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SUSTAINABILITY OF URBAN AGRICULTURE UNDER ECONOMIC AND POLITICAL INSTABILITY IN KAROI, ZIMBABWE

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ABSTRACT

The imposition of targeted sanctions on Zimbabwe brought with it bad publicity, a record low credit rating and a pariah state tag. Investors willingly pulled out of the country, avoided making new investments, or were commandeered by their countries not to make new further investments. The targeted sanctions led to sustained disinvestments and deindustrialisation which severely weakened the Zimbabwean economy with negative consequences for the citizens' welfare. Economic hardships opened the flood gates of rural-urban migration. Adopting a descriptive research design and case study approach, this study explores the sustainability of urban agriculture in Zimbabwean urban areas with specific reference to Karoi. In addition to the desk-based review, informal interviews and structured questionnaires were the key data collection tools for this study. The findings revealed that the sustainability of urban agriculture in Zimbabwe is under threat from a myriad of challenges which encompass political and environmental issues. This paper argues that the role of urban agriculture in Zimbabwe urban areas must not be underestimated and policymakers should address issues confronting this sector, most importantly legalisation of urban agriculture would be a step towards securing land for the urban poor. The illegal status of urban agriculture has left a vacuum which should be filled through policy formulation and regular institutionalised management in a particular manner, including all relevant stakeholders if food security in Zimbabwean urban areas has to be increased and environment improved in an urban development context.

Keywords: Food security, economic hardships, pariah state tag, rural-urban migration, sustainability.

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1. INTRODUCTION

The residents of Karoi have lived under extra ordinary circumstances for the last decade. In addition to an increasingly volatile political climate, they have had to endure the virtual collapse of the national economy, record unemployment, increasing poverty and rampant inflation. In 2005, the government launched a nationwide assault on informality (Murambatsvina) which had a major negative impact on the urban poor of Karoi who lost their homes and or livelihoods. The country's economic collapse decimated the livelihoods and savings of most households in the country and increased their vulnerability to ill health and food insecurity (Ncube & Ncube, 2016). Urban households were particularly vulnerable to food insecurity because of their heavy dependence on food purchases. Most of the food in Zimbabwe is imported (Masvaure, 2016), rendering the urban population more susceptible to external food shocks and rising food prices.

2. STATEMENT OF THE PROBLEM

Urban households have been affected by rising costs of food and high unemployment in Zimbabwe which emanated from an over a decade of economic and political meltdown. The closure of industries and the economic meltdown from year 2000 to date has left many people jobless and with less disposable incomes in most parts of Zimbabwe. The residents of Garikai, Chikangwe and Chiedza of Karoi in Zimbabwe have not been spared from these challenges of unemployment and food insecurity. As a result, achieving food security has become a problem for urban dwellers like Garikai, Chiedza and Chikangwe households. During the rainy season maize is indiscriminately grown in open spaces that include fragile wetlands and steep slopes around all three residential areas in Karoi while vegetables are grown in almost every household all year round. This study therefore sought to assess the sustainability of urban agriculture in Karoi's three suburbs under these economic and political hardships in Zimbabwe against the challenges encountered by urban farmers in order to propose strategies for improving urban agriculture.

3. POLICIES AND LEGAL FRAMEWORK FOR URBAN FARMERS IN ZIMBABWE

Agriculture is not classified as an urban activity in Zimbabwe (Moyo, 2013). Hence, city and town planning systems do not cater for urban agriculture. Urban agriculture is therefore to some extent viewed as illegal in Zimbabwe (Kutiwa et al., 2010) since it is not backed up by any statutory instrument (Moyo, 2010). There is no clearly laid down policy on urban agriculture (Kutiwa et al., 2010; Pedzisai et al., 2014). However, since 2002, local authorities have supported urban agriculture where it has been organised in a systematic manner (Ncube & Ncube, 2016).The Nyanga Declaration on Urban Agriculture in Zimbabwe and the Harare Declaration by Ministers of Local Government in Eastern and Southern Africa acknowledged that urban agriculture contributes to urban food security, poverty reduction, local economic development and sustainable urban development (Havorka, 2005). The Harare Declaration also urged local authorities to develop appropriate incentives necessary for the growth of urban agriculture. Non-Governmental Organisations (NGOs) were also encouraged to support sustainable urban agriculture projects for the benefit of the poor. This Harare Declaration furthermore, paved the way for the formulation of policy and legal frameworks for urban agriculture. Thus, for example, a pertinent policy such as the National Environmental Draft Policy that provides strategic directions including developing and publishing guidelines on urban agriculture was developed. It enables in assisting local authorities to plan ways to integrate and co-ordinate support for urban agriculture and establishing extension programmes to promote sustainable urban agriculture (Kutiwa et al., 2010).Currently, local municipalities in Zimbabwe, in collaboration with the Department of Housing and Community Services, issue permits for cultivation in urban areas but the majority of the public is not aware of this facility (Kutiwa et al., 2010; Moyo, 2013). Although city municipalities have acknowledged the importance of urban agriculture, the recognition of its current or potential importance has not yet been integrated in the legal and statutory provisions of Zimbabwe (Moyo, 2013). Policies and laws specifically dedicated to enhancing and monitoring urban agricultural activities are glaringly absent.

