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Demographic drivers of agricultural performance: An empirical analysis of farmers in Zimbabwe

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Abstract

This study determined the extent to which the change in the demographics of the farmers in Zimbabwe from 1980 has had an influence on agricultural performance. We adopted a sample size of 384 farmers from a population of more than 1,500,000 farmers. Descriptive statistics were used to determine the relationship between demographic characteristics and agricultural performance. 30.5 per cent of the farmers were communal, down from 70 per cent pre -1980. Thus leaving 69.5 per cent under commercial farming and 52.6 per cent were the 25-59 age group, with farms run by family units at 99.5 per cent. The literacy level was 99.7 per cent. There was no statistically significant difference in the farmers agricultural performance margins between the farm classification, $\chi^2 (2) = 2.678$, $p > 0.05$. On provinces, there was a statistically significant difference in the agricultural performance, $\chi^2 (7) = 67.101$, $p < 0.05$. Governments can enact youth farmer training and support programs to ensure capacity building and improved agricultural performance. The importance of demographic characteristics on the adoption of entrepreneurial competences and agricultural performance is brought to clarity by this study. The theoretical framework from this study can be adopted to select and recruit youth potential farmers for training and support in spearheading cluster specialist food security initiatives.

Keywords: Demographic characteristics, farmers, descriptive statistics, agricultural performance, farmer support, education 5.0

Introduction

The demographics of the farmers in Zimbabwe has changed from 1980 where it was predominantly composed of colonial settlers and a few indigenous black farmers to the current set up where it now comprises of a large proportion of indigenous peoples settled through the land redistribution programs. Redistributive land reform broke down the territorial and social segregation of communal farmers allowing a free movement of people, goods, services and livestock. It also altered the social relations of production by decimating the cheap labour system entrenched in the colonial compulsory recruitments often exploitative to the now better working conditions. (Moyo, 2011) ^[17]. From 2000, in terms of hectareage, there has been an increase in the allocation of new farm models namely the A1, predominantly for crops and animal rearing for low end black farmers and the A2 for new black commercial farmers. Despite an increase of 'farmers' there is a decrease in productivity which was previously at 10% maize production in Africa in 1985 to negligible levels which left the country in need of food aid. Though the agricultural sector faces challenges it remains resilient and has minimal prospects of collapsing. (Scoones *et al*, 2010) ^[24]. The study research instrument considered the following demographic profiles: farm classification, age, province of operation, marital status, family unit and the level of education of farmers. Vallabh & Mhlanga (2014)

^[29], point out that whilst there is more research on business skills and performance, researchers seem to pay an afterthought approach or rather a peripheral glance to demographic factors.

Theoretical Background

Research by Atibioke, Ogunlade, Abiodun, Ogundele, Omodara & Ade (2012) ^[2], showed that 75% of the respondents in farming were in the age group of 30-50 years. They assert that younger people have a higher likelihood or inclination to embrace innovative and technological ways to improve farm performance. Research in Tanzania by Kulyakwave, Shiwei & Yu (2019) ^[10], showed that 52% of the respondents had an average of 45 years. Those within the mean age range had higher agricultural performance in terms of yields implying that the younger farmers are active and their participation in adopting novel practices render them effective. Also in another study, using regression analysis across three age groups of 15-19, 20-25 & 26-29, Ahmed & Kar (2019) ^[1], showed that as the entrepreneur age increased, the business performance increased.

Atibioke *et al* (2012) ^[2], found out that 75% of the respondents were married. They assert that marriage is a means of generating family labour who then participate in production, processing, marketing and the employment of technologies. Kulyakwave *et al* (2019) ^[10], showed that

married respondents had an advantage in their study where rice yields were higher and they attribute that to labour benefits.

