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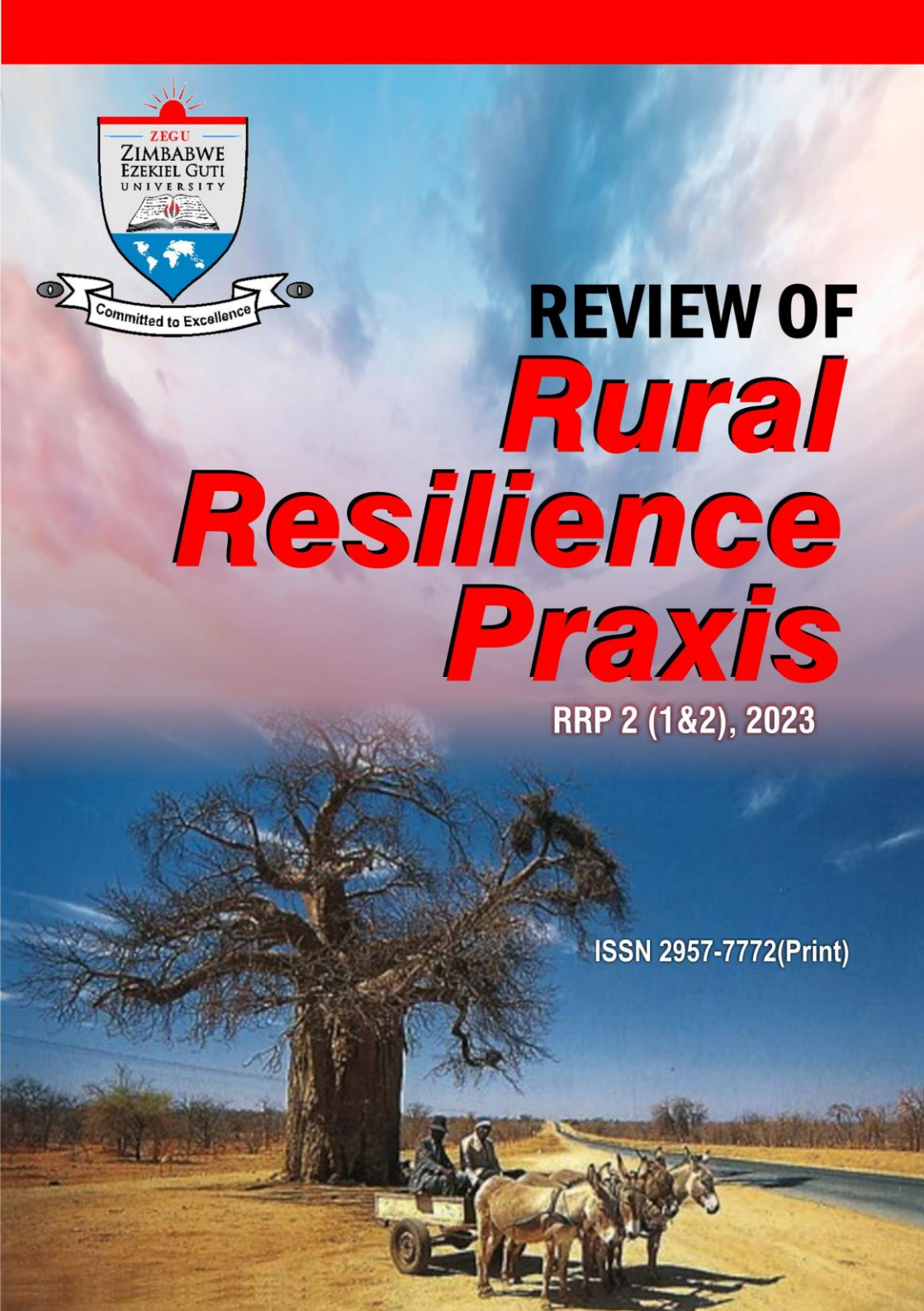
REVIEW OF Rural Resilience Praxis

RRP 2 (1&2), 2023



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About the Journal

JOURNAL PURPOSE

The purpose of the *Review of Rural Resilience Praxis is* to provide a forum for disaster risk mitigation, adaptation, and preparedness.

CONTRIBUTION AND READERSHIP

Sociologists, demographers, psychologists, development experts, planners, social workers, social engineers, economists, among others whose focus is that of rural resilience.

JOURNAL SPECIFICATIONS

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SCOPE AND FOCUS

As much as the urban territory is increasing by each day, the rural economy, especially in many developing countries, still retains a great proportion of the extractive and accommodation industry. Retaining some space as rural remains critical given the sectors role in providing ecosystem services to both wildlife and humanity. In this light, rural resilience as practice beckons for critical studies especially in the face of the ever-threatening extreme weather events and climate change that then impact on the livelihoods and lifestyles of the rural communities. Review of Rural Resilience Praxis (RRRP) comes in as a platform for critical engagement by scholars, practitioners, and leaders as they seek to debate and proffer solutions of the rural sector as well as trying to champion the philosophy of the right to be rural. The issue of conviviality between the different constituencies of the sectors, compiled with the competing challenges of improving rural spaces while also making the conservation, and preservation debates matter is the hallmark of this platform of criticality. The journal is produced bi-annually.

Guidelines for Authors for the Review of Rural Resilience Praxis

Articles must be original contributions, not previously published and should not be under consideration for publishing elsewhere.

Manuscript Submission: Articles submitted to the *Review of Rural Resilience Praxis*are reviewed using the double-blind peer review system. The author's name(s) must not be included in the main text or running heads and footers.

A total number of words: 5000-7000 words and set in 12-point font size width with 1.5 line spacing.
Language: British/UK English
Title: must capture the gist and scope of the article
Names of authors: beginning with the first name and ending with the surname
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Abstract: must be 200 words
Keywords: must be five or six containing words that are not in the title
Body: Where the authors are more than three, use *et al.,*
Italicise *et al.*, *ibid.,* words that are not English, not names of people or organisations, etc. When you use several authors confirming the same point, state the point and bracket them in one bracket and in ascending order of dates and alphabetically separated by semi-colon e.g. (Falkenmark, 1989, 1990; Reddy, 2002; Dagdeviren and Robertson, 2011; Jacobsen *et al.*, 2012).

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‘Climate Change News Is Awash Everywhere, The Phenomenon Is Hitting Hard’: Dialoguing with Rural Communities of Selected Districts in Zimbabwe

MTHABISI MSIMANGA, PRECIOUS MUBANGA, NOMQHELE NYATHI, GILBERT MUSHANGARI, SITHANDEKILE MAPHOSA, DERECK NYAMHUNGA[1], FELIX MADYA[2]

Abstract

The article explores how the availability of climate change news in Zimbabwe is pushing the rural communities’ understanding of threats posed by climate change on rural livelihoods and ways of life. Climate change has become a global threat to the rural livelihoods with the erosion of livelihoods leading to rural-urban exodus that is draining rural brains. This article is based on the argument that the mainstreaming of climate change news increases the awareness of rural people and aids their adaptation and resilience strategies. The study used a qualitative methodology with a bias towards an exploratory research design. The study used focus group discussions and in-depth interviews to gather data. The study used purposive sampling and adhered to all ethical principles. It found that climate change is hitting communal areas hard but rural communities have been benefiting from government and private media of information dissemination of news. The rural communities have been building resilience and adaptation to the vagaries of climate change. The study concludes that climate change remains a global threat to food security and rural development and more focus on climate news targeting rural communities must be introduced to fast-track rural development and resilience building. The study recommends the introduction of community radios and media outlets.

Keywords: *communal areas, awareness, livelihoods, mediums, government, vagaries*

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INTRODUCTION

Climate change is a challenge that is affecting agriculture activities at national, continental and global levels. The four components of food security, i.e. food accessibility, food utilisation, food system stability and food availability, are negatively affected by the effects of climate change on agriculture (Kutyauripo *et al*., 2021). Some of the impacts of climate change are an increase in global temperatures and changes in rainfall patterns that might include excessive rainfall or droughts (Wheeler and Von Braun, 2013). The increasing temperatures, flooding or droughts result in lower crop yields, whilst heat stress and drought lower livestock growth and productivity (Myers *et al.,* 2018). Climate change is adversely affecting communal areas in developing countries more than what scientists had anticipated. Significant attention has been given to improving the understanding of real and imminent impacts of climate change (Madzwamuse, 2010).

The antagonistic effects of climate change on agriculture increase the chances of food insecurity, mostly in Africa and Asia (Kutyauripo *et al.,* 2021). Happer and Philo (2016) observed that the connection between public consumption of mass media and subsequent behaviours has been subject to much debate with the view that the contemporary world is composed of passive and isolated individuals who are subject to the effects of powerful propaganda messages. While the power of audience to resist media messages focused on the polysemy of the text (Morley, 1980; Jenkins, 2006), in the digital environment, conceptions of the audience are being redrawn to reflect the greater potential for participation in public life and the more interactive relationship individuals have with the range of the media at their disposal (Bruns, 2009). Curran *et al.* (2012) observed that in Britain in spite of the potential offered by digital media, there is currently no demand for significant political and cultural change and string evidence for the continuing role of mass media in shaping public understanding (Briant *et al.,* 2011).

Commentators have attempted to associate changes in public concern and growth in scepticism regarding climate change to media attention, and other researchers have examined the complex and dynamic process that media messages influence beliefs (Whitmarsh 2011). Lieserwitz *et al.* (2012) observed that membership of cultural groupings, values and political

ideologies are significant factors in shaping public interpretations of climate change and drive the information that people seek. In rural areas, most of the population depend on agriculture for survival. Aagriculture is the backbone of the country's economy (Chamboko, 2007). Though rural communities already have a better understanding of local climate patterns and are accustomed to dealing with them, an important consequence of climate change is that the future climate will be less familiar, more uncertain and possibly more extreme (World Bank, 2012). Qaisar *et al.* (2022) observed that agricultural informatics, also referred to as e-agriculture, is an emerging field aiming to provide better agricultural services, enhanced technology dissemination, improved communication and information delivery and learning processes, among relevant actors in agriculture through the advances in information and communications technologies (ICTs). The article examines the role played by the media in mainstreaming climate change and how access to climate change news has helped rural communities build resilience and mitigate the impacts of climate change in Zimbabwe.

THEORIES UNDERPINNING THE STUDY

The theory that laid grounding for this study is the climate resilience theory. Resilience is the capacity to regain the original shape or position after bending, stretching, or any other form of deformation (Korber *et al.,* 2017). Rural resilience has become crucial as most of poor families in low-income countries are located in rural areas. Rural resilience is augmented by enhanced network formation of donor agencies and government departments and accepting that change is part of life and avoiding seeing crisis as insurmountable (Van Breda, 2018). It is the capacity of individuals to navigate their way to the social, cultural and physical resources that sustain human well-being and individually and collectively to negotiate for resources to be provided and experienced in culturally meaningful ways (Masten, 2012). Rural resilience is not dependent only on household characteristics, but also external factors such as aid and information dissemination on how to deal with climate change through the media. That is a good risk disaster management system of information dissemination. Resilience is a process that leads to an outcome and the main focus of resilience is on mediating processes. Thus, one could say that an individual, a household or a social system, is resilient because it evidences good outcomes in face of adversity (Chazovachii *et al.,*

2019). The need to build resilience and responsive communities in Zimbabwe pushes the calls for a media that mainstreams climate change dialogues with rural communities as they are the most affected.

LITERATURE REVIEW

This section presents the literature review that guided the construction of the discourse for this article as past studies were used to inform the current study on the pathway and pitfalls involved in the research process, whilst identifying the gaps in literature. The literature was reviewed along the lines of the impacts of climate change and the role of media in climate change.

THE IMPACTS OF CLIMATE CHANGE

Sub-Sahan African countries are dependent mostly on rainfall for their agricultural activities, making them highly vulnerable to climate change through changes in rainfall patterns threatening food security (Calzadilla *et al.,* 2013). Agricultural activities in Sub-Saharan Africa are likely to suffer more compared to Western countries due to the ever-rising temperatures as this region already has high temperatures (Hall *et al.,* 2017). Extreme periods of wet weather have been reported in Zimbabwe, resulting in crop failure and flooding has also been reported to have destroyed crops, livestock and agricultural infrastructure (Muzari *et al.,* 2014). In Zimbabwe, livestock disease prevalence has been attributed to the rising temperatures and drought (Kutyauripo *et al.,* 2021). Lack of enough grazing pastures induced by drought has resulted in low productivity for livestock (Mubaya *et al.,* 2010). The impacts of climate change are heavy rainfall, floods and extreme heat that are moderated by the extent that people and assets are exposed to and vulnerable to these hazards (Kutyauripo *et al.,* 2022).

In low and lower-middle income countries, the impacts are more severe due to weaker revenue capability, lower institutional capacity to upgrade infrastructure and limited capacity to manage emerging risks (Mavhura *et al.,* 2019). Urban areas in Sub-Saharan Africa presently have a population of 472 million and that number is expected to double by 2050. Most of the urban population growth in Sub-Saharan Africa is absorbed by high-density low-income urban settlements, home to more urban dwellers (Kuyaga *et al.,* 2020). These areas are unserved or underserviced, lack secure tenure or property

rights and are dominated by unregulated structures with limited formal physical planning, making them vulnerable to climate change (*ibid.*). The impacts of climate change have been adverse on poor and low-income countries such that there is need for the amplification of the conversation on climate change on all forms of media to help smallholder communities grasp the challenges therein.

MEDIA AND CLIMATE CHANGE

Anderson and Huntington (2017) observed that X (formerly Twitter) is a digital forum where publics seek out and discuss scientific issues as X-oriented research offers opportunities for capturing user knowledge of and views on issues like climate change. Kutyauripo *et al.* (2021) observed that several factors have influenced media coverage of climate change, as climate change news is difficult to report due to uncertainties associated with it and the reaction it might bring to a society as others might feel powerless about the future. Stathers *et al.* (2013) observed that there was no climate change news related to food safety, fisheries and post-harvesting management.

Stathers *et al.* (*ibid.*) argued that climate news is influenced by the fact that at a global scale, there are limited studies on climate change and the entire food system that includes food safety and postharvest management. Climate change news coverage is influenced by policies put in place or donations made towards the implementation of climate change mitigation and adaptation measures (Kutyauripo *et al.,* 2021). Baykoff and Rajan (2007) are of the observation that scientific studies on climate change are reported mostly in terms of possibilities and uncertainties, thus it might be very difficult for a journalist to simplify results from peer-reviewed journals and translate them into comprehensive news that can be understood by the general populace. Agwu and Amu (2015) observed that climate change awareness and rainwater harvesting have the highest news coverage by percentage. This can be attributed to that risks associated with climate change are regarded as news worthy of publishing.

RESEARCH METHODOLOGY

The study utilised the qualitative methodology with a case study research design. Crowe (2011) observed that the case study research design allows in-

depth multifaceted explorations of complex issues in their real-life settings as researchers can deeply immerse themselves in the setting. To craft the discourse forming this study, the researcher engaged purposive sampling to sample the rural people with knowledge on the dissemination of climate news. A total of 15 participants were selected from a population of 150 people who had attended a meeting with Agritex officers in Mudzi District. The study used focus group discussions and semi-structured interviews to gain inside views of the respondents. The study used thematic data analysis to analyse the findings as to answer the research questions of, is climate information available in rural communities, and how knowledgeable are rural people about climate news? The study adhered to ethical considerations with the ethics of confidentiality, respect to privacy and anonymity being observed. The study observed anonymity to protect the identity of the participants through adopting alphabetical letters as names for participants.

FINDINGS

The findings of this study emerged in the form of three themes, i.e. the theme of the availability of climate news, how rural communities learn about climate change, and how knowledgeable rural people about climate change are. These findings were found in the wards in Mudzi District through focus group discussions and semi-structured interviews.

THE AVAILABILITY OF CLIMATE NEWS

In a bid to understand the understanding of rural communities on climate change as it remains the biggest impediment to rural development, the study asked participants if they heard about climate change. The researcher asked the participants if they had heard about climate change and, if so, through what channel. The findings of the study revealed that the news is awash in rural areas as community members showed vast knowledge about climate change. Participants indicated that they heard about it through different channels in rural communities. Participant C indicated that the news is available in the communities through radio channels. Participant C said:

> We have heard about climate change from the radio. National FM [radio] taught us that there is climate change and that it has been affecting our communities in so many ways than one as we notice that the signs that they indicate such as the unavailability of ground water and the crop failure are worsening.

These findings showed that climate change news is awash as it is accessed through national radio channels and this indicates that there is large coverage of climate change news in Zimbabwe. Most people with access to radio can access climate change news as the participants revealed that radio channels have programmes on climate change to share adaptation strategies with communities. The study revealed that news about climate change is awash in rural communities, with most of the rural communities having heard of climate change through Agritex Officers in rural districts and wards. Participant A said:

> We have heard about climate change from the Agritex Officers in our wards as they try [to] educate us about the impacts that climate change is having on our livelihoods and how we can adapt to these impacts. Agritex Officers have been sharing news and knowledge about climate change in our communities with some of us now aware of the deadly effects of climate change on the crops as it is leading to pests' invasion of our crops.

The findings have revealed that Agritex Officers are disseminating the news about climate change in rural communities to educate farmers about the impacts of climate change and the reasons behind crop failures and the invasion of crops by pests and diseases. The findings revealed that the Agritex Officers are sharing the news about climate change with communities to craft livelihoods diversification as most rural communities now look to other livelihoods other than agriculture. The findings revealed that climate information is also disseminated through non-governmental organisations (NGOs) in rural communities. Participant B said:

> We have heard about climate change from NGOs like World Vision that have come to help us cope with the impacts of climate change through the initiation of projects such as gardening and borehole drilling. They have educated us about what has driven groundwater further downwards.

These findings have revealed that NGOs play a pivotal role in the dissemination of climate change information and that the news is awash through communities in rural Zimbabwe as the problems of climate change continue to push rural communities towards change of normal livelihoods. Through crafting new livelihoods for rural communities, NGOs are teaching and spreading news about climate change. The findings of the study revealed that the information is coming to rural communities from schools, as children are taught about climate change, they educate their parents about the issues

around it. Participant E said: “We hear climate change news from these children from school as they learn from school they talk about it here at our homes.”

The findings of this study revealed that climate change news is awash across rural communities as most of the people in rural communities are aware of it through various ways and communication channels.

THE LEVEL OF KNOWLEDGE THAT RURAL PEOPLE HAVE ABOUT CLIMATE CHANGE

The study aim was to understand how well spread climate change news is to understand how rural development can be spearheaded amid the vagaries of climate change. At this juncture, the knowledgeability of rural communities becomes important as it gives an understanding of how useful the climate change news has been to the rural communities. Participant F revealed that:

> I have knowledge about climate change as I have noticed a change in the rainfall patterns as we used to start the farming season as early as October and the rains would go for months raining, but now, the rain is just for two months or three with less intensity. I have come to understand climate change a bit well as it is all facets of life from agriculture to livelihoods.

The study has revealed that people have knowledge about climate change through rainfall variability and the failure of agriculture and other rural livelihoods, revealing that climate change news is awash in rural areas, and it has given people knowledge and context to build an understanding of climate change. The study indicated that some of the participants had knowledge about climate change through lack of survival of certain animal species in the forests. Participant G said:

> “I have come to understand and have knowledge about climate change through the lack of survival of certain animals as they are failing to survive the dry climatic conditions that are characterised by the lack of water and long dry spells.”

The study revealed that people in the rural communities have knowledge about climate change through the extinction of certain wildlife as the prolonged dry spells have become the main characteristic of communities in Zimbabwe and beyond. The study revealed that some other participants’

knowledge of climate change is based on the disappearance of ground water in rural areas. Participant E said:

> "My knowledge of climate change has been based on the disappearance of groundwater as the existing boreholes and wells can no longer have water. The current boreholes have dried up, even the wells, as the hot temperatures continue to dominate than the wet seasons and that's how we have come to know climate change."

The study findings revealed that rural communitie's knowledge about climate change is from dissemination of information through various channels and these communities understanding of the changes in the rainfall variability, the extinction of certain animals and the dwindling of groundwater in Zimbabwe.

DISCUSSION

The study on the news about climate change in rural Zimbabwe revealed that in Zimbabwe, the news is awash as most of the educational media are disseminating information about climate change to make communities understand the scope of the impacts of climate change and shift the focus of communities from viewing climate change as a spiritually induced phenomenon. The study revealed that climate change news in rural Zimbabwe is spread across communities through national radio stations mainstreaming climate change news and programmes to communities to enhance preparedness and resilience building through adaptation strategies. *NewsDay* (2020) is in line with the findings of the study by observing that radio broadcasting provides a great deal of information on how to approach and deal with climate change issues and conditions in Zimbabwe. Similar to the findings of the study is Perez-Teran (2015) who observed that in the Congo, radio has been used to disseminate information about climate change, showing that climate change news is awash in rural communities. The findings of the study revealed that NGOs are playing a pivotal role in the dissemination of climate change news in rural areas as the vagaries of climate change continue to ravage rural communities with livelihoods washed away.

The NGOs are teaching communities about climate change as they prepare communities for climate change adaptation and resilience building through teaching poor communities on the impacts of climate change. Similar to these findings is Morahanye (2020) who observed that school-based knowledge

dissemination on climate change is very minimal. However, NGOs have spearheaded the climate change information dissemination, teaching communities on mitigation and adaptation to climate change. Consistent with the finding of the study are William *et al.* (2015) who observed that the NGOs have the ability to generate and use knowledge to build adaptive capacity for rural communities, inspiring robustness. In concurrence with the study is Harvey (2019) who observed that specific roles of the NGOs in climate change service delivery include knowledge brokering, teaching communities on climate change, the impacts of climate change and the adaptation process to climate change. The study revealed that Agritex Officers in rural communities are spreading the news about climate change as they teach communities climate change and causes of climate change so that the communities can deviate from the belief that climate change is due to spiritual causes. Consistent with these findings is the theoretical framework, the resilience theory, as Koeber *et al.* (2017) observed that resilience is the ability to restore the capacity of households to the pre-destruction period and the Agritex Officers are teaching rural communities climate change to build their resilience through adaptation processes such as small grain farming to restore food security. In support of the findings is Ella (2013) who observed that the role of extension officers in the dissemination of climate information is crucial for resilience and adaptation building in rural communities. Chazovachii (2020) is consistent with the findings as he observed that extension officers are crucial in the dissemination of climate smart agriculture in the rural areas to cope with the impacts of climate change. Grey (2019) is concurrent with the findings of the study as the study observed that Agritex Officers disseminate information on weather forecasts to rural communities. The study revealed that tese officers are teaching rural communities climate change and adaptation methods to climate change. The study indicated that schools are teaching climate change in the rural communities and as the children learn, they share the information with their parent, proving that climate change news is awash in Zimbabwean communities. Consistent with this is the Ministry of Primary and Secondary Education (2020) that observed that taking lessons from the cholera outbreak that cost over 4 000 lives in Zimbabwe, it is believed that children are suitable change agents needed in the area of climate change as theycan promote information dissemination and resilience building through spreading information they learn from school across communities.

The study revealed that rural people have information on climate change and their knowledge base has expanded such that the information has led them to observe rainfall variability, the disappearance of groundwater and extinction of certain wild animals that require water and good climatic conditions.

CONCLUSION AND RECOMMENDATIONS

The study concludes that climate information is awash in Zimbabwean communities as most of the media and stakeholders are pushing for the spreading of climate information. It has been concluded that the knowledge on climate change is triggering rural communities into action towards resilience building and adaptation strategies in the rural areas of Zimbabwe. The study concludes that information dissemination in the school-based model is lagging as the impact of school-based information was observed to be minimal across communities. The study concludes that climate news is awash across the Zimbabwean rural communities as most rural communities are now diversifying their livelihoods because of the new understanding of climate change beyond the scope of spirituality triggering a change in the livelihoods. The study recommends equipping of extension officers with viable transport empowering them to spread climate information to remote areas to ensure rural development, as rural areas remain in danger from climate change and poverty. The study observed the need for a broad information dissemination model that can mainstream climate change impacts and adaptation methods to rural farmers. There is need for the development of non-agricultural rural communities in developing countries as climate change is increasing, leaving rural communities vulnerable. Further studies should look into the accuracy of the information dissemination media in the rural communities of Zimbabwe.

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Smallholder Maize Production, Input Investment, Productivity and Profitability in Ward 1, Chikomba District, Zimbabwe

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Abstract

Most of smallholders in Zimbabwe under the leasehold tenure system are beneficiaries of the Fast-Track Land Reform Programme (FTLRP) of 2000. It is generally argued that the leasehold tenure system has unprecedented impact on agricultural production as farmers fail to secure bank loans using leased land as collateral security. This article is premised on a study whose main objective was to determine the impact of leasehold land tenure system on productivity sby mallholder maize farmers. The study was carried out in Ward 1 of Chikomba District in Mashonaland East Province. Descriptive research design and primary data gathered from the randomly selected 87 farmers out of the 673 farmers, using a structured questionnaire, were used for this study. The data gathered was comprehensively analysed using both correlation analysis and regression analysis to achieve the study objectives. The results revealed that the leasehold tenure system limits farmers' access to credit, meaning, therefore, that the leasehold tenure has a negative impact on input investment, maize production and profitability by the smallholder farmers in Chikomba District. The study concludes that the leasehold tenure system has a negative impact on input investment, production of smallholder maize farmers as it discouraged farmers' access to credit, a key factor that determines farmers' input investment and production. The study recommends the Government of Zimbabwe to change the tenure system on smallholder farmers to a more favourable system to improve smallholder farmer input investment, productivity and profitability.

Keywords: *land tenure; smallholder farmers; leasehold tenure; tenure security*

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INTRODUCTION

Most developing countries, including those in sub-Saharan Africa, have ignored the central role played by land ownership in any economy (Tatsvarei *et al.*, 2018). Many governments thrive when they give farmers complete land ownership rights under the freehold land tenure systems (Zikhali, 2008). This is because farmers will have access to any form of financial assistance using the land as collateral, thereby increasing productivity. The improved agricultural productivity before the FTLRP was evidence why Zimbabwe was recognised as the breadbasket of the Southern African Development Community (SADC) region (Rukuni *et al.*, 2006). In a bid to avoid some colonial economic systems, Zimbabwe partially abandoned the freehold land ownership system, commonly used by the white minority and mostly adopted the leasehold tenure system (Rukuni *et al.*, 2006; Zikhali, 2008). The leasehold tenure system was supported by Statutory Instrument 12(1) of the Land Acquisition Act, 1992, that empowered most smallholder farmers as a reward for a well-fought liberation struggle (Rukuni *et al.*, 2006). Although the leasehold tenure system empowered smallholder indigenous people, the whole process did not bear the intended fruits as this had a negative effect on financial assistance becaause farmers were left with no collateral to secure loans for farm investment and boosting of the agricultural sector (Paradzayi, 2007; Basera, 2015).