4. THE BENEFITS OF URBAN AGRICULTURE

Urban agriculture brings with it great potentials for enhancing the situation of urban citizens, especially those with the lowest incomes and are dependent on the access to locally grown food. Urban agriculture is one of the source of supply in urban food systems and only one of several food security options for households (Mougeot, 2000a). Similarly, it is one of several tools for making use of urban open space (Ellis & Sumberg, 1998), treaty and/or recover urban solid and liquid waste (Mbiba, 2000; Pearson et al., 2010) and generates income and employment (Masvaure, 2016). Today an estimated 800 million people are engaged in urban agriculture worldwide (Mougeot, 2000a) and of these 200 million are market producers (Quon, 1999), employing 150 million people full time

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(Mubvami et al., 2006). Denninger et al. (1998), estimated that 25 out of 65 million people living in urban areas in Africa alone currently obtain part of their food supply from urban agriculture and at least 35-40 million urban residents will depend on urban agriculture to feed themselves in southern Africa alone by 2020 (Masvaure, 2016).

Furthermore, self- produced food in cities provides nutritious food otherwise unaffordable (Mougeot, 2000), replaces purchased food staples or supplement these with more nutritious food stuffs (Crush, Hovorka, & Tevera, 2011), affords saving as much as 20% of income (Mougeot, 2000) which can be spent on non-produced foodstuffs or other needs like school fees and transport. The saved income can be used to generate supplementary or principal income which can be reinvested in other urban businesses. In Harare, for instance, savings accruing to low income farmers are equivalent to as much as several months of earnings (Masvaure, 2016; Moyo, 2013). In Lusaka, urban gardens have significantly increased the quality and quantity of food available to the producers' households and their neighbourhood and improved the financial welfare of the households and enhanced the environmental quality of the community (D'Alessandro & Hanson, 2016; Masvaure, 2016).

Urban agriculture not only provides food, but it has other positive impacts on the community as well. The impact of urban agriculture on urban community welfare is more documented than its impact on the rural counterparts. In low income urban districts of Nairobi, Brazzaville and Lusaka, urban agriculture farmers contributed to community welfare and funeral groups (Mougeot, 2000) and to formal and informal channels of food acquisition (Quon, 1999). The general employment of community residents and additional or seasonal income for other basic needs, link up with food trade, produce food products otherwise unaffordable, reduce dependence on purchased food, enhance their own exchange entitlement and provide food gifts and meal sharing (Drakakis-Smith, 1995). In Cairo and Port-an-Prince, the frequent gifting of food by home producers strengthens reciprocity within assistance networks and reduces incidences of theft (Mougeot, 2000). It is also known that open space producers unwillingly contribute to curbing food insecurity through loss of crops, animals and other asserts to theft (D'Alessandro & Hanson, 2016; Mbiba, 2000; Mougeot, 2000) thus, in this way positively impacting on community.

Besides the direct nutritional and employment creation, there are several environmental advantages worth noticing. Most Least Economically Developed Countries (LEDCs) do not have environmentally sustainable policies when it comes to nutrient recycling (Bryld, 2003). In most cities, there is a general throughput of resources, increasing amount of garbage wasted (Pedzisai et al., 2014). There are various ways of improving the cities' environments and among these are planting of trees, reducing consumption and improving the efficiency of the infrastructure (Bryld, 2003). The cultivation of crops and trees help to reduce dust and absorbs pollutants through its foliage (Kutiwa et al., 2010). Trees and crop plants increase the humidity in arid climates (Bryld, 2003) and reduce radiational heating through conversion of ground water into atmospheric humidity (Pedzisai et al., 2014). Cultivation also turns unsightly areas into green areas, preserving the much needed green belts in the cities. Furthermore, there is a constant demand for fuel wood in LEDCs, a demand, which can be supplied partially by forestry in urban and peri-urban areas (UNDP, 2006). There are other ways in which urban agriculture can contributes to an improved urban environment. One of the most efficient ways of improving the environment is through recycling organic waste (Hovorka, 2005).

