production in agriculture. These include: low skills and knowledge base of farmers; a weak research, education and farmer training and extension system as a source of technology and innovation; the shortage of inputs and equipment; low levels of mechanisation; reliance on rain-fed agriculture; limited access to market information and marketing facilities; limited access to finance; limited security of tenure; pest and disease attacks including the fall army worm; low capacity to manage post-harvest losses; and increased incidence and intensity of climate shocks such as El Niño.

8.3.2 Irrigation and Water Management

Irrigation plays an important role in agriculture because it reduces farmers' vulnerability to weather and climate shocks and risks. The study noted that Zimbabwe has a potential to irrigate more than 2 million hectare of land and yet, less than 206,000 hectares are currently under irrigation. The utilisation of existing water bodies, underground water and transboundary water bodies such as Zambezi River and Limpopo River can make a significant contribution to food security and agricultural growth in the country, especially in drought periods. However, the available water bodies are currently under-utilised, mainly due to lack investment in irrigation development, rehabilitation and modernisation. A number of stakeholders interviewed noted with concerns that the majority of these water bodies are silted. And, as such, there is need for massive investments towards desilting. However, regardless of this observation, the study noted that Zimbabwe has potential irrigable land which is not being fully utilised (see table 9.5).

Table 9.5: Opportunities for Irrigation

Name of Dam	Province	Potential Irrigable Area (Ha)	Natural Region
Zhowe	Matabeleland South	500	V
Muzhwi	Masvingo	680	IV
Manyuchi	Masvingo	330	V
Osborne	Manicaland	1700	IV
Mbindangombe	Masvingo	100	V
Mtshabezi	Matabeleland South	300	V
Tshatshani	Matabeleland North	230	V
Mwarazi	Manicaland	400	IIB
Mwenje	Mashonaland Central	400	IIA
Mazvikadei	Mashonaland West	1000	IV
Tokwe Mukosi	Masvingo	25000	IV
Total		31140	

Source: Ministry of Agriculture (2016) and ZINWA (2018)

Investment opportunities presented in table 9.5 can come through various irrigation schemes which looks very lucrative considering the fact that climate change vulnerability is negatively affecting yields. Investment into irrigation will not only mitigate climate change but also raise productivity and national output considering the fact that farmers will not have to wait for the rains.

8.3.3 Opportunities in Farm machinery and agricultural mechanization

The limited access to agricultural machinery and implements is compromising timeliness of farm operations. For instance, the current national requirements for tractors and combine harvesters stands at 40,000 and 400 units respectively, against the currently available of 14,000 tractors and 300 combine harvesters (Ministry of Agriculture, 2018). This is maintaining the labour-intensive narrative about the agricultural sector in the country. Farm structures for both crops and livestock such as greenhouses, animal handling, crop produce handling, tobacco curing bans, sales pens, dipping tanks, storage facilities and machinery sheds as well as accessible roads are in a poor state and require rehabilitation. Insufficient skills in the use and maintenance of agricultural infrastructure and technology negatively impacts the lifespan of the agricultural infrastructure. From this perspective, there is scope for investment into mechanisation of the agricultural sector in Zimbabwe.

From a financial sector perspective, there is massive scope for lease finance for the acquiring of tractors and combined harvesters.

8.3.4 Opportunities in Livestock production

The study noted that there are numerous opportunities in the livestock sector which range from the actual rearing of animals, the production of stock feeds and the provision of veterinary drugs and services. The cattle herd to cater for beef and milk needs is not enough to meet the demands of local and export markets.

In milk production, the study noted that the country has 34000 cows for milk production against national target of 122000. This therefore shows a gap of 88000 cows which present itself as investment opportunity. In the same vein, in line with the disparities of dairy cows production, the country has a deficit of 51 million litres of milk which is can be filled through investment into dairy farming.

In beef production, the sector requires private sector re-stocking initiatives to complement the Command Livestock programme by the Government. In that regard, banks can avail funding for cattle restocking programmes. Alternatively, abattoirs and other upper value chain participants can also participate in the restocking exercise by providing funding arrangements such as contract production or out-grower schemes.

Investment in veterinary drugs and veterinary services is important to the sector as a lot of farmers have lost their animals to diseases. Farmers require good quality drugs that are affordable.

In addition, evidence from Stockfeed Manufacturers Association shows that there is production gap of 30%, 21% and 26% for layers production feeds, beef maintenance feeds and layers feeds, respectively. This present opportunities for stockfeed manufacturers who intends to upscale production or invest into new factories.

Table 9.6: Investment Opportunities and Risks in Zimbabwe's Agricultural Sector

Animal	Opportunities	Risk
Cattle	• Conduce environment for cattle production • High Demand in domestic market • Potential for export – organic meat • Earnings in Foreign currency • Growing demand for Canned beef	• Outbreak of diseases eg foot and mouth, tick borne diseases • Stock theft • Inbreeding challenges • Poor agriculture practices • Coplex logistics – transportation
Dairy	• Conduce environment for milk production • High Demand in the domestic market over supply • Milk requirement is 120 million litres against a production level of 70 million litres	• Complex logistic when transporting • Lack of Competitiveness in Foreign Markets due to high production cost • Poor Agriculture Practices • No export opportunities • Cheap import alternatives
Pigs	• Conducive environment • High demand in domestic market • High demand in foreign markets (Mozambique) • High demand from Far East countries • High potential of earnings in forex	• Complex export processes • Religion differences • Central Bank regulation of foreign earnings • Poor Agriculture practices
Poultry and eggs	• Conducive environment • High demand in domestic market • High demand for processing machinery eg hatching machine on commercial basis • Fertilised egg production for broilers and layers is 93.6 million eggs against a national requirement of 106.2 million eggs.	• High cost of proper infrastructure • Regulation of exports • Outbreak of diseases – bird flu, Newcastle,
Aqua culture	• Conducive environment • Increasing demand in domestic market • Production can be achieved on a small space • High Potential for export	• Complex logistic when transporting • No Tradition in Fish farming in the country

Source: Authors Own Derivation

From a financial sector perspective, there is scope for advancement of loans, insurance products for each of the categories of investment opportunity with a view of raising production.

10. AGRICULTURE PRODUCTION INDEX

10.1 Introduction

In line with research objectives, the researchers were required to estimate agricultural production index which covers crops and livestock. In line with international best practice as noted by FAO (2016), the overall production index was developed based on the following formula:

$$API = \sum_{i=1}^{n} \frac{P_t Q_t}{P_0 Q_0} w_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (10.1)$$

Where API = Production Index; P_t is the current price per unit of the commodity; Q_t is the volume of output of the commodity; P_0 is the price of the commodity for the base year; Q_0 is the volume of output of the commodity for the base year and W_i is the weight given to the commodity based on the contribution of the commodity to agriculture GDP.

The weight is calculated as follows:

$$W_i = \frac{Contribtion\ to\ agriculture\ GDP\ (\%)}{100} \times Share\ of\ agriculture\ contribution\ to\ GDP \ldots\ldots\ldots (10.2)$$

Interpretation of the findings is as provided in table 10.1.

Table 10.1: Interpretation of Index Findings

Ranking	Index Value	Percentage	Productivity Grade
1	0.50 and below	Below 12.5%	Very Low
2	0.51 to 1.00	12.5% to37.5%	Low
3	1.01 to 1.50	37.5% to 62.5%	Medium
4	1.51 to 2.00	62.5% to 87.5%	High
5	2.01 and Above	87.5% and above	Very High

Source: Bhatia (1967) and FAO (2016)

On the basis equation 10.1 and 10.2, the agricultural production index was calculated using 2009 and 2017 as base years. The 2009 was used as a base year since it coincided with the economic stability which came with the adoption of the multiple currency regime. In the same vein, the 2017 was also used as a base year since it was the year in which the country recorded the best harvest ever since 1998 thanks to Command Agriculture. Results on agricultural production index are presented in table 10.2.

Table 10.2: Agriculture Production Index for 2018

Com-modity	Using 2009 as Base Year			Using 2017 as Base Year		
	Index	Per-centage	Produc-tivity Grade	Index	Percent-age	Pro-duc-tivity Grade
Crops	1.5642	56.42%	Medium	1.1473	14.73%	Low
Horticul-ture	1.4835	48.35%	Medium	1.1964	19.64%	Low
Livestock	1.6428	64.28%	High	1.0852	8.52%	Very Low
Overall	1.5634	56.34%	Medium	1.1429	14.29%	Low

Notes:

1. Figures provided above were based ZIMSTATS (2018) and World Bank (2018) statistics
2. Base year values were assumed to be 1.00
3. Value of crop sales refers to volumes sold to/through marketing authorities
4. Value of livestock refers to livestock slaughtering and milk production by CSC and registered abattoirs

Table10.2 shows that agriculture production index has increased from 1.000 (2009 as base year) to 1.5634 in 2018, that is, an increase of 56.34%. This is necessitated by improvements in crops, horticulture and livestock.

Using 2017 as base year, the agriculture production has actually increase at a low rate. This could have been attributed by dry spells which affected maize and other field crops as well as outbreak of diseases which depleted the stock herd in the country.

10.2 Agriculture Production Efficiency Index

This is an index computed based on yield of agriculture commodities. As noted by FAO (2016), the index is calculated using the following formula:

$$APEI = \sum_{i=1}^{n} \frac{Y_t}{Y_0} w_i \quad \ldots\ldots\ldots (3)$$

Where: Y_t is the yield of current period; Y_0 is the yield of base year and W_i is the weight given to the commodity based on the contribution of the commodity to agriculture GDP. This index is applicable to crops and horticulture. For livestock, several production efficiency indices will be applied depending on the type of livestock and its mostly accepted index.

Table 10.3: Agriculture Production Efficiency Index for 2018

Com-modity	Using 2009 as Base Year			Using 2017 as Base Year		
	Index	Percent-age	Productiv-ity Grade	Index	Per-centage	Produc-tivity Grade
Crops	1.5696	56.96%	Medium	1.2015	20.15%	Low
Horti-culture	1.4327	43.27%	Medium	1.2154	21.54%	Low
Overall	1.5012	50.12%	Medium	1.2084	20.84%	Low

The efficiency was calculated based on field and horticultural crops. Based on the observations in table 10.3, the study shows that overall agricultural efficiency, using 2009 as base year, was 50.12%. This implies that farmers were 1.5 times more productive in 2018 as compared to 2009.

However, using 2017 as a base year, the productivity of farmers improved by 20.84% which is quite significant since this is within a year.

The efficiency index estimated in table 10.3 excludes livestock because of the different measures of efficiency in livestock. The efficiency index of livestock is presented in the next section.

10.2.1 Production Efficiency in Livestock

a. Cattle

The major parameters that determine the productivity of a cattle herd are as noted by FAO (2016):

- the reproductive performance of the breeding females;
- calving ratio;
- mortality;
- growth rates from birth to maturity; and
- division of milk between calves and people.

Although overall mortality and growth are important determinants of herd performance it is the cow-calf unit that drives the system, in the short-term because of the milk supply and in the long-term because it is the number of calves, their survival and growth that determines the sustained viability of the herd. As a consequence, this study focused on the calving ratio.

$$Calving\ Ratio = \frac{Number\ of\ Calves\ born}{Number\ of\ Exposed\ Females} \times 100 \ldots\ldots\ldots\ldots\ldots\ldots (10.4)$$

Calving percentage calculates the percentage of full-term calves relative to the number of exposed females. It does not matter if the calf was born alive or dead, provided it was full-term. Aborted calves, however, are not considered full-term and are not included in the number of calves born. This performance measure is an important calculation as it provides an indication of a cow herd's reproductive efficiency and management during gestation.

A goal for herd calving percentage should be 80% or higher. When calculated, values are lower than desired, it's important to investigate potential causes so management can be adjusted as needed and problems corrected. Low calving percentages may be indicative of:

1) Inadequate nutrition,
2) Mismatched genetics relative to the environment,
3) Low fertility or bull power, and/or
4) The presence of reproductive disease.

A primary goal of cow-calf production is for every cow to produce a calf every 12 months (FAO, 2016). This requires the cow to be rebred within approximately 80 days of calving, assuming a 285-day gestation period. Simultaneously, milk production and associated nutrient requirements peak approximately two months post-calving, which corresponds with breeding.