Studies done in South Africa by Vallabh & Mhlanga (2015) ^[29], show that demographic profiles such as gender, education and income have a positive impact on business performance. They proffer that education and training are essential for improved business performance as skilled personnel can be complementary to future needs of industry. Other studies in Nigeria by Tokula (2019) ^[28], show that education and access to extension services have a significant positive impact to technology adoption in farming. They assert that educated farmers are receptive to innovative agricultural techniques. Kulyakwave *et al* (2019) ^[10] also showed that 56% of the respondents who had accessed primary to tertiary education exhibited higher yields relative to respondents with less education.

The resettled farmers are still active on the farms but the land productivity is still low. However, the low productivity is not peculiar to Zimbabwe as Sheahan and Barret (2017) ^[26] observes that the agricultural industry in Africa is a perennial underperformer and productivity is sluggish with limited uptake of entrepreneurial activities. This view is shared by Sancho (2010) ^[23], who notes that in Latin America the indices for entrepreneurship uptake in agriculture and rural communities is low compared to Asia. Entrepreneurship is a likely key to stimulate rural and agricultural development through exploitation of business opportunities.

Thus Deekor (2019) ^[5], advocates for policies that can include training of current and prospective farmers in agricultural entrepreneurship. This advocacy hinges on the cognitive approach based on empirical research which shows that there is a positive relationship to farm performance when entrepreneurial competences and skills are evident. Deekor (2019) ^[5], citing De Wolf and Schoorlemmer, 2008) ^[6] notes that production skills are a basic requirement for success in the farming business. There is emphasis on farmers to become businesspersons due to various input combinations and the growing complexity of farming as a business. The presence of entrepreneurial competences in agriculture is a precursor towards the development of a sustainable rural economy. (Esiobu, Onubuogu, & Ibe, 2015) ^[7].

Statement of the Problem

As alluded to in the introduction of this paper, despite the uptake of farming by the indigenous farmers, the production is still minimal. The country continues to be in need of food aid. There is a high farm failure rate and food security is still difficult to attain. Entrepreneurial competences by nature have specificity of characteristics pertaining to agricultural performance. Ahmed & Kar (2019) ^[1] point out that this brings to the fore the impact of demographic characteristics as being fundamental to determining agricultural performance. This paper seeks to address the gaps due to scant focus on demographic characteristics and their influence on agricultural performance.

Research Question

Do selected demographic profiles influence agricultural performance?

Significance of the Study

Agricultural performance has an impact on improving the Gross Domestic Product. Tokula (2019) ^[28] asserts that research on agricultural performance is pertinent in that the findings can raise the existing productivity through stimulating the evolution of the production methods towards improved agricultural performance. The findings can induce a policy shift towards attending to the capacity building of some selected demographic characteristics towards improved agricultural performance giving significance to policy and practice. Demographic characteristics approach with focus on agricultural performance is an emerging field thus this study has contributed to the body of knowledge as a whole. Thus, the study has academic significance as it will also further the body of knowledge in agricultural entrepreneurship and agribusiness. It is highly probable that the research is original and has both an academic, theoretical and policy impact.

Materials and Methods

The study used descriptive research design and it sought to establish the relationship between demographic characteristics and agricultural performance. Descriptive statistics were used for analysis and they utilised quantitative methods for non-parametric tests such as the Kruskal Wallis H - Test since the data was not normally distributed.

Data collection

The study population comprised of farmers of various capacities and capabilities picked at random from the 8 provinces of Zimbabwe exclusive of the metropolitan provinces of Bulawayo and Harare. For the sample of 384 farmers, stratified random sampling was used. This study employed questionnaires as the main instrument. The study employed a survey research whereby numeric descriptions of responses were captured for analysis. The study used cross-sectional survey which is descriptive, exploratory and explanatory. The data was analysed through quantitative methods employing descriptive statistics.

Results and Discussion

Demographic Profiles

This section pertains to demographic traits of respondents. The aforementioned traits included information on the farm classification, marital status, and province of operation, family unit and the level of education of respondents. This information enabled the researcher to profile the individuals involved in farming or agriculture so as to give indicators for future planning.

