The Influence of Urban Population Growth on Agricultural Land Degradation "Case Study of Kinyinya Sector in Gasabo District, Kigali City"

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Abstract— *Kigali city is recently expanded over the peripheral areas due to combined factors like potential land in the area in attracting investments activities, proximity to the national market and accessibility for various types of infrastructures. Therefore, the need of this article to assess the influence of urban population growth on agricultural land degradation. The results of urban population growth on agricultural land leading to the conversion of agricultural land to infrastructure development which lead to the shortage of land designed for agriculture and lead to the hunger and increment in cost for basic need especially food. A multi-method data collection approach incorporating household survey, key informant interviews and personal observation has been used to assess urbanization process of the Kigali city and the changing livelihoods. Hence, the result of findings revealed that expansion of the city during the last 5 years made significant impacts on livelihood of farming community on peripheral areas: agricultural land fragmentation, land reduction, and loss of farmer's property on the land. On the other hand, the non-farm economic sector developed in the area was not capable to absorb evicted households. In addition, rehabilitation mechanisms used by the city mainly an arrangement of cash compensation has found to be inadequate to replace their resource base, which is land. As a result, most of the families exposed to further economic, social and cultural impoverishment. Therefore, Kigali city's expansion seems inevitable, to ensure sustainable urban development, government should make sound planning prior to displacement without treating livelihood of vulnerable groups of people living on peripheral area.*

Research findings show that 90% of the respondents agreed and affected by urban expansion. Especially people whom have expropriated due to public infrastructures such as roads, schools, markets, industries, institutions and estates, like families from Murama cell, Kinyinya sector who has relocated and expropriated while 10% of respondents have not yet affected by urban expansion The affected people are mostly living in slums (Gasharu and Murama) and have low income compared to those living in urban parts of Kinyinya(Kagugu and Gacuriro).

Keywords— Kinyinya Sector, Kigali City, Population Growth, agricultural land degradation.

I. INTRODUCTION

The urban population of the world is increasing rapidly, the rapid increase of population is causing urban sprawl especially in the cities of developing world. It is an undesirable form of urban development as it is unsustainable (Sudhir S., 2018). Rapid urbanization has increasingly become a major developmental issue, particularly in developing countries. The global urban population has grown from 751 million in 1950 to 4.2 billion in 2018, and it is projected to increase further to 6 billion by 2050 (UN-Habitat (2011). Highly urbanized regions include Northern America (82% living in urban areas), Latin America and the Caribbean (81%), Europe (74%) and Oceania (68%). Although Africa remains the least urbanized region, with 43% of its population living in cities, it is currently urbanizing at a faster pace. The continent's urban population is estimated to more than triple in the next 40 years, reaching 1.339 billion in 2050, corresponding to 21% of the world's projected urban population (UN-habitat, 2011).

In Rwanda, the socio-economic and demographic trends such as population growth, industrialization, land consumption and infrastructure development, have impacted on the state of the Kigali city expansion (REMA, 2013). The City of Kigali has been grown rapidly after the 1994 Genocide compared to the previous years when Rwanda gained its independence in 1962. Kigali city's expansion is a result population growth due to Rural-Urban migration, economical and socio-political factors (Penine U, 2011).

This is mainly due to favorable reform in the country in terms economic policy that has created conducive environment for private investments and the proximity of these areas to national market. However, in Rwanda urban expansion programs are not supportive to farmers in periphery, and thus has negative impact on people livelihood. AS the urban population increase, the land used for growing food and cash crops in peripheral zones is highly reduced, the need for the study seeks to analyze the influence of urban Population Growth on agricultural land degradation, Case study of Kinyinya sector in Gasabo district of Kigali city.

II. MATERIALS AND METHODS

2.1 Population of the study

The target population of the study was composed by the people living in Kanyinya, all categories of population were taken into account by considering marital status, education background and level, sexes, ages, 46 female respondents and 50 male respondents to make 96 respondents from different households were selected in the cells of Kanyinya Sector. Technical sampling was used to determine the sample size from 57,189 populations. 24 respondents were selected in each 4 cells comprising Kinyinya sector to make 96 respondents and fill the distributed questionnaires. Before filling the questionnaire, the questionnaires were previously revised using chief of villages in the 4 cells of Kinyinya sector of Gasabo District in Kigali city, the respondents were also selected basing on the people living in urbanized and rural area whom depend on different economic activities especially agricultural sector.

2.2 Sample size

William (2004) noted that sampling is a device or a way that is used in selecting of the members is able to question, or who are a fair presentation of all the members in a union. Sampling techniques may be defined as the method used to select sample elements in the population. At this time the researcher will use purposive sampling technique in order to come up with the relevant information to the study. This technique of purposive sampling will be applied to 96 respondents from selected in 4 cells of Kinyinya Sector Gasabo District in Kigali City.