Table 10.4 Calving Ratios/Percentages

Commercial Farming Ratio	Traditional/Communal Farming Ratio	Average Calving Ratio
64-68%	16-24%	40-46%

Ministry of Agriculture (2016), FAO (2017)

Communal or traditional farming calving ratio is between16 -24%, commercial calving ratio is between 64-68% giving an average national ratio of 40-46%. The observation made in table 10.4 shows that communal farmers who has the majority of cows have a low calving ratio. In order to increase national herd, Government should strive to come up with measures aimed at increasing the calving ratio for the communal farmers. This will not only increase the national herd but will improve livelihoods in rural areas.

These measures should inter alia include training, artificial insemination and restocking.

b. Dairy Production Index

The index (that is, milk litres per day per cow (MLDPC)) was obtained by calculating the milk liter production per herd of dairy cows which is in line with observation from FAO (2016).

$$MLDPC = \frac{Annual\ Litres\ of\ milk\ produced}{Total\ in\ milk\ cows} \times \frac{1}{365} \ldots\ldots\ldots\ldots\ldots\ldots (10.5)$$

Cows in milk are estimated at an average of 50% of the dairy cow herd. Given that proportion of the in milk cows, the milk production per herd is calculated as follows.

Table 10.5: Milk Production Per Cow per Day (litres/day)

Year	Average
2009	6.14
2010	9.54
2011	10.36
2012	11.36
2013	11.36
2014	10.40
2015	10.04
2016	10.08
2017	11.12

The productivity of milk production in Zimbabwe has been on the upward trend since 2009 up to 2013 and slumped in 2014 to 2015 before a recovery which was witnessed in 2016 and 2017. Specifically, a cow was producing an average rate of 6.14 litres per day in 2009. However, yield in milk production rose to 11.36 litres in 2013 due to improvements in efficiency.

It is important to note that these are national average figures which are largely driven by commercial farmers. At the time of this research, the researchers failed to secure data which is disaggregated by communal farmers and commercial farmers.

However, it is important to note that Zimbabwe's milk production is well below the benchmark of 15 litres per day. Measures aimed at improving production such provision of quality stockfeed and management of cattle are key.

c. Pigs

There are several indices used in pigs to measure productivity. These include litters per mated female per year (LMFY), pigs weaned per mated female per year (PWMFY) and Piglets per Sow per Year (PSY). For this study pig production efficiency was based on Piglets per Sow per Year (PSY) as noted by FAO (2016).

$$PSY = \frac{sum\ of\ piglets\ born\ alive\ per\ year}{Number\ of\ Sows\ available} \ldots\ldots\ldots\ldots\ldots\ldots (10.6)$$

Table 10.6: Piglets Per Sow Per Year

Year	Commercial Farming	Traditional/Communal Farming
2009	20-24	5-10
2010	20-24	5-12
2011	20-26	6-12
2012	22-26	6-14
2013	22-26	7-14
2014	22-27	7-15
2015	22-28	7-16
2016	22-28	8-16
2017	22-28	8-17
2018	22-28	8-17

Pig Producers Association of Zimbabwe (2018), PIB (2018)

From table 10.6 it is evident that commercial farmers are more productive when it comes to pig production as compared to communal farmers. Specifically, communal farmers registered efficiency levels of 5-10 piglets and improved to 8-17 piglets per sow in 2009 and 2018, respectively. Whilst there was a general improvement in production of pigs by the communal farmers, the output falls far below commercial farmers who registered an average production rate of 20-24 piglets per sow in 2009 and 22 – 28 piglets per sow in 2018.

This is again a striking feature which shows that in all aspects in as far as agricultural production is concerned, communal farmers lags behind commercial farmers. Hence, a deliberate policy aimed at improving productivity and farming practices in communal farms is key.

11. ANNEX 1: PRESENTATION OF CROP AREA, PRODUCTION AND YIELD BY PROVINCE

Table A 11.1: Maize

PROVINCE	Area (HA)		Production (METRIC TONNES)		Yield	
	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17
Mashonaland West	297 539	279 456	461 463	543 622	1.55	1.95
Mashonaland Central	208 124	229 917	359 877	455 666	1.73	1.98
Mashonaland East	219 003	218 559	224 817	274 491	1.03	1.26
Manicaland	257 468	264 695	211 105	267 369	0.82	1.01
Midlands	336 848	392 777	228 515	321 394	0.68	0.82
Masvingo	191 359	245 178	102 800	150 938	0.54	0.62
Matabeleland North	114 414	127 184	46 142	67 759	0.40	0.53
Matabeleland South	97 963	117 531	65 983	74 287	0.67	0.63
Total	1 722 718	1 875 297	1 700 702	2 155 526	0.99	1.15

Table A 11.2:Sorghum

PROVINCE	Area (Ha)		Production (METRIC TONNES)		Yield T/Ha	
	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17
Mashonaland West	4 557	5 440	2 321	3 705	0.51	0.61
Mashonaland Central	23 208	45 866	11 589	31 123	0.50	0.68
Mashonaland East	11 099	21 637	3 118	11 581	0.28	0.54
Manicaland	29 334	59 174	16 802	36 293	0.57	0.68

Midlands	27 466	45 491	12 102	21 998	0.44	0.59
Masvingo	44 927	69 407	19 303	41 213	0.43	0.44
Matabeleland North	18 055	30 703	5 816	13 492	0.32	0.52
Matabeleland South	21 981	43 772	6 463	22 607	0.29	0.48
Total	180 625	321 490	77 514	182 012	0.43	0.57

Table A 11.3: Pearl Millet

PROVINCE	Area (Ha)		Production (METRIC TONNES)		Yield T/Ha	
	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17
Mashonaland West	224	163	53	49	0.24	0.30
Mashonaland Central	1 743	4 677	336	2 021	0.19	0.43
Mashonaland East	1 824	7 669	532	3 096	0.29	0.40
Manicaland	37 199	39 210	14 073	19 455	0.38	0.50
Midlands	8 585	13 378	2 772	5 085	0.32	0.38
Masvingo	35 206	49 511	11 766	22 480	0.33	0.45
Matabeleland North	42 715	59 520	11 697	19 412	0.27	0.33
Matabeleland South	29 869	32 172	7 614	11 065	0.25	0.34
Total	157 366	206 300	48 844	82 663	0.31	0.40

Table A 11.4: Finger Millet

PROVINCE	Area (Ha)		Production (METRIC TONNES)		Yield T/Ha	
	2017/18	2016/17	2017/18	2016/17	2017/18	2016/18

Mashonaland West	354	1 610	118	727	0.33	0.45
Mashonaland Central	885	435	296	170	0.33	0.39
Mashonaland East	3 212	6 723	1 152	3 056	0.36	0.45
Manicaland	9 309	12 243	3 263	5 550	0.35	0.45
Midlands	2 535	8 133	881	3 485	0.35	0.43
Masvingo	9 422	22 428	3 350	10 632	0.36	0.47
Matabeleland North	46	310	10	148	0.22	0.48
Matabeleland South	87	611	14	339	0.16	0.55
Total	25 850	52 493	9 085	24 107	0.35	0.46

Table A 11.5: Cereals Requirements and Gaps

Province	Population	Production (Metric tonnes)					(Metric tonnes)	
		Maize	Sorghum	Pearl millet	Finger millet	Total Cereal	Requirement	Surplus/deficit
Manicaland	1 894 677	211 105	16 802	1 4073	3 263	245 243	227 361	17 882
Mashonaland Central	1 247 810	359 877	11 589	336	296	372 098	149 737	222 361
Mashonaland East	1 504 517	224 817	3 118	532	1 152	229 619	180 542	49 077
Mashonaland West	1 631 535	461 463	2 321	53	118	463 955	195 784	268 171
Masvingo	1 796 808	102 800	19 303	11 766	3 350	137 219	215 617	-78 398
Matabeleland North	774 324	46 142	5 816	11 697	10	63 665	92 919	-29 254
Matabeleland South	709 385	65 983	6 463	7 614	14	80 074	85 126	-5 052
Midlands	1 737 707	228 515	12 102	2 773	882	244 272	208 525	35 747
Harare	2 441 286	0	0	0	0	0	292 954	-292 954
Bulawayo	721 504	0	0	0	0	0	86 580	-86 580

Total	**14 459 553**	**1 700 702**	**77 514**	**48 844**	**9 085**	**1 836 145**	**1 735 145**	**101 000**

Table A 11.6: Sugar beans

PROVINCE	Area (Ha)		Production (METRIC TONNES)		Yield T/Ha	
	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17
Mashonaland West	3 462	1 842	2 379	1 137	0.79	1.62
Mashonaland Central	6 796	4 462	4 047	3 533	0.60	1.26
Mashonaland East	6 771	4 115	3 533	2 680	0.52	1.54
Manicaland	11 624	5 917	7 243	3 076	0.62	1.92
Midlands	3 917	7 915	1 891	4 334	0.48	1.83
Masvingo	3 360	930	1 542	412	0.46	2.26
Matabeleland North	342	167	175	26	0.51	6.42
Matabeleland South	728	404	510	158	0.70	2.56
Total	36 999	25 751	21 320	15 356	0.58	1.68

Table A 11.7: Groundnuts

PROVINCE	Area (Ha)		Production (METRIC TONNES)		Yield T/Ha	
	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17
Mashonaland West	25 411	12 607	12 497	7 583	0.69	1.62
Mashonaland Central	33 958	43 473	13 041	30 424	0.60	1.26
Mashonaland East	42 317	34 026	20 851	20 948	0.52	1.54
Manicaland	55 520	41 248	26 090	25 894	0.62	1.92

Midlands	54 166	45 814	23 387	20 917	0.48	1.83
Masvingo	62 575	47 030	23 142	23 454	0.46	2.26
Matabeleland North	7 360	5 910	2 249	2 501	0.51	6.42
Matabeleland South	13 296	11 579	5 944	7 782	0.70	2.56
Total	294 601	241 687	127 202	139 503	0.58	1.68

Table A 11.8: Sweet Potatoes

PROVINCE	Area (Ha)		Production (METRIC TONNES)		Yield (METRIC TONNES/Ha)	
	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17
Mashonaland West	2 129	11 531	36 540	142 885	17.16	12.39
Mashonaland Central	2 028	4 128	23 426	80 772	11.55	19.57
Mashonaland East	9 004	5 435	67 650	41 033	7.51	7.55
Manicaland	5 781	5 739	55 261	60 021	9.56	10.46
Midlands	6 456	14 142	44 035	103 492	6.82	7.32
Masvingo	11 006	7 594	78 689	62 868	7.11	8.28
Matabeleland North	394	177	4 520	1 268	11.47	7.16
Matabeleland South	1 013	1 516	11 541	20 731	11.39	13.67
Total	37 871	50 262	321 662	513 070	8.49	10.21

Table A 11.9: Roundnuts

PROVINCE	Area (Ha)		Production (METRIC TONNES)		Yield T/Ha	
	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17

Mashonaland West	3 956	2 884	1 401	1 210	0.35	0.42
Mashonaland Central	2 021	5 737	903	2 657	0.45	0.46
Mashonaland East	11 448	10 497	4 645	4 931	0.41	0.47
Manicaland	30 843	29 089	11 381	14 726	0.37	0.51
Midlands	21 901	22 709	8 938	10 261	0.41	0.45
Masvingo	43 331	45 943	15 939	21 283	0.37	0.46
Matabeleland North	4 826	4 247	1 369	1 433	0.28	0.34
Matabeleland South	7 251	6 041	3 060	2 598	0.42	0.45
Total	125 576	127 147	47 594	59 099	0.38	0.46

Table A 11.10: Tobacco

PROVINCE	Area (Ha)		Production (METRIC TONNES)		Yield T/Ha	
	2017/18	2016/17	2017/18	2016/17	2017/18	2016/17
Mashonaland West	34 956	39 120	62 920	66 504	1.8	1.7
Mashonaland Central	29 117	33 003	46 587	46 204	1.6	1.4
Mashonaland East	18 674	18 466	37 348	35 085	2	1.9
Manicaland	21 302	19 346	46 864	40 626	2.2	2.1
Midlands	298	228	566	387	1.9	1.7
Masvingo	48	53	62	79	1.3	1.5
Matabeleland North	0	0	0	0	0	0
Matabeleland South	0	2	0	1	0	0.5
Total	104 395	110 218	194 347	188 886	1.8	1.7