Table 1: Farm classification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Communal	117	30.5	30.5	30.5
	Small Holder	77	20.1	20.1	50.5
	Medium Scale	87	22.7	22.7	73.2
	Large Scale	103	26.8	26.8	100.0
	Total	384	100.0	100.0	

Source: Author(s)

Table 1, shows the distribution of farm classifications in a sample size of 384 farmers. The cumulative percent column shows the percentage of farmers who fall into a particular category or lower. What is of interest in this table is that most farmers are communal, (30.5%). This finding confirms FAO (2016) ^[8] publications which suggest that 49% of Zimbabwe's agricultural land is under communal farming as per earlier reviewed literature in this study and 50.5% of farmers are either communal or small holder. As alluded before in this study, Mkodzongi & Lawrence (2019) ^[16] mentioned that the previous hectareage of communal farms remained static under the land reform programme at 16.4 million hectares. Thus it has maintained its dominance in terms of distribution.

Table 2: Age group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25-29	10	2.6	2.6	2.6
	30-34	27	7.0	7.0	9.6
	35-39	30	7.8	7.8	17.4
	40-44	32	8.3	8.3	25.8
	45-49	29	7.6	7.6	33.3
	50-54	41	10.7	10.7	44.0
	55-59	33	8.6	8.6	52.6
	60-64	34	8.9	8.9	61.5
	65-69	49	12.8	12.8	74.2
	70-74	35	9.1	9.1	83.3
	75-79	30	7.8	7.8	91.1
	80-84	31	8.1	8.1	99.2
	>85	3	.8	.8	100.0
	Total	384	100.0	100.0	

Source: Author(s)

On age group, Table 2 depicts that the dominant bracket was the 65-69 age group (12.8%) and the least was the 25-29 age group (2.6%). The least group was mostly comprised of succession farmers or heirs of deceased parents. The dominant age group consist of mostly the pioneer farmers at the onset of the land reform. By implication, they have the requisite experience and know-how which has accelerated the development of entrepreneurial competences with time. They also have a passion for the farming activity and this also encourages the development of entrepreneurial competences. This group besides a sentimental value approach to farming, has exhibited resilience and stamina a view noted by Cressy & Storey (1995) ^[4] who asserted that in their research older business people exhibited higher survival rates. Cumulatively more than 80% of the farmers were found to be less than 74 years old. This finding mirrors that of the ZIMSTAT (2019) ^[33] survey that found out that 92% of the farmers were less than 74 years old.

Cumulatively, the 25-59 age group was at 52.6%. This age group is the most active in terms of business activity and is well below the retirement age of 65. This group represents self-starters who are keen to approach farming as a business and a source of livelihood in a country where the unemployment rate is high. Government of Zimbabwe (2019) survey notes that the Median age for heads of households in A1 farms ranges from 45-50 years thus confirming this finding. This group consists of goal getter

and self-starters who view farming as an enterprise. This group does not have a 'political legacy' tag as they were too young or not yet born to partake in the war of liberation as frontliners pre 1980 thus Shonhe *et al* (2020) ^[27] views them as emergent commercial farmers who have seized the opportunity and have been innovative in a Schumpeterian narrative.

This group is of interest to the researcher in that they could be key in adopting the recommendations this study proffers. This is a group which is looking for an economic solution to their livelihood. Ruis & Scholman (2012) ^[22] implore researchers to study the effect of age on entrepreneurship and business performance and the possible macro-economic impact in areas such as employment creation. Earlier research by Watkins (1994) ^[31] argues that younger business owners have more motivation, commitment and are risk takers thereby making them perform better in business. This is a view shared by this researcher and it explains the uptake of farming by the 25-59 age group.