5. THREATS AND CHALLENGES OF URBAN AGRICULTURE IN ZIMBABWE

Assumptions upon which the Zimbabwean environmental legislations are based are sometimes criticised for being little more than long standing conventions, questionable scientific truism and the result of parochial natural resource interests (Moyo, 2011). For instance, Crush (2007) illustrates these criticisms with regard to legislations controlling the cultivation of dambo land in urban areas in Zimbabwe. Many of the statutory regulations are too prescriptive and without having the necessary regard for the needs of the people they are affectively controlling. As such they are seen as tools of oppression (Moyo et al., 2010). Most urban poor for example, are not necessarily unaware of their over-use of resources (water in this case) or the dangers of inappropriate land use e.g. Cultivation of steep slopes, rather, it can be argued that they are forced into that situation by the imperatives of daily life and the political economy failing to provide more suitable alternatives for their survival (Moyo et al., 2010). Under the current economic and political circumstances, fiercely implementing urban agricultural policies without also looking for ways of reducing the need for the activities that are the subject of the legislative control will lead to a conflict and is unsustainable in the longer term. It is dealing with the symptoms of effect, rather than the underlying cause of urban agriculture and will become an object of contention.

Another threat to urban agriculture in Zimbabwe includes the country's environmental policies, which are criticised for overlapping, contradiction and omission (Masvaure, 2016). An example of overlapping is the control of dambo (vlei) use which is regulated both by the Water Policy (2008) under the control of Zimbabwe National Water Authority (ZINWA) and the Environmental Management Policy (2002) under Environmental Management Agency (EMA). An example of contradiction is in the control of stream bank cultivation, the Environmental Management Policy (2002) under the control of EMA seeks to control cultivation within thirty metres

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of a stream edge, while the Forest Act (2002) under the control of Forest Commission seeks to control cultivation within one hundred metres. An example of omission is how both the Environmental Management Policy and the Forest Act can only be evoked on land to which legal title is held thus ignoring urban farmers without title deeds and communal land.

Another problem with the environmental laws of Zimbabwe is that they are too great a fragmentation of structures, interests and responsibilities at central and local level. For instance, one of the focuses of EMA is land conservation and it has to execute its mandate through the Natural Resources Act. The task however, overlaps with that of AREX which in turn overlaps with the functions of the Department of Rural Development (DRD). Thus, there is need for streamlining and integrating the currently diverse range of acts and institutions involved in environmental protection so as to avoid confusion and conflict and the need for greater inter-ministerial communication to coordinate environmental matters (Pedzisai, 2014)). There is also a general criticism that although crucial environmental legislations and the infrastructure for its implementation exists, it is put to inadequate of qualified personnel and operational equipment, poor communication systems and inadequate funding (Masvaure, 2016).

6. RISKS OF URBAN AGRICULTURE

There is evidence of human *brucellosis* infection and *echinococcus* infection transmitted by domestic livestock in Kano, Rio de Janeiro, Mumbai and in Calcutta (Mougeot, 2000). The risk of such diseases spreading is real as a result of inappropriate zero grazing, space confined husbandry of pigs, goats and sheep which is growing. Urban agriculturalists have a tendency of using human wastes to enhance agricultural production. This is for instance, urban farmers in Chinese cities of Guangzhou, Fuzhou and Shenzhen have a long tradition of collecting human wastes and apply *night soil* to peri-urban crops (Liu et al., 2016). Such a practice risk urban people as they consume contaminated food.