Table A 11.11: Cotton

PROVINCE	Area (Ha)		Production (METRIC TONNES)		Yield T/Ha	
	2017/18	**2016/17**	**2017/18**	**2016/17**	2017/18	2016/17
Mashonaland West	14 334	12 092	11 467	7 853	0.8	0.65
Mashonaland Central	30 286	56 927	19 383	39 307	0.64	0.69
Mashonaland East	4 303	2 445	2 324	1 080	0.54	0.44
Manicaland	25 540	19 188	16 856	10 638	0.66	0.55
Midlands	97 228	93 289	60 281	53 239	0.62	0.57
Masvingo	17 934	17 709	13 451	10 020	0.75	0.57
Matabeleland North	10 966	6 134	6 580	4 858	0.6	0.79
Matabeleland South	0	2	0	0	0	0
Total	200 591	207 786	130 342	126 995	0.65	0.61

Table A 11.12: Soyabean

PROVINCE	Area (Ha)		Production (METRIC TONNES)		Yield T/Ha	
	2017/18	**2016/17**	**2017/18**	**2016/17**	**2017/18**	**2016/17**
Mashonaland West	14 873	9 876	22 343	14 614	1.50	1.48
Mashonaland Central	18 767	9 496	28 491	16 683	1.52	1.76
Mashonaland East	3 650	1 445	4 565	2 370	1.25	1.64
Manicaland	2 230	163	2 106	430	0.94	2.64
Midlands	800	577	2 184	1 641	2.73	2.84
Masvingo	136	2	82	3	0.61	1.50

Matabeleland North	23	2	1	3	0.03	1.50
Matabeleland South	0	0	0	0	0	0
Total	40 479	21 561	59 772	35 744	1.48	1.66

Table A 11.13: Cattle

Province	Number of Cattle		Number of Slaughters
	2016/17	2017/18	2017/18
Harare	0	0	21 776
Mashonaland West	594 110	599 876	30 038
Mashonaland Central	534 478	580 368	2 758
Mashonaland East	662 158	674 532	39 247
Manicaland	618 120	591 084	23 533
Midlands	728 564	834 752	45 649
Masvingo	1 010 382	997 444	21 628
Bulawayo	0	0	14 401
Matebeleland North	656 898	647 478	41 350
Matebeleland South	685 010	656 807	3 255
Total	**5 489 720**	**5 582 341**	243 635

Table A 11.14: Small Livestock

Province	Sheep		Goats		Pigs	
	2016/17	2017/18	2016/17	2017/18	2016/17	2017/18
Mash West	15 320	14 976	245 499	276 876	27 705	25 678
Mash Central	18 479	68 931	316 565	321 732	89 541	51 086

Mash East	37 173	35 476	284 826	315 796	49 912	46 789
Manicaland	74 625	75 693	553 294	637 123	40 357	41 237
Midlands	4 446	24 566	432 806	538 255	25 127	30 999
Masvingo	95 455	95 460	620 513	625 541	37 123	44 733
Mat North	28 513	39 835	417 266	415 900	16 120	29 335
Mat South	86 222	126 222	534 613	576 134	26 031	24 356
Total	**378 919**	**481 159**	**3 405 382**	**3 707 357**	**311 916**	**4 294**

10 ANNEX 2: PRESENTATION OF CROP AREA, PRODUCTION AND YIELD BY DISTRICT

Table A 10.1: Manicaland Province

Maize

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Buhera	35206	14%	15746	7%	0.447
Chimanimani	18071	7%	19279	9%	1.067
Chipinge	54087	21%	47048	22%	0.870
Makoni	68418	27%	62778	30%	0.918
Mutare	39347	15%	28243	13%	0.718
Mutasa	24912	10%	27579	13%	1.107
Nyanga	17427	7%	10432	5%	0.599
Total	**257468**	**100%**	**211105**	**100%**	**5.725**

Sorghum

District	Area (Ha)	Weight	Production (Metric tonnes)	Weight	Yield (METRIC TONNES/Ha)
Buhera	11338	39%	4283	**25%**	0.378

Chimanimani	1874	6%	1066	**6%**	0.569
Chipinge	7768	26%	7797	**46%**	1.004
Makoni	1961	7%	647	**4%**	0.330
Mutare	4788	16%	2154	**13%**	0.450
Mutasa	129	0%	136	**1%**	1.054
Nyanga	1474	5%	717	**4%**	0.486
Total	**29332**	100%	**16800**	100%	0.573

Pearl Millet

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Buhera	21890	59%	8155	58%	0.373
Chimanimani	1053	3%	329	2%	0.312
Chipinge	2878	8%	841	6%	0.292
Makoni	259	1%	114	1%	0.440
Mutare	9233	25%	3935	28%	0.426
Mutasa	0	0%	0	0%	0
Nyanga	1891	5%	696	5%	0.368
Total	**37204**	**100%**	**14070**	**100%**	0.378

Finger Millet

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Buhera	3910	42%	1388	43%	0.355
Chimanimani	270	3%	69	2%	0.256
Chipinge	538	6%	144	4%	0.268
Makoni	2291	25%	936	29%	0.409
Mutare	1519	16%	358	11%	0.236
Mutasa	600	6%	293	9%	0.488
Nyanga	182	2%	72	2%	0.396

Total	**9310**	**100%**	**3260**	**100%**	0.350

Rice

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Buhera	214	67%	113	69%	0.527
Chimanimani	47	15%	23	14%	0.503
Chipinge	0	0%	0	0%	0
Makoni	17	5%	5	3%	0.330
Mutare	10	3%	3	2%	0.322
Mutasa	33	10%	19	11%	0.563
Nyanga	0	0%	0	0%	0.400
Total	**320**	**100%**	**163**	**100%**	0.511

Groundnut

District	Area (Ha)	Weight	Production (Metric tonnes)	Weight	Yield (METRIC TONNES/Ha)
Buhera	27050	47%	10549	39%	0.390
Chimanimani	1411	2%	833	3%	0.590
Chipinge	4009	7%	2065	8%	0.515
Makoni	9452	16%	5794	22%	0.613
Mutare	8720	15%	4502	17%	0.516
Mutasa	3608	6%	1666	6%	0.462
Nyanga	3398	6%	1472	5%	0.433
Total	**57649**	**100%**	**26881**	**100%**	0.466

Sunflower

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Buhera	318	11%	93	7%	0.292

Chimanimani	391	13%	178	13%	0.456
Chipinge	345	12%	102	7%	0.296
Makoni	878	30%	583	42%	0.664
Mutare	118	4%	60	4%	0.514
Mutasa	292	10%	127	9%	0.434
Nyanga	563	19%	230	17%	0.408
Total	**2905**	**100%**	**1373**	**100%**	0.473

Soyabeans

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Buhera	0	0%	0	0%	0
Chimanimani	3	0%	3	0%	1.077
Chipinge	1882	80%	1458	66%	0.775
Makoni	259	11%	191	9%	0.736
Mutare	1	0%	0	0%	0.060
Mutasa	207	9%	545	25%	2.636
Nyanga	8	0%	5	0%	0.627
Total	**2360**	100%	**2202**	100%	0.933

Sesame

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Buhera	0	0%	0	0%	0.400
Chimanimani	4	0%	1	0%	0.186
Chipinge	1079	100%	728	100%	0.675
Makoni	0	0%	0	0%	0
Mutare	0	0%	0	0%	0
Mutasa	0	0%	0	0%	0
Nyanga	0	0%	0	0%	0

Total	**1083**	**100%**	**729**	**100%**	0.673

Sugarbeans

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Buhera	423	3%	96	1%	0.228
Chimanimani	769	6%	559	7%	0.727
Chipinge	874	7%	461	6%	0.527
Makoni	2982	23%	1187	15%	0.398
Mutare	1706	13%	1531	20%	0.897
Mutasa	3024	23%	1943	25%	0.642
Nyanga	3212	25%	1904	25%	0.593
Total	**12990**	100%	**7680**	100%	0.591

Roundnuts

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Buhera	17595	56%	6620	57%	0.376
Chimanimani	1021	3%	384	3%	0.376
Chipinge	1791	6%	418	4%	0.233
Makoni	3633	12%	1505	13%	0.414
Mutare	5615	18%	2085	18%	0.371
Mutasa	959	3%	280	2%	0.292
Nyanga	823	3%	222	2%	0.270
Total	**31437**	**100%**	**11515**	**100%**	0.366

Cowpeas

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Buhera	3045	30%	877	26%	0.288
Chimanimani	526	5%	118	3%	0.224

Chipinge	1781	18%	654	19%	0.367
Makoni	1944	19%	733	22%	0.377
Mutare	2316	23%	850	25%	0.367
Mutasa	378	4%	117	3%	0.309
Nyanga	169	2%	43	1%	0.253
Total	**10159**	100%	**3392**	100%	0.334

Paprika

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Buhera	22	13%	15	10%	0.700
Chimanimani	0	0%	0	0%	0
Chipinge	0	0%	0	0%	0
Makoni	102	61%	98	68%	0.966
Mutare	0	0%	0	0%	0
Mutasa	35	21%	31	21%	0.883
Nyanga	7	4%	1	1%	0.160
Total	**166**	**100%**	**146**	**100%**	0.879

SweetPotato

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Buhera	868	14%	5008	9%	5.767
Chimanimani	653	11%	5911	10%	9.054
Chipinge	955	16%	16708	29%	17.495
Makoni	1863	31%	16414	28%	8.809
Mutare	1012	17%	7768	13%	7.673
Mutasa	410	7%	2848	5%	6.947

Nyanga	335	5%	3461	6%	10.343
Total	**6097**	100%	**58118**	100%	9.533

Cassava

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Buhera	0	0%	0	0%	0
Chimanimani	1	0%	0	0%	0
Chipinge	720	100%	123	2%	0.171
Makoni	0	0%	0	0%	0
Mutare	0	0%	415	6%	0
Mutasa	0	0%	6086	92%	0
Nyanga	0	0%	0	0%	0
Total	**721**	**100%**	**6624**	**100%**	9.186

Table A 10.2: Mashonaland Central Province

Maize

District	**Area(Ha)**	**Weight**	**Production(Metric tonnes)**	**Weight**	**Yield(METRIC TONNES/Ha)**
Bindura	31121	15%	92553	26%	2.974
Centenary	20663	10%	28840	8%	1.396
Guruve	31820	15%	39230	11%	1.233
Mazowe	52105	25%	155988	43%	2.994

Metric tonnes. Darwin	27742	13%	15407	4%	0.555
Rushinga	14979	7%	866	0%	0.058
Shamva	17121	8%	21615	6%	1.262
Mbire	12573	6%	5378	1%	0.428
TOTAL	**208124**	**100%**	**359877**	**100%**	**10.900**

Sorghum

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield (METRIC TONNES/Ha)
Bindura	266	1%	691	6%	2.598
Centenary	8502	37%	5579	48%	0.656
Guruve	70	0%	26	0%	0.371
Mazowe	93	0%	151	1%	1.624
Metric tonnes. Darwin	6023	26%	2096	18%	0.348
Rushinga	3057	13%	535	5%	0.175
Shamva	66	0%	25	0%	0.379
Mbire	5134	22%	2489	21%	0.485
TOTAL	**23211**	**100%**	**11592**	**100%**	**6.636**

Pearl Millet

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bindura	37	2%	16	5%	0.432
Centenary	104	6%	19	6%	0.183
Guruve	2	0%	0	0%	0
Mazowe	23	1%	8	2%	0.348
Metric tonnes.	727	42%	173	51%	0.238

Darwin					
Rushinga	702	40%	94	28%	0.134
Shamva	5	0%	1	0%	0.200
Mbire	140	8%	27	8%	0.193
TOTAL	**1740**	**100%**	**338**	**100%**	**0.194**