Ruis & Scholman (2012) ^[22], implore researchers to study the effect of age on entrepreneurship and business performance and possible macro-economic impact as in employment creation. Maebane (2023) ^[12], argues that younger business owners have more motivation, commitment and are risk takers thereby making them perform better in business though they need government support. This is a view shared by this researcher and further studies are needed for a Zimbabwean context in the agricultural sector. Osunsan, Kinyatta, Baliruno & Kibirige (2015) ^[20] on studies carried out in Uganda implore government to avail resources to the young as this will lead to employment creation.

Other research in support of these results by Atibioke *et al*, (2012) ^[2], showed that 75% of the respondents in farming were in the age group of 30-50 years. They assert that younger people have a higher likelihood or inclination to embrace innovative and technological ways to improve farm performance. Research in Tanzania by Kulyakwave *et al*, (2019) ^[10], showed that 52% of the respondents had an average of 45 years. Those within the mean age range had higher agricultural performance in terms of yields implying that the younger farmers are active and their participation in adopting novel practices render them effective. Also in another study, using regression analysis across three age groups of 15-19, 20-25 & 26-29, Ahmed & Kar (2019) ^[1], showed that as the entrepreneur age increased, the business performance increased.

Table 3: Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never married	1	.3	.3	.3
	Divorced	4	1.0	1.0	1.3
	Married	360	93.8	93.8	95.1
	Widowed	19	4.9	4.9	100.0
	Total	384	100.0	100.0	

Source: Author(s)

The findings of this study show that most of the respondents were married (93.8%) as depicted in Table 3. The farming pattern is exhibited by family run set ups. The farm units are

operated by families and they are dependent on the farming activity for household incomes and livelihood. There is division of labour in the family set up reducing the need for external personnel who may be expensive to retain and who may not be dependable. This observation confirms the 'Jack of all trades Theory' adopted in this study to explain the into Action Competences in the literature review of this study. Results by Kulyakwave *et al*, Yu (2019) ^[10], show that married farmers exhibited higher yields and high performance. They attribute this to increased labour, knowledge sharing and capital. Due to family needs, the married farmers are more focussed on their sustenance and livelihood.

More studies carried out in South Africa, show that the marital status has a positive correlation with farming performance and there is household support and assistance in the activities. (Mazibuko, Balarane, Antwi & Yeki, 2018) ^[15]. Wairimu *et al*, (2016) ^[30], asserts that large households have the numbers in terms of labour thus they are willing to invest in farming to improve their livelihood and as such they exhibit growth in agriculture.

The results were further supported by Atibioke *et al* (2012) ^[2], who found out that 75% of the respondents were married. They assert that marriage is a means of generating family labour who then participate in production, processing, marketing and the employment of technologies. Kulyakwave *et al* (2019) ^[10], showed that married respondents had an advantage in their study where rice yields were higher and they attribute that to labour benefits.

Table 4: Family Unit

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2	.5	.5	.5
	1	382	99.5	99.5	100.0
	Total	384	100.0	100.0	

Source: Authour(s)

The results in Table 4 concur with the earlier assertion on marital status that the farming units comprise of family operated set ups and therefore the farming activity becomes a source of livelihood and there is division of labour in the family set up reducing the need for external personnel who may be expensive to retain and who may not be dependable thus improving incomes and providing consistency on farm performance. This finding is also consistent to Cliffe, Alexander, Cousins & Gaidzanwa (2011) who suggested that the dominant criteria for land allocation was centred on married couples or that women would seek land within a family unit capacity. Fitz-Koch *et al* (2018) ^[9] noted that globally the family unit is an integral part of the entrepreneurial thrust in agriculture. The farms depend on the collective family contributions and commitment. This is of benefit on succession dynamics and it is highly probable that the successor generations will pursue and adopt modern technologies and they will exhibit a higher entrepreneurial competences aptitude. The researcher concurs with this observation and attests that all of the below 35 years old farmers (from the age demographics) were successors or heirs and the farms were a family inheritance.