Environmental health issues include visual untidiness, soil erosion, and destruction of vegetation, siltation, and depletion of water bodies and pollution of resources (Liu et al., 2016). The use of agrochemical in urban agriculture is one source of concern. Depending on the intensity of urban agriculture production, their use may vary extremely. Whilst urban agriculture for self-consumption relies less on the use of agrochemicals (Pedzisai et al., 2014) more intensive market gardening production such as those in Johannesburg make extreme use of inorganic fertilisers and agrochemicals (Moyo, 2013). Studies carried out in Kano and Dakar by Mbiba (2000) found out that market vegetables farming makes use of more extensive organic and inorganic fertilisers thereby giving values to sub-products of animal husbandry. While in some cities, use of chemical fertilisers is prohibited, urban farmers continue to use it. For instance Masvaure (2016) notes that in Johannesburg peri-urban farmers use large quantities of inorganic fertilisers and they lack knowledge on the safety of waste materials for use as fertilisers or stock feed. In Cairo, compost was found to be severely contaminated with heavy metals because of poor sorting of inorganic wastes (Bryld, 2003).

7. FACTORS THAT HINDER URBAN AGRICULTURE IN ZIMBABWE

Part of the reasons why many African cities have low levels of urban agriculture is that most African nationals and local governments are intolerant of urban agriculture. They view it as incompatible with their modernist visions of what cities should look like (Drakakis-Smith et al.,1995). For instance the attitude of local governments in Lusaka and Harare is typical of local governments in Africa. They view urban agriculture as a rural activity whose practice within the city boundaries is inappropriate sand distracts from the modern image of the city (D'Alessandro, 2016). Researchers have found out that it is only in African cities experiencing steep levels of economic decline that there seems to be high levels of participation in urban agriculture (Moyo, 2013; Mubvami et al., 2006). This is a direct link to the crisis model which views urban agriculture as a response to economic crisis which force the urban poor to engage in urban food production as a means of survival (Drakakis-Smith et al., 1995). Empirical evidence seems to support this, as African cities in countries with particularly difficult economic conditions do seem to have higher levels of urban agriculture (Crush et al., 2007).

Key players in urban agriculture face a major constrain of access to land in terms of its availability, quality, property rights and tenure (Kutiwa et al., 2010). These constraints are aggravated by the ambiguous and negative attitudes of policy makers. Most people who engage in urban agriculture operate without secure title to land, with overlapping tenure systems and rapidly changing land uses and values. Some urban farmers who have no formal access to land end up accessing it through borrowing, squatting, informal renting.

The chronic shortage of water for irrigation is among major concerns to urban agriculture. For instance the supply of water for urban agriculture is the most critical problem in Chinhoyi (Pedzisai et al., 2014). The shortage of water is the most immediate concern in Bulawayo and Chiredzi (Ncube, 2016).Urban agriculture in Zimbabwe is also under threat from crop pests and theft of produce (Moyo, 2010). Deficits in certified seeds, mineral fertilisers and pesticides as well as extension services are also major challenges which are faced by urban farmers in Zimbabwean towns and cities. Extension services are non-existent in urban context for instance,

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in Harare as they are only limited to rural areas (Crush et al., 2012). Access to financial schemes is also generally difficulty in Zimbabwe, unlike in Botswana in which the peri-urban vegetable projects are funded by different schemes which increased from 550 in 200 to 742 in 2009 (Madisa & Assefan, 2011). This positive result is mainly linked to government financial schemes such as the Financial Assistance Policy which started in 1982, the Citizen Entrepreneur Development Agency and the Young Farmers Fund (Madisa, Assefa, & Thebenala, 2010). Thus, Zimbabwean government need to emulate her neighbour which supports urban agriculture financially.

8. CHALLENGES FACED BY URBAN FARMERS IN KAROI TOWN

Although urban agriculture has the potential to alleviate poverty in Karoi, it faces a lot of challenges. One of the constraints to urban agriculture in the town is the land tenure insecurity for off plot agriculture especially in Garikai and Chiedza residential areas. Urban farmers do not own the land they cultivate on, thus they risk losing it for other purposes. Land in Karoi, like in any other urban areas in Zimbabwe, is owned by City or Town Council authorities who place by-laws that restrict free use of land. Moyo (2013) states that due to land tenure insecurity, farmers do not invest on farms hence there is low production. Off-plot urban agriculture is also considered illegal in Karoi and by-laws have been put in place to restrict its practice. In Zimbabwe off-plot agriculture is considered illegal and council authorities have used legislation such as the protection of lands and natural resources to slash maize before harvest (Basure and Taru, 2010). According to Tefere (2010) the illegal status of urban agriculture in Zimbabwe, makes it difficult for urban farmers to access support services such as extension officers and credit facilities. Thus, the Command Agriculture programme, which came after the country spent US $ 253,5 million on importing grain in 2016 alone to feed vulnerable communities in Zimbabwe that were affected by the drought (Sunday Mail, 1 January 2017) is not benefitting the urban farmers in Karoi. Another problem affecting urban agriculture farmers is shortage of land. There is competition for land as more households practice urban agriculture to enhance food security. This leads to farmers cultivating on small pieces of land and as a result they get low yields (Moyo: 2013). Off-plot is also affected by theft as produce is stolen before harvest. Urban farmers also face challenges of lack of inputs hence they use basic subsistence tools such as hoes, shovels, spades, forks and seeds from the previous harvest which leads to low agricultural production.