The leasehold tenure system led to reduced farm input investment, productivity and agricultural profitability, especially on maize. This has been evidenced by the agricultural sector contraction magnitude of 30% as the sector was now dominated by smallholder farmers with limited capital (Richardson, 2004). The World Bank (2020) reported that Zimbabwe imported an average of 800 000 tonnes of maize per year to supplement its food reserves despite having many smallholder farmers who always got support from the government in the form of agricultural inputs, among other things. The depleted foreign currency reserves can be attributed to the decrease in productivity of the staple food in Zimbabwe (Ncube, 2021). It is against this background that the study aims to analyse the impact that the leasehold land tenure system has had on agricultural input investment, maize production and profitability in Zimbabwe.

LITERATURE REVIEW

Several studies before this study were conducted to determine the impact of various land tenure systems around the world, and such analyses are determinants of the country and the tools used in the study. For example, Akram *et al.* (2019) investigated agricultural investment differences in terms of soil conservation and wheat productivity of rural households in Punjab, Pakistan. They used cross-sectional data from rural household farmers and applied a multivariate Tobit regression model to determine the farmers' investment preferences and tenancy status. The findings show that farmers with leasehold tenure systems invest more in their soil and have higher productivity than farmers with other tenure statuses and enough evidence that farmers' secure lands rights such as long-term leases, were more productive compared to those with insecure lease forms. This was attributed to the fact that they had greater access to credit by using land as collateral.

Dlamini *et al.* (2011) discovered that food production in Swaziland follows a dualistic model of land tenure, namely the traditional tenure system (TCT) and the title tenure system (TDT). Using data collected from 63 farmers from both TCT and TDT using the desired sampling method, the researchers aimed to empirically determine whether land ownership, as an institution, contributes to the observed differences in maize productivity among Swazi farmers. Data from the Manzini region of Swaziland were collected in 2008 and analysed using descriptive and recursive regression models. The findings revealed that the size of land holdings and maize yields differed between TDT and TCT farming households. Tenure security was found to influence land improvements through credit access and use, whereas education level influenced credit use. The amount of capital used had a positive impact on maize productivity, whereas TCT farmers were limited by finance and land availability. As argued in the findings, farmers in the TDT system were highly mechanised, whereas farmers in the TCT system primarily used livestock to cultivate their land.

As argued by the Economic Commission for Africa (ECA) (2004), land is critical in promoting rural livelihoods in Africa because access to land and security of tenure is the primary means of achieving food security and sustainable development. Until recently, the dominant view in Africa was that

land titling programmes would increase the security of tenure and encourage agricultural investment, resulting in increased growth and development. However, the programmes failed to develop the smallholder agriculture sector because investment expectations were not met.

Nothale (1979) conducted a study in Malawi to determine the effect of the leasehold tenure system on crop profitability and compare it to other tenure systems because Malawi's tenure arrangements provide a diverse range of opportunities for agricultural output and development. Individuals who have complete access to their land and are free to do whatever they want, are more likely to be profitable, as argued in the findings. Again, it appeared that smallholder farmers under lease tenure were unable to increase agricultural productivity prior to the implementation of development projects due to the costs associated with increased inputs and the cost of leasing, hampering the return per unit of land.

Teshome (2014) describes that land in the highlands of Ethiopia is a scarce resource. Sustainable use is affected by both physical and institutional factors. This researcher aimed at investigating farmers' perceptions of tenure systems and their influences on sustainable land management in the Ethiopian North Western highlands. The study used a detailed survey of households and plots in three watersheds using simple descriptive statistics to analyse the perceptions of farmers about land-related factors and profitability based on the leasehold tenure system. A multidimensional probit model was used to analyse a group of SLM practices, considering land-related variables. Results show that the average household in this study managed 4.54 parcels of land in different locations, with an average parcel size of 0.26 hectares. The MVP model analysis indicates that farmers were investing in a combination of practices at the parcel level, considering the substitution and complementarily effects of the practices. The study also found that tenure arrangements influence farmers' investments in sustainable land management practices, leading to increased profitability.

THEORETICAL FRAMEWORK

The research applied an economic perspective from the Evolution Theory of Private Property Rights developed by Neoclassical Economists in the 1970s.

Property rights are social institutions which specify or limit the range of privileges granted to individuals on specific resources such as land and water (Bruce *et al.*, 1993). When it comes to land ownership, these property rights are referred to as land tenure systems.

The Neoclassical Economist's point of view emphasizes the importance of property rights in influencing resource allocation decisions, thereby influencing the nation's economic behaviour and performance (Feder and Fenny, 1991). This is also supported by Bruce *et al.* (*ibid.*) who believed that tenure security, in that an individual has full right to a piece of land on an ongoing basis and without interference, motivates one to invest in and improve the land. In the same vein, Deininger *et al.* (2006) contend that both land transferability and tenure security have an impact on investment.

As argued in Rukuni (2000) and Bruce *et al.* (1993), land ownership security is critical, influencing perceptions of a return on labour and capital investment in smallholder farming. In the case of insecure tenure or land ownership, the system reduces investment in agricultural farming activities, reducing potential production and landholders' profits. This idea is supported by Rukuni (2000) who claims that smallholder farmers' inability to obtain loans because they cannot use the land as collateral, prevents them from investing in seeds, fertilisers, chemicals, and other inputs. The end results of the tenure system are then noted in this study on poor economic performance and resource utilisation by smallholder farmers under the leasehold land tenure system.

RESEARCH METHODOLOGY

The research was carried out in the Chikomba District, Mashonaland East Province. With an area of 6 503 km^2 and an estimated population of 120 986 people, Chikomba District includes all tenure systems, including communal, resettlement, leasehold, state land and freehold tenure. The district is located in Agroecological Region III, with an annual rainfall range of 650mm to 800mm. It is dominated by livestock and crop production, both intensive and extensive. Cereal crops (such as maize, sorghum, and finger millet), legumes (such as common beans, sweet potatoes, Irish potatoes, round nuts and groundnuts), horticulture crops (such as vegetable and water melons), and tobacco, are all grown in this area. Maize is the most common cash and cereal

crop grown in Chikomba District across all tenure systems. Cattle, goats, sheep, donkeys and chickens are the main livestock and major sources of income in both large- and small-scale livestock productions.

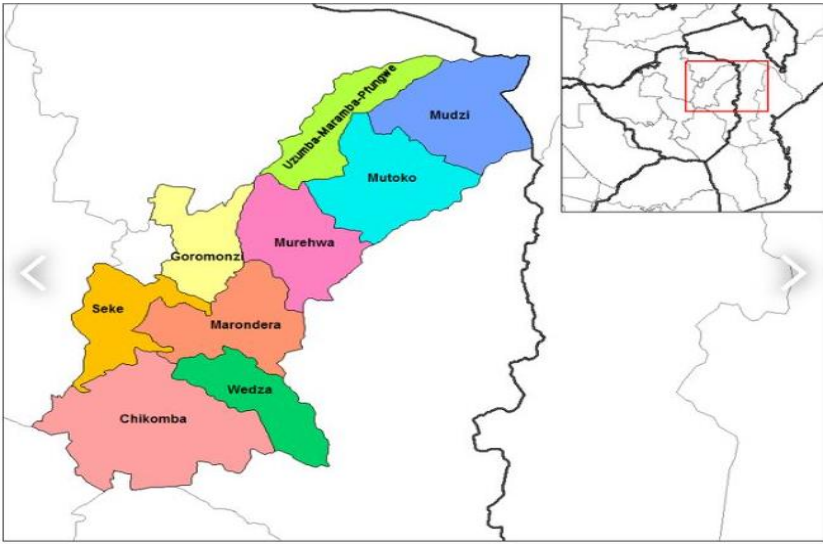

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Figure 1: *Mashonaland East Map* (Google Maps, 2021).

AREA SAMPLING AND RESPONDENT SAMPLING

Purposive sampling was used to select the study site resulting in the selection of only one ward (Ward 1) out of the 52 wards in the Chikomba District. The area was chosen on purpose because it is densely populated by smallholder farmers with leasehold tenure. To ensure that both A1 and A2 farmers participated in the study, stratified sampling was used to divide farmers into groups based on the size of their farmlands. This ensured that the study was not skewed by the size of land used by the farmer, given that farmers have different productivity and profitability. Respondents were randomly drawn from each stratum. To avoid bias and ensure that each unit of the strata has an equal chance of being selected in the study, random sampling was then employedusing the leasehold register obtained from the local Agritex officer.

SOURCES OF DATA

Primary and secondary data sources were used. Primary data was collected using structured questionnaires from the randomly sampled 87 smallholder maize farmers out of 673 under leasehold tenure between August and September 2021. Information on input investment, maize production and maize earnings was obtained from a primary data source. SPSS v.22 was used to compile and analyse the data.

DATA ANALYSIS TECHNIQUES

Both descriptive and econometric analysis approaches were used in the study. The influence of the leasehold tenure system on input investment, production and profitability in smallholder maize production was evaluated using the statistical t-test. Because the impacts of other factors on the models were not captured by the student t-test, econometric models were used to analyse the impact of leasehold tenure on investment, maize output and profitability.

RESEARCH TECHNIQUES

The influence of the leasehold tenure system on smallholder maize farmers' input investment was assessed using a multiple regression model adapted from Dube *et al.* (2013). The following equations were used to treat input investment and tenure as an optimising function in the model.

$$\mathbf{C} = \mathbf{f}(\mathbf{X}, \mathbf{TS}) \quad (1)$$

$$\boldsymbol{L} = \boldsymbol{f}(\boldsymbol{X}, \boldsymbol{TS}, \boldsymbol{C}) \quad (2)$$

$$\boldsymbol{I} = \boldsymbol{f}(\boldsymbol{X}, \boldsymbol{L}, \boldsymbol{C}) \quad (3)$$

$$\boldsymbol{Y} = (\boldsymbol{X}, \boldsymbol{L}, \boldsymbol{I}) \quad (4)$$

The endogenous variables *C, L, I* and *Y* denote credit, land improvements, variable inputs, and yield, respectively. The *TS* stands for exogenous tenure security, and the *X* stands for exogenous features of smallholder farmers. Tenure security has also been tweaked to better reflect the tenure system (either leasehold or other tenure systems). The model's tenure system has an indirect influence on smallholder production (Dube *et al.* 2013). Place *et al.* (1993) formulated the following equations:

$$\boldsymbol{L} = \boldsymbol{f}(\boldsymbol{x}, \boldsymbol{TS}, [\boldsymbol{sub}\ \mathbf{1}]) \quad (5)$$

$$\boldsymbol{I} = \boldsymbol{f}(\boldsymbol{X}, [\boldsymbol{sub}\ \mathbf{2}], \boldsymbol{C}) \quad (6)$$

$$\boldsymbol{Y} = (\boldsymbol{X}, \boldsymbol{L}, [\boldsymbol{sub}\ \mathbf{3}]) \quad (7)$$

where *L* stands for maize production land, *I* for commercial inputs (seeds, fertilisers, herbicides, pesticides) and *Y* for yield. *Y* is the continuous endogenous variable, *TS* are exogenous explanatory variables and the *X*s are exogenous explanatory variables included in each equation. The survey data was used to build a multiple regression model to evaluate the effects of tenure on input investment.

$$\boldsymbol{I_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \varepsilon}$$

where $\boldsymbol{\beta_{0-10}}$ are parameters to be estimated, X_{1-n} represents a set of explanatory variables that are family size, the labour size used per plot, the experience of the farmer, access to credit, land holding, the land size used for maize production, access to extension training, education level attained by a farmer, amount of fertilisers used, maize seed quantity used and, the herbicides and pesticides. I_i is the total input investment level. The student t-test was used to assess the statistical significance of the hypothesis at 5% of significance.

IMPACT OF THE LEASEHOLD TENURE ON MAIZE PRODUCTION BY SMALLHOLDER FARMERS

To test for maize yields differential under the leasehold tenure and other tenure systems (communal and freehold), the research adopts an econometric production function adapted from Zikhali (2008) asshown:

$$\boldsymbol{YIELDS_i = f(TS_i X_i)} \quad (8)$$

where *yields* is the total quantity of maize produced from each plot holder under the leasehold tenure systems, *TS* represents the dummy variable which is the tenure system and *X* is a vector representing smallholder farmer characteristics. The vector of characteristics includes the family size, labour size used per plot, the experience of the farmer, access to credit, land holding, land size used for maize production, access to extension training, education level attained by a farmer, amount of fertilisers used, maize seed quantity used and, herbicides and pesticides.

The following equation summarises the situation:

$$\boldsymbol{Maize_i = f(TS_i X_i) = Y = (X, L, [sub\ 3])} \quad (9)$$

where *TS* is an exogenous factor influencing maize production in an indirect way through credit, input use and land improvement by smallholder farmers. The research assumes the maize production function is represented by a simple linear regression model that can be simplified as follows;

$$\boldsymbol{M_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \varepsilon} \quad (10)$$

where $\boldsymbol{\beta_{0-12}}$ are parameters to be estimated and $\boldsymbol{\varepsilon}$ is the random, normally distributed, independent error term, with zero mean and constant variance. The student t-test was used to assess the statistical significance of the hypothesis at 5% level of significance.

THE EFFECT OF LEASEHOLD TENURE ON THE PROFITABILITY OF SMALLHOLDER MAIZE FARMERS

To assess the profitability hypothesis of smallholder maize production under the leasehold tenure system in the Chikomba District, the research adopted the gross margin analysis from a study by Katema *et al.* (2017). GM was obtained as shown below

$$\boldsymbol{GM = TR - TVC} \quad (11)$$

where *GM* is the maize gross margin, *TR* is the total revenue from maize of all the farmers and *TVC* is the total variable cost of maize production for all the farmers. If the gross margin value is positive, then it means smallholder maize production under the leasehold tenure is profitable. The study adopted the benefit-cost ratio from a study by Basera, (2015) to measure the profitability of smallholder maize production under the leasehold tenure system. The formula is shown below:

$$\boldsymbol{BCR} = \frac{\sum_{t=0}^{T} \frac{B_t}{(1+r)^t}}{\sum_{t=0}^{T} \frac{C_t}{(1+r)^t}} \quad (12)$$

where $\boldsymbol{B_t}$ is the measure of the benefit value of producing maize for the smallholder farmers at time *t*, $\boldsymbol{C_t}$is the measure of costs of producing maize for the smallholder farmers at time *t*. In this research, all the maize produced was recognised as the benefits and the cost are production costs associated with producing the same quantity of maize, discounted at a 10% interest rate. If the *BCR* is greater than 1, then smallholder maize production under the leasehold

tenure system is profitable, and if it is less than 1, it means smallholder maize production is non-profitable. The student t-test was used to assess the statistical significance of the hypothesis at 5% level of significance.

RESULTS

The first objective of the study considered determining the effect of the leasehold tenure system on input investment. The researcher first performed a point-bisection correlation analysis as the dependent one of the variables, the tenure system was dichotomous. The results of Pearson's Point-Bisection Correlation of 0.234 between the Tenure System and Input Investment are associated with a p-value of 0.003. These findings show that there is a statistically significant ($p<0.05$) correlation between Tenure System and Input Investment. Given these results, it is evident that there exists some positive correlation between the two variables. Multiple regression was used to determine the effect of the leasehold tenure system on input investment based on the data obtained from A1 and A2 farmers in Ward 1, Chikomba District.

Table 1: *Multiple Regression Model Coefficients*

Model		Unstandardised Coefficients		Standardised Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	28.093	39.689		.708	.481		
	Gender	30.424	16.126	.122	1.887	.063	.783	1.277
	Education	15.462	10.863	.086	1.423	.159	.911	1.098
	Labour	7.299	5.229	.097	1.396	.167	.679	1.473
	Experience	-.274	.545	-.034	-.503	.616	.733	1.364
	Family Size	-2.520	2.243	-.085	-1.124	.265	.581	1.721
	Land Used	2.280	2.094	.071	1.089	.280	.769	1.301
	Land Holding	1.479	.642	.163	2.303	.024**	.658	1.520
	Access to extension input	-12.520	14.963	-.052	-.837	.406	.849	1.179
	Extension Training	72.704	16.754	.311	4.339	.000*	.642	1.558
	Other Sources of Income	-11.296	15.758	-.050	-.717	.476	.680	1.472
	Access to Credit	175.884	16.552	.688	10.626	.000*	.787	1.271
	Draft Power	53.896	27.800	.135	1.939	.057	.679	1.474

Key, *, ** denotes 1%, 5% level of significance respectively

Collectively, the regression model is a good fit for the data (F=19.591, p=0.000). Thus, the characteristics of the leasehold tenure system are statistically significant in determining input investment. R-Square of 0.776 shows that 77.6% of the variation in input investment is explained by the model's independent variables representing the leasehold tenure system. The 175.884 coefficient for access to credit implies that when all other variables are held constant, an increase in access to credit by a unit leads to an increase in input investment per hectare by about 176 units. Credit has a significant impact on input investment as indicated by a significant t-statistic (t=10.626, p=0.000) at 5% level of significance. This implies that credit was an important factor required to improve smallholder farmers' input investment under the leasehold tenure system. In addition, it also means that farmers with access to credit had high input investment under the leasehold tenure system.

Secondly, extension training was also significantly impacting maize input investment as indicated by significant t-statistic (t=4.339, p=0.000). The positive coefficient of 72.704 shows that increasing farmer training in maize production leads to an increase in input investment per hectare. This also implies that more extension training should be availed to all smallholder farmers under the leasehold tenure system to increase maize input investments. It also means farmers who had greater access to extension training had higher input investment levels. Lastly, land holding size also appeared to have a statistically significant effect on input investment (t=2.303, p=0.024). Looking at the coefficients, holding all other variables constant, increasing the land holding size of the smallholder farmers by one unit will force input investment to also increase by 1.479 units.

Overall, it is evident from the study results that the tenure system has a positive effect on the input investment of smallholder farmers under the leasehold tenure system. Three variables proved to have a positive impact on input investment, and these are credit, extension training and land holding. However, given that the leasehold tenure system discourages farmers from accessing loans from banks, it thus evident that the leasehold tenure system has a negative impact on input investment as results proved that an increase in credit assistance will increase input investment and decreases input

investment when credit access is limited (a characteristic of a leasehold tenure).

RESULTS ON THE EFFECTS OF LEASEHOLD LAND TENURE SYSTEM ON MAIZE PRODUCTION

Another objective of the study sought to determine the effect of the leasehold tenure system on maize production. The researcher again performed a point-bisection correlation analysis as one of the variables, the tenure system was dichotomous. The results of Pearson's Point-Bisection Correlation of 0.369 between the Tenure System and maize production are associated with a p-value of 0.000. These findings show that there is a statistically significant ($p<0.05$) correlation between Tenure System and maize production. Given these results, it is evident that there exists some positive correlation between the two variables. Multiple regression was used to determine the effect of the leasehold tenure system on maize production based on the data obtained from A1 and A2 farmers in ward 1, Chikomba District.

Table 1: *Multiple Regression Model Coefficients*

Model		Unstandardised Coefficients		Standardised Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.729	.375		1.945	.056		
	Gender	.033	.152	.018	.217	.829	.783	1.277
	Education	.146	.103	.112	1.420	.160	.911	1.098
	Labour	.037	.049	.068	.749	.456	.679	1.473
	Experience	-.001	.005	-.012	-.137	.891	.733	1.364
	Family Size	.019	.021	.087	.877	.384	.581	1.721
	Land Used	.037	.020	-.161	2.870	.017**	.769	1.301
	Land Holding	.009	.006	.144	1.557	.124	.658	1.520
	Access to extension input	.020	.141	.012	.145	.885	.849	1.179
	Extension Training	.365	.158	.217	2.306	.024**	.642	1.558
	Other Sources of Income	.297	.149	.182	1.997	.049**	.680	1.472
	Access to Credit	.793	.156	.430	5.072	.000*	.787	1.271
	Draft Power	.729	.263	.254	1.777	.607	.679	1.474

a. Dependent Variable: Maize Production

Results revealed that the variables included in the model have a collective significance effect (F=9.040, p=0.000). This means that the independent variables are jointly statistically significant in determining maize production. This is supported by an R-Square statistic of 0.615 The R-Square confirmed that 61.5% of the variation in maize production is explained by the model's independent variables representing the leasehold tenure system.

Table 2 results show that four variables; that is, access to credit (t=5.072, p=0.000), extension training (t=2.306, p=0.024), other sources of income (t=1.997, p=0.049), and land used (t=2.870, p=0.017), were statistically significant in explaining the variation in smallholder maize production under the leasehold tenure system. From the findings of the study shown in Table 4.12, the 0.793 coefficient for credit implies that when all other variables are held constant, an increase in access to credit by a unit leads to an increase in maize production per hectare by about 0.793 tonnes, implying a positive effect of credit on maize production.

Secondly, all other variables being constant when farmer extension training increases, maize production per hectare would also increase by 0.365 tonnes. This again implies that more extension training should be availed to all smallholder farmers under the leasehold tenure system to increase maize production given that farmers who had greater access to extension training had higher maize production levels. Moreover, land used also appeared to have a statistically significant effect on maize production, withholding all other variables constant, increasing land used by farmers by one unit would force maize production to rise by 0.037 tonnes. This was due to the fact that land size used for maize production was an important parameter for the production. With an increase in land size used for maize production, farmers could attain higher production levels. This also implies that farmers who used large land sizes had high production levels compared to those who used small land sizes. Lastly, when the farmer increases other sources of finance, maize production will boost by making a subsequent increase in tonnage by 0.297 units.

Overall, it is evident from the study results that the tenure system has a positive effect on maize production by smallholder farmers under the leasehold tenure system. Out of the four variables that have a significant impact on maize production, access to credit had the most significant effect (B=0.793, p=0.000). Given that the leasehold tenure system limits the farmers' access to credit; it therefore, means that the leasehold tenure has a

negative impact on maize production by the smallholder farmers in Chikomba District.

Results on the Impact of Leasehold Land Tenure System on Profitability

The last objective of the research was pivoted towards determining the impact of the leasehold tenure system on profitability. To determine the impact of the leasehold tenure system on profitability by smallholder maize farmers, the researcher adopted the gross margin (GM) analysis that was calculated as shown in Table 3 below.

Table 3: *Gross Margin per hectare for Smallholder Maize Farmers (N=81)*

GM/ha	Minimum	Mean	Maximum
Before leasehold	-USD$233.00	US$292.09	US$1310.75
Under leasehold	-US$350.00	US$250.40	US$657.50
Method	Df	Value	Probability
T-test	80	0.7926	0.4319

Results show that both smallholder maize productions under leasehold and before leasehold were profitable with positive average GMs per hectare of $250.40 and $292.09, respectively. The results show that there was an insignificant difference in profits obtained before leasehold tenure and under the leasehold tenure system as indicated by the p-value of 0.4319 and t-value of 0.7926 at 5% level of significance. These results imply that smallholder maize production under leasehold made comparably lower profits than before the tenure was introduced. This was also assessed by BCR shown in Table 4 below.

Table 4: *Benefit Cost Ratio (BCR) of Small Holder Maize Production*

BCR	**Minimum**	**Mean**	**Maximum**
Before leasehold	-1.09	0.39	4.0
Under leasehold	-0.36	0.16	1.37
Method	**DF**	**Value**	**Probability**
T-test	80	1.862	0.056

The results in Table 4 reveal that smallholder maize production was not profitable under both tenure forms and tenure systems as indicated by the mean BCRs of less than 1. Both t-value (t=1.862) and p-value (p=0.056) at 5% level of significance shows insignificant differences in profits obtained in smallholder maize production before leasehold and under leasehold, though the period under leasehold tenure system shows lower profits, suggesting that the leasehold tenure system has a negative impact on profitability as most farmers incur losses under the said tenure.

Therefore, these results imply that smallholder maize farmers in Zimbabwe need to adopt cost-effective ways of maize farming and commercial farming skills to cut costs that enable them to earn profits. This also means reducing the fixed cost associated with land licensing and variable costs such as fertilisers, seeds and pesticides, could boost smallholder maize production and profitability position in a positive way.

DISCUSSION

The study results proved that credit, land holding and extension training were significantly affecting smallholder farmers' maize input investment. This is contrary to research findings by Dube *et al.* (2013) who did similar research on land tenure security and farm investments amongst small-scale commercial farmers in Zimbabwe. Their results indicated that the level of input investment was not significantly affected by credit, extension training, and landholding by farmers among other factors. This study research also shows that input investment was significantly explained by the explanatory variables of the study that is contrary to the findings of Dube *et al.* (*ibid.*), where the model results confirmed the statistical insignificance of the explanatory variables.

On the second objective of this study, the research results proved that land used, extension training, other sources of income and access to credit, were statistically significant in affecting the maize output of smallholder farmers per hectare. This was contrary to the findings of Dube *et al.* (*ibid.*) where both long and medium investment were insignificantly impacting on yields and it was noted that the farm size of land and education had positive significant impacts on the level of yields. This study confirmed that leasehold had negative impact on maize production as indicated by the negative coefficients.

Similar results were reported by Tatsvarei *et al.* (2019) who noted a decrease on production in their studies as farmers were under the leasehold tenure system. The negative change in maize production under the leasehold tenure is attributed to failure by smallholder farmers to maximise their land use, because of lack of adequate funding, agricultural input shortages and limited commercial farming skills, and failure to access financial assistance due to fact that land could not be used as collateral (Mutondi, 2011).

Profitability assessment shows insignificant change under the leasehold tenure system. This was not supportive of the fact that farmers were farming on good fertile soils with good climatic conditions for maize production and had increased land used for maize production, unlike before leasehold. In addition, despite the government prioritising farmers under the leasehold in input provision for maize, unlike before leasehold tenure, farmers remain unprofitable, negatively impacting profitability. Again, when profitability was assessed using BCR, smallholder maize production for both before leasehold and under leasehold, were not profitable, with the leasehold tenure system giving lower values. Similar results were reported by Basera (2015) who posits that maize production by smallholder farmers is not profitable under the leasehold tenure. This is attributed to the fact that the leasehold tenure system is associated with high expenditure under total fixed costs for land taxes and no access to credits by the farmers.

CONCLUSION AND RECOMMENDATIONS

The first objective of the study determined the effect of the leasehold tenure system on input investment. The regression model results show that access to credit, extension training and landholding were statistically significant ($p<0.05$) in explaining the variation in input investment on smallholder maize production under the leasehold tenure system. Credit proved to be the leading factor determining input investment, coinciding with the fact that the leasehold tenure system has limited access to credit from financial institutions as they do not have the required collateral security to offer banks. Overall, this proved that the leasehold tenure system has a negative impact on input investment of smallholder maize farmers.

The second objective of the study sought to determine the effect of the same tenure system, the leasehold, on maize production. A point-bisection correlation analysis results point out that a change in the tenure system from the leasehold system to any other system, will increase maize production, while the production will drop if the tenure system changes back to be leasehold. The results of multiple regression analysis revealed that access to credit (t=5.072, p=0.000), extension training (t=2.306, p=0.024), other sources of income (t=1.997, p=0.049), and land used (t=2.870, p=0.017), were statistically significant in determining maize production. Access to credit appeared to be the most significant variable determining maize production. This variable is associated with a beta value of 0.793, implying that when all other variables are held constant, an increase in access to credit by a unit leads to an increase in maize production per hectare by about 0.793 tonnes, while if the access to credit drops or is zero (as in most leasehold tenure systems), maize production will also drop significantly. This, therefore, again suggests that the leasehold tenure system has a negative effect on maize production.