Finger Millet

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bindura	92	10%	27	9%	0.293
Centenary	40	5%	24	8%	0.600
Guruve	133	15%	28	9%	0.211
Mazowe	75	8%	20	7%	0.267
Metric tonnes. Darwin	52	6%	23	8%	0.442
Rushinga	10	1%	3	1%	0.300
Shamva	427	48%	142	48%	0.333
Mbire	55	6%	28	9%	0.509
TOTAL	**884**	**100%**	**295**	**100%**	**0.334**

Rice

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bindura	2	5%	1	7%	0.500
Centenary	0	0%	0	0%	0
Guruve	0	0%	0	0%	0
Mazowe	2	4%	2	13%	1.000
Metric tonnes. Darwin	0	0%	0	0%	0
Rushinga	6	17%	2	15%	0.300

Shamva	8	24%	4	36%	0.495
Mbire	17	49%	3	29%	0.203
TOTAL	**34**	**100%**	**12**	**100%**	**0.340**

Groundnut

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bindura	3525	10%	1137	8%	0.322
Centenary	3746	11%	1567	11%	0.418
Guruve	4526	13%	2631	19%	0.581
Mazowe	3470	10%	1489	11%	0.429
Metric tonnes. Darwin	7118	20%	1839	13%	0.258
Rushinga	3782	11%	1603	12%	0.424
Shamva	6012	17%	2189	16%	0.364
Mbire	2801	8%	1262	9%	0.450
TOTAL	**34981**	**100%**	**13717**	**100%**	**0.392**

Sunflower

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bindura	31	5%	23	6%	0.747
Centenary	76	11%	47	13%	0.623
Guruve	13	2%	4	1%	0.348
Mazowe	87	13%	41	12%	0.478
Metric tonnes. Darwin	165	24%	97	27%	0.587
Rushinga	172	25%	99	27%	0.577
Shamva	45	7%	14	4%	0.306
Mbire	93	14%	34	9%	0.366

Total	**682**	**100%**	**361**	**100%**	**0.529**

Soya Beans

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bindura	3489	19%	5810	20%	1.665
Centenary	545	3%	674	2%	1.236
Guruve	2106	11%	1794	6%	0.852
Mazowe	11730	63%	19364	68%	1.651
Metric tonnes. Darwin	84	0%	54	0%	0.642
Rushinga	0	0%	0	0%	0
Shamva	813	4%	781	3%	0.962
Mbire	0	0%	0	0%	0
Total	**18767**	**100%**	**28476**	**100%**	**1.517**

Sesame

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bindura	1501	37%	388	24%	0.258
Centenary	1426	35%	970	60%	0.681
Guruve	0	0%	0	0%	0
Mazowe	118	3%	24	1%	0.200
Metric tonnes. Darwin	93	2%	22	1%	0.241
Rushinga	0	0%	0	0%	0
Shamva	887	22%	224	14%	0.252
Mbire	0	0%	0	0%	0
Total	**4025**	**100%**	**1628**	**100%**	**0.404**

Sugarbeans

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bindura	821	12%	320	8%	0.390
Centenary	1207	18%	779	19%	0.645
Guruve	1574	24%	1022	25%	0.649
Mazowe	1001	15%	1115	27%	1.114
Metric tonnes. Darwin	263	4%	137	3%	0.520
Rushinga	380	6%	157	4%	0.415
Shamva	464	7%	253	6%	0.545
Mbire	941	14%	318	8%	0.338
Total	**6651**	100%	**4102**	100%	0.617

Roundnuts

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bindura	274	8%	187	12%	0.682
Centenary	360	11%	279	18%	0.777
Guruve	350	10%	151	10%	0.430
Mazowe	17	1%	8	0%	0.446
Metric tonnes. Darwin	240	7%	69	4%	0.288
Rushinga	166	5%	54	3%	0.327
Shamva	231	7%	105	7%	0.454
Mbire	1754	52%	725	46%	0.413
Total	**3392**	**100%**	**1578**	**100%**	**0.465**

Cowpeas

District	Area(Ha)	Weight	Production(Metric	Weight	Yield(METRIC

			tonnes)		TONNES/Ha)
Bindura	1290	13%	462	14%	0.358
Centenary	1082	11%	241	7%	0.223
Guruve	332	3%	115	3%	0.348
Mazowe	1329	13%	479	14%	0.360
Metric tonnes. Darwin	1739	17%	521	16%	0.300
Rushinga	698	7%	227	7%	0.324
Shamva	3397	34%	1229	37%	0.362
Mbire	115	1%	44	1%	0.388
Total	**9982**	**100%**	**3319**	**100%**	**0.332**

Paprika

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bindura	0	1%	0	1%	0.700
Centenary	11	26%	7	19%	0.600
Guruve	21	50%	9	26%	0.425
Mazowe	9	21%	17	52%	1966
Metric tonnes. Darwin	0	0%	0	0%	0
Rushinga	0	0%	0	0%	0
Shamva	1	2%	1	2%	0.600
Mbire	0	0%	0	0%	0
Total	**42**	**100%**	**34**	**100%**	**0.801**

Sweet Potato

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bindura	114	5%	1115	4%	9.805

Centenary	115	5%	1249	5%	10.835
Guruve	673	28%	7382	28%	10.962
Mazowe	306	13%	4196	16%	13.723
Metric tonnes. Darwin	173	7%	1796	7%	10.357
Rushinga	299	12%	4010	15%	13.396
Shamva	90	4%	1447	5%	16.082
Mbire	662	27%	5202	20%	7.861
Total	**2433**	**100%**	**26397**	**100%**	**10.851**

Cassava

District	**Area(Ha)**	**Weight**	**Production(Metric tonnes)**	**Weight**	**Yield(METRIC TONNES/Ha)**
Bindura	388	24%	208	96%	0.535
Centenary	970	60%	0	0%	0
Guruve	0	0%	0	0%	0
Mazowe	24	1%	0	0%	0
Metric tonnes. Darwin	22	1%	0	0%	0
Rushinga	0	0%	0	0%	0
Shamva	224	14%	9	4%	0.040
Mbire	0	0%	0	0%	0
Total	**1628**	100%	**217**	**100%**	**0.133**

Table A 10.3:Mashonaland East Province

Maize

District	Area (Ha)	Weight	Production (METRIC TONNES) (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chikomba	32991	15%	23038	**10%**	0.698
Goromonzi	33844	15%	84951	**38%**	2.510
Hwedza	17453	8%	22487	**10%**	1.288
Marondera	25840	12%	25981	**12%**	1.005
Mudzi	12189	6%	544	**0%**	0.045
Murehwa	35079	16%	19737	**9%**	0.563
Mutoko	24766	11%	10533	**5%**	0.425
Seke	24316	11%	35054	**16%**	1.442
UMP	12528	6%	2492	**1%**	0.199
Marondera Urban	0	0%	0	**0%**	0
Ruwa	0	0%	0	**0%**	0
Total	**219006**	100%	**224817**	**100%**	1.027

Sorghum

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chikomba	40	0%	15	0%	0.375
Goromonzi	141	1%	135	4%	0.957
Hwedza	123	1%	68	2%	0.553
Marondera	81	1%	43	1%	0.531
Mudzi	6739	61%	1786	57%	0.265
Murehwa	116	1%	14	0%	0.121
Mutoko	1900	17%	677	22%	0.356
Seke	29	0%	14	0%	0.483
UMP	1926	17%	363	12%	0.188

Marondera Urban	0	0%	0	0%	0
Ruwa	0	0%	0	0%	0
Total	**11095**	100%	**3115**	100%	0.280

Pearl Millet

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chikomba	29	2%	8	2%	0.276
Goromonzi	1	0%	0	0%	0
Hwedza	61	3%	28	5%	0.459
Marondera	49	3%	21	4%	0.429
Mudzi	1032	57%	302	57%	0.293
Murehwa	21	1%	2	0%	0.095
Mutoko	260	14%	66	12%	0.254
Seke	3	0%	1	0%	0.333
UMP	364	20%	104	20%	0.286
Marondera Urban	0	0%	0	0%	0
Ruwa	0	0%	0	0%	0
Total	**1820**	100%	**532**	100%	0.292

Finger Millet

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chikomba	744	23%	301	26%	0.405
Goromonzi	317	10%	109	9%	0.344
Hwedza	342	11%	169	15%	0.494
Marondera	268	8%	114	10%	0.425
Mudzi	272	8%	49	4%	0.180
Murehwa	754	24%	214	19%	0.284
Mutoko	144	4%	44	4%	0.306
Seke	160	5%	55	5%	0.344

UMP	206	6%	97	8%	0.471
Marondera Urban	0	0%	0	0%	0
Ruwa	0	0%	0	0%	0
Total	**3207**	100%	**1152**	100%	0.359

Rice

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chikomba	0	0%	0	0%	0
Goromonzi	328	51%	135	47%	0.412
Hwedza	43	7%	17	6%	0.397
Marondera	0	0%	0	0%	0
Mudzi	8	1%	3	1%	0.420
Murehwa	247	38%	102	36%	0.414
Mutoko	7	1%	5	2%	0.800
Seke	13	2%	20	7%	1.557
UMP	2	0%	1	0%	0.511
Marondera Urban	0	0%	0	0%	0
Ruwa	0	0%	0	0%	0
Total	**649**	100%	**285**	100%	0.439

Groundnut

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chikomba	3898	7%	3350	13%	0.859
Goromonzi	3436	7%	2272	9%	0.661
Hwedza	1379	3%	685	3%	0.496
Marondera	9295	18%	5228	20%	0.562

Mudzi	5586	11%	2146	8%	0.384
Murehwa	6598	13%	2318	9%	0.351
Mutoko	4902	9%	2006	8%	0.409
Seke	9151	17%	4065	16%	0.444
UMP	1933	4%	806	3%	0.417
Marondera Urban	3232	6%	1623	6%	0.502
Ruwa	3036	6%	1522	6%	0.501
Total	**52446**	100%	**26021**	100%	0.496

Sunflower

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chikomba	38	2%	27	49%	0.710
Goromonzi	124	8%	68	122%	0.552
Hwedza	6	0%	6	10%	1.000
Marondera	331	21%	169	302%	0.509
Mudzi	185	12%	36	64%	0.193
Murehwa	210	13%	87	155%	0.414
Mutoko	154	10%	44	79%	0.286
Seke	49	3%	17	30%	0.344
UMP	417	26%	77	138%	0.184
Marondera Urban	66	4%	29	51%	0.433
Ruwa	0	0%	0	0%	0
Total	**1580**	100%	**558**	100%	0.353

Soyabeans

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chikomba	126	3%	30	1%	0.239
Goromonzi	1581	43%	2878	63%	1.820
Hwedza	255	7%	76	2%	0.298

Marondera	418	11%	463	10%	1.108
Mudzi	0	0%	0	0%	0
Murehwa	537	15%	455	10%	0.848
Mutoko	139	4%	35	1%	0.251
Seke	601	16%	627	14%	1.043
UMP	3	0%	1	0%	0.396
Marondera Urban	0	0%	0	0%	0
Ruwa	0	0%	0	0%	0
Total	**3661**	100%	**4566**	100%	1.247

Sesame

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chikomba	0	0%	0	0%	0
Goromonzi	1	3%	0	6%	0.200
Hwedza	0	0%	0	0%	0
Marondera	0	0%	0	0%	0
Mudzi	0	0%	0	0%	0
Murehwa	0	0%	0	0%	0
Mutoko	0	0%	0	0%	0
Seke	0	0%	0	0%	0
UMP	24	97%	2	94%	0.100
Marondera Urban	0	0%	0	0%	0
Ruwa	0	0%	0	0%	0
Total	**25**	100%	**3**	100%	0.120

Sugarbeans

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**

Chikomba	1059	15%	1105	27%	1.043
Goromonzi	798	11%	494	12%	0.619
Hwedza	486	7%	351	8%	0.721
Marondera	182	3%	55	1%	0.304
Mudzi	781	11%	173	4%	0.222
Murehwa	687	10%	166	4%	0.241
Mutoko	854	12%	513	12%	0.601
Seke	465	7%	99	2%	0.212
UMP	506	7%	416	10%	0.821
Marondera Urban	399	6%	302	7%	0.756
Ruwa	754	11%	462	11%	0.614
Total	**6972**	100%	**4136**	100%	0.593