Table 5: Education Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No formal education	1	.3	.3	.3
	Grade 1-7	7	1.8	1.8	2.1
	Form 1-4	124	32.3	32.3	34.4
	Form 5-6	144	37.5	37.5	71.9
	Tertiary	108	28.1	28.1	100.0
	Total	384	100.0	100.0	

Source: Authour(s)

Table 5 shows that the literacy levels of the respondents were at a high of 99.7%. The dominant group of 37.5% had attained Advanced level studies and degreed or tertiary level respondents were at 28.1%. The literacy levels are confirmed by the ZIMSTAT (2023) ^[34] report which places the national literacy levels at 95.1%. This means that the respondents have a better understanding on entrepreneurial competences which are cognitive and they have a higher aptitude to learn or to acquire them through training besides those who innately possess them. Lewa & Ndingu (2012) ^[11] in studies done in Kenya note that respondents who practiced and learnt agriculture at secondary school exhibited a higher propensity to take up farming as a career. Though their study was on career options, they assert that the skills learnt have a positive bearing on future farm performance. Research by Paltasingh & Goyari (2018) ^[21] in India show that education level has a positive effect on farm performance and that is attributed to a higher capacity to adopt modern technology. They view farmer educational level as a complementary to research, development and adoption of technologies in the farming sector which then becomes a precursor for improved yields and farm

performance. The researcher concurs with this observation and as education levels in Zimbabwe imply a high aptitude towards adoption of technologies and consequently a better farm performance.

Furthermore, studies in Vietnam show that a low level of education attained, adversely affects agricultural output. Though the farmers in the Vietnamese study exhibited a low level of education, they have endeavored to send their children to school as it is their expectation that education will bring economic value to their farming business. (Ninh, 2021) ^[19]. Thus, this researcher contends that education attainment has positive implications for a better understanding on technologies, acumen and agricultural practices needed to bolster farm performance.

The results were further supported by Vallabh & Mhlana (2015) ^[29], show that demographic profiles such as gender, education and income have a positive impact on business performance. They proffer that education and training are essential for improved business performance as skilled personnel can be complementary to future needs of industry. Other studies in Nigeria by Tokula (2019) ^[28], show that education and access to extension services have a significant

positive impact to technology adoption in farming. They assert that educated farmers are receptive to innovative agricultural techniques. Kulyakwave *et al* (2019) ^[10] also showed that 56% of the respondents who had accessed primary to tertiary education exhibited higher yields relative to respondents with less education.

From the researcher perspective these results imply that Zimbabwe can tap into the 95.1% literacy rate to introduce innovative agricultural techniques and there is a high probability that these will be well received by the farming community and adopted so as to improve the agricultural performance. Research on the dairy farming in Marirangwe and selected Eastern Highlands in Zimbabwe by Ngongoni, Mapiye, Mwale & Mupeta, (2006) ^[18], concurs with this assertion by showing that the adoption of new and improved technologies in agriculture was positively related to education. In their research the calibre of dairy farmers were retired professionals who had a significant capital outlay to invest in modest infrastructure and good breeds.

Demographic Profiles Analysis

The Shapiro-Wilk test was used to assess the normality of the data. The test results show that the p-values for all five variables were less than 0.05, which indicates that the data is not normally distributed. Therefore, non-parametric tests were used for further analysis. The Shapiro-Wilk test is a statistical test that is used to test the null hypothesis that a data set is normally distributed. The test results are reported as a p-value. A p-value of less than 0.05 indicates that the null hypothesis can be rejected, which means that the data is not normally distributed.