The last objective of the research aimed to determine the impact of the leasehold tenure system on profitability. The GM analysis results from this analysis show that smallholder maize production both under leasehold and before leasehold, was profitable with positive average GMs per hectare of $250.40 and $292.09, respectively. However, these results show that there was an insignificant difference (t=0.7926, p=0.4319) in profits obtained before leasehold tenure and under the leasehold tenure system. These results imply that smallholder maize production under leasehold made comparably lower profits than before the tenure was introduced, suggesting that the leasehold tenure system impacted negatively on profitability. On the contrary, the benefit-cost ratios of smallholder maize production before leasehold and under leasehold tenure show that smallholder maize production was not profitable under both tenure systems as indicated by the mean BCRs of less than 1, though the BCR under the leasehold tenure system was lower than that for the period before it was adopted. As a result, these results greatly support the fact that the leasehold tenure system has a negative impact on profitability. Given that the research findings indicate that the leasehold tenure system has a statistically significant negative effect on input investment, maize production and profitability, the study, therefore, recommends the Government of

Zimbabwe to change the tenure system on smallholder farmers to a more favourable system to improve maize productivity and input investment. If the government has to maintain the leasehold system, it is recommended that farmers are offered title deeds or lease documents that makes it possible for farmers to make effective long-term decisions on their respective farms. On the other hand, the research also recommends banks and other financial institutions offer loans to these smallholder farmers given that agriculture is the backbone of the economy, hence supporting agriculture in the form of loans will go a long way in improving the national GDP and general livelihoods. Given that the majority of the farmers are utilising less than five hectares of the leased land, it is also recommended that the government continues to provide farmers with inputs and enact some pieces of legislation that will seize some portion of land that remains unused for some time as this is a prejudice to the state efforts to increase food productivity.

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Project Resilience: Relevant or a Far-fetched Concept in the Context of Zimbabwe's Rural Projects by NGOs?

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Abstract

Project resilience ensures the continued existence and relevance of projects. It is a product of a variety of factors, thus a complex phenomenon that requires a systems approach to analysis. Little research exists on project resilience. For on-governmental organisations (NGOs) to remain relevant and essential, there is need for analysis of their projects using project resilience concepts. This article discusses the factors that affect project resilience in rural projects involving NGOs using a systems approach. It then suggests the Panarchy Model be used to do a project resilience analysis using three eco-cycles. After carrying out a narrative literature review. 35 articles were included in this study. A three-layered eco-cycle in the model is suggested with individual resilience at the bottom layer, community resilience in the middle layer and project resilience at the topmost layer. These layers have various players that interact in a cyclic manner. It was found that collaboration, knowledge generation, understanding the context and monitoring and evaluation are among key issues that ensure project resilience. It is recommended that NGOs partake in bottom-up collaboration with communities to inform their projects. Researchers are recommended to also do empirical studies to test the three-layered eco-cycle suggested for its relevance in practice.

Keywords: *adaptive capacity, vulnerability, poverty, sustainability, livelihoods, monitoring and evaluation, eco-cycle*

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INTRODUCTION

Resilience that is viewed as both a process and an attribute or outcome has been a central topic across disciplines and no agreement to a single definition exists (Manyena, Fordham and Collins, 2008; Naderpajouh *et al.*, 2020). Resilience is a complex concept that is a product of a variety of factors and it, in turn, affects numerous areas of human existence (Manyena, 2006). Viewed as a process, the concept of resilience is not static as it affects and is affected by the environment (Moenkemeyer *et al.*, 2012). As a product, resilience it is a creation of context that varies across cultures, social settings, economic and historical aspects (Tierney, 2015). Resilience includes the ability to bounce back and continue to function, the ability to predict potential problems and prevent them, the ability to improvise using available resources in innovative ways, having a shared vision of danger and how to address it and a way to constantly monitor the ever-changing environment for threats (Aguirre, 2006). Project resilience is defined as the capability of project systems to understand their contexts and weaknesses and to adapt in a manner that allows the projects to recover from stressors to achieve set objectives (Rahi, 2019). Project resilience entails creation of resilient projects and resilient management styles as managers may notice adversities more and correctly interpret the risks, giving room to act realistically to manage the risks and recover from any setbacks (Kutsch and Hall, 2016).

NGOs aim to eradicate poverty in rural areas by developing institutions and creating the ability to distribute assets and capacity in people (Begum *et al.*, 2004). Poverty is the opposite of resilience that is associated with vulnerability (Mutambara and Bodzo, 2020). This means after project completion, NGOs need to leave communities independent and empowered. Resilient projects can be seen by producing resilience in the communities they target. For this reason, NGO effectiveness entails the evaluation of both processes that NGOs go through in providing aid and the impact they then have on the communities. However, NGOs fail to adequately impact communities positively, at times due to poor implementation of effective strategies (Mago *et al.*, 2015). Poverty eradication is possible if there exists a clear understanding of what poverty is according to the communities receiving the aid. Poverty varies across places and time, and it manifests in a variety of ways, thus no single indicator can determine poverty and ultimately

vulnerability (Mutambara and Bodzo, 2020). Vulnerability and resilience are opposing dimensions of adaptability and household resilience is necessary to ensure project resilience (Cassidy and Barnes, 2012). Vulnerability is the reduced capacity to cope with stress and it indicates a need for systems to change (Aguirre, 2006; Mutambara and Bodzo, 2020). Vulnerability are distinct yet intertwined concepts. Vulnerability is the exposure to stress or difficulty, while poverty is the lack of access to resources that satisfy basic needs (Dube, 2021).

Another aspect linked to poverty reduction is the improvement of livelihoods. Livelihoods include activities and assets that people use to make a living (Mago *et al.*, 2015). Assets include natural (land, property etc.), social (networks, empowerment, etc.) and human (knowledge, skills, etc.) assets (Chitongo, 2013; Mago *et al.*, 2015) Livelihoods of individuals and communities determine resilience of the people and understanding the dynamics linked to livelihood in communities informs the level of acceptance of NGO efforts (Carr, 2019). Context remains a key aspect that NGOs need to understand because it breeds variability. Carr (2019) claims that, in some cultures, for instance, livelihoods are linked directly to men's authority, thus bringing forth power dynamics that are gendered. Livelihood brings focus to assets and the options people must partake in various activities to survive in context (Chitongo, 2013). Control of resources is political and political constraints and opportunities affect operations of social movements and these vary across contexts because of culture and set norms (Mutongwizo, 2017). Interfering with community livelihoods places NGOs in a position where they need to have an in-depth understanding of each community's power dynamics, hence the need for community participation in project implementation.

Community participation ensures NGOs activities are informed by the needs and circumstances of its beneficiaries (Chitongo, 2013). However, at times, NGOs fail to carry out a need's assessment for their projects in the communities they are assisting, that then affects effectiveness of interventions (Chofi, 2010). To effectively understand community needs, participation of the community needs to be from the onset of the projects, starting with project

identification, its design and eventual implementation, monitoring and evaluation (Tagarirofa & Chazovachii, 2013; Mago *et al.*, 2015).

To ensure rural communities are sufficiently served by NGOs to eradicate poverty, understanding project resilience is key. Project resilience helps to identify inherent risks of projects and how to manage the risks to ensure continued adaptation and existence of NGO projects (Rahi, 2019). This is essential in shaping quality of aid given and in determining relevance of NGO involvement in community development projects. To appraise the effectiveness of NGOs, the article adopts the view of project resilience both as a process and a product that is organised in a systemic way. Being systemic, the concept comprises layers that are interdependent. In this study, three hierarchical layers are proposed, with individual resilience being the bottom layer, followed by community resilience and finally the top layer being project resilience.

BACKGROUND

The world is constantly facing shocks and disturbances in human existence. To guarantee communities adapt and survive, NGOs were made to fulfil social purposes through organising people and creating awareness in the communities to ensure the people are development oriented (Begum *et al.*, 2004). NGOs have always led efforts in providing economic development, with Christian NGOs emerging from missionary efforts in the colonial era (Bornstein, 2002). They supplement government efforts given that most governments, especially in the third world, are incapacitated to care adequately for the needs of their people (Begum *et al.*, 2004; Matsvai, 2018). The donor community also prefers NGOs to governments as key agencies for empowerment of communities, citing better accountability than governments (Mago *et al.*, 2015). Bornstein (2002) argues that NGOs in the 1990s came to the fore, leading development more than governments. This may suggest an evolution in processes to ensure continued relevance of NGOs in Zimbabwe. How this evolution in processes occurs needs to be investigated as it has fostered NGO relevance and adaptation in a context.

To eradicate poverty, NGOs engage in a variety of interventions. Empowerment is one social aspect that NGOs focus on. Meetings and

discussions are agents of empowering individuals and giving them awareness while raising their entitlement to the communities (Begum *et al.*, 2004). NGOs also empower women through actively improving provision of formal and informal education given that the best way to develop human resource is through issuance of appropriate education (Begum *et al.*, 2004, Bornstein, 2002). Women, for instance, could now speak up for their development (Bornstein, 2002). Employment was another method used to empower communities. NGOs create employment by assisting communities through micro financing and assistance in management skills building to create and run own organisations and by employing members of the communities in their NGOs (Begum *et al.*, 2004; Han and Goetz, 2015; Nipa *et al.*, 2022).

However, the effectiveness of NGOs has been brought to question. It has been suggested that since the donor community prefers to fund NGO efforts, to ensure funding is obtained, NGOs target projects that are assured of getting funding at the expense of the needs of the beneficiaries' needs (Mutongwizo, 2017). Other scholars claim NGOs concentrate on the causes of poverty instead of changing the attributes linked to the poverty, thus addressing symptoms of poverty, not the root causes (Begum *et al.*, 2004). Involving communities may be more effective in addressing relevant poverty concerns for communities, ensuring projects are relevant and so resilient. Inclusion of community members ensures inclusion of indigenous knowledge systems that arise from community experiences, technologies and skills and local governance (Tagarirofa and Chazovachii, 2013). Some scholars are sceptical of the notion that indigenous people's possession of indigenous knowledge translates to effective use of this knowledge to obtain sustainability that is only possible in resilient communities (Gwimbi, 2009).

CONCEPTUAL FRAMEWORK

The Panarchy Theory, also known as the adaptive cycle, provides concepts that help elucidate complex systems and their dynamics (Allen *et al.*, 2014). Panarchy in resilience emphasizes the ability of self-organisation across multiple scales and that disruptive change is inevitable since disruption creates opportunities (Tierney, 2015). The model describes how complex systems are organised in space and time using the systems approach that emphasizes hierarchical structuring. Tierney (*ibid.*) states the model proposes that not only

top-down control is key, but attention should be paid to bottom-up processes to inform how multiple subsystems interact. As a tool, the adaptive cycle focuses on reorganisation and destruction to understand growth and conservation. An analysis of preconditions for resilience is key to elaborate how different stakeholders in the system create resilience to support innovation (Richtnér and Södergren, 2008). This article adapts some principles from this model to help evaluate the resilience of NGO rural projects.

The adaptive cycle model is a three-layered eco-cycle of the project. It comprises the individual resilience as the bottom layer, community resilience as the second layer and the project resilience at the topmost layer. Each layer of the eco-cycle is connected to the other as the players in these layers continuously interact in community projects. Each level has internal and external factors that influence its performance with cyclical relations, rather than linear ones (Garmestani and Benson, 2013).

There are four phases in the adaptive cycle, the exploitation, release, reorganisation and conservation phases (Allen *et al.*, 2014). The exploitation or rapid growth phase is where establishment of the system is done, there is assumption of a perception of unlimited opportunity and available resources are exploited to result in growth. Resilience is high. The conservation phase follows the exploitation phase, where resources are accumulated and connections in the system increase. The system becomes more rigid and structured. Resilience is low. Release or collapse phase follows where the shock outside the system exceeds the system's resilience and uncertainty is rampant. Resilience is low. Reorganisation is the renewal phase. The system is open to reorganisation and the likelihood of creative change is highest. Here, the resilience is high. Understanding project resilience using this model will inform NGOs of the fact that resilience levels differ across phases and rejuvenation of projects to ensure continued resilience depends on manipulating each stage to foster future existence.

LITERATURE REVIEW

Understanding resilience aids in the better understanding of acute and chronic challenges to adaptation (Carr, 2019). Resilience is both the capacity a system

holds to react adequately to crises not anticipated and the ability to anticipate the crises and act upon them systematically to mitigate effects (Aguirre, 2006). Resilience comprises a network of adaptive capacities that impact social capital, improve community competence and foster effective communication and economic development (Tierney, 2015). Resilience aids in the recognition of systems weaknesses so the system can successfully bounce back after challenges (Rahi, 2019). Aguirre (2006) also finds that resilience comprises various systems, including psychological, social, and physical subsystems. Resilience entails, in addition to being consistent and robust in the face of disturbances, utilising opportunities opened by the disturbances as systems evolve to give new trajectories (Carr, 2019).

A project is viewed as an ecological system that is complex with multiple interlinking subsystems (Naderpajouh *et al.*, 2020). Situations vary in context and adversity and the ability to handle the unexpected events depends on competencies, previous experience and attitudes (Amaral *et al.*, 2015). Resilience requires that a system be flexible enough to manage change through learning and information sharing (Reed *et al.*, 2015). Actions linked to resilience include the ability to plan, absorb shocks, recover from shock and adapt to various situations (Naderpajouh *et al.*, 2020). Most aspects linked to individual resilience are found in community resilience, though new dynamics arise from how the team members interact (Nyahunda *et al.*, 2020).

Projects must be structured in a manner to enhance capacity of learning and reorganising (Reed *et al.*, 2015). Communities need to be flexible and open to learning. Knowledge heightens community resilience (Nyahunda *et al.*, 2020), as the ability to learn and reorganise is essential in attaining resilience for a system (Chitongo, 2013; Matsvai, 2018). Community resilience is defined as the ability for communities to renew themselves to restore after facing shocks (Matunhu *et al.*, 2022). Other processes, for example, networking, capacity-building and collaboration must also be in play (Reed *et al.*, 2015). Knowledge-building occurs continuously at different levels to enable the continued use of technologies after NGOs withdraw their assistance (Matsvai, 2018). Capacity-building is also key in building community resilience. Following a setback, it is important to ensure the innovative capabilities of individuals are strengthened (Moenkemeyer *et al.*, 2012). Action research

provides guidance in building capacity for those that are marginalised and in challenging underlying assumptions and power structures (Reed *et al.*, 2015).

Reed *et al.* (*ibid.*) found participatory assessment by stakeholders with the support of experts was key in coproduction of knowledge of the whole system through the bottom-up process that is part of resilience-building. Application of local knowledge in projects was found to be an important factor of empowerment to local communities (Gwimbi, 2009). Community involvement from planning stages is key for successful projects (Kativhu *et al.*, 2017). Other scholars agree with the participatory approach being key in knowledge generation (Richtnér and Södergren, 2008; Mago *et al.*, 2015;). Development processes must consider levels of knowledge that vary to enable partaking in skills development that ensures future survival of projects (Tagarirofa and Chazovachii, 2013). Indigenous knowledge systems are vital in relevant knowledge generation since interventions may be a vital source of knowledge that supports resilience of projects as this informs disaster preparedness of communities basing on inherent capacities of the communities (Gwimbi, 2009; Manyena *et al.*, 2020). Communities are the focal points in dealing with shocks and stressors and communities must be able to self-organise, adapt and learn (Gwimbi, 2009).

Resilience is found in the immediate environment. If resources are perceived as inadequate, the challenges that come with change are seen as a threat, rather than a healthy challenge (Richtnér and Södergren, 2008). Closely linked to this notion, resilience of individuals, communities and projects is affected by the livelihood of individuals and communities. A livelihood is viewed as sustainable where it can withstand stresses and shocks (Matsvai, 2018). NGOs complement each other in their interventions to give a complete package of sustainable development and livelihoods. Positive spillovers were also noted to those that have not participated in the projects by NGOs (*ibid.*). Livelihood is partly dependent on the distribution of assets. Household assets are important for community resilience and adaptation (Lwasa, 2018). One aspect of economic resilience includes infrastructure as this, among others, improves access to various markets and makes houses affordable (Nipa *et al.*, 2022). Olayide *et al.* (1981) as cited in Matsvai (2018) define rural development as provision of basic social services, including infrastructure and

improved agriculture aimed at improving social and economic need of the rural people.

A resilient system is where there is awareness of potential hazards and acting in anticipation of the demands to minimise them (Aguirre, 2006). However, environments are not static, they are continuously evolving and changing as subsystems interact. There are various power dynamics that exist at different ecological levels of systems, making adapting to the ever-changing environment by NGOs a continuous effort (Mutongwizo, 2017). With the effects and causes of disturbances being observed at broader levels, core impacts usually arise from individuals or the community that are then cascaded up through the projects (Naderpajouh *et al.*, 2020). In individuals, a psychological level of resilience is considered where a shift from the external disruption to the internal strength of the individual (*ibid*.)). Project resiliencies is a form of a temporary way of organising meant to react to disruptions and the creation of long-term resilience at various systemic levels (Naderpajouh *et al.*, 2020).

Collaboration is a key ingredient in resilient projects (Richtnér and Södergren, 2008). Various stakeholders include academics, NGOs the business society and the political system to collaborate (Richtnér and Södergren, 2008; Matunhu *et al.*, 2022). Community involvement is another form of collaboration necessary to ensure project resilience. Having direct contact with communities ensures NGOs know needs and circumstances of the communities (Matsvai, 2018). Community participation and application of local knowledge has the advantage of positively addressing local socio-economic concerns. A different way of thinking is necessary where people aspire to achieve more than the minimum coping to stressors and reduction of vulnerability (Manyena *et al.*, 2020). Vulnerability and resilience are opposing dimensions of adaptability and household resilience is necessary to ensure project resilience (Cassidy and Barnes, 2012). Cassidy and Barnes (*ibid.*) also find that social connectivity affects household resilience. Policy and legal framework reforms have also been found to be key in ascertaining resilience (Matunhu *et al.*, 2022).

Community leadership must be able to encourage communities to partake in development projects (Gwimbi, 2009) Although the bottom-up approach collaboration with communities is recommended, some scholars feel top-to-bottom approaches may be necessary. Although people may have experiences of their lives, they may fail to scientifically analyse and resolve their problems, thus creating a gap for external help, including NGOs who assist in analysing the problems (Begum *et al.*, 2004). Some communities with the opportunity to select priorities linked to their resilience, opt for aspects that address immediate threats only, rather than those that deal with transformative change resulting in outcomes that are not as meaningful as others (Carr, 2019).

In addition, participatory development has not ensured practical and meaningful involvement of the people in their development projects. NGOS employ structured approaches that leave little room for community participation as they are prescribed to meet community needs in the short term (Dube, 2021). Different stakeholders also hold different interests, and they need to be satisfied with their level of involvement from the beginning (Tagarirofa and Chazovachii, 2013). In Bangladesh, NGO projects did not meet the needs of the communities (Saifuddin, 2006). Manyena *et al.* (2020) echoe the same sentiments as they find that NGOs do not meet the needs of the Tonga. In Kabuda, NGOs carried on distributing food where communities felt they could produce their own and did not need the donations (Nyathi, 2012). NGOs also lack appropriate evaluation of their projects, especially where the donors are not sensitive to the local communities' needs (Johnson-Lans & Kamdar, 2005). An understanding of poverty affects how the elite prioritise poverty alleviation and the measures they take and are willing to support (Hossain, 1999). Even with these concerns, however, resilience ensures an accommodation of interests of multiple stakeholders who may have divergent interests (Tierney, 2015). Accommodation of interests is aided by an analysis of how different stakeholders in the system create resilience to support innovation, given that innovation is a precondition for progress (Richtnér and Södergren, 2008). In addition, direct involvement in projects complemented by close monitoring and evaluation systems js essential in successful NGO projects (Matsvai, 2018).

NGOs at times have their agenda to fulfil. Some believe there are NGOs that are political yet not all NGOs care for politics, as others are focused on delivering development to communities (*ibid.*)). The distortion prevalent is

that participation means merely coming together of stakeholders, yet no consultation is really done (Tagarirofa and Chazovachii, 2013). It seems that NGOs impose their will on the people they are supposed to be assisting in implementation of projects (*ibid.*). Some NGOs are religion-based, for instance, World Vision and Christian Care (Bornstein, 2002). This means that communities' needs are determined by combining relative development with exposure to Christianity. Bornstein (2002) argues that economic development in Zimbabwe is a religious act for those involved and religion is viewed as a unifying social force. Cultural sensitivity thus becomes relevant and an in-depth understanding of communities benefiting from interventions is necessary to ensure that these interventions are in line with community cultures. Strategy, culture and structure are the building blocks of project resilience (Rahi, 2019). In Africa, the realms of spirituality care not divorced from material aspects (Bornstein, 2002).

An enabling environment breeds transformation, thus NGOs need to take heed of the contexts of communities they are carrying out projects in. This gives rise to socio-ecological resilience comprising management of social and natural aspects in a system to maintain certain socio ecological statuses (Carr, 2019). Social factors act as catalysts or hindrances of transformation. Some socio-ecological projects threaten the social order and so are a threat to the stability of a system. Therefore, resilience that accounts for the social difference, power within communities and agency in the communities need to be theorised (*ibid.*).

METHODOLOGY

A narrative review of literature was adapted for this study. This provides a qualitative analysis of existing literature to establish concepts linked to project resilience (Manyena *et al.*, 2020). The review enabled this study to elucidate on the complex relationship of NGO project resilience with its subsystems of community and individual resilience (Allen *et al.*, 2014). To avoid researchers bias, , although no framework exists for narrative literature reviews (Ferrari, 2015), some systematic literature review concepts were utilised. Google and Google Scholar search using key words "project resilience" and "NGO rural projects", was employed. Only peer reviewed articles in open access were used. The researchers read the article abstracts to further screen the articles for relevance.

Articles excluded from the study include project resilience articles that were linked to projects undertaken by organisations as temporary measures to address shocks. Narrative review allowed the researchers to identify a pattern in the articles read in terms of concepts raised. These concepts were utilised to identify more articles to be included in the review. Researchers utilised the reference lists in the articles that met the inclusion criteria of being articles that dealt with rural projects done by or in partnership with NGOs. Researchers also included articles identified from key concepts raised in selected articles and these derived key words included "resilience", "community resilience", "livelihoods" and "vulnerability. Using prevalent themes, cases were identified and summarised in the findings, basing on key concepts they were addressing. These key concepts were identified through thematic analysis. The Panarchy Model was then used to analyse the relationships found in the subsystems that the researchers felt were different levels of resilience that influenced project resilience, and these are individual resilience and community resilience. Project resilience was found as the third layer of resilience. Concepts identified from articles reached saturation point, the researchers stopped searching for additional articles.

RESULTS

Thirty-five articles were reviewed in this study. Below is a discussion of some cases that stood out in the Zimbabwean setting. All cases are rural area setting cases. Various themes raised included the importance of collaboration, monitoring and evaluation of projects, knowledge generation, capacity building and empowerment, project systems analysis using the Panarchy Model and understanding the context.

CASES

The following cases illustrate major factors found to affect project resilience. The review by Dube (2021) based on literature concerning rural cases of Zimbabwe. The cases that follow the Dube (*ibid.*) review summary cover various areas in Zimbabwe across provinces to provide a variety in spatial location of the cases.

REVIEW OF THE STRATEGIES USED BY (NGOS) TO REDUCE VULNERABILITY IN ZIMBABWE RURAL AREAS, DUBE (2021)

Dube highlighted how communities were excluded from projects they were supposed to benefit from. Households and individuals were found to be incapacitated to make decisions. Indigenous systems were not considered, for instance, an oversight of traditional methods to care for the poor was mentioned, for example, *Zunde raMambo* and growing of grain resistant crops. A case in Chivi, for the Rupike Irrigation Scheme, was identified where outsiders took over the irrigation scheme and excluded the beneficiaries in the decision-making processes. The researcher highlighted how Zimbabweans lacked disaster preparedness. Inclusive participation was stated as a way of encouraging innovativeness in the communities. A deficit of research was posited as one cause of the inability of NGOs to reduce vulnerability as this created a literature gap.

Dube also found that NGOs focused on short-term poverty reduction as they met the immediate needs of the communities. The researcher alluded to the assertion that sustainable development could not be promoted by NGOs because they were not engaged for that purpose by their donors. Development was said to be more political as it was controlled by Whites who were not in the context. Some NGOs instead created a dependency syndrome, hardly empowering to the communities.

Power dynamics were also found to be inherent in communities and these shaped who participated in the projects instead of using the needs basis. NGOs thus needed to prioritise communities and relinquish power to design and plan the programmes. This was found to address better the root cause of vulnerability, not just addressing the symptoms of poverty.

STUDY ON FACTORS INFLUENCING SUSTAINABILITY OF COMMUNALLY MANAGED WATER FACILITIES IN NYANGA, CHIVI AND GWANDA DISTRICTS. KATIVHU ET AL. (2017)

Kativhu found that financial capital was necessary to ensure project resilience for the water supply project in Nyanga, Chivi and Gwanda districts. Households had to provide finances for the maintainance of their boreholes. This was not sustainable due to low levels of income. On average, households earned USD38 per month, while the poverty datum line was pegged at USD481 Zimstat, 2016). This created a vicious cycle in that water sources

were not producing enough water waterto assist in income generation, since they not adequately maintained. This brings forth a systemic relationship that gives insights into livelihoods of households and project resilience. Some water points were, however, useful in maintaining nutrition gardens that supported livelihood activities.

STUDY ON EXPLORING THE POLITICS OF LOCAL PARTICIPATION IN RURAL DEVELOPMENT PROJECTS OF SMALL DAMS' REHABILITATION IN MUSHANGASHE COMMUNITY, MASVINGO PROVINCE

This article (Tagarirofa and Chazovachii, 2013) revealed the need to understand the socio-political setup of communities in their contexts. A top-down approach to projects was found to be prevalent. The development agent planned the projects alone and then informed the Village Development Committee (VIDCO) of the plans. This case showed how some collaborations are done in the life of the projects. Partial consultations were made at some points of the projects where all participants indicated they were consulted in identifying the project but were left out in the planning stages (55% excluded). Some participants were not involved in the implementation (25%) and only 25% took part in monitoring and evaluation. Undemocratic leadership was found to be ineffective in motivating the community in partaking in community projects. Technocrats and those labelled professional experts usually dominate decision-making and so manipulate, rather than facilitate, development processes. Politicisation of projects was found to have a huge impact on defining how projects were run. Participation or lack thereof resulted in labelling of some members along political party lines. NGOs were found to be hypocritical. on paper claiming to include communities, yet implementation differed on the ground. This study emphaszsed on the need for partnership, transparency, empowerment and cooperation among communities and project implementers.

STUDY ON THE CONTRIBUTION OF NGOS TO RURAL DEVELOPMENT IN MUREHWA DISTRICT WARD 28

The Chitongo (2013) study focused on Catholic Relief Services and how they protected vulnerable livelihoods of communities. Fifty five percent of the Zimbabwean rural population, according to the Zimbabwe Vulnerability Assessment Committee (ZIMVAC), were found to have no livestock that

could be sold in times of need. The majority were found to rely on agro-based casual labour for livelihood. Factors affecting vulnerability were identified in this article as including wealth, power relations and market access. Natural calamities threaten food security. NGOs perceived as critical of the government, face repression and were not afforded freedom of operation as politics plays a key role in determining their operational space. This article introduced the need to have external support that was in line with community needs to ensure project resilience.