Roundnuts

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chikomba	1397	13%	791	19%	0.566
Goromonzi	1820	16%	950	22%	0.522
Hwedza	951	9%	380	9%	0.399
Marondera	1058	10%	352	8%	0.333
Mudzi	1695	15%	534	13%	0.315
Murehwa	1167	10%	338	8%	0.290
Mutoko	1113	10%	357	8%	0.321
Seke	787	7%	215	5%	0.273
UMP	533	5%	123	3%	0.230
Marondera Urban	135	1%	39	1%	0.291
Ruwa	466	4%	194	5%	0.417
Total	**11122**	100%	**4274**	100%	0.384

Cowpeas

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chikomba	100	2%	33	2%	0.332
Goromonzi	436	8%	169	12%	0.388
Hwedza	267	5%	76	5%	0.285
Marondera	1544	28%	383	26%	0.248
Mudzi	348	6%	45	3%	0.130
Murehwa	654	12%	139	10%	0.212
Mutoko	864	16%	170	12%	0.197
Seke	632	11%	185	13%	0.293
UMP	231	4%	81	6%	0.350
Marondera Urban	195	4%	58	4%	0.298
Ruwa	293	5%	114	8%	0.389
Total	**5565**	100%	**1455**	100%	0.261

Paprika

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chikomba	2	14%	0	9%	0.100
Goromonzi	1	8%	1	40%	0.800
Hwedza	0	0%	0	0%	0
Marondera	0	0%	0	0%	0
Mudzi	0	0%	0	0%	0
Murehwa	0	0%	0	0%	0
Mutoko	3	23%	0	15%	0.100
Seke	7	55%	1	36%	0.100
UMP	0	0%	0	0%	0
Marondera Urban	0	0%	0	0%	0
Ruwa	0	0%	0	0%	0
Total	**13**	100%	**2**	100%	0.154

Sweet Potato

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chikomba	1212	13%	9834	12%	8.114
Goromonzi	864	9%	8470	10%	9.802
Hwedza	507	5%	3707	4%	7.315
Marondera	469	5%	3164	4%	6.752
Mudzi	2960	31%	19963	23%	6.745
Murehwa	1285	13%	8497	10%	6.612
Mutoko	667	7%	5716	7%	8.564
Seke	884	9%	11201	13%	12.666
UMP	353	4%	6970	8%	19.773
Marondera Urban	222	2%	3201	4%	14.411
Ruwa	261	3%	4469	5%	17.119
Total	**9684**	100%	**85191**	100%	8.797

Cassava

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chikomba	0	0%	7	1%	0
Goromonzi	1	17%	32	7%	64.165
Hwedza	0	0%	0	0%	0
Marondera	0	0%	0	0%	0
Mudzi	0	0%	238	52%	0
Murehwa	0	0%	182	40%	0
Mutoko	0	0%	0	0%	0
Seke	0	0%	0	0%	0
UMP	2	83%	0	0%	0
Marondera Urban	0	0%	0	0%	0
Ruwa	0	0%	0	0%	0

Total	**3**	100%	**459**	100%	153.000

Maize

District	Area (Ha)	Weight	Production (Metric tonnes)	Weight	Yield (METRIC TONNES/Ha)
Chegutu	50848	17%	65591	14%	1.290
Hurungwe	74309	25%	96675	21%	1.301
Kadoma	1335	0%	987	0%	0.739
Kariba	8605	3%	3214	1%	0.374
Makonde	49621	17%	123381	27%	2.486
Zvimba	56976	19%	124764	27%	2.190
Chinhoyi	0	0%	0	0%	0
Chegutu Urban	0	0%	0	0%	0
Kariba Urban	0	0%	0	0%	0
Norton	0	0%	0	0%	0
Karoi	0	0%	0	0%	0
Mhondoro-Ngezi	22796	8%	16144	3%	0.708
Sanyati	33048	11%	30707	7%	0.929
TOTAL	**297538**	100%	**461463**	100%	1.551

Sorghum

District	Area (Ha)	Weight	Production (Metric tonnes)	Weight	Yield (METRIC TONNES/Ha)
Chegutu	200	4%	174	7%	0.870
Hurungwe	118	3%	49	2%	0.415
Kadoma	18	0%	5	0%	0.278
Kariba	2292	50%	985	42%	0.430
Makonde	390	9%	289	12%	0.741

Zvimba	141	3%	168	7%	1.191
Chinhoyi	0	0%	0	0%	0
Chegutu Urban	0	0%	0	0%	0
Kariba Urban	0	0%	0	0%	0
Norton	0	0%	0	0%	0
Karoi	0	0%	0	0%	0
Mhondoro-Ngezi	220	5%	98	4%	0.445
Sanyati	1180	26%	556	24%	0.471
TOTAL	**4559**	100%	**2324**	100%	0.510

Pearl Millet

District	**Area (Ha)**	**Weight**	**Production (Metric tonnes)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chegutu	18	8%	8	33%	0.444
Hurungwe	29	13%	3	13%	0.103
Kadoma	0	0%	0	0%	0
Kariba	82	37%	15	63%	0.183
Makonde	0	0%	0	0%	0
Zvimba	0	0%	0	0%	0
Chinhoyi	0	0%	0	0%	0
Chegutu Urban	0	0%	0	0%	0
Kariba Urban	0	0%	0	0%	0
Norton	0	0%	0	0%	0
Karoi	0	0%	0	0%	0
Mhondoro-Ngezi	11	5%	3	13%	0.273
Sanyati	82	37%	24	45%	0.293
TOTAL	**222**		**53**	**100%**	0.239

		!00%			

Finger Millet

District	Area (Ha)	Weight	Production (Metric tonnes)	Weight	Yield (METRIC TONNES/Ha)
Chegutu	118	33%	22	19%	0.186
Hurungwe	11	3%	1	1%	0.091
Kadoma	0	0%	0	0%	0
Kariba	0	0%	0	0%	0
Makonde	3	1%	1	1%	0.333
Zvimba	146	41%	59	50%	0.404
Chinhoyi	0	0%	0	0%	0
Chegutu Urban	0	0%	0	0%	0
Kariba Urban	0	0%	0	0%	0
Norton	0	0%	0	0%	0
Karoi	0	0%	0	0%	0
Mhondoro-Ngezi	34	10%	17	15%	0.500
Sanyati	43	12%	17	15%	0.395
TOTAL	**355**	100%	**117**	100%	0.330

Rice

District	Area (Ha)	Weight	Production (Metric tonnes)	Weight	Yield (METRIC TONNES/Ha)
Chegutu	0	0%	0	0%	0
Hurungwe	0	0%	0	0%	0
Kadoma	0	0%	0	0%	0
Kariba	27.96161905	93%	12.84116667	88%	0.459
Makonde	2.024166667	7%	1.800458333	12%	0.889

Zvimba	0	0%	0	0%	0
Chinhoyi	0	0%	0	0%	0
Chegutu Urban	0	0%	0	0%	0
Kariba Urban	0	0%	0	0%	0
Norton	0	0%	0	0%	0
Karoi	0	0%	0	0%	0
Mhondoro-Ngezi	0	0%	0	0%	0
Sanyati	0	0%	0	0%	0
TOTAL	**29.98578571**	100%	**14.641625**	100%	0.488

Groundnuts

District	**Area (Ha)**	**Weight**	**Production (Metric tonnes)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chegutu	3251	19%	1811	25%	0.557
Hurungwe	1111	6%	821	11%	0.739
Kadoma	3080	18%	1492	20%	0.484
Kariba	2355	13%	785	11%	0.333
Makonde	1664	9%	649	9%	0.390
Zvimba	1024	6%	336	5%	0.328
Chinhoyi	498	3%	185	3%	0.372
Chegutu Urban	723	4%	145	2%	0.201
Kariba Urban	743	4%	150	2%	0.202
Norton	555	3%	176	2%	0.316
Karoi	717	4%	196	3%	0.273
Mhondoro-Ngezi	432	2%	97	1%	0.225
Sanyati	1411	8%	487	7%	0.345

TOTAL	**17564**	100%	**7330**	100%	0.417

Sunflower

District	Area (Ha)	Weight	Production (Metric tonnes)	Weight	Yield (METRIC TONNES/Ha)
Chegutu	18	2%	8	2%	0.460
Hurungwe	13	2%	4	1%	0.329
Kadoma	334	47%	196	59%	0.586
Kariba	200	28%	68	20%	0.340
Makonde	0	0%	0	0%	0
Zvimba	27	4%	16	5%	0.594
Chinhoyi	3	0%	5	1%	1.479
Chegutu Urban	2	0%	0	0%	0.226
Kariba Urban	8	1%	3	1%	0.340
Norton	28	4%	6	2%	0.219
Karoi	67	9%	14	4%	0.206
Mhondoro-Ngezi	18	2%	13	4%	0.764
Sanyati	0	0%	0	0%	0
TOTAL	**717**	100%	**333**	100%	0.465

Soya beans

District	Area (Ha)	Weight	Production (Metric tonnes)	Weight	Yield (METRIC TONNES/Ha)
Chegutu	935	6%	1388	6%	1.484
Hurungwe	2566	17%	2318	10%	0.903
Kadoma	0	0%	0	0%	0
Kariba	69	0%	41	0%	0.589
Makonde	8845	59%	14990	67%	1.695
Zvimba	2357	16%	3502	16%	1.486
Chinhoyi	0	0%	0	0%	0

Chegutu Urban	0	0%	0	0%	0
Kariba Urban	0	0%	0	0%	0
Norton	0	0%	0	0%	0
Karoi	0	0%	0	0%	0
Mhondoro-Ngezi	101	1%	102	0%	1.002
Sanyati	0	0%	0	0%	0
TOTAL	**14873**	100%	**22340**	100%	1.502

Soya beans

District	**Area**	**Weight**	**Production**	**Weight**	**Yield**
Chegutu	15	2%	0	0%	0.020
Hurungwe	0	0%	0	0%	0
Kadoma	0	0%	0	0%	0.600
Kariba	2	0%	1	0%	0.400
Makonde	77	8%	19	9%	0.248
Zvimba	768	81%	178	87%	0.232
Chinhoyi	0	0%	0	0%	0.600
Chegutu Urban	0	0%	0	0%	0
Kariba Urban	0	0%	0	0%	0
Norton	0	0%	0	0%	0
Karoi	36	4%	1	0%	0.026
Mhondoro-Ngezi	54	6%	5	2%	0.095
Sanyati	2	0%	1	0%	0.300
TOTAL	**954**	100%	**205**	100%	0.215

Sugar beans

District	Area (Ha)	Weight	Production (Metric tonnes)	Weight	Yield (METRIC TONNES/Ha)
Chegutu	521	30%	321	27%	0.617
Hurungwe	325	19%	331	28%	1.017
Kadoma	445	26%	358	30%	0.804
Kariba	315	18%	135	11%	0.430
Makonde	29	2%	13	1%	0.437
Zvimba	61	4%	32	3%	0.527
Chinhoyi	12	1%	10	1%	0.810
Chegutu Urban	1	0%	0	0%	0.080
Kariba Urban	1	0%	0	0%	0.100
Norton	0	0%	0	0%	0.400
Karoi	0	0%	0	0%	0
Mhondoro-Ngezi	0	0%	0	0%	0
Sanyati	0	0%	0	0%	0
TOTAL	**1709**	100%	**1200**	100%	0.702

Round nuts

District	Area (Ha)	Weight	Production (Metric tonnes)	Weight	Yield
Chegutu	660	10%	298	14%	0.452
Hurungwe	126	2%	46	2%	0.362
Kadoma	340	5%	117	5%	0.343
Kariba	831	12%	279	13%	0.336
Makonde	533	8%	179	8%	0.335
Zvimba	789	12%	295	14%	0.374
Chinhoyi	205	3%	73	3%	0.355
Chegutu Urban	471	7%	127	6%	0.270
Kariba Urban	582	9%	105	5%	0.180

Norton	398	6%	117	5%	0.293
Karoi	544	8%	91	4%	0.167
Mhondoro-Ngezi	419	6%	146	7%	0.348
Sanyati	789	12%	278	13%	0.353
TOTAL	**6689**	100%	**2151**	100%	0.322