Kruskal Wallis: Agricultural Performance vs Farm classification

Table 6: Test Statistics^{a,b}

	Profitability_ave
Chi-Square	2.678
Df	3
Asymp. Sig.	.444
a. Kruskal Wallis Test	
b. Grouping Variable: 1. Your Farm classification	

Source: Authour(s)

Table 6 demonstrates that the Kruskal-Wallis H test showed that there was no statistically significant difference in the farmers agricultural performance margins between the farm classification $\chi^2(2) = 2.678$, $p > 0.05$. Previous research had shown resettled farmers to be more productive than communal farmers. This was attributed to a higher usage of inputs and better know how on maximisation of inputs such as fertilisers. (Zikhali, 2008) ^[32]. However, the results show otherwise and the researcher attributes the indifference on agricultural performance to innovative approaches targeting the communal farmer such as conservation agriculture and climate change mitigatory strategies such as *pfumvudza*. In concurrence Mavesere and Dzawanda (2023) ^[13], in studies carried out in Mutare, assert that *Pfumvudza* has improved agricultural performance in communal areas through adoption of climate change resilient varieties. They further advocate for the adoption of this system nationally. Thus the communal areas have caught up on agricultural performance with other farmer classes notwithstanding the different

approaches and capacity.

Kruskal Wallis: Agricultural Performance vs Province

Table 7: Test Statistics^{a,b}

	profitability_ave
Chi-Square	67.101
Df	7
Asymp. Sig.	.000
a. Kruskal Wallis Test	
b. Grouping Variable: 3. Province	

Source: Authour(s)

Zimbabwe has different agro-ecological regions which cut out across the provinces. The resultant diversity means that the different provinces have unique farming systems peculiar to the natural conditions. Table 7 demonstrates that the Kruskal-Wallis H test shows that there is statistically significant difference in the farmers agricultural performance margins between the provinces $\chi^2(7) = 67.101$, $p < 0.05$. Mashonaland East Province rated higher on their performance scores while Masvingo province had the lowest performance scores. Mashonaland East has very stable rainfall and farmers are into cash crops hence their entrepreneurial focus is higher. Mashonaland East is predominantly in the agro-ecological region II. In studies done in the dairy sector, milk yield and quality was significantly higher in natural region II than other regions. (Mavunga, Gororo & Tada, 2022) ^[14].

Research conducted over a 19-year period by Sharara, Shekede, Gwitira, Masocha & Dube (2022) ^[25], showed that in drought probability assessments agro-ecological regions 4 and 5 are predominantly drought prone with an estimated 40% chance of experiencing a drought in any season. This finding resonates with this study and explains the performance of Masvingo Province. Though literature places Matebeleland provinces in the same predicament, the reliance on livestock productive rather than cropping overall, mean they performed better than Masvingo. Research by Chingarande, Mugano, Chagwiza & Hungwe (2020) ^[3] notes that from 2017, Masvingo province has had foot and mouth disease outbreaks and droughts leading to dependency on food aid in areas such as Mwenezi, Zaka, Chivi and Bikita. They note that the aforementioned districts exhibit low levels of resilience, poverty and low food security and the situation was worsened by Cyclone Idai in 2019 which damaged infrastructure and fields. According to reviewed literature Masvingo has high water insecurity and is a food deficit area and this is a factor contributing to low performance scores.

Kruskal Wallis: Agricultural Performance vs Education Level

Table 8: Test Statistics^{a,b}

	Profitability_ave
Chi-Square	58.323
Df	4
Asymp. Sig.	.000
a. Kruskal Wallis Test	
b. Grouping Variable: 8a. What is the highest level of education of you and your spouse?-self	

Source: Authour(s)

Table 8 on the Kruskal-Wallis H test shows that there is no statistically significant difference in the farmers profitability margins between the levels of education $\chi^2(4) = 58.323$, $p < 0.05$. Farmers that had reached tertiary level rated higher their profitability scores while those finished with 'O' level had the lowest profitability scores.

Conclusion and recommendations

Demographic Profiles and Agricultural Performance

The demographic profiles considered were farm class, family unit, province and educational levels.

For Theoretical Perspectives: On farm classification levels, the results showed that there was no statistically significant difference in the agricultural performance between farm classification. This could be due to innovations on agriculture which are being carried out to include the communal farmer to mainstream agriculture. These innovations such as conservation agriculture and 'pfumvudza' entail improving productive capacity.