NON-GOVERNMENTAL ORGANISATIONS AND RURAL POVERTY REDUCTION STRATEGIES IN BINGA

Mago *et al.* (2015) did a study in Binga where they indicated a limited understanding of the livelihoods of the poor in the community? Poverty was found to be worsening, even with NGO aid. Sustainable livelihoods were found to be a goal for alleviating poverty. Productivity, poverty reduction, enhanced capabilities and resilience of livelihoods, sustainability of natural resources govern sustainable livelihoods. Sixty-seven and a half percent of the participants were found to be living in poverty. NGOs had failed to create an independent and empowered people. Instead, a dependency syndrome was found to be prevalent in some areas. Binga is a rich place in natural resources, but due to the dependency syndrome, communities are not utilise these resources.

NGOs were concerned only about meeting their objectives as community needs were not taken into account and addressed. For example, NGOs were issuing fertiliser in Siachilaba, the most arid ward in Binga District. Some NGOs like CADEC and Save the Children, gave out food to those who were not in need as the recipients exchanged the food they received for alcohol. No consultation on projects was done with the communities. In Kabuda, food distribution has no benefit to the communities because they produce their own food. Five percent in Manjolo confirmed benefiting from the NGOs and most of these were the unemployed elderly. NGOs were also found to be duplicating efforts.

How communities defined poverty seemed to differ from NGO definition of poverty, resulting in little improvement in poverty levels. The local people's

definition of poverty includes a lack of hospitals, schools and infrastructure and NGO efforts are not addressing these. NGOs view poverty as a uniform phenomenon across geographic places. Another limitation of NGOs in alleviating poverty was linked to donors instructing NGOs on what to do without consulting and understanding the communities that were benefiting. In addition, NGOs failed to reach the poorest members of the community as they were inaccessible, especially during the rainy season due to lack of proper roads and bridges. NGOs do not do home visits, thus many needy people, including those with disabilities and the elderly, are excluded. NGO offices are located far from the beneficiaries, thus a call for NGOs to decentralise. Some of the needy may have been excluded because selection of beneficiaries was left to kraal heads who may not be aware of these needy families.

DISCUSSION

The Panarchy Model informs how resilience is a systems concept where multiple layers in the system exist. This article takes a stance of having three eco-cycles to denote the subsystems that are linked to project resilience. The lowest level is individual resilience, followed by community resilience and the topmost layer is project resilience. A systems approach is adapted as complex subsystems have been found to be linked to project resilience (Naderpajouh *et al.*, 2020). Factors that affect individual resilience, in turn, affect community and project resilience, though the relationship is not linear but cyclical (Allen *et al.*, 2014).

At the individual level, aspects found to influence resilience include livelihoods, empowerment, social relations, social support, control of resources and level of awareness and knowledge, among others (Chitongo, 2013; Mago *et al.*, 2015; Dube, 2021 For projects to be resilient, NGOs need to understand these needs and the individual contexts that they occur in as they vary. Collaboration was found as a necessary ingredient that informed NGO projects (Richtnér and Södergren, 2008; Matsvai, 2018; Reed *et al.*, 2015; Matunhu *et al.*, 2022). A labyrinth of factors were found to affect collaboration that understanded context, donor influences, political and social factors of the communities. Collaboration also bred an understanding of community needs that was believed to foster project resilience. NGOs had to

understand and get clear needs of individuals as their resilience affect project resilience.

Most aspects linked to individual resilience are found in community resilience. Community resilience also depends on capacity-building and collaboration (Reed *et al.*, 2015), community knowledge and capacitation (Matsvai, 2018), socio political variables like control of resources and power dynamics (Begum *et al.*, 2004, Mago *et al.*, 2015). Control of resources is political; thus, NGOs need interpersonal skills in leadership that can navigate the power dynamics existing in communities (Mutongwizo, 2017). Community resilience is dependent on knowledge (Nyahunda *et al.*, 2020) and this knowledge includes that which is necessary for the communities to carry on with projects after donor funding has been discontinued.

Community livelihood is a necessity for community resilience, and this depends on, among others, empowerment of communities (Mago *et al.*, 2015). Empowerment was found to be a function of indigenous knowledge systems where adaptation of the communities, with the assistance of NGOs, could benefit if NGOs paid attention to inherent strengths of communities and to build on these (Lwasa, 2018). Understanding context informs NGO approaches, and this can be possible with enough consultation of communities from project implementation levels (Tagarirofa and Chazovachii, 2013).

This article suggests the topmost eco-cycle to be is project resilience itself (Allen *et al.*, 2014). As project resilience entails creation of resilient projects and resilient management styles to act realistically to manage the risks and recover from any setbacks (Kutsch and Hall, 2016), this study suggests NGOs identify across the three eco-cycles the stages of adaptation where the systems are accepting to change and high in resilience (Allen *et al.*, 2014). Resilient projects produce resilience in the communities. NGOs must ensure they have capable leadership that navigates the multiple relationships that inform the layers of resilience across the eco-cycle. Collaboration with the community ensures project resilience and the Panarchy Model champions a bottom-up approach to inform decisions and actions (Matsvai, 2018). Context must always be understood to limit conflicts that are linked to the different stakeholders that partake in community projects as each stakeholder has their own interests. Strategy, culture and structure are building blocks of project resilience (Rahi, 2019). Another key aspect necessary to maintain project resilience is monitoring and evaluation (Matsvai, 2018). These two processes will ensure projects remain relevant to their communities and that set

objectives are being met. Effective monitoring and evaluation will ensure NGOs understand the trajectory that their projects are taking, and corrective action can be taken timeously. Involving the communities helps the NGOs to understand the context they are operating in, given that the environment is not static, but continuously changing.

CONCLUSION AND RECOMMENDATIONS

In conclusion, project resilience may seem a far-fetched concept in Zimbabwe. Most cases reviewed indicated, to a large extent, the failure of NGOs in meeting community needs which are a prerequisite for project resilience. Given the complex nature of factors that affect project resilience, adapting a systems approach to analysing project resilience is necessary to investigate the multiple relationships that exist against the subsystems. This article suggests three layers in the eco-cycle as the Panarchy Model is employed to analyse resilience of projects by NGOs. There are a variety of internal and external factors that give rise to shocks and opportunities to ensure project resilience is attained. Collaboration, understanding the context and able leadership that possesses good interpersonal skills, allows for the different interests of the stakeholders to be championed to benefit both communities and NGO relevance in rural projects. Monitoring and evaluation is a necessary component that will ensure NGOs are still relevant to their cause and are achieving goals that they set out to achieve. Just like any other stages in the project, monitoring and evaluation must be done with the collaboration of communities.

NGOs remain key in the fight to eradicate of poverty in Zimbabwe, as in other Sub-Saharan countries, because of the government's incapacity. However, genuine NGO efforts must be witnessed. It is, therefore, recommended that genuine collaboration with the communities be done, and monitoring and evaluation of projects be done effectively. It is further recommended that the Panarchy Model be used to understand the relationships of the multiple subsystems in existence as discussed. Empirical studies by researchers must also be done using the suggested project resilience eco-cycle layers to improve and perfect its application and test its relevance in real life settings.

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Social Networks and the Human Factor Perspective on Rural Development in Chimanimani District, Zimbabwe

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Abstract

Uplifting human factor principles is a *sine qua non* for rural development. However, severe human factor decay has become a reality in remote rural districts of Zimbabwe. Failure to network seems to be a paradox that needs to be unlocked. Networks are based on good relationships. Relations impact on science and any livelihoods programmes. Networks are the bedrock for trust. Trust is a resilience builder for that sustainability. Limited networks and the general low human factor as evidenced my mistrust, poor service delivery, corruption and poor communication, have led to stagnation or even regression of the development gains brought by political independence. The conclusions of this article are drawn from a study done in Chimanimani Rural District of Zimbabwe. Whilst councils are the nerve centres for rural development, their members are continuously failing to make most of the ongoing networking platforms at their disposal. Respondents were chosen conveniently and judgmentally. This study revealed very poor networking among community members and organisations operating in the district. The conclusions of this article arrived at reminding to "going-back-for-it" (*sankofaism*), thereby integrating globalised philosophies with African indigenous knowledge on leadership. Indeed, Chimanimani District has the capacity for growth and sustenance of the same.

Keywords: *sankofa*, *dare*, social capital, communication, social resilience

INTRODUCTION

Globalised philosophies have invaded societies time and space. In this article, globalised philosophies refer to western science-based beliefs and its related religions. It is not the aim of this piece to draw a battlefield with globalised philosophies, but to integrate them with indigenous knowledge systems. There is severe inadequacy of investment in social networking. This is a misfire in rural development on the part of local government and evidence of severe human factor deficit. Social networking is one of the social capitals imbedded in the human factor development philosophy. Local government is the nerve centre for rural development (Marango, Francis and Adjibolosso, 2016). It

plays the coordinating and facilitation role in rural development. It is the local government system that can either empower or stifle citizens' participation on matters that determine their destinies.

There is a dearth of literature that highlights the benefits of investing in strengthening social capital. Social capital is one component embedded within the human factor development theory. The two are a driver for rural development initiatives. Therefore, there is need to single out the benefits of social networking. Social capital is the total sum of trust, social solidarity, knowledge, information, mutual support, empowerment, leadership, encouragement and social networking (Coleman 1988; Putnam, 1993, Marango, Francis and Mathaulula, 2016). However, there is a problem that scholars have tended to look at social capital in its entirety, without singling out its components such as social networking. This is problematic in that one swims in a myriad of concepts where the head and tail is not clear.

Social networks, as the ties between individuals or groups, could be considered the "structural" element of social capital (Baum and Ziersch, 2003). Social networks could be either formal or informal. Baum and Ziersch (*ibid.*). posit that formal networks are those ones that are developed through formal organisations and guided by some legal rules and regulations. These organisations include voluntary organisations and associations. On the other hand, informal networks are ties bound by mutual understanding and trust such as friendship, family, neighbourhood and work related. The primary role of informal networks is particularly the provision of scarce resources like social support. Social networks cement or cultivates the three forms of social capital, namely bonding, bridging and linking.

Bonding refers to the links that exist between like-minded people or the reinforcement of homogeneity. They are 'strong or thick ties' (Dale and Sparkes, 2008). Bridging refers to connecting heterogeneous groups. Lastly, linking social capital strengthens bonding and bridging. An example is family to family or community to community links. Another example is the community-donor linkage. Links are, therefore, are bridges of social capital (Putnam, 2000). There is always need for integrating these social capitals. This is so because, for example, bonding tends to shut out outsiders from community who might want to invest in it though it binds people together to work as an entity and reduce possibility of sabotage.

Social capital is linked to human factor development. Human factor development is part of African philosophies. Human factor bridges

Afrocentric thinking to science-based thinking. This is so because Africa is battling to recover its lost indigenous knowledge. Human factor refers to:

> The spectrum of personality characteristics and other dimensions of human performance that enable social, economic and political institutions to function and remain functional over time. Such dimensions sustain the workings and application of the rule of law, political harmony, a disciplined labour force, just legal systems, respect for human dignity and the sanctity of life, social welfare, and so on. As is often the case, no social, economic or political institutions can function effectively without being upheld by a network of committed persons who stand firmly by them. Such persons must strongly believe in and continually affirm the ideals of society (Adjibolosoo, 1993: 142).

Based on this, human factor does not only look at the present, it reflects at the past, the present and the future for sustainable development. This brings into account the philosophy *sankofaism*. Literary *sankofaism* refers to the idea that "go back for it" to that that has been lost or forgotten. The concept is derived from and symbolises the *sankofa* bird among the Akan people of Ghana. The bird is popular for its forward and backward gaze that symbolises that it is not wrong, shameful or too late to go back for something one had previously forgotten (Osei, Morrissey & Lloyd, 2005). Critical *sankofaism* is the way to go if Africa is to regain the lost time and the different types of its resources. Among the Ndau people of Chimanimani and Chipinge districts of Zimbabwe, the *matare* concept is vital as a networking platform.

The *matare/imbizo/inkundla* concept represents an all-encompassing, neutral, democratic, good governance and socially inclusive platform that is non-reprisal to all the actors (Marango, 2011). Having this in mind, the philosophy of "going back for it" is based on the saying that, "It is not a taboo to go back for a (valuable) thing one has forgotten" (Quan-Baffour, 2012: 2). This concept motivates all Africans to mobilise their moral and intellectual capacities for sustainable development of the continent (Osei, 2005). Marango *et al.* (2016) note that there is lack of synergy between globalised philosophies and indigenous knowledge even though there is potential for using them complementarily for rural development.

To demonstrate the wholesomeness of human factor, Adjibolosso (2013) outlined its six critical dimensions. These are: Spiritual capital—referring to the aspect of human personality that is usually in tune with God and His universal spiritual principles that inform how everyone must live to experience a life of meaning, fulfilment and greater productivity. There is the moral capital that represents habits and attitudes of the human heart based on universal moral principles regarding right and wrong, and the ability to live by these precepts. Aesthetic capital is the deep sense of and love for beauty. It

equips the individual to know and to decipher the true differences between what is beautiful and ugly, inclusive of a strong passion for positively ennobling and propelling music, art, drama, dance and other artistic capacities. Fourth is human capital that refers to the knowhow and acquired skills (i.e., technical, conceptual, intellectual, analytic and communications). Fifth is human abilities. This constitutes the power or capacity of an individual to competently undertake projects or effectively perform tasks requiring mental and physical effort. Lastly are human potentials that refer to untapped human talents which may or may not be fully harnessed and effectively utilised.

It is through social networks that talents, human capital, human abilities, moral capital and aesthetic capital are identified. Networking is nothing new among the indigenous Ndau people. It was part of the socialisation process. The *dare* will remain a central platform where people meet, not only as a judiciary platform, but a platform where development issues are discussed and evaluated together. Afrocentricity and rural development are anchored on the principle of *dare/matare* (singular and plural tense)/*imbizo/inkundla*.

Dare represents a meeting of minds, a place for implementing initiatives, lobbying, and advocacy. In the process, participants find it as a place that provides encounters with the newness of sharing, and uniqueness of exchange. Information is disseminated and consensus is built (Khoza 1994; Haruperi 2003; Mnyaka 2003). According to Mtuze (2004), *imbizo* is a traditional meeting or gathering called by a chief or headman, for listening to the news or concerns that affect individuals or community, and to discuss matters of common interest, e.g., to inform the community of rising levels of crime in the neighbourhood.

Communication is a strong component of social networking. It is aimed at the conveyance of the ongoing meaning or understanding from one person to another (Huband, 1992). It is the transfer of information from one person to another person. Communication is a way of reaching out to others to transmit ideas, facts, thoughts, feelings and self-worth (Marango, Francis and Adjibolosso, 2016). Social networking is propelled by a high level of healthy communication. Networking cultivates trust among the people in their own communities (*ibid.*). Trust is a multi-layered concept that is composed of a range of attributes such as dependability, credibility, faithfulness, information sharing, and the expectation of cooperation between partners (Lamothe and Lamothe, 2011). Effective communication inculcates, enhances and sustains unity of purpose and social inclusion.

Social inclusion refers to social attachments (Krishna and Shrader, 1999). This inclusion provides a feeling of safety, trust and community spirit. Networking cultivates social solidarity and collective action among people (Marango, Francis and Adjibolosso, 2016). Social inclusion is another pillar for rural development. Healthy communication equals to high level of social inclusion and social cohesion. It is through social networking that rural development is propelled. Networking enables communities to reach out to sources of resources such as human capital, economic opportunities such as markets and political awareness for governance purposes.

In a study in Chimanimani District of Zimbabwe by Marango, Francis and Adjibolosso (*ibid.*), severe human factor decay in the form of communication and social inclusion was noted to be unprecedentedly high. It should be borne in mind by development practitioners and scholars that investing in social networks is not a waste of time. Failure to appreciate this reality results in squandering of resources (Sandwith, 1994). Another example is one given by Manzungu and Van Dar Zaag (1996) in Nyamaropa area, Nyanga district in Zimbabwe.

In this study, the Nyamaropa irrigation scheme failed due to pitfalls associated with lack of effective communication among stakeholders. They were not networking in a healthy way. The Nyamaropa case reveals how an irrigation project, established as a rural development project, can collapse. The collapse was due to an astronomically high communication breakdown and conflicts between government officials who managed the scheme and the farmers. The irrigators were compelled to grow food crops for sale. In addition, a compulsory crop rotation of beans and wheat was introduced and imposed on them. As a result, the irrigators refused to give up dry-land cultivation. Government officials also dictated what to plant and when to plant. They failed to make most of the indigenous leadership and networking styles. Using local knowledge works since it is more compatible with local realities.

In this instance, farmers were not consulted for input into the project. Instead, government officials brought blueprints as if the farmers were *tabula rasa*, to use Freire's (2000) words. There was no social inclusion of these critical actors in development. Resultantly, time was wasted, resources were squandered and relationships soured (Sandwith, 1994). These outcomes are reflective of severe human factor decay. Adjibolosso (2014) notes that citizens of African counties find it difficult to create a sustained vision of their own manumission. This is due to interferences on a gargantuan scale that denies

them the opportunity to control their own planning, policy formulation, project development and programmes (i.e. the 4Ps portfolios).

CONCEPT OF RESILIENCE

The concept of resilience is increasingly being placed at the centre of development narratives as stated in the Sustainable Development Goal 11 through which world leaders committed to creating sustainable, safe, resilient and inclusive communities by 2030 (Parnell, 2016). In general terms, social resilience explains the ability of cities and towns to sustain continuity amid the stresses and shocks that it may go through. In their definition, Meerow, Newell and Stults (2016: 39) state that urban resilience is the ability of an urban system and all its constituent's socio-ecological and socio-technical networks across temporal and spatial scales to maintain or rapidly return desired functions in the face of disturbance, to adapt to change and to quickly transform systems that limit current or future adaptive capacity. In this setting, social resilience is the ability of communities to manage and adapt to change, including their vulnerabilities. Central to definitions of community resilience are ideas of robustness, mitigation and adjustment at all levels This includes national, city and local level formal governance, to how residents respond to their local circumstances at hand. Flexibility and responsiveness in how cities and their residents adapt and respond to change, both positive and negative, are central to understanding notions of urban resilience and sustainability (Sudmeier-Rieux, 2014), as the urban system is confronted with a plethora of stresses that disrupt the ideal or envisaged urban set-up. Urban resilience, thus becomes of utmost importance as it helps cities to bounce back after going through rough times.

SOCIAL RESILIENCE

Resilience is a multi-disciplinary concept that has gained prominence in development discourse, planning and design. It gained prominence in response to environmental/ecological and socio-economic problems affecting communities. Yet there are limited studies showing the nexus between rural development and social resilience. Adger (2003) defines, social resilience as "the ability of human communities to withstand external shocks to the social infrastructure, such as environmental variability, or social, economic and political upheaval." Later, Adger *et al.* (2002) describe social resilience as the ability to cope with and adapt to environmental and social change mediated

through appropriate institutions. Keck and Sakdapolrak (2013) provide a more expansive understanding of social resilience when they structure social resilience as comprising three dimensions: (i) coping capacities – the ability of social actors to cope with and overcome all kinds of adversities; (ii) adaptive capacities – their ability to learn from past experiences and adjust themselves to future challenges in their everyday lives; and (iii) transformative capacities – their ability to craft sets of institutions that foster individual welfare and sustainable societal robustness towards rural development.

Less known is the resilience in rural settings. Rural areas have long been places whose relationship with urban areas is exploitative. Rural areas provide the labour force for thriving urban systems. They also provide the bulk of the food supplies urban communities survive on. In this study, we explore social resilience in the context of social networks to achieve sustainable rural development. In particular, we analyse the transformative capacities that exist in communities of Chimanimani District.

The growing attention on community resilience remains unclear as to the best approaches to integrate resilience analysis in the development of cities and towns. Ironically, little research has been undertaken with regards to social resilience in the context of social network analysis. Therefore, this study examines the nexus between social networking and rural development in Zimbabwe. Three main research questions guiding this study are: Is there a relationship between social networking and rural development? How does social networking reduce vulnerability and increase resilience of communities? What are the best mechanisms of ensuring sustainable resilience?

METHODOLOGY

Chimanimani Rural District is located in the eastern highlands province of Manicaland, Zimbabwe. As shown in Figure 1 and Figure 2**,** the district shares borders with Mozambique in the east, Chipinge in the south, Buhera to west and Mutare District in the north. Chimanimani has approximately 133 810 people (Zimbabwe National Statistics Agency (ZIMSTAT), 2012). Of that population, the majority (52%) are females. The district is highly rugged in terrain. This is typified by the Chimanimani Mountain range, that is part of a

stretch of mountains from the Drakensberg Mountains in South Africa to Mount Kilimanjaro in Kenya. Its altitude ranges between 6 000 m in the east and 600 m in the west. The annual rainfall ranges between 1 000 mm in the east and 200 mm in the west.

The district is richly endowed with natural resources and if enough investment is put in, in social networking, there is potential for rural development. Natural resources include natural and commercial forests, fertile soils and precious minerals such as gold, diamonds, lime and copper.

STUDY AREA MAPS

Figure 1 show a map of Zimbabwe highlighting provincial and district boundaries. The study was conducted in Chimanimani District,is located in Manicaland Provimce

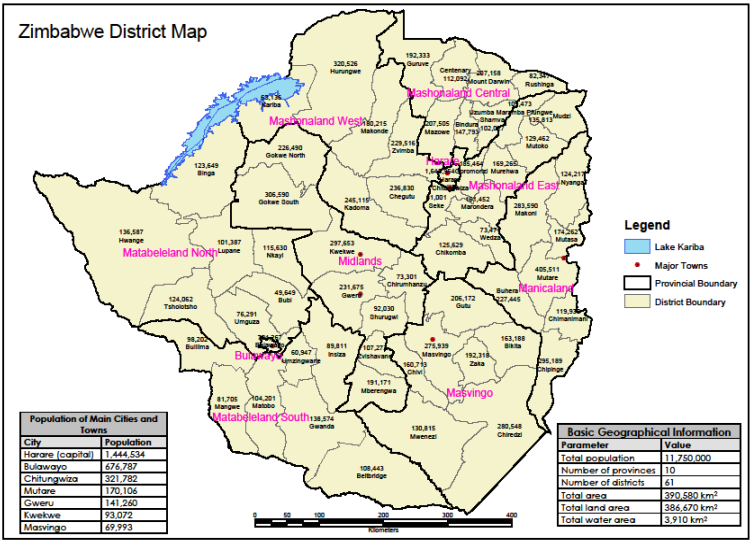

Figure 1: *Map of Zimbabwe Showing Provinces* (ZIMSTAT, 2012)

Figure 2 Wards in Chimanimani District

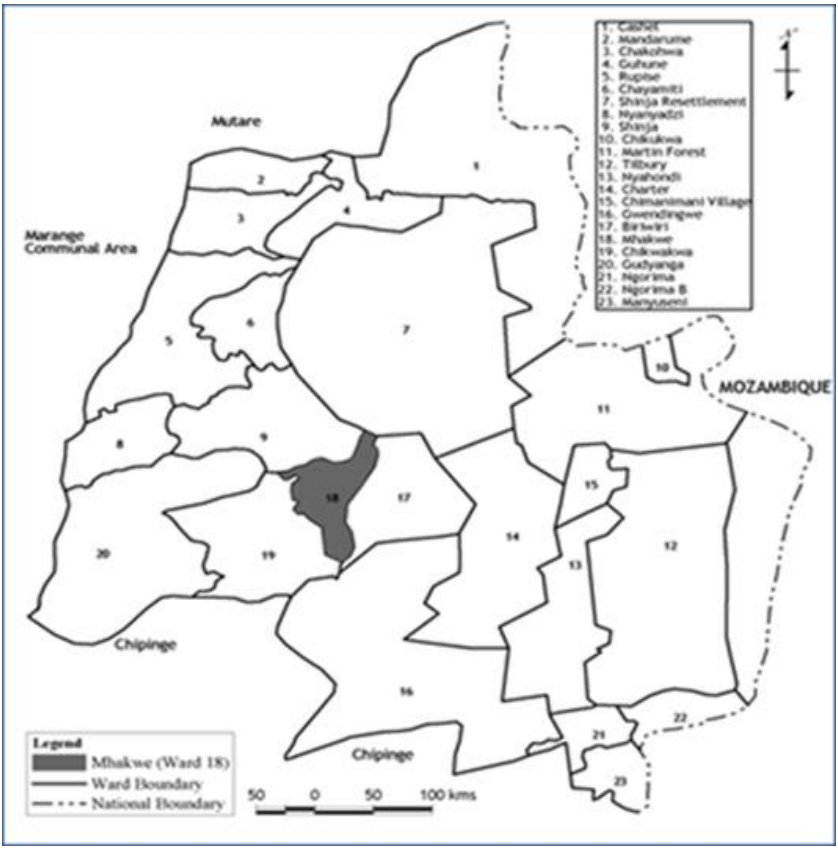

Figure 2: *Map of Wards in Chimanimani District* (Chimanimani Rural District Council, 2020)

Chimanimani boasts spectacular tourist sites, namely the Bridal Veil Falls, Pera Falls, Tessa's Pool, Vhimba Botanical Reserves and Chimanimani Mountains, locally known as Mawenje. These and others make Chimanimani a viable tourist destination (see Figure 1.1. A mixed design in the form of a survey and historical designs was employed in the study. A Likert-scale was used to collect community perceptions and to assess opinions on the level of networking. Non-probability sampling methods (i.e., convenience and judgmental sampling) were employed. This was due to the fact that the Chimanimani Rural District Council (CRDC), the local authority, did not have

clear records of its residents. Secondly, there were certain respondents with valuable information who could only be sampled purposively.

Five wards out of 23 in the district, namely Mhandarume (Ward 2), Mhakwe (18), Chikwakwa (19), Chakohwa (3) and Chimanimani Urban (15) participated in the study. Mhandarume has a population of 2 938, 2 457, 3, 573 4 492, and 3 647, respectively. From each ward, 44 respondents representing various households were conveniently and judgmentally selected. A total of 220 local residents participated in the study. Data collected through a questionnaire were entered into the computer using the Microsoft Excel software package. They were then imported into the Statistical Package for Social Sciences (SPSS) version 19.0 for windows (SPSS Inc: Chicago, IL, USA). Frequencies of the scores of the dimension social networking were calculated. The Kruskal-Wallis test for k-independent samples was used to determine if there were any differences in perceptions relating to social capital dimensions among the Wards. Post-hoc tests for effects that were found to be significantly different were then carried out using the independent samples Mann-Whitney test.

Permission was sought from the CRDC to interview its residents and to get access to its records. Meetings with key stakeholders (i.e. District Administrator, local community and political leadership) were carried out. Respondents' consent was sought before data collection. Those who participated understood what it meant to either participate or not. Personal details such as the names of respondents were not included on the questionnaire to protect them from possible reprisals. The researchers made it clear to the participants as to the way to the publication of the findings ensuring honesty and justice.