Cow peas

District	**Area (Ha)**	**Weight**	**Production (Metric tonnes)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chegutu	776	13%	258.8	14%	0.333
Hurungwe	330	6%	121.4	6%	0.369
Kadoma	148	3%	36.8	2%	0.249
Kariba	623	11%	203.6	11%	0.327
Makonde	853	15%	268.4	14%	0.315
Zvimba	847	15%	285.6	15%	0.337
Chinhoyi	257	4%	133.7	7%	0.520
Chegutu Urban	276	5%	53.6	3%	0.194
Kariba Urban	559	10%	120.5	6%	0.216
Norton	371	6%	125.9	7%	0.340
Karoi	161	3%	30.8	2%	0.191
Mhondoro-Ngezi	196	3%	83.4	4%	0.426
Sanyati	417	7%	154.9	8%	0.372
TOTAL	**5812**	100%	**1877.5**	100%	0.323

Paprika

District	**Area (Ha)**	**Weight**	**Production (Metric tonnes)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chegutu	95	95%	18	77%	0.190
Hurungwe	0	0%	0	0%	0

Kadoma	5	5%	5	23%	1.000
Kariba	0	0%	0	0%	0
Makonde	0	0%	0	0%	0
Zvimba	0	0%	0	0%	0
Chinhoyi	0	0%	0	0%	0
Chegutu Urban	0	0%	0	0%	0
Kariba Urban	0	0%	0	0%	0
Norton	0	0%	0	0%	0
Karoi	0	0%	0	0%	0
Mhondoro-Ngezi	0	0%	0	0%	0
Sanyati	0	0%	0	0%	0
TOTAL	**100**	100%	**23**	100%	0.234

Sweet Potatoes

District	Area	Weight	Production	Weight	Yield
Chegutu	220	21%	3612	22%	16.387
Hurungwe	96	9%	2229	14%	23.172
Kadoma	81	8%	1264	8%	15.567
Kariba	217	21%	3350	20%	15.426
Makonde	120	11%	2338	14%	19.438
Zvimba	131	12%	1546	9%	11.763
Chinhoyi	0	0%	1	0%	15.000
Chegutu Urban	11	1%	122	1%	11.099
Kariba Urban	19	2%	203	1%	10.791
Norton	50	5%	562	3%	11.263
Karoi	43	4%	471	3%	10.950
Mhondoro-Ngezi	18	2%	190	1%	10.798

Sanyati	45	4%	564	3%	12.414
TOTAL	**1052**	100%	**16451**	100%	15.632

Cassava

District	Area (Ha)	Weight	Production (Metric tonnes)	Weight	Yield (METRIC TONNES/Ha)
Chegutu	0	0%	0	0%	0
Hurungwe	0	0%	0	0%	0
Kadoma	0	0%	0	0%	0
Kariba	0	0%	0	0%	0
Makonde	19	9%	0	0%	0
Zvimba	178	87%	0	0%	0
Chinhoyi	0	0%	0	0%	0
Chegutu Urban	0	0%	0	0%	0
Kariba Urban	0	0%	0	0%	0
Norton	0	0%	0	0%	0
Karoi	1	0%	0	0%	0
Mhondoro-Ngezi	5	2%	0	0%	0
Sanyati	1	0%	0	0%	0
TOTAL	**205**	100%	**0**	0%	0

Table A 10.4:Matebeleland North Province

Maize

District	Area (Ha)	weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Binga	21769	19%	6188	13%	0.284
Bubi	14128	12%	9281	20%	0.657
Hwange	5872	5%	2818	6%	0.480
Lupane	23298	20%	6602	14%	0.283
Nkayi	18145	16%	3939	9%	0.217

Tsholotsho	9169	8%	3215	7%	0.351
Umguza	22034	19%	14099	31%	0.640
Total	**114415**	100%	**46142**	100%	0.403

Sorghum

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Binga	6825	38%	1841	32%	0.270
Bubi	1406	8%	702	12%	0.499
Hwange	1493	8%	758	13%	0.508
Lupane	3288	18%	702	12%	0.214
Nkayi	1843	10%	567	10%	0.308
Tsholotsho	2403	13%	941	16%	0.392
Umguza	797	4%	304	5%	0.381
Total	**18055**	100%	**5815**	100%	0.322

Pearl Millet

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Binga	14139	33%	2308	20%	0.163
Bubi	1602	4%	700	6%	0.437
Hwange	3017	7%	1249	11%	0.414
Lupane	8772	21%	2615	22%	0.298
Nkayi	1547	4%	407	3%	0.263
Tsholotsho	13069	31%	4138	35%	0.317
Umguza	570	1%	277	2%	0.486
Total	**42716**	100%	**11694**	100%	0.274

Finger Millet

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Binga	15	33%	3	30%	0.200
Bubi	1	2%	0	0%	0
Hwange	0	0%	0	0%	0
Lupane	0	0%	0	0%	0
Nkayi	9	20%	1	10%	0.111
Tsholotsho	0	0%	0	0%	0
Umguza	21	46%	6	60%	0.286
Total	**46**	100%	**10**	100%	0.217

Rice

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Binga	0	0%	0	0%	0
Bubi	0	0%	0	0%	0
Hwange	0	0%	0	0%	0
Lupane	0	0%	0	0%	0
Nkayi	0	0%	0	0%	0
Tsholotsho	0	100%	0	100%	1.000
Umguza	0	0%	0	0%	0
Total	**0**	100%	**0**	100%	

Groundnut

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Binga	1109	7%	443	7%	0.400
Bubi	2106	14%	739	11%	0.351

Hwange	1732	12%	586	9%	0.338
Lupane	3856	26%	1549	24%	0.402
Nkayi	3796	26%	2162	33%	0.570
Tsholotsho	993	7%	394	6%	0.397
Umguza	1226	8%	625	10%	0.510
Total	**14819**	100%	**6499**	100%	0.439

Sunflower

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Binga	61	37%	15	29%	0.248
Bubi	15	9%	4	8%	0.291
Hwange	25	15%	2	4%	0.076
Lupane	22	13%	9	17%	0.414
Nkayi	22	13%	15	28%	0.699
Tsholotsho	16	10%	4	8%	0.257
Umguza	6	3%	3	6%	0.565
Total	**167**	100%	**53**	100%	0.317

Soyabeans

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Binga	0	0%	0	0%	0
Bubi	0	0%	0	0%	0
Hwange	0	0%	0	0%	0
Lupane	23	97%	1	94%	0.027

Nkayi	0	0%	0	0%	0
Tsholotsho	0	0%	0	0%	0
Umguza	1	3%	0	6%	0.056
Total	**23**	100%	**1**	100%	0.043

Sesame

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Binga	17	7%	4	54%	0.261
Bubi	0	0%	0	0%	0
Hwange	0	0%	0	0%	0
Lupane	0	0%	0	0%	0
Nkayi	0	0%	0	0%	0
Tsholotsho	0	0%	0	0%	0
Umguza	227	93%	4	46%	0.017
Total	**244**	100%	**8**	100%	0.033

Sugarbeans

District	**Area (Ha)**	**Weight**	Production (METRIC TONNES)	Weight	**Yield (METRIC TONNES/Ha)**
Binga	267	27%	133	21%	0.500
Bubi	77	8%	189	29%	2.460
Hwange	27	3%	15	2%	0.554
Lupane	20	2%	9	1%	0.433
Nkayi	438	44%	232	36%	0.529
Tsholotsho	71	7%	35	5%	0.498
Umguza	103	10%	34	5%	0.332
Total	**1002**	100%	647	100%	0.646

Roundnuts

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Binga	622	8%	136	4%	0.218
Bubi	776	10%	248	8%	0.320
Hwange	730	9%	315	10%	0.431
Lupane	2197	27%	643	20%	0.293
Nkayi	2497	31%	1508	46%	0.604
Tsholotsho	684	8%	113	3%	0.165
Umguza	591	7%	301	9%	0.509
Total	**8098**	100%	**3263**	100%	0.403

Cowpeas

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Binga	366	8%	101	7%	0.277
Bubi	556	12%	178	12%	0.320
Hwange	450	10%	105	7%	0.234
Lupane	1105	25%	338	22%	0.305
Nkayi	1538	34%	562	37%	0.365
Tsholotsho	230	5%	59	4%	0.255
Umguza	245	5%	189	12%	0.773
Total	**4491**	100%	**1532**	100%	0.252

Paprika

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Binga	0	0%	0	0%	0
Bubi	0	0%	0	0%	0
Hwange	0	0%	0	0%	0
Lupane	0	0%	0	0%	0
Nkayi	0	0%	0	0%	0
Tsholotsho	0	0%	0	0%	0
Umguza	0	0%	0	0%	0
Total	**0**	0%	**0**	0%	

SweetPotato

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Binga	71	6%	781	6%	11.017
Bubi	116	10%	1259	10%	10.884
Hwange	42	4%	476	4%	11.397
Lupane	61	5%	690	5%	11.281
Nkayi	125	11%	1471	12%	11.795
Tsholotsho	67	6%	803	6%	12.064
Umguza	654	58%	7196	57%	10.995
Total	**1135**	100%	**12676**	100%	11.168

Cassava

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Binga	4	54%	0	0%	0
Bubi	0	0%	0	0%	0
Hwange	0	0%	0	0%	0
Lupane	0	0%	0	0%	0
Nkayi	0	0%	0	0%	0
Tsholotsho	0	0%	0	0%	0
Umguza	4	46%	0	0%	0
Total	**8**	100%	**0**	0%	0

Table A 10.5:Matebeleland South Province

Maize

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Beitbridge	5578	6%	949	1%	0.170
Bulilima	6478	7%	2194	3%	0.339
Mangwe	4945	5%	1024	2%	0.207
Gwanda	27799	28%	8241	12%	0.296
Insiza	32884	34%	39885	60%	1.213
Matobo	10148	10%	4371	7%	0.431
Umzingwane	10132	10%	9319	14%	0.920
Total	**97964**	100%	**65983**	100%	0.674

Sorghum

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Beitbridge	3122	14%	644	10%	0.206
Bulilima	2741	12%	813	13%	0.297
Mangwe	3890	18%	994	15%	0.256
Gwanda	6970	32%	2007	31%	0.288
Insiza	1384	6%	943	15%	0.681
Matobo	3585	16%	915	14%	0.255
Umzingwane	290	1%	140	2%	0.483
Total	**21982**	100%	**6456**	100%	0.294

Pearl Millet

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Beitbridge	3769	13%	1188	16%	0.315
Bulilima	9690	32%	2638	35%	0.272
Mangwe	5505	18%	953	13%	0.173
Gwanda	7338	25%	2332	31%	0.318
Insiza	204	1%	46	1%	0.225
Matobo	3366	11%	454	6%	0.135
Umzingwane	2	0%	1	0%	0.500
Total	**29874**	100%	**7612**	100%	0.255

Finger Millet

District	Area (Ha)	Weight	Production (METRIC	Weight	Yield (METRIC

			TONNES)		TONNES/Ha)
Beitbridge	0	0%	0	0%	0
Bulilima	15	18%	0	0%	0
Mangwe	0	0%	0	0%	0
Gwanda	0	0%	0	0%	0
Insiza	8	9%	12	92%	1.500
Matobo	62	73%	1	8%	0.016
Umzingwane	0	0%	0	0%	0
Total	**85**	100%	**13**	100%	0.153

Rice

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Beitbridge	50	49%	43	42%	0.851
Bulilima	17	17%	41	40%	2.375
Mangwe	0	0%	0	0%	0
Gwanda	28	27%	11	11%	0.395
Insiza	1	1%	0	0%	0.324
Matobo	6	6%	6	6%	1.000
Umzingwane	0	0%	0	0%	0
Total	**102**	100%	**101**	100%	0.990

Groundnut

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Beitbridge	2813	7%	1642	9%	0.584
Bulilima	9439	22%	3812	21%	0.404

Mangwe	6640	15%	2200	12%	0.331
Gwanda	13053	30%	4886	27%	0.374
Insiza	3160	7%	1789	10%	0.566
Matobo	3498	8%	1409	8%	0.403
Umzingwane	4562	11%	2144	12%	0.470
Total	**43166**	100%	**17881**	100%	0.414