On the family unit, 99.5% of the farmers operate as a family unit. This is encouraging in that there is a likelihood of the development of farming as a tradition and this may guarantee succession and continuity. The presence of younger farmers who ordinarily are not direct beneficiaries of the land reform programmes has positive future orientation of agriculture and impacts well for envisaged agricultural performance.

On the province, there was a significant difference in the performance of farmers. Mashonaland East Province exhibited higher performance scores and Masvingo ranked last. Mashonaland East has very stable rainfall and farmers are into cash crops hence their entrepreneurial focus is higher. They are able to enter into contract farming in some instances.

Lastly on education levels, farmers who reached tertiary level rated higher on agricultural performance than lower education level farmers. This may be due to a capacity to grasp technologies and innovative methods of farming. Since entrepreneurial competences are cognitive, these farmers have shown that they have a higher capacity to be trainable. Their approach to farming is not of a subsistence level but an income generating venture.

For Policy Perspectives: The researcher highlights the importance for policy planners and stakeholders such as contractors to explore and pay attention to the demographic profiles of farmers who are beneficiaries of government or private schemes. Farmers can also utilise the findings of this study to enhance their chances of an improved agricultural performance.

There is need for youth farmer support programs to encourage this emerging group. The support can be in the form of financial or technical support so that it becomes an incentive.

Government can also enact policies that favour training at affordable rates to youth farmers so as to improve their effectiveness and agricultural performance.

For Extension and Education Perspectives: Governments through their extension workers can identify a pool of farmers per province who will be trained and supported with adequate capital in specific agricultural activities where their provinces enjoy a competitive advantage over others

and be monitored so as to build a business culture to agriculture. These farmers will be selected according to the demographic profiles, exhibition of entrepreneurial competences and must undergo training and capacity building and be state supported financially in their farming activities. Alluding to the literature review on agro-ecological zones these farmers will be tasked with agricultural production on sectors where they are domiciled and where they have a competitive advantage.

Disclosure of Interest Statement

No potential conflict of interest was reported by the Author(s).

Declaration of Funding

No funding was received

Ethics Approval and Consent to Participate

When conducting this study, the authors observed the following ethical tenets such as anonymity, beneficence, deception, informed consent and plagiarism. These ethical tenets are consistent with the expectations of the Graduate Studies Directorate at Chinhoyi University of Technology. In this study the research instrument was designed in such a manner that there was no provision for the name and contact details of the respondents. In this study the respondents were advised that the research and information gleaned from the instrument will fill a knowledge gap and ultimately benefit the agriculture industry. The authors avoided extolling the benefits of the research on individual level and adopted a holistic approach. In this study the purpose of the research was fully communicated to the respondents and the enquiry was above board with no hidden or misrepresented inclinations. The authors acknowledged all information obtained from other works and shunned plagiarism so as to safeguard the integrity of this study.

Informed Consent

Respondents gave information truthfully with full consent and were not under any form of duress. For this study, the researcher explained that the research was for both academic and practical purposes so as to increase the scope of knowledge and assured the respondents that there was no risk whatsoever in partaking.

Consent for Publication

All the Authors are willing for the publication of this manuscript.

Author Contribution Statement

- 1) Conception, Design, Analysis and Interpretation of the Data-Jabez Moyo, Zororo Muranda, Desderio M. Chavunduka.
- 2) Drafting of the paper-Jabez Moyo, Desderio M. Chavunduka.
- 3) Revision for Intellectual Content- Desderio M. Chavunduka, Zororo Muranda.
- 4) Approval for Final Version to be published- Jabez Moyo (Dr), Zororo Muranda (Prof), Desderio M. Chavunduka (Prof).

Data Availability Statement

The data that support the findings of this study are available from the corresponding author Jabez Moyo upon reasonable

request.

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