OBSERVATIONS AND RESULTS

Out of the 220 people who participated in this study, 53% were females. Forty-five percent of the respondents were 20-35 years old, followed by 33% who were aged 36-50 years. Those aged 51-65 years constituted 10% of the respondents, with 7% and 5% being less than 20 years and more than 65 years of age, respectively. The majority of the participants (63%) were married,

with 23% being single and 8%, widowed. Divorcees and those cohabiting formed 5% and 1% of the total number of respondents, respectively.

Most of the respondents (43%) had attained secondary school level education compared to 32% who had tertiary qualifications. Almost 15% had only primary schooling with the remainder having no formal education at all. Approximately 66% of the respondents had lived in the district for more than 10 years, while 18% had resided there for 6-10 years. Only 16% of the respondents had resided in the respective wards for less than five years. While 47% reported that they were not employed, 31% were permanently employed and 12% self-employed. About 8% of the respondents were still attending school. An almost negligible proportion of the respondents were in temporary employment.

LEVEL OF NETWORKING IN CHIMANIMANI DISTRICT

Table 1 shows the level of networking in the Chimanimani District. Most of the respondents (70%) were not actively involved in the school governing body. The majority of respondents (69%) were not active in their village development platform, save for the minority (30%). There was poor networking in the wards since most of the respondents (71%) were not actively participating in village development. Seventy-one percent of the respondents were also not active in any development associations in their respective wards. The majority of professionals in the wards (68%) did not actively belong or participate in work-related associations. There was, however, very high networking among church-mates as evidence that the majority (83%) actively participated.

There was fair networking within the economic arenas within the district, since 48% were not active and 47% were active. Political groups were not warm and people-friendly enough as 65% were not actively involved, neither were the cultural groups as evidenced by the fact that 79% were not active too. Sixty-eight percent of the residents were not concerned with what would befall them when they died because they were not actively involved in burial societies within their respective communities. On the other hand, 68% were not active in any sporting activities. Youth networking was lukewarm since 46% were not active and 44% were active in youth empowerment programmes, so was participation in community-ased organisations (CBOs) as

revealed by a 44% no and a 45% yes response. On the other hand, 77% was inactive in micro-finance programmes in their respective wards. Lastly, 83% of the respondents were not active in any rural development programmes within their wards.

Table 1: *Level of Networking in Chimanimani District*

I am an active member in the following development organisation

Perception		Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1.	School Development Committee	31	35	4	14	16
2.	Village Development Committee	31	35	3	13	18
3.	Ward Development Committee	33	30	8	16	13
4.	Other Development Association (Specify)	30	26	15	15	14
5.	Professional Association	36	25	7	16	16
6.	My Church	7	10	6	24	53
7.	Business Association/Farmers' Club	25	23	6	24	22
8.	Political Group	38	23	4	20	15
9.	Cultural Group	31	26	12	18	13
10.	Burial Society	30	26	12	18	14
11.	Sports Association	25	27	11	19	18
12.	Youth Development Group	25	21	10	25	19
13.	Community-Based Organisation	22	22	11	26	19
14.	Non-Governmental Organisation	14	26	10	18	32
15.	Micro Finance Club	35	33	9	10	13
16.	Other (Specify)	34	30	19	6	11

Proportion of respondents (n = 220)

Basing on educational backgrounds, there was a significant difference among wards on the perception "I am an active member of the Ward Development Committee" ($p<0.001$). The mean rank for females was lower. On the "I am an active member in a political group" ($p<0.05$), the mean rank for males was significantly higher. Significant difference was also detected on the view that "I am an active member of a cultural group" ($p<0.05$). On the perception "I am an active member of a burial society ($p<0.001$)", he mean rank for male respondents was higher. There was significance difference on the perception

"I am an active member of a burial society" ($p<0.001$), with males having a significantly higher mean rank.

There was also significance difference on "I am an active member of a micro finance club" ($p<0.05$). Lastly, basing on educational achievements, there was significance difference on the view that "I am an active member of other associations not specified ($p<0.05$), with males having a significantly higher mean rank. However, basing on the duration of stay in a respective ward, a significant difference was detected on the perception "I am an active member of a professional association" ($p<0.05$). Males had a higher mean rank. However, females had a significantly higher mean rank on the view "I am an active member of my church" ($p<0.05$).

DISCUSSION

A study in the US by Moser and Pike (2015) reveals that municipal and county staff, and community organisations, find public support as one of the greatest barriers they face. However, in this study, the local government, council and other development stakeholders fail to make most of the existing and on-going social networks. This appears to be the root cause of the current human factor decay. While legal statutes such as the Rural District Councils Act, the Traditional Leaders Act, and many others provide, in black and white, a conducive platform for productive networking, the local government officials and other development partners are failing to capitalise on this.

The Zimbabwean local government was decentralised with the aim of ensuring that people at the grassroots level network and bring development within their local communities. Stewart *et al.* (1994) argue that decentralisation was adopted through a Prime Minister's Directive on Decentralisation (1984 and 1985). Decentralisation promotes democracy, increase efficiency and effective service delivery by reducing the role of central government in local service provision and management (Government of Zimbabwe, 2002). However, the term 'directive' makes the noble idea problematic in that it implies non-participation of citizens.

The Traditional Leaders Act (Chapter 29:17) of 1996 provides the Village Assembly and the Ward Assembly as neutral platforms (*matare*), where the

whole village is led by the village head (*sabhuku*) and headman (*sadunhu*), respectively. The *dare/matare* concept is one African philosophy that provided a platform for all to come together and discuss issues of mutual concern, share information, sorrows and joys. This worked at family, community and judiciary level (Marango, 2011). Traditionally, traditional leaders are supposed to be neutral. The Constitution of Zimbabwe (Amendment No. 20) of 2013, section 281 subsection (1) (c) uplifts this principle as quoted, "Traditional leaders must treat all persons within their areas equally and fairly". However, discussions with citizens revealed that these platforms were being overwhelmed by party politics since traditional leaders are now appointed by the Minister of Local Government. This rendered the apolitical platform political.

Traditionally, these platforms took care of all concerns of the citizens of respective communities, be it religious, social, economic or political. The Traditional Leaders Act attempted to create platforms that resembled the traditional *matare* with a globalised 'flavour'. Marango (2011) argues that Afrocentricity is anchored on the *matare* principle. The *dare* concept is a human factor ideal and a *sine qua non* for rural development. The Rural District Councils Act (Chapter 29:13) also provides platforms for experts who can lead rural development from the grassroots level to the district level. These are the Village Development Committee (VIDCO), Ward Development Committee (WADCO) and the Rural District Development Committee (RDDC).

The results, however, revealed that people only networked effectively at church level. This is despite the presence of various networking platforms. This could be so because churches are still under little national and local political influence. Church still thrives through contributions by the local people, rather than the government or non-governmental organisations whose support comes with conditions. As a result, other platforms have been invaded by party politics. Even the traditional leaders have become partisan. This is so because they are paid allowances and these allowances are not banked into their accounts but directly handed to the leaders by officials from the District Administrators' Offices. As such, it is easy to manipulate the esteemed and revered traditional leaders. From the late 1990s to date, when opposition

parties became very influential, local government has been run through directives. As alluded to above, there were allegations that appointments of staff were being corruptly done on political grounds rather than on merit. If true, this is absolute violation of section 9 of the Zimbabwe Constitution (Amendment No. 20) of 2013, i.e. good governance.

This section encourages adoption and implementation of policies and legislation to develop efficiency, competence, accountability, transparency and personal integrity. This is done through appointments to public offices primarily on the basis of meritocracy. Zimbabwe Institute (2005) observes how the Ministry of Local Government, Public Works and National Housing increasingly developed a controlling and directive rather than a facilitatory one. Chatiza (2010) argues that, that is due to fear of susceptibility to capture by opposition forces that has resulted in the ruling party, the Zimbabwe African National Union Patriotic Front (ZANU-PF) to silently limit local government powers. This has, however, grossly impacted negatively on social networking for effective service delivery.

Olowu and Wunch (1993) also note that politics in most post-independence African countries, Zimbabwe included, was characterised by development stagnation, decline in rural welfare, intensified ethnic conflicts, civil wars and many civilian regimes falling to military despotisms or rule as narrow oligarchies. Jonga and Chirisa (2009) argue that party politics adds confusion in the platforms of the apolitical and neutral role of local government. In fact, interference by the local government minister in councils' affairs, through use of directives, is an indication of a propensity to re-centralise. Centralisation is a globalised philosophy which does not consider citizens as knowledgeable people who have capacity to lead their own development but, instead, treat them as *tabla rasas* (Marango, Francis and Adjibolosso, 2016).

Jonga and Chirisa (2009) cite examples of the year 2000 when legally elected urban council mayors of Mutare, Harare and Chitungwiza, among others, were fired by the Minister for Local Government using the directives method. These were replaced by imposed District and Provincial Administrators, civil servants who reported directly to central government. Another example of a directive is the June 2006 takeover of water and sewer by the Zimbabwe

National Water Authority (ZINWA) through a ministerial directive. Directives are the tool used by central government to meddle in issues of a local nature (*ibid.*). All these examples are a demonstration of failure to use the African vitality of the *dare* philosophy where transparency and group decision-making is key.

Churches in Zimbabwe, on the contrary, to a larger extent, use local approaches in administration. This has led them to successfully maintaining high human factor in the form of social networks. Use of local culture to influence development is a vehicle for rural development. Churches use the *matare* concept. There are *matare* for men, youths and women in all local churches in Chimanimani in which concerns of these various categories are dealt with. This is *sankofaism* used by churches in an intelligent way. And, of course, there is nothing wrong with going-back-for-it. Going back to tradition using modern technology, e.g. social media, internet and public media to share information, is the right way to go. This ensures citizen participation.

There is potential for Zimbabwe to become an economic giant, provided enough social networks are fostered as evident from the results that there is potential for networking among business people and communities, farmers and visa-versa. Failure to take advantage of the ongoing networking is a recipe for development regression. Adjibolosso (2013) observes that while the attainment of political independence in Africa raised a ray of hope and aspirations among citizens of political emancipation, socio-economic growth and civil liberties, these are being shattered by current realities. There is no investment in communication and social networks for development.

Marango (2011) affirms that resources were availed from the donor community, non-governmental organisations (NGOs) and governments, but regardless of this reality, African economies remained stagnant for a little while (Marango, Francis and Adjibolosso, 2016). Recently, some have entered a phase of regression (Marango, 2011). This implies that financial resources without requisite investment in good communication, good governance and, above all, proper social network, is not eventful. Chimanimani District, for example, is a very rich district. Vhudzijena (1999) confirms this reality, but is quick to rank it the poorest in terms of the people's livelihoods. This is

affirmed by ZimVac (2015) that there are various development challenges in the district. This paradox, therefore, can be unlocked only by investment in social capital, a human factor component.

CONCLUSION AND RECOMMENDATIONS

With the current levels of human factor decay in local government, rural development remains a pipedream. There is need to invest in networking. Local government and specific councils should play a leading role in facilitating networking among various development partners to foster good governance. Good governance is an ingredient for rural development. The parent ministry of local government should foster good governance in councils, rather than be a player and referee at the same time. Good statutes are as good as having none as long as the calibre of executives is non-visionary.

There is need for institutional leaders with enough human abilities. Human abilities constitute the power or capacity of an individual to competently undertake projects or effectively perform tasks requiring mental and physical effort. To lack human abilities is to be bankrupt of those qualities required to be effective leaders. Organisational leaders hand-picked on political affiliations lines, rather than merit, are one of the recipes for the current severe human factor decay. Zimbabwe needs type 1 leaders (see Adjibolosso, 2014). They are honest, selfless, serviceable servants and principle-centred. They put the last first in the process of development (Chambers, 1994). Such leaders take rural development to its rightful people.

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The Impact of the Russia-Ukraine Conflict on Farmer Input Supply in Small-ccale Maize Production in Mashonaland East Province Zimbabwe

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Abstract

The conflict between Russia and Ukraine created economic impacts felt across the whole world and has high potential to derail the economic outlook for Zimbabwe among many other countries that heavily depend on imports. Starting in early 2022, fertiliser prices rose almost 30% due to the Russian invasion of Ukraine. In this study, the effect of the Russia-Ukraine conflict on the cost of maize inputs, maize productivity and profitability of maize production was evaluated in Chikomba District, located within Mashonaland East Province for the 2021-2022 and 2022-2023 maize growing seasons. Simple random sampling was used to obtain a sample size of 385 participants derived from the conversion of a standard deviation of 0.5 at a 95% confidence level into a z-score. Questionnaires were used to obtain primary data from the participants. Benefit cost ratio (BCR) and gross margin budget analysis were used to evaluate the profitability of maize production. Out of the five explanatory variables that had a significant impact on maize productivity, AN use had the most significant effect in both seasons, 2021/22 and 2022/23, with (B=0.575, p=0.025) and (B=0544, p=0.025), respectively. Given that the Russia-Ukraine conflict period was characterised by exorbitant AN price increases that reduced affordability by many smallholder farmers across Zimbabwe, it therefore, means that the conflict has had a negative impact on maize productivity by farmers. This is due to the use of a lower fertiliser rate in response to the 57% and 71% price hike in basal and top-dressing fertiliser, respectively, lowering the yield/productivity of maize, meaning that there will be less maize to sell for covering costs and making a profit. The reduction in input levels lowered both the cost of production and the potential yield that could be produced for the market. There is need for further study aimed at

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developing solutions that enhance the farmers' resilience to the effects of conflict on input prices, productivity and profitability of maize production.

Key words: *productivity, profitability, smallholder farmer*

INTRODUCTION

Maize is Zimbabwe's staple crop with approximately 2.1 million metric tonnes (t) required for the nation to be food secure. Unfavourable macroeconomic conditions and recurrent droughts have made it difficult for Zimbabwe to meet this target, compelling the government to import maize from neighbouring countries (Dugbazah *et al.*, 2022). Maize production, productivity and profitability are crucial for food insecurity alleviation both at household and national level. In the recent past, a lot of factors have negatively affected maize productivity and profitability. Notable changes in the agrarian sector, macroeconomic challenges and climate variability are some of the problems that are blamed for the poor performance of the Zimbabwean agricultural sector, specifically maize (Bhasera, 2015). Maize ranks first in terms of the number of producers, area grown and total cereal production in Zimbabwe. Maize is the staple food crop of the nation and is also an important cash crop. About 64%of Grain Marketing Board (GMB) maize sales is used for human consumption, 22%as livestock and poultry feed and 14% for industrial purposes (Dugbazar *et al.*, 2022). For a standard maize producer, the cost of inputs is broken down as follows; seed (6.58%), fertiliser and lime (55.04%), herbicides (9.17%), insecticides (0.18%), labour (5.26%), tractor hires (14.91%) and harvesting with combine (11.05%) (SEEDCO, 2018). Maize production and its profitability in Zimbabwe is dependent largely on the cost and availability of fertiliser (55.04%), regardless of the sub sector (Mail, 2022). The conflict between Russia and Ukraine created economic impacts felt across the whole world and has high potential to derail the economic outlook for Zimbabwe aand many other countries that depend heavily on imports (*ibid.*). Starting in early 2022, fertiliser prices rose almost 30% due to the Russian invasion of Ukraine (Nduva *et al.*, 2022).

In January this year, fertilisers constituted 11, 8%or US$74.57 million of the country's import bill of US$632 million (*ibid.*). Russia is the second largest producer of ammonia after China, while Ukraine is ranked 18th based on production statistics for 2020 and the war is going to contract supply of ammonia and hence cause a spike in its prices. On the other hand, Zimbabwe is a net importer of ammonia, especially since the closure of the electrolysis plant at Sable Chemicals in Kwekwe (Paul, 2022). Other fertiliser dealers in

Zimbabwe import finished fertilisers from different parts of the world and the conflict has disrupted the commodity's value chains (*ibid.*).

Russia, which is contending with Western sanctions due to its invasion of Ukraine, produces large quantities of key chemicals used in the production of fertilisers. It also supplies much of the natural gas used to produce ammonia, a major component of nitrogen fertilisers (*ibid.*). As a result, the price of fertiliser went up by 55% in the last round of price increases, piling pressure on local farmers and food producers who are battling huge increases in operational costs (*ibid.*). Fertiliser sold in formal shops was costing between ZWL$25 000 and ZWL28 600 a 50-kg bag as of the 2022 agricultural season, while others demanding US dollars were charging between US$68 and US$78 a bag. Hikes in the price of fertiliser meant that production costs world increase against normally depressed producer prices. Grower viability is heavily compromised. Productivity will also be compromised as farmers may try to stretch the little as they must cover wide areas. Additionally, the cost of chemicals has gone up by 20%, diesel 35%, and labour up by 45% in US dollar terms, apart from the 55% increase in the price of fertiliser (*ibid.*).

LITERATURE REVIEW

Conflicts have two main effects on the cost of producing goods and services. First, shocks brought on by armed conflict disrupt markets and restrict trade (Arias *et al.*, 2019). Armed conflicts, terrorist attacks, looting, or general damage destroys public and private capital, assets and resources, reducing the productive potential of businesses and people (*ibid.*). Attacks on the civilian population result in kidnappings, murders and other forms of mortal injury that degrade or destroy human capital. Conflicts directly affect market efficiency as well (*ibid.*). Prices rise and network sizes decrease due to a decline in the supply of commodities and greater transaction costs.

THE EFFECTS OF THE RUSSIA-UKRAINE CONFLICT ON THE PROFITABILITY OF MAIZE PRODUCTION

Farmers and agricultural officials have struggled with the instability of smallholder farmers' income in emerging nations because of variable farm prices over the years (Emmanuel, 2020). The Russia-Ukraine conflict, directly affecting African countries, particularly the farmers who depend on agricultural inputs from these nations, poses a serious threat to the global economy at a time when farmers are still struggling to recover from the socio-economic effects of the Covid-19 pandemic (Agroforestry, 2022). Even outside of the continent where the war is being fought, numerous countries have been impacted by Russia's war on Ukraine. (*ibid.*).

The cost of goods has altered. Food costs are being driven up by the conflict, making agricultural supplies scarce for farmers. Compared to the cost before the conflict, goods and services are now very expensive (*ibid.*). Russia is one of the largest producers of fuel oil in the world; but, since the war, there has been a decline in fuel oil imports, leading to an increase in the cost of gasoline in the nation. As a result, farmers now pay more for transportation which lowers their earnings (*ibid.*). Few smallholder farmers can afford the rising costs of items because of the knock-on effects (*ibid.*). In January this year, fertilisers constituted 11.8%or US$74.57 million of the country's import bill of US$632 million (Mail, 2022). Russia is the second largest producer of ammonia after China, while Ukraine is ranked 18th based on production statistics for 2020 and the war is going to contract supply of ammonia and hence cause a spike in its prices. On the other hand, Zimbabwe is a net importer of ammonia, especially since the closure of the electrolysis plant at Sable Chemicals in Kwekwe (Paul, 2022). Other fertiliser dealers in Zimbabwe import finished fertilisers from different parts of the world and the conflict has disrupted the commodity's value chains (*ibid.*).

HOW CONFLICT AFFECTS LAND USE: A CASE AGRICULTURAL ACTIVITY IN AREAS SEIZED BY THE ISLAMIC STATE (IS)

Socio-economic shocks, technogenic catastrophes and armed conflicts often have drastic impacts on local and regional food security through disruption of agricultural production and food trade, reduced investments, and deterioration of land and infrastructure (Eklund *et al.*, 2017). The study noted that there were differences in the effects to land use between IS controlled areas and non-IS areas. It was discovered that signs of land abandonment in the IS zones were 7% of what had been cropland during the reference period (2000-2013) had changed to fallow/bare soil in 2015 (*ibid.*). This is only slightly more than land abandonment outside the IS zones, in that only 5% of the cropland was converted to fallow/bare soil (*ibid.*). A special report from Reuters stated that many farmers in the IS zones of Iraq had not planted any seeds for the 2015 season due to land access problems, fertiliser and fuel shortages, and uncertainty of getting their crop bought by the new 'government' (Fick, 2015). Non-IS zones saw a much larger relative change, where 52% of the high intensity cropland changed from having two to only one harvest. This indicates that farmers in both Iraq and Syria were having problems maintaining high intensity agriculture, but that farmers inside the IS zones were maintaining high-intensity agriculture to a wider extent. The results of the study showed that 63% of the high-intensity agriculture was maintained in IS areas (compared to 40% in non-IS areas). This may be because the IS has forced landowners to keep cultivating the land to control food production

(*ibid.*). This is similar to a move taken by the government of Iraqi during a period of international trade sanctions in the 1990s, when it forced farmers to increase the cropland extent to compensate for the government's inability to import food and fertiliser (*ibid.*).

RUSSIA-UKRAINE WAR: GLOBAL IMPACT ON LOGISTICS

The Russia-Ukraine conflict has affected the global logistics market at every level (Blogs, 2022). The effects of the COVID-19 pandemic on warehouse capacity and container availability had just started fading when the Russia-Ukraine war started impacting the industry. The war impeded the flow of goods, fuelled cost increases and product shortages, and created catastrophic food shortages around the globe. Russia has been destroying Ukraine's agricultural infrastructure, thereby disrupting the entire supply chain (iibid.). The Black Sea and Azov Sea had been blocked by Russia, and the Ukrainian grain shipments were hijacked in the early months of the attack. However, in July, Russia and Ukraine signed a United Nations (UN) deal to allow Ukrainian grain exports from three Black Sea ports to ease shortages. Despite the deal, Russia attacked Odesa's seaport with cruise missiles hours after signing the deal. The uncertainty has had a snowball effect on supply chains across the globe (*ibid.*).

FOOD SUPPLY SHORTAGE AND RISE IN PRICES

In Europe, natural gas prices rose by around 120-130% in the six months since the start of the war, while coal prices rose by 95-97% during the same period. The prices of soybean, corn and crude oil – of which Russia is the leading producer – have been increasing ever since the attack (*ibid).* The cost of fertilisers, mainly for crops and animal feed, was already high due to increased demand during the pandemic. Similarly, the household stockpiling of several products led to a shortage and the recently created shipment crisis deepened it. Russia and Ukraine are major suppliers of fertiliser and the land destruction and commercial constraints due to the war have brought a major export concern for fertilisers and, in turn, food and grains (*bid.*).

RISE IN OIL AND GAS PRICES

The surging oil and gas prices, coupled with the geopolitical risks arising from the conflict, are bound to cripple global supply chains, especially in the energy-intensive logistics sectors. The Black Sea ports, along with several other routes, has become non-operational following the war, cutting off the supply of several products and commodities, including transport equipment, machinery, electronics, metals, chemicals, fertilisers and food products (*ibid.*). The European Union has also been struggling with the availability of these

energy sources, and the sharp surge in prices. The EU imports a significant share of energy from Russia. It also depends on Russia for 35% of its natural gas imports, around 20% of crude oil imports and 40% of coal imports. The rise in oil and gas prices has a crippling global effect. Organisations involved in supply chain operations need to take active measures to mitigate risks and soften the blow of rising prices and energy shortages (*ibid.*).

PORT CONGESTION, CONTAINER SHORTAGE, AND SURCHARGES

Several ports shut down due to the war, leading to a rise in ocean shipping costs (*ibid.*). Ships had to be re-routed causing congestion and leading to delays in cargo flows that worsened the global supply chain condition. In addition to this, sanctions and restrictions led to a shift from rail transport to ocean transport, creating more pressure and resulting in deeper container scarcity. This led to steep price increases for many essential goods, like grains, shooting up by around 60% between February and May 2022.

CONTAINER SHORTAGE

Average container prices continue to soar. The conflict has led to a massive increase in one-way pickup rates in India amid container shortages, wreaking major havoc on the peak shipping season. A stream of cancelled orders and delayed shipments have led to port congestion in the U.S (*ibid.*). Cargo is being moved away from the U.S. West Coast and there is an increase in container vessels anchored at Savannah and Houston. Because of U.S. port congestion, ocean carriers are cancelling shipments and sailings, leading to significant productivity issues at the ports. On the East and Gulf Coasts, container delivery volume is high and is pushing the prices up. The increase of containers on the East Coast is benefiting the warehouse sector, leading to fast-increasing warehousing costs. In August 2022, the prices were up by around 8% since January (*ibid.*).

However, the container volume in China is down. Manufacturing orders are being cancelled, resulting in a decrease in container bookings (*ibid.*). Also, several new projects are being launched to help provide some relief in the logistics sector. In July 2022, Fuzhou, the capital of east China's Fujian Province, launched its 9 900-kilometre China-Europe long freight train named 'Mindu.' The train is expected to take 20 days less than the sea route (*ibid.*).

RESEARCH METHODOLOGY

Mashonaland East Province was the site of the research. It measures a total of 32 230 km² with a total population of 1.35 million and is one of the largest

maize-growing provinces in Zimbabwe (City-facts, 2022). It has a combination of favourable climate, rich soils and the greater part of the province lies in natural region 2A and 2B where intensive farming takes place. The rainfall ranges from 750-1000 mm per annum and the temperature averages 25-30^{0}C (*ibid.*). Livestock and vast and intense crop production make up much of the economy of Mashonaland East Province. This region is used for the cultivation of tobacco and cereal crops like maize, sorghum and finger millet, and legumes like common beans, sweet potatoes, Irish potatoes, round nuts, and groundnuts. Across all tenure systems, maize is the most widely produced cash and cereal crop in the province (*ibid.*).

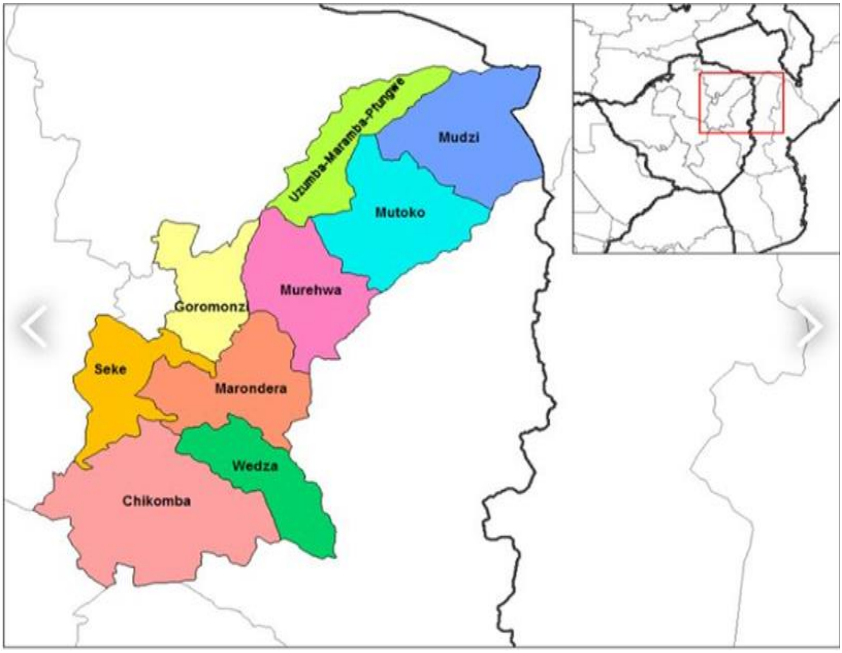

Figure 1: *Mashonaland East Province*

SAMPLING PROCEDURE

From Mashonaland East, 30% of the nine districts were selected and this translates to at least three wards in each district. Simple random sampling was used in this study to choose study respondents. Simple random sampling was done, using the maize farmer record received from the provincial Agritex officer to minimise bias and guarantee that every maize farmer participating in

the study had an equal chance of being chosen. A sample size of 385 smallholders was used. Both primary and secondary data were used in this research to meet the study's objectives.