Sunflower

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Beitbridge	340	16%	195	23%	0.572
Bulilima	402	19%	139	16%	0.345
Mangwe	395	19%	139	16%	0.351
Gwanda	436	21%	186	22%	0.427
Insiza	183	9%	63	7%	0.346
Matobo	305	15%	128	15%	0.420
Umzingwane	2	0%	0	0%	0.220
Total	**2064**	100%	**851**	100%	0.412

Sesame

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Beitbridge	752	43%	238	43%	0.317
Bulilima	125	7%	39	7%	0.317
Mangwe	463	26%	190	34%	0.411

Gwanda	208	12%	75	13%	0.359
Insiza	0	0%	0	0%	0
Matobo	214	12%	13	2%	0.062
Umzingwane	0	0%	0	0%	0
Total	**1762**	100%	**556**	100%	3.432

Sugar beans

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Beitbridge	76	2%	28	2%	0.373
Bulilima	10	0%	2	0%	0.203
Mangwe	136	4%	6	0%	0.043
Gwanda	309	10%	81	6%	0.263
Insiza	1633	51%	875	62%	0.536
Matobo	537	17%	241	17%	0.449
Umzingwane	479	15%	174	12%	0.363
Total	**3180**	100%	**1408**	100%	0.443

Roundnuts

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Beitbridge	973	5%	671	9%	0.689
Bulilima	2511	12%	885	12%	0.352
Mangwe	2727	13%	1150	16%	0.422
Gwanda	4424	22%	1527	21%	0.345
Insiza	5288	26%	1080	15%	0.204

Matobo	2906	14%	1188	17%	0.409
Umzingwane	1596	8%	635	9%	0.398
Total	**20425**	100%	**7138**	100%	0.349

Cowpeas

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Beitbridge	1852	18%	492	16%	0.265
Bulilima	2567	25%	772	25%	0.301
Mangwe	2611	26%	916	30%	0.351
Gwanda	1597	16%	483	16%	0.302
Insiza	490	5%	135	4%	0.276
Matobo	658	7%	180	6%	0.273
Umzingwane	317	3%	79	3%	0.248
Total	**10092**	100%	**3057**	100%	0.303

Paprika

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Beitbridge	0	0%	0	0%	0
Bulilima	0	0%	0	0%	0
Mangwe	0	0%	0	0%	0
Gwanda	0	0%	0	0%	0
Insiza	0	0%	0	0%	0
Matobo	216	100%	472	100%	2.185
Umzingwane	0	0%	0	0%	0

Total	**216**	100%	**472**	100%	2.185

Sweet Potato

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Beitbridge	215	4%	2076	5%	9.675
Bulilima	915	16%	6202	16%	6.775
Mangwe	758	14%	4904	13%	6.469
Gwanda	2244	40%	14646	39%	6.526
Insiza	778	14%	5632	15%	7.244
Matobo	269	5%	2041	5%	7.575
Umzingwane	387	7%	2416	6%	6.246
Total	**5566**	100%	**37918**	100%	6.812

Cassava

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Beitbridge	238	43%	0	0%	0
Bulilima	39	7%	0	0%	0
Mangwe	190	34%	0	0%	0
Gwanda	75	13%	0	0%	0
Insiza	0	0%	0	0%	0
Matobo	13	2%	0	0%	0
Umzingwane	0	0%	0	0%	0
Total	**556**	100%	**0**	0%	0

Table A 10.6:Midlands Province

Maize

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC

					TONNES/Ha)
Chirumhanzu	17414	5%	17444	8%	1.002
Gokwe North	85765	25%	40855	18%	0.476
Gokwe South	87382	26%	42687	19%	0.489
Gweru	23614	7%	32469	14%	1.375
Kwekwe	64095	19%	53189	23%	0.830
Mberengwa	23078	7%	13801	6%	0.598
Shurugwi	16017	5%	15228	7%	0.951
Zvishavane	19481	6%	12842	6%	0.659
Gweru Urban	0	0	0	0	0
Kwekwe Urban	0	0	0	0	0
Redcliff	0	0	0	0	0
Zvishavane Urban	0	0	0	0	0
Shurugwi Urban	0	0	0	0	0
Gokwe South Urban	0	0	0	0	0
Total	**336846**	**100%**	**228515**	**100%**	**0.678**

Sorghum

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chirumhanzu	168	1%	94	1%	0.560
Gokwe North	3872	14%	1686	14%	0.435
Gokwe South	12689	46%	6130	51%	0.483
Gweru	1058	4%	444	4%	0.420
Kwekwe	3994	15%	1215	10%	0.304
Mberengwa	3246	12%	1243	10%	0.383
Shurugwi	629	2%	488	4%	0.776
Zvishavane	1808	7%	793	7%	0.439

Gweru Urban	0	0	0	0	0
Kwekwe Urban	0	0	0	0	0
Redcliff	0	0	0	0	0
Zvishavane Urban	0	0	0	0	0
Shurugwi Urban	0	0	0	0	0
Gokwe South Urban	0	0	0	0	0
Total	**27464**	100%	**12093**	100%	**0.440**

Pearl Millet

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	Yield (METRIC TONNES/Ha)
Chirumhanzu	82	1%	26	1%	0.317
Gokwe North	317	4%	89	3%	0.281
Gokwe South	4321	50%	1334	48%	0.309
Gweru	1	0%	0	0%	0
Kwekwe	1961	23%	674	24%	0.344
Mberengwa	1335	16%	442	16%	0.331
Shurugwi	43	1%	16	1%	0.372
Zvishavane	528	6%	192	7%	0.364
Gweru Urban	0	0	0	0	0
Kwekwe Urban	0	0	0	0	0
Redcliff	0	0	0	0	0
Zvishavane Urban	0	0	0	0	0
Shurugwi Urban	0	0	0	0	0
Gokwe South Urban	0	0	0	0	0
Total	**8588**	100%	**2773**	100%	**0.323**

Finger Millet

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chirumhanzu	242	10%	128	15%	0.529
Gokwe North	481	19%	174	20%	0.362
Gokwe South	456	18%	100	11%	0.219
Gweru	149	6%	36	4%	0.242
Kwekwe	164	6%	48	5%	0.293
Mberengwa	552	22%	234	27%	0.424
Shurugwi	196	8%	49	6%	0.250
Zvishavane	293	12%	110	13%	0.375
Gweru Urban	0	0%	0	0%	0
Kwekwe Urban	0	0%	0	0%	0
Redcliff	0	0%	0	0%	0
Zvishavane Urban	0	0%	0	0%	0
Shurugwi Urban	0	0%	0	0%	0
Gokwe South Urban	0	0%	0	0%	0
Total	**2533**	100%	**879**	100%	**0.347**

Rice

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chirumhanzu	0	0%	0	0%	0
Gokwe North	3	1%	0	0%	0.050
Gokwe South	0	0%	0	0%	0
Gweru	69	13%	20	11%	0.284
Kwekwe	187	34%	74	40%	0.395
Mberengwa	168	30%	68	37%	0.406

Shurugwi	0	0%	0	0%	0
Zvishavane	91	16%	15	8%	0.161
Gweru Urban	1	0%	0	0%	0.530
Kwekwe Urban	30	5%	6	3%	0.198
Redcliff	2	0%	0	0%	0
Zvishavane Urban	0	0%	0	0%	0
Shurugwi Urban	0	0%	0	0%	0
Gokwe South Urban	0	0%	0	0%	0
Total	**552**	100%	**183**	100%	**0.332**

Groundnut

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chirumhanzu	3783	5%	1843	6%	0.487
Gokwe North	7405	10%	4268	15%	0.576
Gokwe South	8062	11%	2394	8%	0.297
Gweru	6865	9%	2487	9%	0.362
Kwekwe	7678	10%	2849	10%	0.371
Mberengwa	8240	11%	3135	11%	0.380
Shurugwi	6108	8%	2443	9%	0.400
Zvishavane	7678	10%	2772	10%	0.361
Gweru Urban	9330	13%	3373	12%	0.361
Kwekwe Urban	4629	6%	1455	5%	0.314
Redcliff	2849	4%	1227	4%	0.431
Zvishavane Urban	517	1%	285	1%	0.552
Shurugwi Urban	0	0%	0	0%	0
Gokwe South Urban	0	0%	0	0%	0
Total	**73144**	100%	**28531**	100%	**0.390**

Sunflower

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chirumhanzu	11	2%	8	4%	0.738
Gokwe North	176	25%	36	16%	0.202
Gokwe South	81	11%	11	5%	0.137
Gweru	69	10%	26	11%	0.377
Kwekwe	101	14%	43	19%	0.430
Mberengwa	171	24%	64	28%	0.376
Shurugwi	31	4%	21	9%	0.684
Zvishavane	2	0%	2	1%	0.975
Gweru Urban	25	4%	5	2%	0.181
Kwekwe Urban	20	3%	10	4%	0.479
Redcliff	16	2%	2	1%	0.106
Zvishavane Urban	2	0%	0	0.02%	0.020
Shurugwi Urban	0	0	0	0	0
Gokwe South Urban	0	0	0	0	0
Total	**705**	100%	**227**	100%	0.322

Soyabeans

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chirumhanzu	5	1%	2	0.1%	0.374
Gokwe North	0	0%	0	0.0%	0
Gokwe South	47	6%	12	0.5%	0.254
Gweru	2	0%	1	0.1%	0.696
Kwekwe	802	94%	2274	99.3%	2.836

Mberengwa	0	0%	0	0.0%	0
Shurugwi	0	0%	0	0.0%	0
Zvishavane	0	0%	0	0.0%	0
Gweru Urban	0	0%	0	0.0%	0
Kwekwe Urban	0	0%	0	0.0%	0
Redcliff	0	0%	0	0.0%	0
Zvishavane Urban	0	0%	0	0.0%	0
Shurugwi Urban	0	0%	0	0.0%	0
Gokwe South Urban	0	0%	0	0.0%	0
Total	**856**	100%	**2289**	100%	**2.675**

Sesame

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chirumhanzu	0	0	0		0
Gokwe North	0	0	0		0
Gokwe South	33	28%	16	44%	0.490
Gweru	20	18%	5	15%	0.256
Kwekwe	20	17%	1	2%	0.040
Mberengwa	0	0%	0	0%	0
Shurugwi	2	1%	1	4%	0.800
Zvishavane	14	12%	3	9%	0.216
Gweru Urban	22	19%	4	12%	0.202
Kwekwe Urban	0	0%	0	0%	0
Redcliff	5	4%	5	15%	1.073
Zvishavane Urban	0	0%	0	0%	0
Shurugwi Urban	0	0%	0	0%	0
Gokwe South Urban	0	0%	0	0%	0

Total	**115**	100%	**36**	100%	**0.313**

Sugarbeans

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chirumhanzu	322	8%	170	7%	0.527
Gokwe North	408	10%	311	13%	0.762
Gokwe South	574	14%	92	4%	0.161
Gweru	8	0%	4	0%	0.535
Kwekwe	364	9%	241	10%	0.661
Mberengwa	1064	26%	339	15%	0.318
Shurugwi	848	21%	613	27%	0.722
Zvishavane	395	10%	224	10%	0.566
Gweru Urban	76	2%	23	1%	0.297
Kwekwe Urban	26	1%	3	0%	0.111
Redcliff	1	0%	97	4%	69.141
Zvishavane Urban	0	0%	196	8%	0
Shurugwi Urban	0	0%	0	0%	0
Gokwe South Urban	0	0%	0	0%	0
Total	**4086**	100%	**2310**	100%	**0.565**

Roundnuts

District	Area (Ha)	Weight	Production (METRIC TONNES)	Weight	Yield (METRIC TONNES/Ha)
Chirumhanzu	1062	2%	440	3%	0.414
Gokwe North	3975	9%	1388	8%	0.349
Gokwe South	6441	14%	2167	13%	0.336
Gweru	4101	9%	1763	10%	0.430

Kwekwe	4614	10%	1687	10%	0.366
Mberengwa	6729	14%	2591	15%	0.385
Shurugwi	4334	9%	1826	11%	0.421
Zvishavane	3910	8%	1484	9%	0.380
Gweru Urban	6906	15%	2344	14%	0.339
Kwekwe Urban	3647	8%	1368	8%	0.375
Redcliff	920	2%	198	1%	0.215
Zvishavane Urban	1	0%	27	0%	36.517
Shurugwi Urban	0	0%	0	0%	0
Gokwe South Urban	0	0%	0	0%	0
Total	**46640**	100%	**17285**	100%	**0.371**