However, the formula of Taro Yamane was used to calculate the sample size

Therefore, the fact that it is not possible to meet the whole population to achieve the research objectives, for the purpose of collecting detailed information that can lead to paramount decision making, a sub-set of the total population (sample size) would be selected. From the population of 2123 respondents of Kigali kitchen fires, the sample size of 96 respondents will selected. As such, Sloven's formula for determining sample size was applied as illustrated below:

$$n = \frac{N}{1+(N)\,e^2} \tag{1}$$

Source: Yamane, 1967 Where N= Total population, n=Sample size, and e= Error margin, e² is 0.01 level of significance

Applying the above formula, the sample employed for this study was calculated from the total 2123 households using gases in both Gitega and Nyarugenge sectors of Nyarugenge District. The sample was calculated as follows:

$$n = \frac{57189}{1+57189\,e^2} \tag{2}$$

$$n = \frac{57189}{1+57189\,(0.1)^2} \tag{3}$$

$$n = \frac{57189}{1+57189\,(0.01)} \tag{4}$$

$$n = \frac{57189}{1+ 57.189} \tag{5}$$

$$n = \frac{57189}{58.189} \tag{6}$$

N = 95.8 which makes approximately 96 participants ; whereby, n is the sample size, N stands for population and e² is 0.01 level of significance.

III.   RESULTS AND DISCUSSIONS

3.1   People affected by urban expansion

From the respondents' views regarding to the above question, 90% of them have said "YES" and agreed that there were many people affected by urban expansion. They said that those people were expropriated due to public infrastructures such as roads, schools, markets, industries, institutions and estates. For instance, there were families from Murama cell, Kinyinya sector who were expropriated and went to live in other parts of Gasabo District. 10% of respondents have said NO. It was remarked that the respondents who said YES are those who live in slums (Gasharu and Murama) and have few income while those who said No are those who live in urban parts of Kinyinya(Kagugu and Gacuriro).

Like in Ethiopia, the rate of urban growth often strains the capacity of local and national government to provide urban residents with even the most basic services of housing, water supply, sewerage and solid waste disposal (MWUD, 2008). In Addis Ababa, a report in 2008 also found that 80% of the houses in the city were classed as slums due to the physical deterioration of its housing, overcrowding, high density, poor access and lack of infrastructure services (Tolon, 2008).

This means that the people are affected differently. Some are obliged move to other areas; others struggle to live in bad conditions of lacking basic services due to their livelihood depends on daily paid jobs in the city.

3.2   Reduction of agricultural production

The agricultural production has greatly reduced due to land reduction. 30 % of the respondents gave Beans,20% gave maize,15% gave sorghum 10 % gave 15 sweet potatoes and 10% gave cassava. The decrease agricultural production has been justified by the comparison of the previous harvests to the current years. Most land reserved for agriculture it is being converted to settlement area and if there is no immediate action, the people of Kigali city and kanyinya will be face by famine in the near future.

3.3   Activities practiced contributing to environmental degradation

From the respondents' views, it has been indicated that 70 % of the respondents used the existing land for agricultural for quarrying activities. and this are accelerating environmental destruction. And lead to generation of pest, and reduce the production from agriculture.

3.4   The unappropriated implementation of Kigali city master plan.

40% of respondents from slums have said NO meaning that they don't know its role while 60% of the respondents mostly coming from urban part said YES to mean that they know Kigali city master plan and its role. It means that those who are unaware the role of Kigali master plan keeps developing slums /unplanned settlements once they are not controlled. Kigali Master Plan is known through awareness of Kigali city master plan; Sensitizing planned settlement in public meetings, establishing model villages and internet, the failure in implementation of master plan is highly affecting the area reserved for agriculture.

IV.   CONCLUSION AND RECOMMENDATION

4.1   Conclusion.

The study conducted in Gasabo district, Kinyinya Sector with the core objective of assessing the influence of urban population growth on agricultural land degradation. For attaining the purpose, the researcher tried to point out the specific objectives in achieving the stated objectives and to generate data findings that can be used by natural resources management, policy makers and other leaders on advocacy for rapid urban population growth and agricultural land reduction in general. Findings indicated that urban population growth influences agricultural land degradation found in the peri-urban areas of

Kigali city as whole. Briefly 54.4.0 % of respondents agreed that urban population growth influences agricultural land negatively within peri-urban area.

RECOMMENDATION

Rereferring on the findings from consulted respondents, the following recommendations were addressed:

1. Government institution should adopt a sustainable approach of limiting horizontal construction by adapting mansions construction that occupy a small space, setting long term goals for urban development, and improving life of people living in slums areas by strengthening the **Integrated Development Program** (IDP model villages) which accommodate high number of citizens. (KARAMA and BUSANZA are the typical example in Kigali city)

2. Urban population growth is unavoidable; the urban planners should strongly consider agricultural land in the periphery of the city because it is the main source of food for survival.

3. It has been revealed that high population density in urban areas live in unplanned settlements and it is at risk of disasters like floods, landslides, soil erosion as a result of much rainfall, wastes management challenges and the spread of diseases/epidemics. Therefore, the Government encourages planned settlement and accelerates the relocation of families living in high-risk areas like steep slopes and wetlands.

4. Governments should develop rural areas by spreading all basic infrastructures for the sake of reducing rural -urban migration of the people.ie developing secondary cities.

5. Finally, Government should sensitize the Rwandans to use family planning for the sake of reducing high birth rate that increases population which is a very big burden to the country

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