9. MATERIAL AND METHODS

9.1 Study Area

Chikangwe, Chiedza and Garikai are the three main high density residential suburbs in Karoi town ($16^0$48''S; $29^0$42''E) characterised by a high prevalence of urban agriculture hence food and poverty are widespread under economic and political instability and become important concerns. Karoi is located in the northern bread basket region of Mashonaland West in Zimbabwe. This region is characterised by high average temperatures of above 25^0C and annual rainfall totals of well over 800 mm. Karoi town has 28 606 people (ZIMSTAT, 2012). In Zimbabwe, urban agriculture was studied in all major towns and cities and has not been done in the small town like Karoi.

9.2 Research Design and Methods

The research was a descriptive survey. It focussed on systematic description salient aspects of sustainable agriculture in the three high density residential areas of Karoi. In the research study the methods used comprised the questionnaire and interview based surveys supplemented by field observations. Four interviews with purposively sampled respondents in key institutions were done. Six field observations campaigns, before and during therainy season were done. The study targeted 150 urban farmers (50 in Chikangwe, 50 in Chiedza and 50 in Garikai) high density residential areas of Karoi town. One hundred households from the 150 total numbers of practising households were selected using convenience sampling of respondents from the 150 households. Adult members of the visited households found in the field were questioned based on a structured questionnaire, thus the structured questionnaire was administered to the urban farmers. Ethical considerations, including permissions from Karoi town chairmen and other superior bodies (e.g. Environmental Management Agency (EMA), Agricultural Research and Extension (AREX), Police, and Department of Housing, Health, Education and Community Services (DHHECS) whose institutions were involved in interviews were catered for. This instrument was pretested before the main data collection campaign to ensure clarity of the questions. Purposive sampling was used for the four interviewees from EMA, AREX, police and Karoi town council DHHECS and an in-depth interview method was used. A structured closed-ended questionnaire for farmers, interview schedule for key informants and observation checklists for field observations were the key data collection tools for this study. The interview schedule was used to contact key informants from institutions named above. The researchers carried out seven in-depth interviews from seven key informants from EMA, AREX, Department of Community services, Zimbabwe Republic Police and three ward councillors. In each case twelve questions were asked

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and the researchers were recording the responses that emerged on interview schedules. Observation checklists were used to observe aspects that were identified (e.g. number of fields per suburb, size of fields, crops grown, sex of farmers). Field notes were taken in note books on important observations.

10. RESULTS AND DISCUSSION

This section of the paper presents results of the study. The findings are based on the data collected from households engaging in urban agriculture on sustainability of urban agriculture under economic and political challenges in Zimbabwe, taking Karoi as a case study. In Karoi data was collected from the three residential areas of Chiedza, Chikangwe and Garikai. Chikangwe is the oldest residential area while Garikai is the most recent residential area in which there are many vacant stands and people are taking advantage of these spaces to grow crops.

Table 1: Distribution of respondents by age and sex

Age (Years)	% Males	% Females	Total
Below 15	0	0	0
16-25	1	8	9
26-35	20	50	70
36-45	6	10	16
46 and above	2	3	5
Total	29%	71%	100%

Table 1 shows the distribution of respondents by age and sex in the three residential areas in Karoi. Most of the sampled respondents were aged 26-35 (70%). Sixteen percent of the respondents were aged between 36- 45 and those aged 46 and above constituted only 5%. The results show that 9% of the respondents were aged 16-25 and there were no respondents in the age group 15 years and below. The findings show that in Karoi urban agriculture is practised mainly by females (71%) while males were 29% of the sampled population. It is also noted that urban agriculture in Karoi is practised by those who are mature 16 years and above.