ANALYTICAL TOOLS

The first objective of the study was to determine the effect of the Russia-Ukraine conflict on productivity of maize production in Zimbabwe. Maize productivity in the study is the measure of the total number of 50-kg maize bags produced per hectare by a farmer. To test for maize productivity variance during the Russia-Ukraine conflict period, the research adopted an econometric Cobb Douglas production function shown below from the study by (Dube and Guveya, 2013).

$$Maize = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 X_1} + \boldsymbol{\beta_2 X_2} + \boldsymbol{\beta_3 X_3} + \boldsymbol{\beta_4 X_4} + \boldsymbol{\beta_5 X_5} + \boldsymbol{\beta_6 X_6} + \boldsymbol{\beta_7 X_7} + \boldsymbol{\beta_8 X_8} + \boldsymbol{\beta_9 X_9} + \boldsymbol{\beta_{10} X_{10}} + \boldsymbol{\beta_{11} X_{11}} + \boldsymbol{\beta_{12} X_{12}} + \boldsymbol{\varepsilon}$$

where maize is the total quantity of maize of 50-kg bags from each hectare during the Russia-Ukraine conflict period, RK represents the dummy variable that is Russia-Conflict and X is vector representing farmer characteristics. The vector of characteristics includes gender, age, experience, maize variety, credit access, extension contact, Pesticides Control in 2021/22 season, Cultural Pest Control in 2021/22, Pesticide Control in 2022/23, Pest Cultural Control in 2022/23, Weed Cultural Control 2021/22, Weeds Cultural Control 2022/2023, Compound D Use 2021/22, AN Use 2021/2022, Compound D Use 2022/23, and AN Use 2022/23.

THE EFFECT OF THE RUSSIA-UKRAINE CONFLICT ON THE PROFITABILITY OF MAIZE PRODUCTION.

The last objective of the study was to determine the effect of the Russia-Ukraine conflict on the profitability of maize production in Zimbabwe. Gross margin (GM) analysis, a method for evaluating an enterprise's viability, was used. Like other investment analyses, GM is static and does not account for time value of money. Nonetheless, there are certain benefits to using GM as an analytical tool, such as its capacity to provide sensible alternatives for an organisation's operating structure. Data on variable expenses and revenue was used by GM. GM was obtained by subtracting the Total Variable Costs (TVC) of maize for all the farmers from the Total Revenue (TR) of produce of all the farmers as shown below. Fertiliser, herbicides, salaries and fuel

expenditures are examples of variable costs. Total output per hectare was multiplied by price per kilogram to determine Total Revenue (TR). The following equation was used to do GM budget analysis:

GM = TR – TC

where: GM = Gross margin, TR = Total revenue and TVC = Total variable cost

If the GM is positive, it means maize production during the Russia-Ukraine conflict (2021/23 and 2022/23 season) was profitable. The choice rule for the GM analysis is to select a harvesting method whose GM is higher, relative to the other method. The study also used the Return per Dollar Invested (RDI) and break-even price to measure profitability of maize production during the Russia-Ukraine conflict (2021/23 and 2022/23 season). A return per dollar above USD1.5 is usually considered as a basic guideline with regard to the return per dollar as a measure of the financial viability and sustainability of a project (Mahoo, 2011). ROI= Profit/Cost of Investment and break-even price was obtained by calculating (Total fixed costs/Production unit volume) + Variable Cost per unit. Also, a harvesting technique with a significantly better return on investment is thought to be more practical and sustainable. Chagwiza *et al.* (2008) claim that calculating the GM is a crucial stage in budgeting for and planning a farm. GM is not a good indicator of profitability, although Johnsen (2003) found that it is the most acceptable indicator at farm level. One may immediately evaluate the profitability and viability of similar businesses using GM. In this study, the financial viability of tea production using the two harvesting techniques of hand and machine was evaluated using GM analysis. According to Orr (2008), the use of GM clearly identifies the areas that require improvement, and that GM analysis is crucial. To increase profits, one can quickly determine what must be improved.

RESULTS

The first objective of the study sought to determine the effect of the Russia-Ukraine conflict on the productivity of maize production in Zimbabwe. The researcher performed a Classical Multiple Linear Regression Model (CLRM) analysis. The results of the analysis are presented in Table 1 below.

Table 1: *Testing for Independence of Residuals* (Research Data and SPSS Results, 2023)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.852[a]	.810	.58	3.382	2.185

The test for independence of residuals is shown in Table 1, where the researcher computed the Durbin Watson test. A Durbin Watson statistic value of 2.185, which is suggestive that error terms (μ) generated by the Classical Linear Regression Model (CLRM) are free of auto-correlation though there is some form of negative correlation. Nevertheless, in this regard, the researcher adopted the general rule of the thumb by E-views (1997) which stipulates that a Durbin Watson test is considered to have no auto-correlation when it lies between 1.5 and 2.5. This, therefore, means the first assumption has been met.

Table 2: *Model Goodness of Fit - The ANOVA Table* (Research Data and SPSS Results, 2023)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	87.052	13	6.696	14.586	.000[b]
	Residual	983.388	371	11.435		
	Total	1070.440	384			

Table 2 results show that the explanatory variables included in the Classical Linear Regression Model (CLRM) have a collective statistical significance effect (F=14.586, p=0.000) on maize productivity in Zimbabwe. This means that the independent variables are jointly statistically significant in determining maize productivity (Table 2). The R-Square show that 81% of the variation in maize productivity is explained by the model explanatory variables representing the Russia-Ukraine conflict.

Table 3: *Classical Linear Regression Model results on Maize Productivity* **(**Research Data and SPSS Results, 2023)

Model		**Unstandardised Coefficients**		**Standardised Coefficients**	T	Sig.
		B	**Std. Error**	**Beta**		
1	(Constant)	33.663	6.802		4.949	.000
	Gender	.121	.982	.018	.123	.902
	Age	.023	.026	.128	.886	.378
	Maize Varieties	.393	.673	.067	.585	.560
	Experience	.157	.113	.112	1.42	.160
	Credit Access	.491	.135	.182	2.306	.049**
	Extension Contact	.033	.152	.181	.217	.829
	Pesticides Control 2021/22	.352	2.594	.053	.136	.892
	Cultural Pest Control	.327	2.680	.049	.122	.903
	Pesticide Control 2022/23	.241	3.643	.032	2.066	.047**
	Pest Cultural Control 2022/23	1.790	3.710	.234	.482	.631
	Weed Cultural Control 2021-2022	.723	.728	.110	.993	.323
	Weeds Cultural Control 2021/2022	1.064	.966	.130	1.101	.274
	Fertiliser Use Compound D Use 2021/22	.664	.691	.105	.960	.340
	AN Use 2021/2022	.575	.761	.085	2.755	.025**
	Compound D Use 2022/23	.432	.810	.011	2.102	.019**
	AN Use 2022/23	.544	.842	.073	1.646	.025**

Dependent Variable: YIELD (BAGS/Ha) Key, *, ** denotes 1%, 5%, level of significance respectively

Table 3 shows the explanatory variable coefficients together with the p-values used to determine whether an explanatory variable is statistically significant or not. The model results show that four variables; that is, credit access (t=2.306, p=0.049), pesticide use (2022/23) (t=0.066, p=0.047), AN use (2021/22) (t=0.755, p=0.025), Compound D use (2022/23) (t=0.105, p=0.019), and AN use in (2022/23) (t=0.646, p=0.025), were statistically significant in explaining the variation in maize productivity in Zimbabwe during the time of the Russia-Ukraine conflict. From the results of the study shown in Table 3, it

can be noted that the beta values are 0.491, 0.241, 0.575, 0.432, and 0.544 for credit access, pesticides control during 2022/23 season, AN use during 2021/22 season, compound D use in 2022/23 season, and AN use in 2022/23, respectively. The 0.491 coefficient for credit access implies that when all other variables are held constant, an increase in access to credit by a unit, leads to an increase in maize productivity per hectare by about 0.491 bags, implying a positive effect of credit on maize productivity.

Secondly, all other explanatory variables being constant, when farmer increases pesticide control as in 2021/22 season, maize productivity per hectare also increase by 0.241 bags per hectare. This also implies that more pesticide should be availed and affordable to all smallholder farmers in the Russia-Ukraine conflict period to increase maize productivity given that farmers who had used pesticide control method had higher maize productivity levels. Additionally, AN use also acted to have a statistically significant effect on maize productivity, with holding all other explanatory variables constant. Increasing AN use by farmers in 2021/22 season by one unit would force maize productivity to increase by 0.575 bags per hectare. This was due to fact that AN use for top-dressing the maize crop was an important parameter for productivity. With an increase in AN used for maize production, farmers could attain higher productivity levels. This also implies that farmers who used more AN for top-dressing had high productivity levels compared to those who used small amounts or none.

The positive coefficient of 0.432 shows that increasing compound D use on maize production led to increase productivity per hectare. This also implies that during the Russia-Ukraine conflict farming season of 2022/23, farmers should have used more compound D to increase maize productivity. It also means farmers who used greater compound D had higher maize productivity levels. Lastly, AN use in 2022/23 season also appeared to have a statistically significant effect on maize productivity ($t=0.646$, $p=0.025$). Basing on the coefficient, holding all other explanatory variables constant, increasing AN use by farmers by one unit would force maize productivity to also increase by 0.5544 bags.

RESULTS ON THE IMPACT OF RUSSIA-UKRAINE CONFLICT ON SMALLHOLDER MAIZE PROFITABILITY.

The last objective of the research was hinged o determining the effect of the Russia-Ukraine conflict on the profitability of maize production in Zimbabwe. The researcher used a point-bisection correlation analysis in SPSS v.22. The results of correlation analysis are presented in Table 4 below.

Table 4: *Pearson's Point-Bisection Correlation between Russia-Ukraine and Profitability* (Research Data and SPSS Results, 2023)

		Russia-Ukraine	Profitability
Russia-Ukraine	Pearson Correlation	1	-.16
	Sig. (2-tailed)		.242
	N	385	385
Profitability	Pearson Correlation	-.16	1
	Sig. (2-tailed)	.242	
	N	385	385

**. Correlation is significant at the 0.05 level (2-tailed).

Table 4 shows Correlation analysis of -0.016 between Russia-Ukraine and profitability associated with a (p-value of 0.242). These results show that the relationship between the Russia-Ukraine and profitability was statistically insignificant (r=-0.16, p=0.242). Based on the correlation analysis results, the researcher used GM analysis and sample paired t-test to determine the effect of Russia-Ukraine conflict profitability. GM was obtained by subtracting the total variable costs (seeds, fertilisers, pesticides, labour and marketing) associated with maize production from total revenue for producing maize per hectare for all the farmers included in the study.

Table 5: *Gross Margin per hectare for Smallholder Maize Farmers (N=385)* (Research Data and SPSS Results, 2023)

Farming Season	GM/Ha	Return per $ investment (ROI)	Breakeven price ($/bag)
2021/22	USD$214.00	US$0.47	US$11.00
2022/23	US$107.00	US$0.27	US$13.00
Method	Df	Value	Probability
T-test	383	0.992	0.193

The findings show that maize production during both the 2021/22 and 2022/23 seasons, was profitable with positive average GMs per hectare of $214.00 and $107.00, respectively. However, sample t-test results confirmed that there was an insignificant difference in profits obtained during the 2021/21 and 2022/23 seasons as indicated by the p-value of 0.193 and t-value of 0.992 at 5% level of significance. These results mean that maize production during the 2022/23 season made comparablly lower profits than the 2021/22 season. This was also assessed by Return per Dollar Investment (RDI) as shown in Table 5 above 0.47 and 0.27 for 2021/22 and 2022/23, respectively. The RDI findings confirm a decrease in return per dollar invested, meaning that there is a drastic increase in prices of the variable inputs, while holding other factors at constant during the Russia-Ukraine season. The RDI findings are also supported by the inverse relationship in break-even price per 50kg bag of maize shown in the Table 5 of $11.00 and $13 for 2012/22 and 2022/23 seasons, respectively.

Therefore, these results mean that maize production in Zimbabwe need to adopt an effective pricing system to enable farmers enjoy a better profit position while covering all costs associated with production. This also means increasing prices associated with producing a tonne of maize.

DISCUSSION

The Russia-Ukraine Ukraine onflict has had a noticeable effect on the supply chain of agricultural inputs. Due to the limitations of the researcher to make direct observations of real-time changes and effects in the supply chain dynamics, indirect observations were made and conclusions inferred from the data and results on the change in input costs. From this, it was observed that the cost of basal fertiliser (Compound D), top dressing (AN) and maize seed (25kg), rose by 57%, 71% and 26%, respectively. This is due to the closure of ports in Ukraine and Russian products being sanctioned by the EU from using certain trade routes that resulted in the cancellation of orders and delay in shipments and congestion (Blogs, 2022). Due to the supply chain interruptions, there are now more expensive shipping costs, fewer available containers and less warehouse space (*ibid.*).

The agricultural infrastructure in Ukraine has been destroyed and the entire supply chain disrupted by Russia. Russia had closed the Black Sea and Azov Sea, and in the early months of the assault, grain shipments from Ukraine were commandeered. To alleviate shortages, Russia and Ukraine struck a United Nations (UN) agreement in July to allow Ukrainian grain shipments from three Black Sea ports. Several hours after the agreement was made,

Russia launched a cruise missile attack on the port of Odesa. Worldwide supply networks have become more and more strained because of the uncertainty (*ibid.*). The crisis between Russia and Ukraine has had a profound impact on the world logistics sector. When the Russia-Ukraine war began to influence the sector, the impacts of the epidemic on storage capacity and container availability had just begun to fade. The conflict slowed down trade, fuelled price hikes and commodity shortages, and led to disastrous food shortages across the world.

The steep increase in prices of maize inputs is a cumulative result of the disruptions that the Russia-Ukraine conflict has caused. Following the war, the Black Sea ports and several other channels ceased to be active, cutting off the supply of a number of goods and commodities, including transport machinery, electronics, metals, chemicals, fertilisers, and food items (*ibid.*).

The first objective of the study sought to determine the effect of the Russia-Ukraine conflict on the productivity of maize production in Zimbabwe. The yield dropped by 25% despite the increase in cultural weed and pest control by 25% and 15%, respectively. The drop-in yield is due to firstly the reduction in fertiliser use in the field, because the synthetic inorganic fertilisers are specific, have high rates of N, P and K, and are fast acting within a period of seven days depending on the intensity the sun (Kong *et al.*, 2022). The composition by mass of a 50-kg basal fertiliser bag (compound D) is 7% N :14% P: 7% K compared to cow manure with NPK values of 0.73%, 0.48% and 0.55%, respectively (SEEDCO, 2018). The composition by mass of a 50-kg bag of top dressing (AN) is 34.5% N compared to 2.40% N and 1.0% N of rabbit and chicken manure, respectively (*ibid.*). This astronomical difference in macronutrient concentration, coupled with high specificity and rate of reaction results in a drastic reduction in yield/productivity of maize when the fertiliser application rate/Ha is reduced. Animal manure is characterised mostly by a high carbon-nitrogen ratio, because most livestock are grazers, topped off by the fact that there is little use of concentrated animal feed by smallholder farmers due to financial constraints. When the microbes start breaking down the manure with a high carbon-nitrogen ratio, they first absorb the nitrogen available in the manure and use it to synthesise proteins for breaking down the manure and then release the nitrogen after they die. The nutrients may then be released well after the time the crop needed it, resulting

in a delayed and retarded crop response to the nutrients, leading to lower yields with manure. Manure is, therefore, ideal for soil amelioration (acidity and structure) and not as a primary source of nutrients (*ibid.*). Table 3 shows the effect of different fertiliser application rates on the yield potential/productivity of maize.

CONCLUSION

The first objective of the research was premised on determining the effect of the Russia-Ukraine conflict on the productivity of maize production in Zimbabwe. The study findings revealed a 25% drop in yield (Table 3) between the 2021-22 and 2022-23 growing seasons This also occurred simultaneously with a 33% drop in basal fertiliser application (compound D), a 25% drop in chemical weed control and a 15% reduction in chemical pest control. However, the use of cultural methods in weed control and pest control, rose by 25% and 15%, respectively as the smallholder farmers resorted to more inexpensive solutions for weed and pest control. Fall army worm (FAW), a persistent pest that attacks several fertilised crops, including pastures, sorghum, pearl millet and corn, is controlled by urine (Zhakata, 2021). Use of female urine, particularly that of a pregnant woman, is excellent for eradicating the FAW. To spray the crops, combine a 500-ml bottle of urine with 16 litres of water. The worms will die shortly after spraying the crop. Women's urine is particularly effective in worm control after it has been fermented for at least 24 hours. The hormonal changes that occur during pregnancy are most likely key for the control of FAW (*ibid.*). For the control of weeds, the smallholder farmers resorted more to traditional methods such as using hand hoes which are slow and not precise in targeting the weeds.

Overall, it is evident from the study findings that the Russia-Ukraine conflict has had a negative effect on maize productivity by farmers in Zimbabwe. Out of the five explanatory variables that had a significant impact on maize productivity, AN use had the most significant effect in both seasons 2021/22 and 2022/23 with B=0.575, p=0.025 and B=0544, p=0.025, respectively. Given that the Russia-Ukraine conflict period was characterised by exorbitant AN price increases which reduced affordability by many smallholder farmers across Zimbabwe, it therefore, means that conflict has had a negative impact

on maize productivity by the farmers. These results are consistent with another study by Arias *et al.* (2019).

The last objective of the research was hinged on determining the effect of the Russia-Ukraine conflict on the profitability of maize production in Zimbabwe. A GM results for the 2021-22 season has an ROI that is $0.20 higher than that of the 2022-23 season despite having a higher total production input cost of $456 compared to $395.50 of the 2022-23 season. This can be attributed to the use of a lower fertiliser rate in response to the 57% and 71% price hike in basal and top-dressing fertiliser, respectively, that lowers the yield/productivity of maize, meaning that there will be less maize to sell for covering costs and making a profit. The reduction in input levels lowered both the cost of production and the potential yield that could be produced for the market. This resulted in a higher break-even point for the 2022-23 season of $13/bag of maize against a lower yield, compared to the lower break-even point for the 2021-22 season which was lower by $2 at $11/bag of maize. Maize production during the Russia-Ukraine conflict in the 2022-23 season was, therefore, 15% less profitable than maize production before the Russia-Ukraine conflict. In other words, a smallholder farmer who made a 15% yield loss in the 2021-22 season is on par with a productive smallholder farmer in the 2022-23 season.

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"Water Provision Will Trigger Us into Action and Livelihood Vibrancy and Skyrocketing": Deciphering Messages from Biriri Wards, Chimanimani

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Abstract

Water remains the source of all human activities and its availability in arid and semi-arid regions has been erratic with most rural communities of Zimbabwe affected the unavailability. The article explores how the dwindling of water resources can push communities into water conservation practices and how the availing of water provision projects has pushed rural communities into action. Climate change has pushed the groundwater further and caused low rainfall, leaving rural communities that depend on rain-fed agriculture and borehole irrigation short of water. The article is based on the argument that groundwater and rainfall patterns with periodic droughts and extreme weather events. The study engaged a qualitative research methodology with a case study research design. The study used purposive sampling to sample for the participants. The study used in-depth interviews and focus group discussions. It adhered to all ethical principles. The study revealed that the availability of water will trigger communities into livelihoods diversification and changing of of rural communities' lifestyles. The study found that rural communities have begun to diversify their livelihoods and taking advantage of the water provision projects. The study concludes that the increase of water provision can be the missing link for rural development. The study recommends diversification of water provision.

Keywords: *semi-arid, groundwater, agriculture, diversification, conservation, droughts*

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INTRODUCTION

IPCC (2012) observed that not only greenhouse gas (GHG) emissions are already changing the global climate, but also that Africa will experience increased water stress, decreased yields from rain-fed agriculture, increased food insecurity and malnutrition, sea-level rise and an increase in arid and semi-arid land as a result. Extreme weather events, notably floods, drought and tropical storms, are also expected to increase in frequency and intensity across Africa (*ibid.*). The World Meteorological Organisation Assessment Report (WMO, 2013) observed that years the 2001-2012 were the warmest years with an expected increase in global average temperature over the next two decades. The latest prediction suggests that global temperatures could rise by 2100 (Allen *et al.,* 2018). IPCC (2013) argued that climate change is real and Africa is the most vulnerable continent as it is likely to warm during this century and the regions warming more than the moist tropics. The climate of the most parts of the African continent may be classified as arid and semi-arid with high drought risks (Raduba, 2019).

Southern Africa is vulnerable to climate change and the rural communal lands are in severe danger of droughts due to water variability. Chagutah (2010) has observed that Zimbabwe is particularly vulnerable due to its dependence on rain-fed agriculture and climate sensitive resources. Agriculture's sensitivity to climate-induced water stress is likely to intensify existing problems of declining agricultural outputs, declining economic productivity, poverty and food insecurity with smallholder farmers particularly affected (Brown *et al.,* 2012). Whereas clean water has been an elusive goal for most sub-Saharan African countries, especially among the poorest rural communities, climate change-induced extreme weather events such as drought aggravate the situation (Chigusiwa *et al.,* 2022). An estimated 64% of the population in sub-Saharan Africa has no access to clean water, compared with 2% in the developed world (WHO/UNICEF, 2021). IPCC (2021) observed that a decline in rainfall in Southern Africa in recent years went up to 50% as a result of climate change. Poor institutional arrangements and governance exacerbate water shortages as only 4% of annual renewable water flows are harvested and stored in sub-Saharan Africa compared with 70%-90% in developed countries (Lehmann *et al.*, 2018).

Apart from encumbering the attainment of Sustainable Development goal 6 of achieving universal access to clean water and sanitation (UN-WATER, 2019), drought has modified the conditions under which social-interactions occur (Carleton *et al.,* 2016). In the absence of formal distribution channels like local authorities, the resultant distributional burden of drought-induced water scarcity is marred with inefficiencies and often skewed toward certain groups within societies that bestir disgruntlement, thereby increasing the likelihood of violent confrontation and conflict at water points (Roche *et al.,* 2020). While Africa is identified as a continent highly vulnerable to climate change impacts due to its weak coping capacity, the vulnerability of countries varies. In the past decades the peculiarity of Southern Africa, *vis-à-vis*, climate change vulnerability, especially water scarcity, has become an issue of political and economic concern (Patrick, 2020). Despite efforts to ensure access to water for all, the exponential increase in violent protest around water scarcity has become an issue around Africa (Kusangaya *et al.,* 2014). The article examines how water provision will usher people into action.

THEORIES UNDERPINNING THE STUDY

The theory that guided this study is the theory of public goods propounded by Samuelson (1954). The theory of public goods takes the standpoint that the privatisation of public entities will likely lead to inadequate standards of infrastructure for two reasons (*ibid.*). The first problem for the failure arises from the public goods nature of standards that inevitably leads to a free rider problem and the resul is under-investment in the provision of infrastructure (*ibid.*). The problem of free riders is that Zimbabwean rural district councils and are operating using a neo-liberal standpoint without investing in water provision infrastructure in the rural areas, leaving the rural communities vulnerable to climate change and its vagaries. The second reason is coordination failure because of wrong sub-optimal investments (*ibid.*). Rural district councils in Zimbabwe lack the capacity to build resilience in their areas because they are over -invested in politics more than development (*NewsDay*, 2022). The delivery of public goods such as water will force rural people into action against climate change as it allows them to kickstart projects successfully. This concept becomes applicable to this study as it brings to the fore the reasons that lead to action against climate change through provision of a public goods such as water.

LITERATURE REVIEW

This section looks at the literature from past studies trying to understand how these were done trying to navigate how can the present study can provide a way forward to fill the gaps on climate change and provision of water. The literature review looked at the water supply in the world.

WATER SUPPLY IN GLOBE

Huntjens *et al*. (2012) observed that there has been a rise in the frequency of extreme events and water scarcity in Africa and the challenges these pose to communities with weak coping capacity. The increase in extreme climate events will lead to increase in water extremes, thereby affecting freshwater availability (Gabrielsson and Ramasar, 2013). Nganyanyuka *et al.* (2014) argue that, whilea sustainable proportion of the population in Africa are denied access to public water, there are inconsistencies between water access as stated in the official statistics, and the tangible state of affairs from the viewpoint of end-users. The focus on the security dimensions of climate change to global peace and stability has also received increased global attention in recent years (Scott 2015; Chirisa *et al.,* 2016).

It is pertinent to note that while the variation in rainfall and temperature pattern, as a result of the impact of climate change, will immensely affect the availability of water resources, infrastructure capacity and the management of available water in the face of its depletion is also key (Patrick, 2020). Gain and Giupponi (2015) argue that water scarcity is rooted in not only the inadequacy of water resources, but also in the management and institutional incapacity to provide water service. Jeunesse *et al.* (2016) argue that tension and conflict can arise from competition over the use and control of water resources at the national and transnational or local level. Birkenholtz (2016) affirms that the threat to continuous access to a level of affordable water has stirred people to resort to actions that can destabilise the relative peace in the community. Water provision remains an issue in Zimbabwe, an issue that can drive people in the rural communities into action. Because of poor institutional arrangements in developing countries, in general, and in rural societies, in particular, the burden of environmental anomalies, like drought, quickly diffuses into the household matrix without a cushion from some pre-arranged shock absorbers (Garrick and Hahn, 2021). Nunbogu and Elliot

(2021) argue that access to water and its distribution is influenced greatly by gender due to socio-cultural, political and economic roles assigned to men and women. In rural communities in most developing countries, the role of sourcing water for household use usually falls on women and girls (Rao *et al.,* 2019).

This increases the exposure of women and girls to high risk of assaults and physical trauma (Geere *et al.,* 2018). The scarcity of water in low-income countries like Zimbabwe can prompt a new dispensation of people into action against climate change. Collins *et al.* (2019) observed that violence has emerged, indicating that violence experienced during water acquisition in times of shortages is largely gendered and disadvantages women and girls more. Nunbogu and Elliott (2021) argued that violence experienced at water points comes in the form of physical, psychological and sexual violence. Physical violence is perpetrated by both male and female adversaries. The feminist theory disadvantages women and girls more due socio-cultural power structures (Anwar *et al.,* 2020). Zimbabwe, like most Southern African countries, is a semi-arid country whose annual water depends heavily on irregular rainfall patterns. The region has climatically shifted significantly amid a climate crisis that is threatening the ecological balance within the region (Chigusiwa *et al.,* 2022).