Cowpeas

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chirumhanzu	452	8%	328	20%	0.726
Gokwe North	524	9%	162	10%	0.310
Gokwe South	651	11%	156	9%	0.240
Gweru	925	16%	329	20%	0.356
Kwekwe	430	7%	113	7%	0.263
Mberengwa	219	4%	47	3%	0.214
Shurugwi	178	3%	46	3%	0.257
Zvishavane	1185	20%	228	14%	0.192
Gweru Urban	810	14%	181	11%	0.224
Kwekwe Urban	291	5%	50	3%	0.170
Redcliff	221	4%	30	2%	0.136
Zvishavane Urban	0	0%	0	0%	0
Shurugwi Urban	0	0%	0	0%	0
Gokwe South	0	0%	0	0%	0

Urban					
Total	**5885**	100%	**1670**	100%	**0.284**

Sweet Potato

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chirumhanzu	332	3%	2381	3%	7.167
Gokwe North	506	4%	3382	4%	6.679
Gokwe South	783	7%	5457	7%	6.974
Gweru	244	2%	1659	2%	6.806
Kwekwe	541	5%	4219	5%	7.803
Mberengwa	1492	13%	10882	13%	7.292
Shurugwi	2066	18%	14032	17%	6.792
Zvishavane	1277	11%	8872	11%	6.945
Gweru Urban	2965	25%	18576	22%	6.265
Kwekwe Urban	1166	10%	10089	12%	8.655
Redcliff	275	2%	3317	4%	12.060
Zvishavane Urban	22	0%	407	0%	18.541
Shurugwi Urban	0	0%	0	0%	0
Gokwe South Urban	**0**	0%	**0**	0%	0
Total	**11669**	**100%**	**83274**	**100%**	**7**

Cassava

District	**Area (Ha)**	**Weight**	**Production (METRIC TONNES)**	**Weight**	**Yield (METRIC TONNES/Ha)**
Chirumhanzu	0	0%	0	0	0
Gokwe North	0	0%	0	0	0
Gokwe South	16	54%	0	0	0
Gweru	5	18%	0	0	0

Kwekwe	1	3%	0	0	0
Mberengwa	0	0%	0	0	0
Shurugwi	1	4%	0	0	0
Zvishavane	3	10%	0	0	0
Gweru Urban	3	11%	0	0	0
Kwekwe Urban	0	0%	0	0	0
Redcliff	0.1	0%	2	100%	40.000
Zvishavane Urban	0	0%	0	0	0
Shurugwi Urban	0	0%	0	0	0
Gokwe South Urban	**0**	0%	**0**	0	0
Total	**30**	100%	**2**	**100%**	**0.068**

Table A 10.7: Masvingo Province

Maize

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bikita	22918	12%	9748	9%	0.425
Chiredzi	26088	14%	10134	10%	0.388
Chivi	19169	10%	6048	6%	0.316
Gutu	36029	19%	23686	23%	0.657
Masvingo	38472	20%	26009	25%	0.676
Mwenezi	15833	8%	5256	5%	0.332
Zaka	32848	17%	21919	21%	0.667
TOTAL	**191357**	**100%**	**102800**	**100%**	**0.537**

Sorghum

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bikita	1972	4%	908	5%	0.908

Chiredzi	23200	52%	9716	50%	9.716
Chivi	2336	5%	693	4%	0.693
Gutu	790	2%	252	1%	0.252
Masvingo	1763	4%	1111	6%	1.111
Mwenezi	14002	31%	6345	33%	6.345
Zaka	864	2%	280	1%	0.280
TOTAL	**44927**	100%	**19305**	**100%**	**19.305**

Pearl Millet

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bikita	2213	6%	766	7%	0.346
Chiredzi	4121	12%	1328	11%	0.322
Chivi	1181	3%	207	2%	0.175
Gutu	4769	14%	1744	15%	0.366
Masvingo	764	2%	281	2%	0.368
Mwenezi	21641	61%	7259	62%	0.335
Zaka	518	1%	179	2%	0.346
TOTAL	35207	100%	11764	100%	0.334

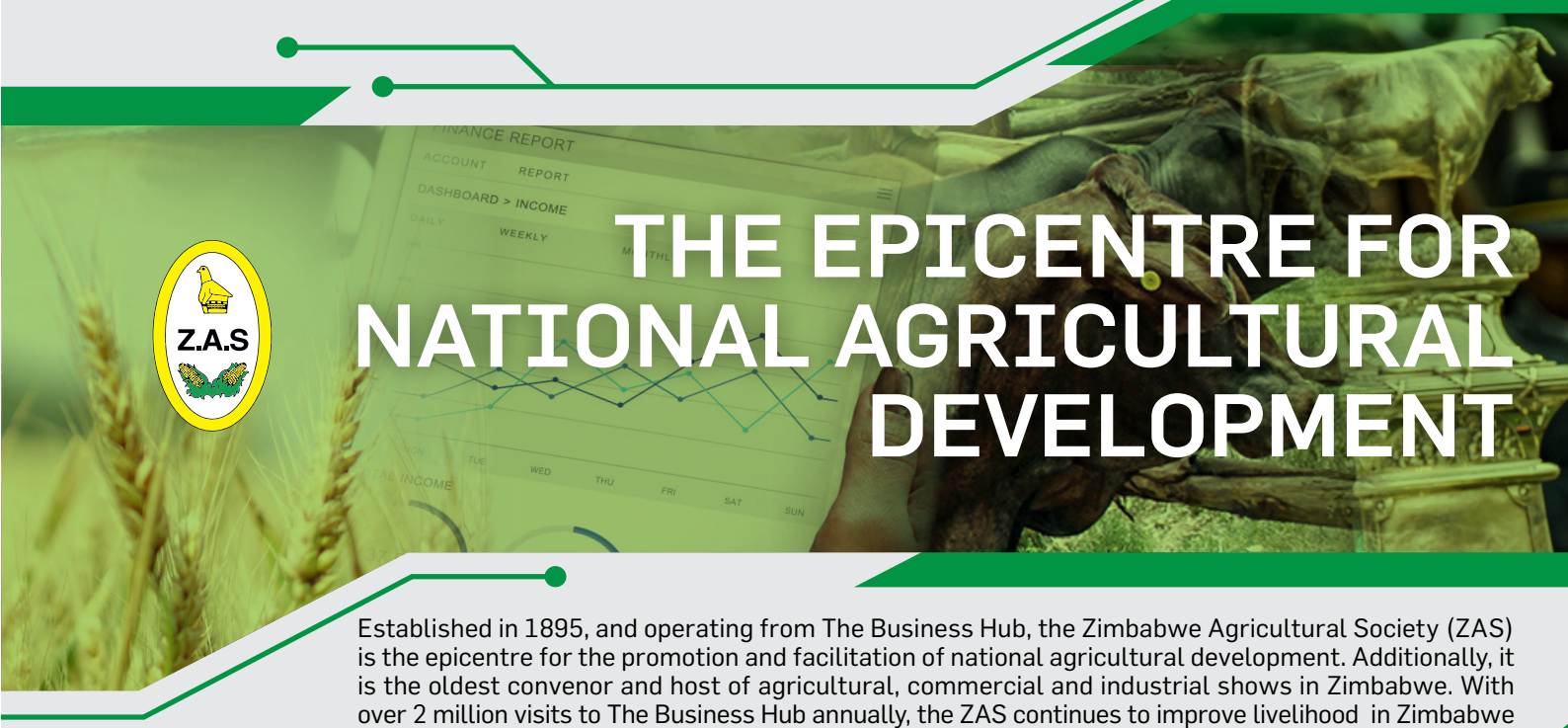
Finger Millet

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bikita	1510	16%	506	15%	0.335
Chiredzi	336	4%	125	4%	0.372
Chivi	715	8%	284	8%	0.397
Gutu	3444	37%	1289	39%	0.374
Masvingo	951	10%	401	12%	0.422
Mwenezi	475	5%	82	2%	0.173

Zaka	1992	21%	660	20%	0.331
TOTAL	**9423**	**100%**	**3347**	**100%**	**0.355**

Soya beans

District	Area(Ha)	Weight	Production(Metric tonnes)	Weight	Yield(METRIC TONNES/Ha)
Bikita	18	13%	11	13%	0.606
Chiredzi	47	35%	19	22%	0.394
Chivi	3	2%	1	1%	0.180
Gutu	12	9%	8	10%	0.660
Masvingo	16	12%	34	41%	2.109
Mwenezi	8	6%	2	3%	0.303
Zaka	31	23%	8	9%	0.246
TOTAL	**136**	**100%**	**82**	**100%**	**0.606**



THE EPICENTRE FOR NATIONAL AGRICULTURAL DEVELOPMENT

Established in 1895, and operating from The Business Hub, the Zimbabwe Agricultural Society (ZAS) is the epicentre for the promotion and facilitation of national agricultural development. Additionally, it is the oldest convenor and host of agricultural, commercial and industrial shows in Zimbabwe. With over 2 million visits to The Business Hub annually, the ZAS continues to improve livelihood in Zimbabwe with the following programmes and services:

Annual Agriculture Sector Survey

The annual Agricultural Sector Survey, initiated by the ZAS and the Financial Gazette, is meant to assist stakeholders in the sector by providing authenticatic, independent, up-to-date and in-depth analysis of the sector while highlighting the challenges and illuminating opportunities and attempting to proffer solutions for a rapid, robust, inclusive and sustainable agricultural growth trajectory. Benchmarking and best practice "pit-stops" and "pain stops" in the survey should spur motivation among actors to accelerate activities to transform the sector.

Agriculture Media Awards

The awards are being introduced to capacitate reporting in agriculture and to complement two of the ZAS' Strategic Pillars thus: The "Word" and "The Narrative". The awards are meant to be a stimulus towards improvement in the coverage of agriculture related issues and to use journalism as a vehicle for clear reliable and accurate reportage for the success of agriculture as a primary sector which anchors Zimbabwe's quest to become a middle income economy by 2030.

Farmers Festival

The Zimbabwe Agricultural Show witnessed the launch of the inaugural Farmers Festival as a platform to celebrate the Zimbabwe agricultural story as well as provide exhibiting companies with opportunities to activate their brands through the branded entertainment programme held at the Glamis arena. The festival is an opportunity for companies to experience full brand exposure, brand positioning and create sustainable brand equity.

Livestock Revitalisation Project

The Zimbabwe Agricultural Society in partnership with various mining and financial companies introduced the Livestock Revitalisation Programme whose main objective is to help improve cattle genetics (quality) and quantity within communal farming areas in all the Provinces of Zimbabwe. The Livestock Revitalisation Programme involves artificial insemination. The intended outcomes of the Livestock Revitalisation Programme include the following: (1) Increased and improved indigenous breeds nationally; (2) Improved regular incomes for participating rural households; (2) Improved food and nutrition security; (3) Improved rural livelihoods; (4) Improved national socio-economic development; (5) Promotion of sustainable agricultural processes.

Zimbabwe Agricultural Show

The annual Zimbabwe Agricultural Show is the premier event organized by the ZAS for the national facilitation and promotion of agricultural development in Zimbabwe. Attracting more than 550 exhibitors and over 250 000 people annually, the Show presents a unique business opportunity for national and regional organizations and is the highlight of many Zimbabweans' annual entertainment calendar.

Agricultural Discussions

ZAS organises the Leadership for Enhanced Agricultural Development Series (LEADS) discussions which focus on analysing, synthesising, distilling and collating, for immediate use, tangible, relevant and timely agricultural development and policy interventions. Premised on a value chain approach, these monthly discussions are a must attend event for stakeholders.

Next Generation

Youth involvement in all spheres of the ZAS' activities has been recently invigorated by the establishment of a dedicated "Youth Desk" to ensure vibrant and real time exchange of information among Youth in agricultural and related matters. To ensure continuity in the society's heirs, youth between 20 to 30 years old are encouraged to be members of the Next Generation initiative to cultivate interest in the agriculture and participate in many society activities.

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