Table 2: Distribution of the respondents by employment status and Monthly income

Employment Status	Monthly income	Frequency	%age
Government & Council Employees	Below US $350	98	65.3
Unemployed	Above US $350	15	10
Private sector employee	Above US$1000	21	14
Self employed	No income	16	10.7
Total		150	100

Table 2 shows that65.3 % (98) of the sampled households indicated that they were either government or Karoi Town council employees and were earning less than US$350 per month. It also shows that 14% (21) of the respondents involved in urban agriculture were private sector employees who earn above US$1000 and there were 10% (15) Karoi town residents who were unemployed with an income above US$350. The self-employed constituted 10.7% (16) of the people involved in urban agriculture in Karoi Town. The findings of this study shows that most of the people in Karoi who were either government or council employee were earning salaries which were below the poverty datum line pegged at US$622 by end of 2016 in Zimbabwe (ZIMSTAT, 2016). This study also shows that urban agriculture in Karoi is mostly practised by the urban poor who are government or council employee who cannot afford their food requirements and have resorted to urban agriculture to enhance their food security. This sounds true as most of council employees in Zimbabwe are not paid on time and some even went for over a year without being paid (Moyo, 2013). In some instances urban council employees in Zimbabwe were offered stands as payment since the councils owe employees thousands of US dollars in unpaid salaries (Moyo, 2010). This study concurs with Moyo (2013) whose views are that the disposable income for urban households in Zimbabwe is low due to low wages and people have resorted to urban agriculture to achieve food security.

Table 3: Size of cultivated land in Karoi urban

Size of cultivated land in square metres	Frequency	Percentages

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(m^2)		
20-49	66	44
50-99	10	6.7
100-149	23	15.3
150-199	18	12
200 and above	33	22
Total	150	100

The findings showed that in Karoi's three residential areas, most respondents, 44% (66) cultivate on land that is between 20-49 m^2 while 22% (33) cultivate on land that is over 200 m^2. This shows that urban agriculture in Karoi town is practised on small pieces of land due to shortage of land especially in old residential areas of Chikangwe and this affects their production. Only 6.7% (10) respondents stated that they cultivate on land that is between 50-99 m^2 and 15.3 % (23) cultivate on land which is 100-149 m^2. Most of those who reside in Chikangwe cultivate small areas of land and they do so mostly within the confines of their yards while those who cultivate large areas of over 200 m^2 do so outside the parameters of their yards in Garikai and Chiedza where there were many vacant pieces of land. Thus, the major problem affecting urban agriculture farmers in Karoi is shortage of land. There is competition for land as more households practise urban agriculture to enhance food security under economic and political challenges in Karoi. This leads to farmers cultivating on small pieces of land and as a result they get low yields. Off-plot farming is also affected by theft as produce is stolen before harvest. Urban farmers interviewed in the study a area also face challenges of lack of inputs hence they use basic subsistence tools and seeds from previous harvest, a scenario also noted by Ncube (2016) to lead to low agricultural output by urban farmers in Bulawayo. Regardless of these problems, the Command Agriculture Programme is concentrating on rural farmers only.

Table 4: Main crops grown in Karoi Town

Crop	% age area coverage
Maize	86
Vegetables	12
Sweet Potatoes	2
Total	100

Table 4 shows the main types of crops grown in Karoi. The findings show that 88% of the land under cultivation in Karoi was under maize while 12% was under vegetable and only 2% of the cultivated land in Karoi was under sweet potatoes. Maize is a staple food in Zimbabwe. The results of this study concurs with Moyo (2011) and Ncube (2016) who state that during the rainy season maize crop is seen in every open space along roads, railway lines and between power lines.

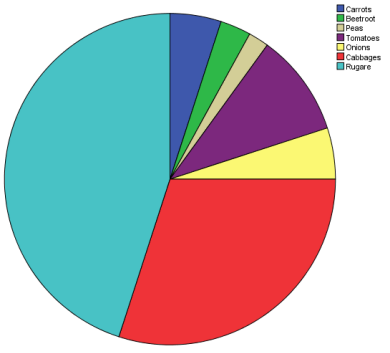

Figure 1: Types of vegetables grown in Karoi.

Figure 1 shows the distribution of vegetables grown in Karoi town. Rugare, (a type of vegetables similar to rape but is a perennial bush vegetable) constitute the bulk (45%) of all the vegetables grown in Karoi and cabbages constitute 30% of all the vegetables grown in town. Onions and carrots constitute each 5% of the vegetables grown in Karoi while tomatoes are the third largest vegetables grown as

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they constituted 10% of the vegetables grown in Karoi. Peas and beetroot were less favoured as each constituted 2% and 3% respectively of the vegetables grown in the three residential areas of Chikangwe, Chiedza and Garikai.