The Southern African region has been identified as one of the most vulnerable to climate change and is expected to experience more frequent and prolonged droughts and long dry spells (IPCC, 2021). Zimbabwe is a landlocked country and its major source of safe drinking water in communal areas is groundwater that is relatively cheaper to clean (Chigusiwa *et al.,* 2022). It is imperative to note that water the crisis will push Zimbabwe into action on climate change and water conservation strategies in rural Zimbabwe like in other countries where the reuse of water for agricultural and industrial use has been championed to sustain families in terms of food security and livelihoods maintenance.

RESEARCH METHODOLOGY

The study investigated the impacts of water provision in the rural communities amid the vagaries of climate change within the context of rural

development and poverty alleviation through agricultural projects and other livelihoods. The study used a qualitative methodology with a narrative research design. DeMarco (2020) observed that a narrative research design aims to explore and conceptualise human experiences as it is represented in textual form. The study used purposive sampling to sample participants for the study. The study drew a sample of 12 respondents and four informants. The study used the focus group discussions and in-depth interviews. The study empoyed narrative data analysis to analyse the data findings. The study adhered to all ethical principles and noteworthy is the observation of the anonymity ethical principle. The study adopted the use of pseudonyms to maintain the anonymity of the participants assigning numbers to participants.

FINDINGS

The water crisis in Zimbabwe and beyond has affected many livelihoods and led to the entrapment of many families into debt. The study seeks to explore how water provision can trigger rural families in their fight against rural poverty and lack of development. The findings that emerged were along the lines of the impacts of climate change on water provision in rural areas and the provision of water triggering action from Biriri wards in the rural communities of Chimanimani.

IMPACTS OF CLIMATE CHANGE ON WATER PROVISION IN RURAL AREAS

Rural people showed an understanding on the impacts of climate change on the provision and availability and provision of water in rural communities, with some communities forfeiting their livelihoods because of climate change direct impacts on water provision. Participant 1 indicated that:

> "The rainfall patterns have changed because of this climate change. The places we lived [in]before had water that did not dry [up], we did not fetch water two kilometres away or five kilometres away, we had water around the places we lived [in], but at the moment, the areas that had *madove* where we grew rice and other crops, no longer exist. Some of the wetlands (*madoro*) that were not occupied are now occupied with houses and they are now dry lands."

These findings revealed that water scarcity has triggered inaction and unsustainability in the rural areas as most of the wetlands are not conserved but inhabited because of climate change. The study revealed that the rainfall

season had altered and this had caused water scarcity in rural areas, leading to people lagging behind in terms of development. Participant 4 revealed that:

> "In the past, we used to get water from October up to April or May as it used to rain, but at the moment, we are getting it from November to January and some showers in March and it is gone there are no rains."

These findings indicated that climate change has affected water provision in most wards in Chimanimani with some communities experiencing low rainfalls for a short period of time and struggling to find water. This change in the rainfall patterns has been characterised by inaction, crop failure and food insecurity. The findings revealed that climate change has had an impact on groundwater and water tables in Chimanimani rural communities. Participant 6 said that:

> "My observation is that the signs of climate change are that where we used to fetch water before, we no longer fetch water. The wells, the water tables have gone down, even bananas are drying because they are lacking water as we do not have enough water."

The findings have revealed that climate change has had adverse impacts on communities, forcing them into inaction as most of them are agrarian-based communities and without water, agriculture is useless along with other livelihoods, pushing the communities towards donor dependency rather than self-sufficiency development.

THE PROVISION OF WATER TRIGGERING ACTION

The study revealed that the provision of water can spark action from the people from Biriri wards in the rural communities of Chimanimani. The study revealed that the major problem hindering rural development in Chimanimani is the lack of water and the provision of water. The findings of the study revealed that people face acute water shortages for their day-to-day livelihoods. Participant 8 said that:

> "The problem we have is water for people to plough. If we can get more boreholes in our community, even more irrigation schemes, so that we can be able to do irrigation since the rains are now low so that we can survive, both people and animals. If we get irrigation, we can get something to assist us."

These findings revealed that since rural communities are agrarian communities, provision of more water through irrigation schemes and

borehole drilling can ensure food security for the propel. The findings of the study indicated that water availability can encourage people through the development of projects that use irrigation. Participant 9 revealed that:

> "We need water because the boreholes we have at the moment are now very low and our boreholes are at the top [because of the low water table]. Water provision will accelerate us into action through projects as I have pigs, but the problem I face now is lack of water."

The findings revealed that lack of water has been the main impediment to development and action to alleviate poverty among rural communities. Participant 10 said:

> "The problem is that we need boreholes. This side that is our main problem, we cannot do any project that is successful because we do not have water. Everything is [at a] standstill. There is nothing we are doing except that if you get chickens to keep and you do not have water, they will need a lot of water whilst you getting one or two buckets per day. So, there is nothing. We are on at a standstill. They should assist us with boreholes to complete our projects."

The findings of the study indicated that the lack of water is pushing communities into rural poverty and food insecurity as most of the households are failing to kickstart projects. The availability of water in rural communities will trigger communities into action and kickstart projects.

DISCUSSION

The findings of the study revealed that climate change has an effect on the availability of water as most of the rural communities in Zimbabwe are finding it hard to carry out production. The study showed that climate change has impacted the availability of water through the shortening of the rain season, making agricultural production impossible, therefore, leaving families in poverty and food insecure. The study revealed that the impact of climate change has been the shortening of the rain season in Zimbabwe from five months to three months. The study showed that groundwater has dwindled further, making it impossible for agricultural production and other rural livelihoods that require water. In support of these findings are Chuma *et al.* (2016) who observed that groundwater has dwindled in Zimbabw, driving most communities into hunger, starvation and poverty. Concurrent with these findings is Chikodzi (2013) who noted that there is a decline in groundwater

in most parts of Zimbabwe and this will affect economic development especially rural economies.

The study showed that the availability of water will trigger communities into action as the lacking of water has remained the main problem hindering projects for rural communities. Rural communities need water to kick start the irrigation projects. The study revealed that the availability of water will trigger communities into action as the rains remain low people now look forward to the provision of more boreholes for communities to augment the little rain water with borehole irrigation schemes that can sustain communities. The study indicated that the lack of water was stopping the ploughing by the rural communities hence the need for irrigation schemes through addition of borehole schemes. Similar to these findings are Dube *et al.* (2021) that have observed that the provision of irrigation schemes in Tsholotsho has led to food security the area as people were triggered into action to grow crops using the irrigation schemes improving food and income security in the rural areas.

The study revealed that the available boreholes are not deep enough and rural households are engaging in projects such as the rearing of pigs which requires a lot of water. Similar to the findings are Mutiro and Lautze (2015) who observed that improving agriculture and enhancing productivity through smallholder irrigation is a strategy for poverty alleviation and improvement of livelihoods in rural communities, as the majority poor depend on agriculture. This indicates that the provision of water will trigger rural communities into action towards rural development. The study indicated that there are no successful projects in some areas as there are no boreholes that provide water for rural communities to embark on projects. In support of these findings on the provision of water strengthening and triggering rural communities into action is the theoretical framework the Public Goods Theory by Samuelson (1954) that states that public, and not privatised, building infrastructures can help communities build resilience and adaptation capacity.

CONCLUSION AND RECOMMENDATIONS

In conclusion, the study concludes there remains gaps on the sustainability of the actions that water provision can trigger as there remains the need for agro-entrepreneurship in most rural areas of Zimbabwe through the farming of fast-

maturing crops that guarantee food and income security. The provision of water remains the most needed for rural development and poverty alleviation. There are different views on that water provision will trigger rural communities into action as the agricultural sector and the models of rural development in Zimbabwe still lack innovation and entrepreneurship factors that can propel rural communities into action towards rural development.

The study recommends the training of rural communities in agro-entrepreneurship and innovative farming techniques that guarantee food security. There is need for development frameworks for water provision that ensure social and gender inclusiveness. There is need for sustainable use of water resources in rural communities as this can improve households' food and income security, while ensuring that coming generations are guaranteed of a bright future. There is need for the invention of innovative use of water resources such as the re-use of water. There is need for future studies to look into the sustainability of the provision of water for agriculture as a form of rural development as most of cash crops grown in rural areas threaten sustainable development through deforestation.

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Perceptions of Villagers on Traditional Food Crops Production in Response to Climate Change in Bocha Village, Manicaland Province, Zimbabwe

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Abstract

Based on the qualitative approach, this research highlights an assessment of the perceptions of villagers on traditional food crop production in response to climate change. The study was inspired by the need to unearth views on traditional food crop production, how they are produced in the wake of climate change and the mitigation measures they employ to ensure food security and poverty reduction. The study was undertaken in Bocha Village in the Manicaland Province of Zimbabwe. The Indigenous Knowledge (IK) theoretical framework used hypothesised ways of knowing, seeing and thinking, passed down orally from generation to generation and that reflect thousands of years of experimentation and innovation in all aspects of life. A sample of 10 was drawn using purposive sampling. Data was gathered using semi-structured interviews and focus group discussions with participants. Findings were thematically presented. The study revealed that villagers view traditional food crops as food security commodities with drought-tolerant and climate mitigation potential produced using indigenous knowledge systems. They also reduce poverty through commercial and nutritional benefits derived from their processing.

Keywords: *adaptation; mitigation; drought, food security, indigenous knowledge systems, poverty*

INTRODUCTION

The consumption of traditional food crops among African societies has been highly revolutionised since pre-colonial days due to exotic cultural interactions, shifting from being considered poor man's food crops to

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nutritious strategic food crops (Sanchez, 2004). This has resulted in the low uptake of indigenous food crops that are highly nutritious and adaptive to the local climatic environment. Most farmers no longer grow these crops at all including those located in arid and semi-arid regions of the country. Maize has become the preferred crop grown by smallholder farmers in the region, although it is characterised by very low yields. Semi-arid regions of Zimbabwe are adversely characterised by adverse climate changes that include erratic rainfall, excessive temperatures, mid-season droughts during the growing season and low soil fertility that sustain agricultural production under continuous cultivation (Mapfumo and Giller, 2001).

Increasing food productivity is a priority concern of the Hunger Task Force of the United Nations through strategies to sustain the Millennium Development Goal 1 (FAO, 2011), through Sustainable Development Goals (SDGs), thus the ability of farmers to produce more nutritious food per unit area of land. Traditional food crop production systems are critically used as adaptation methods to address climate change problems that minimise crop failure by using drought-tolerant traditional crop varieties (Achamwie, 2015), hence reaching poverty reductions and food security objectives of a nation (SEAVEG, 2012).

Over the last decade, production of traditional food crops by smallholders has declined due to numerous factors that include financial, social and environmental factors. Thus, farmers are now focusing mainly on cash crops, such as tomatoes, tobacco, flowers and soya-beas production, although these production systems fail in marginal areas due to adverse climate change. Traditional food crops play a crucial role in addressing food security and malnutrition and boosting the HIV/AIDS immunity of positively infected patients (ZIMSTAT, 2012).

Cultural interactions, urbanisation and negative perceptions have contributed to the neglect of traditional food crop production and consumption. Traditional agriculture is one of the high-priority sectors in the rural village setup where the impacts of climate change exceed tolerance limits. Climate change projections for rural villagers are inherently severe, bringing difficulties to people living in marginal areas for whom achieving food

security is already problematic and is the most pressing challenge as the nation seeks to nourish its people to sustain the MDGs through SDGs. These points necessitated an assessment of the perceptions of traditional food crops as a key source of information on adaptive capacity among villagers to build resilience to deal with climate change stresses.

THEORETICAL FRAMEWORK

Indigenous knowledge hypothesises the ways of knowing, seeing and and thinking, passed down orally from generation to generation and reflect thousands of years of experimentation and innovation in all aspects of life in a particular context (Kang and Banga, 2013). IK theory is grounded in an indigenous worldview that operates on seven principles (Simpson, 2000). The seven principles of indigenous worldviews are: the knowledge is holistic, cyclic and dependent upon relationships and connections to both animate and inanimate beings; there are many truths and these truths are based on individuals' experience; everything has life; all things are equal; the land is sacred; the relationship between humans and the spiritual world is relevant and humans are least significant in the world. According to Demi (2014), these principles differentiate IK based on social constructionism from other forms of knowledge.

It is observed that "Indigenous knowledge" specifically refers to the epistemic salience of cultural traditions, values, belief systems and worldviews that, in any indigenous society, are imparted to the younger generation by community elders (Dei, 2004). Advocates for IK theory have highlighted the potential it holds in addressing contemporary glitches such as poverty, hunger and underdevelopment (Moock and Rhodes 1992; Esiobu, 2019).

LITERATURE REVIEW

Southern Africa, Zimbabwe included, is vulnerable to climate change, causing social, economic, ecological and environmental stresses (Lichtfouse, 2012). The stresses compound communities' susceptibility to vulnerability. Elevated temperatures, unpredictable precipitation and increased frequency of droughts and floods are combining to cause biodiversity loss, depressing crop yields and increased production risks (Achamwie, 2015). Due to climate change, impacts on food dimensions which include food availability, food accessibility, food utilisation and stability have been eroded (Ganpat, 2015). Traditional food crops such as Cleome gynandra, Amaranthus, loquats, sorghum, millet, cowpea and Bambara nuts, originally from Eastern and

Southern Africa, have a long history of cultivation, domestication and use in African communities (Grubben and Denton, 2004; Shackleton *et al.*, 2009; Nyakupfika, 2013). However, the production of traditional crops has been constrained by the negative impacts of climate change and inadequacy of scientific knowledge. The change in African diets to western dishes has further eroded the cultivation and use of these traditional food crops. This has led to underutilisation of traditional food crops, resulting in increased food insecurity and malnutrition (Shackleton *et al.*, 2009, Ng'tich *et al.*, 2012;). Traditional food crops have been used as livelihood strategies of escaping hunger during times of femine (Legwaila *et al.*, 2011). The importance of traditional food crops as a supplement for medicines and hunger survival strategy, is being overlooked (*ibid.*). Understanding farmers' perceptions towards traditional food crops is crucial in incorporating indigenous food plants into existing food systems at the advent of climate change (*ibid.*).

RESEARCH METHODOLOGY

The study used the interpretivism and a case study approach, focusing on Bocha. A sample of 10 respondents was drawn based on the quality of information gleaned from views given to the research. Data was collected through key informant interviews, semi-structured interviews and focus group discussions. This systematic analysis involved the researcher devising a coding system to classify information or themes.

RESULTS

Perceptions accounted for in this article are purposively from villagers who are producing traditional food crops in Bocha Village, Manicaland Province as identified by traditional leaders of the village.

TYPES OF TRADITIONAL CROPS AND REASONS FOR THEIR PRODUCTION

From the interviews, respondents indicate that they grow a wide variety of traditional food crops representing broad categories of cereals, legumes, root and tuber crops and leafy vegetables.

Millet *(Panicum species)* and sorghum *(Sorghum bicolour)* known by villagers as *zviyo* and *mhunga* are common traditional cereal crops grown in Bocha Village. One of the farmers interviewed for this research revealed that:

> "Millet and sorghum are the cereal crops we grow since the time of our ancestors for *sadza* in Bocha Village that is prone to high temperatures and erratic rainfall."

These crops represent cereal crops and have been indigenised due to many years of cultivation and natural and farmer selection. Cultivation of millet and sorghum is practised mainly at a subsistence level by smallholder farmers in arid and semi-arid conditions where water and excessive heat are limiting factors for crop growth. These findings are congruent with the finding by Bichard *et al.* (2004) who concluded that the production of millet and sorghum is intensified in villages where maize (cereal) normally fails due to droughts.

Millet and sorghum are crops grown in Bocha Village for their nutritional values which respondents believe are vitamins and carbohydrates. In the focus group discussion, it was reiterated that: "We grow these cereal crops because they have high nutrient value."

The fact that these cereals contain balanced nutrients makes them suitable crops for combating nutritional challenges to Bocha households. Millet and sorghum are often referred to as "high-energy" cereals as they contain high oil content, protein and vitamin A (NRC, 1996). Compared with other cereal grains such as maize, oats and wheat, sorghum and millet are less susceptible to pests and diseases (*ibid.*). Hence the IK theory has shown its ability to transfer the worldview of traditional knowledge to later generations through years of trial and error in the context of cereal production for sustainability under drought conditions.

Bambara groundnut (*Vigna subterranea*) or (*nyimo*) and Cowpea (*Vigna unguiculata*) or *nyemba* are the oldest legume crops grown in Bocha Village with their level of domestication in the area being closely related to millet and sorghum through IK preservation. Traditionally, these legumes are cultivated in Bocha village where rainfall is erratic, limited access to irrigation and fertilisers, with little guidance on improved agronomic practices. From the interviews, it emerged that:

> "We grow Bambara groundnuts and cowpea because they are crops that we have grown since childhood, rainfall in the area is erratic, our water sources cannot keep water for long and we cannot afford fertilisers."

They have been produced mainly for the sustenance of families as a complement to cereals. To the villagers, they serve as important sources of

protein in their diets. Cowpea leaves are consumed as vegetables, while cowpea and Bambara groundnut seeds are eaten in the same manner as dry beans. From the focus groups, it was highlighted that: "We eat the legumes together as a family; cowpea leaves are vegetables whilst the seeds are boiled for relish as we cannot afford meat."

When utilised both as leafy vegetables and grain legumes, these crops have the potential to close the hunger gap that often plagues farmers during periods before the next harvest. When used in this way, they have significant potential to contribute towards food and nutrition security by providing vitamins, minerals and protein (Bressani, 1985).

The legumes' drought tolerance and low levels of water use potential make them ideal crops for cultivation in semi-arid areas of Bocha, which continues to face an increased frequency and intensity of droughts and impoverished soils due to climate change. Through integration with other communities, these legume crops have become to be known to replenish nitrogen in the soil through nitrogen fixation. "Mutsubvu" (pseudonym) said, "Most of the time, this area experiences high temperatures and low rainfall and the soil is evident of nutrient deficiency but we always have a harvest to store each year."

From these sentiments, in can be seen that these legumes are drought tolerant and have soil-replenishing potential that is important to villagers who are unable to afford inorganic nitrogen fertilisers. Thus, they are important crops to incorporate in rotations with cereal crops. Cowpea and Bambara groundnuts are drought tolerant and thrive in arid and semi-arid conditions. They can be produced in areas with average optimum rainfall of 400 mm/year (DAFF, 2011). These legumes are widely reported to be drought tolerant (Mabhaudhi *et al.*, 2013) and are traditional food crops that have received significant attention concerning their drought tolerance.

These legumes are perceived as a traditional food crop based on social and economic restrictions imposed on IK. One of the villagers said:

> "We never enrolled for formal lessons to produce bambara groundnuts and cowpea. We usually observed our grandparents growing them and we and our parents also adopted them. Most of the time, we grow them and we have a harvest under all circumstances."

As such, cowpea and bambara groundnut germplasm improvement and agronomic management practices have relied mainly on local experience and resources, that is, IK (Mukurumbira, 1985).

Cat's whiskers *(Cleome gynandra)*, amaranth (*Amaranthus* spp) and wild cucumbers (*Enchinocytis Lobata)* leaves also known as *nyevhe*, *mowa* and *musesera*, respectively, by Bocha villagers, are major traditional leaf vegetables grown due to their nutritional benefits and drought-tolerant capabilities. The vegetables are perceived as highly nutritious and adaptive to the local environment as they can grow naturally as weeds. Their production attention has also shifted from being problematic weeds of arable lands to crops capable of alleviating food insecurity by addressing malnutrition concerns. As unveiled by one respondent;

> "In other areas, Cat's whiskers and Amaranth and Wild cucumber leaves are weeds, but as for us, we grow them for relish, nutrition and as medicine since time memorial. However, even in drought conditions, we are assured of a harvest."

The study unearthed that, these traditional leafy vegetables that form part of traditional diets and heritage of Bocha villagers, was adopted into the IK system through many years of cultivation. The multiple under-exploited benefits in terms of nutritional value, food security, income-generation and medicinal value that is suitable for low input systems and harsh climatic conditions, are explored by Bocha villagers. Some of the most important unearthed believed health and household benefits of these vegetables highlighted from focus group discussions are:

> "their ability to spur growth and development, protect the heart, boost the immune system, strengthen bones, increase blood circulation, optimise digestion and induce appetite. The grains of Cat's whiskers and amaranth crops can be made into flour as a substitute for modern flour sources whilst the fresh fruit of Wild cucumber is used as a bio-pesticide against aphids and ticks on domestic animals.".

The fact that in Zimbabwe, information on cultivation, drought tolerance and water use of local Amaranth, Cat's whiskers and wild cucumber is limited in extent and scale is a reality, but vast information is enclosed within the IK system. The principles of indigenous worldviews that knowledge is holistic and there are many truths and these truths are based on individuals' experience (Simpson, 2000), indicate that traditional vegetable crops serve as healthy food and medicines, at the advent of climate harshness for Bocha villagers.

Therefore, exhaustion of soils over many years and limited access to fertilisers, has not hindered the successful production of these vegetables under marginal climatic conditions (Shackleton *et al.,* 2009). A review by Alemayehu *et al.*, (2014) reported that owing to their drought tolerance and promotion of amaranth, cats' whiskers and wild cucumber production are alternative crops vital for combating food and nutrition security under climate change.

STRATEGIES EMPLOYED TO ENSURE TRADITIONAL FOOD CROPS' SUCCESS IN THE WAKE OF CLIMATE CHANGE

Bocha village farmers prefer the use of traditional grains such as millets and sorghums that are more drought-resistant than maize and, therefore, give a good yield even with very little rain. They also prefer specific crop varieties for drought seasons, such as an indigenous finger millet variety (*rukweza*), as it ripens fast and an early maturing cowpea (*Vigna unguiculata*) (*Nyemba*) variety. The villagers highlighted that;

> "Millet, sorghum and cowpea survive under drought stress conditions but maize cannot survive, traditional crops require even spatially distributed rains to secure a harvest. In the case of finger millet, it yields after two months from germination time."

The growing of drought-tolerant crops is a strategy of great significance as they point the way for resource-poor farmers living in Bocha Village, which is in a marginal environment, providing the basis for adaptive natural resource management strategies that privilege the diversification of cropping systems that lead to greater stability and ecological resilience under climatic extremes (Achamwie, 2015). This is coherent with the Indigenous Knowledge Theory principle that Dei (2004) posits that land is sacred in that it suits certain crops to survive even if external forces do not permit it.

Bocha villagers tend to combine polyculture systems as part of a typical household resource management scheme aimed at reaching acceptable productivity levels amid environmentally stressful conditions. One of the farmers highlighted that:

> "We plant different crop types and varieties in the same field, examples are sorghum, millet and groundnuts. This ensures maximum land use and multiple yields of different crop types or at least one of the crops in the case of adverse climatic conditions."

The practice of multiple cropping systems enables smallholder farmers to achieve several production and conservation objectives simultaneously. Polycultures exhibit greater yield stability and less productivity declines during a drought than in the case of monocultures. By practising this production strategy, it then holds that the Indigenous Knowledge Theory has the potential of addressing contemporary glitches such as poverty, hunger, climate change and underdevelopment (Moock and Rhodes, 1992).

Natarajan and Willey (1986) noted that intercrops over-yield consistently at five levels of different moisture availability, over the cropping season. They further note that the rate of over-yielding increased with water stress, such that the relative differences in productivity between monocultures and polycultures became more accentuated as stress increased (*ibid.*). These types of ecological studies suggest that more diverse plant communities are more resistant to disturbance and more resilient to environmental perturbations (Vandermeer, 2002).

In addition to adopting a strategy of interspecific diversity, many Bocha villagers exploit intraspecific diversity by growing, at the same time and in the same field, different cultivars of the same crop. The type of diversity that prevails in different areas depends on both climatic and socioeconomic conditions and farmers' responses. For example, one of the farmers unearthed that:

> "Locally adapted landrace varieties of cowpea (*Vigna unguiculata*) that have been grown for centuries and are genetically heterogeneous, uniquely combine optimal nutritional profiles, high tolerance to environmental stresses, high biomass productivity and nutrient and moisture contributions to the soil if cross mixed with hybrid."

The existence of genetic diversity has special significance for the maintenance and enhancement of productivity of small farming systems, as diversity also provides security to farmers against diseases, especially pathogens, that may be enhanced by climate change. By mixing crop varieties, farmers can delay the onset of diseases by reducing the spread of disease-carrying spores and by modifying environmental conditions so that they are less favourable for the spread of certain pathogens. The outcomes of this study are congruent with findings by Jarvis *et al.* (2007) that considerable crop genetic diversity

continues to be maintained on a farm in the form of traditional crop varieties, especially of major staple crops. Villagers maintain diversity as insurance against future environmental change or to meet social and economic needs. These crossbreeds that exhibit high genetic variability have a huge success potential to be grown in marginal environments of Bocha, as it is threatened by climate change.

Adaptation of traditional food crops to marginal lands, by villagers of Bocha, makes them constitute an important part of the local diets by providing valuable nutritional components, which are often lacking in staple crops. Based on one of the villagers' views, for example of Cat whiskers' medicinal benefits:

> "Sap from leaves cures scurvy, improves eyesight when mixed with milk, reduces dizziness and labour pains in pregnant women and helps quicken recovery after baby delivery. The vegetables' leaves have acaricidal properties and are used in controlling ticks on cattle, sheep and goats. In crop production, Cat's whiskers extracts have pest deterrent uses against crop pests such as aphids."

Traditional vegetables are characterised by a high nutritional value compared with global vegetables like tomatoes and cabbage (Keatinge *et al.*, 2011). As a source of essential vitamins, micronutrients, protein and other phytonutrients, traditional vegetables and legumes such as cowpea, have the potential to play a major role in strategies to attain nutritional security.

Villagers avoid some of the high economic cost challenges caused by high inputs of agrochemicals, fertilisers, mechanisation and water supply, hence they grow traditional food crops. By incorporating indigenous crops and increasing crop diversity, farmers are ensured of cost-effective diets and increased agricultural resilience to pests, diseases and weather changes. "We grow traditional crops that have a definite yield capability, meaning that we don't waste money to supplement food in times of famine and droughts"

The benefits of growing more diverse crops include seed saving and the processing of traditional foods. With dried and other preserved traditional foods, villagers have a more secure and reliable food source during the off-season and seed saving and exchange enable villagers to remain independent from commercial agricultural companies, helping to ensure future food

security at affordable prices. A villager explained that: "we venture into food processing of traditional vegetables through sun-drying and ensure food availability in off-season periods".

With the advent of healthy diet requirements of locals, traditional food crops are of considerable commercial value and thus can make a significant contribution to household income. Value addition by applying appropriate production and post-harvest techniques ensures that high-quality products reach the market and satisfies consumer expectations. In Zimbabwe, selected traditional cereals, legumes and vegetables are becoming an increasingly attractive food group for the wealthy segments of the population and are slowly moving out of the under-utilised category into the commercial mainstream (Weinberger, 2007).

Apart from their commercial, medicinal and cultural value, traditional food crops are also considered important for sustainable food production as they reduce the impact of production systems on the environment. From the focus group discussions held, it emerged that:

> "traditional food crops are important for sustainable food production as they reduce the impact of production systems on the environment. Traditional food crops have the potential to make a substantial contribution to food security, protection against internal and external market disruptions and climate uncertainties and lead to better ecosystem functions and services, thus enhancing sustainability".