Table 5 Residential area and percentage of land ownership

Residential Area	Land Tenure	
	% owned	% others
Chiedza	45	55
Garikai	16	84
Chikangwe	49	51

Table 5 shows land tenure in Karoi by residential areas. It shows that in Chikangwe 49 % of the residents involved in urban agriculture owned land on which they practise farming while 51% of them were on others category which implies that they were cultivating on land which either belongs to the council or they were renting from others who owned land but were not practising urban agriculture. In Chiedza 45% of those sampled practised urban agriculture on land they own while 55% did so on either council land or other people's land on which they did not have title deeds. Garikai had the most farmers (84%) who were cultivating on land which did not belong to them and only 16% owned the land on which they were cultivating.

Whilst urban agriculture has the potential to alleviate poverty (Ncube, 2016), not only in Karoi, but in all urban areas of Zimbabwe, it faces a lot of challenges. One of the constraints as shown by the results is the land tenure insecurity for both in-plot and off-plot agriculture. Like many other urban areas, urban farmers in Karoi do not own land they cultivate on, thus they risk losing it for other purposes. In Karoi, land is owned by Karoi Town Council and there are by-laws that restrict free use of land. This restricts urban farmers in Karoi to improve land. Thus, the findings concurs with Moyo (2013) who finds out that due to land tenure insecurity, urban farmers in Zimbabwe do not invest on urban farms and hence there is low production.

In Zimbabwe, it is impossible to invest in urban agriculture because urban agriculture is illegal (Ncube, 2016) and there are by-laws which restrict its practise (Masvaure, 2016). In Zimbabwe urban agriculture is considered illegal and both City and Town Councils have legislations such as the protection of lands and natural resources, which they use to slash crops before harvest (Basure and Taru, 2010). Due to the fact that urban agriculture is illegal, it is thus difficulty for urban farmers in Zimbabwe to access support services such as extension officers and credit facilities (Tefere, 2010). Thus, the current 2016-2017 government programme called "The Command Agriculture" where farmers are being given inputs is not benefitting urban farmers in Karoi town.

Table 6: Reasons for engaging in urban agriculture

Reason	Frequency	% of Respondents
Home Consumption	109	72.7
Home consumption and selling	30	20
Sell	2	1.3
Leisure	9	6
Total	150	100

Table 6 shows the reasons why residents of the three residential areas in Karoi engage in urban agriculture. It shows that 72.7% (109) indicated that they engage in urban agriculture so as to have food for home consumption while 20% (30) engage in urban agriculture for home consumption and sell the surplus. Only 1.3 % (2) was involved in urban agriculture so as to sell the products and 6% (9) did so for leisure in which they grew flowers so as to decorate their homes.

Generally the data on table 5 shows that in Karoi urban agriculture is practised for food consumption. This fact concurs with Karoi Town Council, Director of Housing and Community Services who said, "*Urban agriculture in Karoi is useful in enhancing food security because it ensures availability of food at least all the times during this current economic hardship in Zimbabwe"*. In the same vein, (Kutiwa et al., 2010) posit that in Harare up to 60% of food consumed by low income earners is self-produced. Similarly, Tefere

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(2010) states that in Kenya around 300 000 households partly depend on urban agriculture for food and income. This shows that urban agriculture plays a very important role in enhancing food security in Karoi under economic and political hardships.

Table7: Methods of acquiring land for urban agriculture

Method	Frequency	Percentage
Permit from Council	16	10.7
Squatting	100	66.7
Informal renting	14	9.3
Borrowing	20	13.3
Total	150	100

Table 7 shows methods of acquiring land for urban agriculture in Karoi. The results show that 66.7% (100) of the sampled urban farmers were squatting while 13.3 % (20) were borrowing land for urban agriculture. It also shows that 9.3% (14) informally renting and 10.7% (16) of the sampled urban farmers were offered permits by the council. In Karoi, it is the Department of Housing, Health, Education and Community service (DHHECs) which is responsible for allocation of land for urban agriculture. According to the department at the beginning of each season, permits are issued to those residents who want land for agriculture. It cost US$10 per hectare in Karoi for those who want land. The permit is issued every year at the beginning of each growing season. From an interview with the Director of DHHECs it had been revealed that in Karoi there are no by-laws which permit the slashing of crops. However, urban farmers along Harare-Chirundu road were complaining that they were receiving threats that their crops could be slashed as they were cultivating on undesignated places. Observations made showed that cultivation was done on either side along the Harare-Chirundu Highway and maize crop was seen starting from Crescent road to Maunga Turn-off.

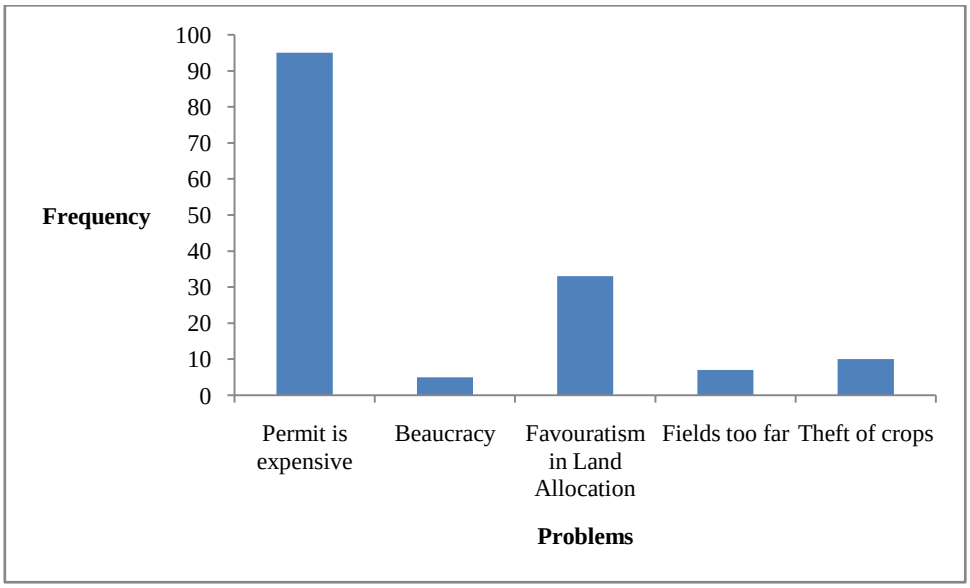

Figure 2 Problems faced by residents in acquiring pieces of land

Figure 2 shows results on perceptions of residents on the problems faced in acquiring pieces of land for urban cultivation. The results showed that the majority of residents 95 (63.3%) of the sampled urban farmers felt that the council is charging too much for one to acquire a piece of land. It cost one US$10 per hectare for one to get a piece of land per growing season in Karoi. The informal interview with urban farmers in the three residential areas where urban farming is taking places revealed that people felt that the US$10 is too high considering the economic challenges the country is facing. Figure 2 also shows that 5 (3.3%) of the sample felt that there was a lot of bureaucracy in land allocation and 33 (22%) cited favouritism in land allocation. The other 4.7% (7)of the residents

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felt that fields were too far from residential areas while 6.7% (10) cited theft of crops as the main problem they encounter in their farming.

11. RECOMMENDATIONS

Basing on the above findings, the study makes the following recommendations:

- Karoi Town Council should legalise urban agriculture and offer title deeds to all urban farmers who own pieces of land.
- The 2016-2017 government of Zimbabwe Command Agriculture Programme needs to include urban farmers as well. If extended to urban areas it will assist urban farmers with agricultural inputs.
- The Government of Zimbabwe, through AREX and EMA, needs also to deploy its officers in urban areas to educate and equip urban farmers with modern farming skills in order to sustain urban agriculture in Karoi.
- Karoi Town Council needs to amend its by-laws to allow urban farmers to use vacant land on a lease basis until the land is required for other development purposes. This can be done in Chiedza and Garikai where there is a lot of land currently lying idle. If this is done, it will encourage farmers to invest on land that they own and it will solve the problem of land insecurity.
- Slashing of crops by Karoi Town Council and EMA needs to be outlawed.
- There is need for equal distribution of vacant land to all deserving Karoi Town Council residents.
- Council needs to levy all urban farmers and use the money to educate them on proper farming in Karoi.
- The US$10 per hectare for acquiring land for urban agriculture needs to be reduced to US$2 per hectare so as to cater for those people who cannot afford the current cost of acquiring the permit.
- The council should allow residents to keep a limited number of small animals like broilers, rabbits for them to have meat as the current by-laws do not allow keeping of any kind of animals in Karoi.

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