It was further indicated by "Muzambani" (pseudonym) that:

> "a wider use of traditional food crops and species, in intercropping systems, provide multiple options to build temporal and spatial heterogeneity into uniform cropping systems, thus enhancing resilience to biotic and abiotic stress factors and ultimately leading to a more sustainable supply of diverse and nutritious food".

Many of these crops are hardy, adapted to specific marginal soil and climatic conditions and can be grown with minimal external inputs (Hughes and Ebert, 2013). Due to harsh climatic conditions only robust, drought-tolerant traditional vegetables, such as *Cowpea* and Amaranth, with short growth cycles, can survive and produce food (Maurya *et al.*, 2007).

CONCLUSION AND RECOMMENDATIONS

Views, perceptions and methods towards traditional food crops by traditional farmers in Bocha have adapted to ever-changing environments by developing diverse and resilient farming systems in response to different opportunities and constraints faced over time. Many of these agricultural systems serve as models of sustainability that offer examples of adaptation measures that can help millions of rural people to reduce their vulnerability to the impact of climate change and to maintain ecosystem goods and services.

Bocha villagers are the key actors and players with responsibility for improving the land and as land managers; their needs, priorities, resources and preferences are highly diverse. They have a wealth of knowledge about their crops, soil, farming environment and economic condition embedded in traditional knowledge systems. The local knowledge systems and agricultural practices and techniques adopted by local people remain the dominant form of coping mechanisms for climate change and food security.

Some of these adaptation strategies include the use of locally adapted varieties/species exhibiting more appropriate thermal time and vernalisation requirements with increased resistance to heat shock and drought, enhancing the water-holding capacity of soils through cover crops, thus increasing water holding capacity and use of crop diversification strategies.

- There is need to re-evaluate and consider indigenous knowledge and technology as a key source of information on adaptive capacity centred on the selective, experimental and resilient capabilities of farmers in dealing with climate change.
- The implications of climate change for food security are explored and understood, not only at global and national levels, but also at local levels. It is also imperative to have a better understanding of how to sustain and combine indigenous agricultural knowledge systems and scientific knowledge and how to translate this into decision-making processes that provide the necessary support to the local peoples.
- Emphasis must be placed on involving farmers directly in the extension of innovations through well-organised farmer-to-farmer networks. The focus should be on strengthening local research and

problem-solving capacities. Organising local people around projects to enhance agricultural resilience to climate change must make effective use of traditional skills and knowledge as this provides a launching pad for additional learning and organising, thus improving prospects for community empowerment and self-reliant development in the face of climatic variability.

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Ancestry versus Presidency: Unpacking Rural Land Ownership in Zimbabwe

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Abstract

For more than 90 years, British settlers ruled Rhodesia, now Zimbabwe. Whilst studies have been conducted to assess and document the history of rural land ownership in Zimbabwe, little has been done to assess the effectiveness in procedure and constitutionality of land reform programmes. This article explores land ownership in Zimbabwe and its relation to state control and the implications of the law. It argues that the quest for land ownership in Zimbabwe created a hostile environment that prompted a review of laws and policies by Africans towards a fair land distribution programme. This is because land in Zimbabwe has been a subject of immense politicisation. In a bid to create a balance of land ownership, the government introduced a strict land reform programme that sought to uphold and promote land ownership among ordinary citizens. Land ownership in Zimbabwe becsme a central issue for discussion during the Lancaster House Talks to end white dominance of precious land. This was worsened further by the Fast Track Land Reform Programme (FTLRP) in 2000 which changed the shape and look of land ownership. The historical 2000 FTLRP further weakened and paralysed an already deteriorating relationship between the government and white settlers who had remained in Zimbabwe after independence. The article then seeks to unravel the consequences of land reforms in Zimbabwe that caused recorded most violent moments of all time. Further, it shows that the effectiveness of the government scheme for expropriation of land without compensation was later adopted, strengthened and further consolidated in Zimbabwe's Constitution, which then becomes a human rights question. Accordingly, the article affirms that the laws of Zimbabwe simply put communal land in the

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hands of the presidency, something that has drawn wide attention as to the power vested in the presidency towards land ownership.

Keywords: *legislation, segregation, politicisation, land reform, colonialism, constitutionality*

INTRODUCTION

Land is central for social and economic development and its ownership has created a culture of violent disputes since the pre-colonial era. Land ownership has been marred by great radicalism, inequality and total discrimination that favoured white settlers to fully occupy most of Zimbabwe's fertile lands. In the 16th century, Portuguese explorers had attempted to open up Zimbabwe for trading purposes, but the country was not permanently occupied by European immigrants until 300 years later (Nelson, 1975). Inequalities resulted in the government adopting new laws that sought to promote blacks in owning land, something that, however, negatively caused an economic meltdown. After the expiration of the entrenched constitutional conditions mandated by the Lancaster House Agreement in the early 1990s, Zimbabwe outlined several ambitious new plans for land reform (Fisher, 2000). During the periods of disputed land ownership in Zimbabwe, inequalities were caused by a growing population in need of land, great depletion of natural resources and the rise of poverty that created an unstable environment. Quite a few laws were reviewed before independence and post-independence which include the Land Apportionment Act of 1930, the Native Land Husbandry Act of 1951, the Communal Land Act of 1981 and the Land Acquisition Act of 1992. These laws had similar objectives, being to improve the welfare of land ownership, formalise separation of land between blacks and whites, fair compensation for land acquired and acquisition of more land for resettlement. Despite spirited efforts, most of the laws left exclusive powers in the hands of the government ruling elite.

The perceived monopolisation of land by the ruling party, the Zimbabwe African National Union-Patriotic Front (ZANU PF), provoked intense opposition, arguing that those from outside the patronage of ZANU PF, were unlikely to benefit. The 2000 FTLRP was the most celebrated but yet an era of violence that displaced white farmers from much of the land. By the year 2013, every white-owned farm in Zimbabwe had been either expropriated or confined for future redistribution. Of recent, the legislation governing rural land is the Communal Land Act (Chapter 20:18) which repealed the Land

Commission Act No 12 of 2017. The article, therefore, argues that excessive power or authority of rural land ownership in the name of the presidency has created a rhythm of widespread criticism that has brought to the fore that expropriation of land without compensation remains an accepted unconstitutional practice.

Ownership of communal land is vested solely in the state. It is because land is viewed as an essential property that can never lose its value. The researchers conducted indepth interviews with a variety of stakeholders in land administration who gave their insights about the position of rural land ownership. Although primary data was used, the article relied much on secondary data that was efficient in bringing about answers to repeated disputes on rural land ownership. Secondary data, as per this article, involved published materials, articles, books, reports that served as solid sources of information. This allowed the researchers to identify gaps towards effective land ownership programmes leading to the making of key findings and recommendations on what needs to be done in future. The qualitative data collected from published sources were analysed following the grounded theorising approach (Holton, 2017).

The data helped in making thorough analysis on ownership of land before and after independence in Zimbabwe and general African beliefs. Tanner (2002), asserts that,

> "Ownership of land, consequently, the idea that people were returning to their land (after the civil war) had ended, had no real foundation. [but the] reality on the ground was very different .and post war occupation of abandoned and apparently 'unoccupied' land by new investors gave rise to many conflicts".

The intention behind the use of all these approaches was for the researchers to quickly adhere to the stages and structure of land ownership, particularly rural land, that is from an era of chieftainship, kingship then presidency. Such constant comparison has helped researchers to keep comparing the pre-colonial period and post-independence which assisted in evaluating whether there has been a bigger change as compared to the customary practices. To this end, the researchers also made use of computer qualitative data, Acts of Parliament governing land ownership in a variety of ways, which then improved the credibility of the findings.

CONCEPTUAL FRAMEWORK

The evolution of land ownership, particularly "rural", has been a topic worthy of discussion with different theorists bringing conflicting theories on the

concept of land ownership and its distribution process. The value and meaning of land, therefore, become context specific (Borras and Franco, 2010). Historically, evidence has suggested that land belonged to the king who ruled the kingdom, and he monopolised power that gave him inherent authority over his subjects. This article seeks to unpack rural land ownership in Zimbabwe, making use of the Customary Land Theory, being the core theory explaining how communal land is vested in the state. The theory evolves from the customary law, that is a set of rules, usually uncodified, drawing on tradition yet continually evolving under the influence of contextual pressures (Diala, 2017). It has been identified as an uncodified set of laws that is buried in the hearts of the Africans.

According to this theory, land generally belongs to the state headed by a king who has power to distribute land. Because this theory sees the king or ruler as owner of the land, it is still in force in modern-day Africa that has seen Presidents of African societies as owners of rural land (Bekker, 2008). The concept of land ownership, thus has created a wide range of debates that customary land rights or ownership must be replaced by a method of having titles or have such ownership recorded. According to conservative theorists, it is argued that uncodified customary land ownership creates a better tenure of security than the former. This is widely contested, as arguments boiling from this argument stem from a point of rural land ownership being vested in the hands of one man is deemed to be undemocratic (Mlambo, 2014). At the same time, theorists against this argue that the living customary land ownership theory is a hinderance to the development of land markets and modernisation of the economy. Due to the overlay of colonial influence, modern customary tenure systems may carry little resemblance to pre-colonial customs, which may be undemocratic and unconstitutional (Claassens, 2008). These theories have helped shape the study on the concept of rural land ownership and the existing dilemmas on whether the exclusive ownership of land in the hands of the state is democratic.

LITERATURE REVIEW

Literature has extensively debated the rural land ownership issue in Zimbabwe. In a bid to face such contestations, the article has used different literature relating to central terms, being rural land ownership, land

management, presidential powers and literature relating to governing Acts of Parliament which helped in defining the terms. Land has remained an important commodity to advance the sustainable development goals. Rural land is that which is not urban (US Census Bureau, 2017). Rural land is, therefore, identified by its characteristics that include agriculture, natural resources and lesser human development (Davy, 2012). Section 4 of the Communal Land Act (Chapter 20:04) states that communal land shall be vested in the president, who shall permit it to be occupied and used in accordance with this Act. The fact that the Communal Land Act vests communal land in the hands of the presidency, justifies the customary law theory of land ownership that argues that since time immemorial, land was owned by kings or rulers of kingdoms, in contemporary societies, although kings and chiefs are still in recognition, the President, who is the head of the state, has exclusive power over communal land. Rural land was further defined as basically land other than urban land, statutory land or land owned by the state, a statutory body or local authority (Statutory Instruments Rural Land (Farms Sizes) Regulations), 1999). The article used literature from different sources that included textbooks, journals, which provided extensive debates on the concept of ownership and its precise definition. In the case of segmented societies that acknowledge neither a single nor a series of chiefs, these descent lines are usually called dominant clans, aristocratic or landowner lines (Audrey & Irvine, 2003). The literature used then helped in consolidating the objective of the quantitative research on rural land ownership in Zimbabwe and employ methods and hypothesis pertaining to the phenomenon under inquiry.

HISTORICAL PERSPECTIVE ON LAND OWNERSHIP IN ZIMBABWE

The increasing politicisation of land reform was accompanied by the deterioration of diplomatic relations between Zimbabwe and the UK (Andy, 2017). In the early years of 2000 a referendum was conducted on the new constitution that allowed the government to acquire land compulsorily without compensation. This sparked intense unprecedented conflicts as the issue of acquisition without compensation was regarded to be against democratic values. More commonly, violence was directed against farmworkers who were often assaulted and killed by war veterans (David, 2010). The motive behind such action by the war veterans was pushed by the mere fact that, in

Zimbabwe, the distribution and ownership of land have been divisive topics prior to colonisation. For 90 years, black landowners in Rhodesia (now Zimbabwe) saw their land systematically taken from them by British colonists using a system of brutality, segregation and persecution (Peter, 2000).

Following independence negotiations, the Lancaster House Constitution was released as a schedule to the Zimbabwe Constitution Order 1979 (S.I. 1979/1600 in the UK). The Constitution was a British law or idea. Statistics by Shonhe and Muchetu (2016) showed that the white settlers took the best land (51%), leaving the Africans with infertile lands (22%), while the remaining state land (27%) was set aside for forestry and national parks. Through the implementation of post-independence land reform, the black majority was to be resettled from unproductive native reserves. For the first 10 years, beginning in 1980, the land reform phases used a market-based "willing seller–willing buyer" approach. Hhowever, from 1992 to 2000, forced acquisitions were based on gazetted compensation fees (Laakso, 1997). Apart from transitional/unallocated land (2 684 million hectares) and corporation, church and corporate estates (2 041 million hectares), 96% of agricultural land in Zimbabwe is owned by its citizens. Many people— (nearly 70%) — live in rural areas and depend on agriculture (World Bank, 2007).

In the 16th century, Portuguese explorers had attempted to open up Zimbabwe for trading purposes, but the country was not permanently occupied by European immigrants until 300 years later (Harold, 1975). Despite many years of unsettled or undefined land ownership, the Government of Zimbabwe had to redress previous injustices of racially unequal land distribution upon independence. The Land Reform Programme, Phase 1 of 1980 to 1989, saw the acquisition of 3.6 million hectares of land under European occupation under the “willing-buyer, willing-seller” basis, as part of an ambitious programme to resettle an estimated 162 000 families (Kanyenze, 2011). Before the implementation date, the process involved determining the land's technical viability, following the proper legal procedures for acquisition, thorough planning and an assessment by an Inter-Ministerial Committee made up of senior officials from government agencies and representatives of development partners.

After the expiration of the entrenched constitutional conditions mandated by the Lancaster House Agreement in the early 1990s, Zimbabwe outlined several ambitious new plans for land reform. This resulted in the programme launched in early 2000 that had one objective, which was to empower blacks against white superiority over land. The FTRLP was launched in July 2000 and was initially scheduled to end in December 2001. But before the FTLRP, in mid-1992, there was a national land policy enshrined as the Zimbabwe Land Acquisition Act of 1992 that empowered the government to acquire any land as it deemed fit. The perceived monopolisation of land by the ruling party provoked intense opposition from those arguing that those outside the patronage of ZANU PF were unlikely to benefit (Andy, 2017).

Rural Land Ownership from a Constitutional Perspective: Laws and Policies Governing Rural Land Ownership

The Zimbabwean Constitution, that is the ultimate national law of the country, was approved in 2013. It contains explicit guidelines about the ownership, transfer and hypothecation of agricultural land within the nation, as well as how land should be handled in public discourse. Sections 71 and 72 of the Zimbabwean Constitution govern property and land rights. In terms of the term "ownership", this is defined to mean a right to hold and use and take benefits perpetually, to alienate (sell) or bequeath to one's heirs, while "leasehold" denotes a right to hold and use and take benefits for a specified number of years, conditional on payment of rent and depending on lease terms, and possibly other conditions (World Bank, 2015). The property rights system in Zimbabwe has been a contested arena since the colonial era, particularly because colonial subjugation in Zimbabwe was characterised by politically motivated land dispossession and inequitable property rights distribution patterns (Tsabora, 2016). The constitutional regulation of property and land rights in Zimbabwe has always responded to mainstream political and economic undercurrents. Rugege (2016) alludes that South Africa and Zimbabwe share a common history of colonisation where the struggle for liberation from colonial and apartheid domination in South Africa and from colonial and minority rule in Zimbabwe was based partly on the objective of regaining the land.

Agricultural land is defined as "land used for agriculture on a separate piece of land on Deeds Registry" in Section 72 of the constitution of Zimbabwe. However, this definition does not include communal land or rural land, covered by Section 282, that grants traditional leaders the authority "to administer communal land and protect the environment" as well as settle disputes (Constitution of Zimbabwe, 2013). A land tenure system that encourages greater productivity and investment in agricultural land by Zimbabweans is outlined in Section 289(e), whereas Section 289(b) guarantees actual rights to all Zimbabweans, irrespective of gender or race. The "freedom to acquire, hold, occupy, use, transfer, hypothecate, lease, or dispose of, agricultural land" is, thus, granted to citizens who own agricultural land (Polgreen, 2012). It is sufficient to say that landowners in rural areas have restricted rights over the property they occupy. The great majority of native African farmers were restricted to designated Tribal Trust Lands, where customary land distribution was handled by traditional authority. The Communal Land Act of 1982, passed after political independence, transferred power from chiefs to district councils and Village Development Committees (VIDCOs). But in 1996, cabinet decided to go against the recommendations of the Rukuni Commission (1994) and change this (Fisher, 2010).

Part II of the Communal Land Act, specifically sections 3, 5 and 6, defines communal land as land that was once classified as "Tribal Trust Land." Consequently, any minister may designate any land area as communal land by secondary legislation, such as a statutory instrument. A portion of common land cannot be withdrawn until after deliberation with the rural district council and concurrent adoption of a proposed law that will become a statutory instrument. When the Communal Land Act's Part III (occupation and use of communal land) is consulted, it becomes evident that while anyone may, in accordance with the Regional, Town, and Country Planning Act, occupy and use communal land for residential and agricultural purposes, first obtaining permission from the rural district council, should that permission be denied, an appeal may be filed. Following the first application, the rural district council works with the community chief in accordance with the Traditional Leaders Act and further examines customary law pertaining to the distribution, occupation and use of land in the area in question.

Numerous national legislations passed before 2013, and are out of compliance with the national constitution, still need to be adjusted. In contrast, Chapter 16 of section 276 (2) of the Constitution states that,

> traditional leaders have authority, jurisdiction and control over the Communal Land or Rural Land for that they have been appointed, and over persons within those Communal Lands or areas, except as provided in Act of Parliament.

The Rural District Councils Act [Chapter 29:13] then grants rural district councils the authority to administer communal land. In accordance with section 296 of the Constitution, the President announced the establishment of a nine-member Zimbabwe Land Commission on Friday, June 10, 2016. It remains to be seen how new legislation eventually in line with the Constitution, will be put into practice. The political will to carry out the Constitution's provisions will also determine it. The Commission will, among other things, "investigate and determine complaints and disputes regarding supervision, administration and allocation of agricultural land" and is silent on rural land (*The Herald,* 13 June 2016).

Zimbabwe's economic policies show that the country urgently needs economic development and expansion. But the overuse of natural resources can have detrimental effects on nearby communities and small-scale farmers' livelihoods that they might never fully recover from. One instance is the Marange diamond extraction in Chiadzwa, where hundreds of homes had to be relocated to make room for what was thought to be a more structured method of mining. Unlike the villagers who were panning on the diamond fields, the Government of Zimbabwe and a few foreign private investors chose to mine for diamonds in the Chiadzwa mining fields. The 2013 Zimbabwean Constitution's section 13 on national development, serves as another evidence of the country's desire for progress. Although internally displaced people are not specifically mentioned in this clause, it is implied by the Zimbabwean Constitution that their involvement in the projected development is required at every stage. The rights of women and children are also specifically protected in this clause. Protection from deprivation of property is one of the human rights guaranteed by the Zimbabwean Constitution, which states that no property of any kind may be seized or taken away without legal justification. Anybody with a right to or interest in land that was forcibly taken for the land

reform programme, however, can appeal against the compensation issue but cannot contest the acquisition in court.

(I) The lack of a properly designated agency to safeguard the rights of internally displaced rural landowners lead to a lack of knowledge regarding the existence of these inalienable rights. It's also critical to remember that rural landowners in communal areas and A1 resettlement schemes make up most people impacted by problems on ownership of land.

RURAL LAND OWNERSHIP AND MINING

In Zimbabwe, ownership of rural land is inextricably linked to the rules governing mining. Before beginning any mining activity, a potential miner must obtain permission from the owner of land whose farm is less than 100 hectares under the Mines and Minerals Act, section 31 (1)(g) (I-iii). Regrettably, this is removed by section 31(1)(g)(iii) also, that gives the Minister of Mines the authority to use his judgment and reject the landowner's request not to allow mining operations to occur on his/her property. Due to the size of their land, landowners who run the possibility of being evacuated have no avenue for arbitration or presentations.

The nearby miners and workers bring new social and cultural norms, relationships and ills, that the farmer must learn to cope with. When a farmer is outnumbered, interactions can sometimes become acrimonious than amicable. The farmer, who might be entirely or partially relocated, is not involved in this case. The minister in charge of mines is the only one with discretionary authority. Under the current land tenure structure, this section can make things worse for the farmers that are currently in place. The present mining laws were passed in 1961, and they have not been updated to reflect the way the mining industry and national policy directions have changed over time. Since private ownership of agricultural land was the predominant land title at the time the current Act was enacted, when farming was mostly done by white farmers who held title documents over farms, the Mines and Minerals Act recognised private ownership of farming land. Therefore, references to private ownership and the ability to demand payment or be bought out are found throughout the Act. These rights are exclusive to private owners. They do not extend to rural landowners who have restricted control

over their property. Since the farmers could demonstrate ownership, it was simple to enforce these rights. To guarantee that people with the right to occupy and use the land are granted, the same benefits and rights as the prior land title-holders, the Act has not been changed. The existing farm occupiers are now in a weaker position to negotiate for compensation because of this. They can have trouble receiving compensation for the value of lost land because the state owns that value and offers investors tremendous negotiating leverage to choose the location of resettlement or even the amount of compensation. A potential miner must obtain permission from the local rural district council over communal land, according to section 31(1)(h).

Rural residents, however, lack tenure documents that would allow them to fight against relocation or bargain for a better place to live. Every land, including state, communal and private land reserved for the Government of Zimbabwe, is considered open to pegging and prospecting under section 26 of the Mines and Minerals Act. However, the parties involved in the negotiations will depend on the title held over the relevant territory.

(I) INFORMATION AVAILABILITY TO RURAL LAND OWNERSHIP.

Sections 15, 16 and 17 of the Water Act also provide for public notice of the plans of the authorities. They nevertheless have the same drawbacks as previously mentioned, namely that notices are published or displayed in a way that makes them difficult for residents to access, making it difficult for them to serve their intended function. It should be highlighted that the corresponding legislation generally leaves the executive with an excessive amount of discretionary power to make the final decision following objections from interested parties. The only option available to the locals will be the legal system, which most of the rural residents find intimidating. Additionally, the necessary time and financial commitment may be beyond their means. Before a final judgment is made, there ought to be an opportunity for arbitration with a third party to guarantee openness and justice in the handling of this kind of business.

The Rural Land Act, that only stipulates in section 5 that a notice of acquisition must be published in a newspaper that is distributed in the region of interest, is now the least progressive Act of Parliament. To put it succinctly,

very few people in rural areas read newspapers. Furthermore, only those with title deeds or whose name is registered on the land are required by the Rural Land Act to plead their case against any purchase. Most of the rural residents in the area are now unregistered and lack a title deed to the land they have lived on for many generations. Although they lack a tenure document, people from rural areas have their names added to a book by a headman as a sign of acceptance and recognition as members of the community (Ashgate, 2000). Thus, it prevents these common citizens from exercising their right to take part in any plans for development, or at the very least, it greatly reduces their negotiating leverage. The Land Acquisition Act, which lays out further choices and requirements for compensating displaced residents, is not even mentioned in the Act. It follows that there is no aim to protect the residents of rural areas from its silence on compensation and resettlement issues as well as its refusal to acknowledge the dominant tenure structure in such areas.

Like the Rural Land Act, the Rural District Councils Act does not offer any kind of inclusion regarding the process of acquiring land for development. Because of this, land acquisition and development procedures run the risk of isolating themselves from the local population, even if rural areas bear the brunt of development's effects — particularly given that sections 13 and 264 of the Constitution explicitly address the topic of development. According to section 78 of the Rural District Councils Act, the minister's wish to see development is all that is required, and anybody impacted by such choices would get compensation under the rules of the Land Acquisition Act. The populace is vulnerable to arbitrary relocation even in cases where it is not truly essential due to the gap in community participation. Section 18 of the Rural District Councils Act points to the need to enforce compensation for acquired property and section 124 also provides rural councils with the option of borrowing to pay for compensation (Makonde, 2001).

(iii) WOMEN'S RIGHTS TOWARDS LAND OWNERSHIP

Most communities have long-established laws to control how land is passed down through generations since land is a valuable resource and a necessary source of income. But women's access to land inheritance is frequently restricted. Customary law states that a man's claim to family property supersedes a woman's, regardless of the woman's age or seniority within the

family. As a result, widows are not eligible to inherit land or other family property (Manilal ,2019) The sons of the head of the household are meant to inherit land from other family holdings upon their death. Since they are taught to be legitimate heirs to family property, older sons are given preference when it comes to property inheritance (Ndulo, 2017). Regarding inheritance, everyone agreed that male offspring should inherit the farm in the event of a death. Both patriarchy and customary law served as the foundation for this. The son inherited the property since he would typically assume the role of head of the household. Unexpectedly, most of the women think that the boys of the departed should be the ones with the final say over the farms, not the girl child.

DISCUSSION

Land security and reforms had reconfigured Zimbabwe's land ownership system. There is much to build and focus on land ownership, particularly development. Thirty-seven percent of Zimbabweans live in urban areas, with most of them residing in unofficial settlements devoid of tenure security and inadequate services (Mpofu, Chavhunduka and Chirisa, 2023). Millions of people are left vulnerable in Zimbabwe because there is no legislation allowing for the regularisation of informal land rights. Critics of land reforms have contended that rural land ownership that was spearheaded by the land reforms programmes had serious detrimental effects on Zimbabwe's economy (Richardson, 2004). When examining the sections of the Zimbabwean Constitution pertaining to the compulsory acquisition of property, it is crucial to remember that it is widely acknowledged, on a global scale, that governments have the authority to acquire property on a compulsory basis. Section 71 of the constitution stipulates that any compulsory acquisition, sometimes known as expropriation, must serve a public purpose, be non-discriminatory and be followed by compensation. In Zimbabwe, land rights and property are governed under the 2013 Zimbabwe Constitution. Since colonial times, Zimbabwe's property rights system has been a contentious one, especially considering that the country's colonial subjection was marked by politically motivated land dispossession and unequal patterns of property rights.

CONCLUSION

Decades of laws forbidding Africans from owning land contributed to an inherent struggle that created, sparked and ignited unprecedented records of violence and deaths in the history of Zimbabwe. The results of the study have

shown that, before Zimbabwe attained its independence, the overall practice, according to customary law, was that land belonged to those who were the "obeyed", who made laws and his subjects were to follow. Amid socio-economic tensions that dominated Zimbabwe's land ownership programmes, the FTLRP saw its birth to address land ownership disputes. Rural land ownership became a central point of great contestations accompanied by government interests towards rural land that is primarily fertile for mining activities. The results of the study have shown that land administrators, judiciary and local chiefs are of significance towards fair distribution of communal land. The article, however, presented an argument that ownership of ancestral land in the hands of the presidency is debatable for purposes of advancing democratic values. However, in principle, although land is vested in the presidency, in practice, land belongs to the inhabitants of a certain group, clan or society. The concept of delegation of powers from President to the chiefs in distributing land is now moot. Progressive rural land management is a pre-requisite for essential, effective and progressive production and investment. Improving rural land ownership is central, not only for the lives of rural residents, but since most of Zimbabwe's mining areas are mainly rural, the government should also take steps in respecting ancestral land, whilst at the same time bear the goal for sustainable development, trade and investment through robust rural development. Rural land must be sufficiently managed because a failure to manage rural land can lead to misuse, environmental degradation and pollution that can repudiate development and scare away potential investors.

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