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Population Declines and Land Use Management in Rwanda

Abstract

Rwanda, like several other sub-Saharan African (SSA) countries, experienced a population boom following the Tutsi genocide of 1994. However, the growing population exacerbated the impact of human activities, such as deforestation, on the environment. The purpose of this study is to examine the impact of population decline on land use management, focussing particularly on the issues faced by the inhabitants of Rwanda's Jali and Kigali mountains. Population decline was recognised as the main contributing factor to land use management, so the government policy of relocating people from the Jali and Kigali mountains, as well as the literature, identified many issues, such as settlement in high-risk locations, areas of degradation and general environmental issues, which have been analysed in this paper. Due to lack of sufficient research on the topic, this study uses quantitative questionnaires involving 1,000 households. Moreover, a mixed methods (qualitative and quantitative) approach has been employed for a better understanding of phonemes and to help governments develop better environmental policies in the future. It also provides some suggestions for future research on the issues and proposes recommendations for interventions.

Keywords: land-use management, mountain, Jali, Kigali, population decline, Rwanda

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Introduction

The Government of Rwanda National Environment Policy of 2003 contains policy statements and strategic options balancing national population policy with land--use management. The main policies and strategies are centred on a master plan in urban areas, space management in rural areas, the grouping of human settlements (Imidugudu), the management of natural resources and the environment, and family planning (Ministry of Environment, 2019). Surrounded by the Republic of Uganda in the north, the Republic of Tanzania in the east, the Republic of Burundi in the south and the Democratic Republic of the Congo in the southwest, Rwanda

is a landlocked country with an area of only 26,338 km2 dominated by highlands, which have earned it the name *'land of a thousand hills'*.

Rwanda's population has grown significantly since 1994, with an average of 6.17 children per woman (NISR, RPHC4 Thematic Report, 2014). It has approximately 13 million people, which is a 2.95% increase on the 12.7 million in December 2018, resulting in a population density of 495 people per km2 (Imasiku & Ntagwirumugara, 2020). As a result, some negative consequences have begun to accumulate, including increased habitation in risk zones (Amaneka), deforestation for firewood and arable land, and environmental degradation. A public institution to combat such negative impacts on the environment called the Rwanda Environment Management Authority (REMA) was developed with Organic Law No. 04/2005 of 8 April 2005 for '*determining the modalities of protection, conservation, and promotion of the environment in Rwanda'* (Official Gazette No. 41 of 14 October 2013).

The Rwandan government launched a population policy aimed at controlling this increase by developing key indicators, such as the health sector, education, women empowerment and the labour sector, resulting in a decline in fertility from 6.17 children per woman in 1995 to 4.2 per woman in 2015 (NISR, DHS 2019–2020, 2021).

Therefore, this research paper aims to demonstrate the impact of population slowdown and a relocation policy on land-use management in Rwanda. This research paper focuses on urban land use, particularly in Kigali, as well as the implementation of clustered settlements (Imidugudu) and the creation of basic human facilities (infrastructure), such as schools, health centres, access to water and electricity, and population sensitization on environmental issues and family planning.

This paper is organized as follows: Section 1 consists of the introduction; Section 2 presents the literature review; Section 3 details the methodology; and Section 4 defines the data analysis and data discussion.

Colonization introduced into Rwandan society new elements, both exogenous and dominant, that not only brought changes but also distortions in social balances, culminating in the horrifying genocide against Tutsis in 1994. Even though more than 1,000,000 Tutsis were killed, and many others had migrated to the Democratic Republic of the Congo – formerly known as Zaire – large populations from the four neighbouring countries began returning from exile (some for the first time since 1959), leading to rapid population growth in 1995 that threatened to become uncontrollable (NISR, RPHC4 Thematic Report, 2014). Rising rural population densities in parts of sub-Saharan Africa (SSA), combined with broadly defined policy decisions, affect farming systems and indeed the overall trajectory of the economy in ways that are underappreciated in the current discourse on the region's development. Research on the issue has demonstrated that a rapidly rising population is associated with various factors, such as mentality, ignorance and belief of large families as a sign of wealth (World Bank Group, June 2019).

Migration from rural to urban areas is the primary factor driving urbanization in many of the developing world's cities, with people moving to the metropolis because they believe there are more job opportunities there than in rural areas (Mazumdar, 1987). The high rate of migration from rural to urban areas in emerging countries, particularly in West Africa, is compelling evidence of this (Arthur,

1991). Thus, migration from rural to urban areas is a major issue in nations like Zimbabwe, directly impacting the country's poverty rates (Andersson, 2001). The major factors in West African migration include poverty, a faltering economy and social and political issues, with many of these migrants settling in the biggest cities (Adepoju, 2002). South Africa, for example, has become an increasingly urbanized country (Kok & Collinson, 2006). The large migration of individuals from rural to urban areas in SSA is a major factor in the country's rapid urbanization (Hove et al., 2013).

The failure to adopt, at all levels, appropriate rural and urban land policies and land management practices remains a primary cause of inequity and poverty" (UN-Habitat, 2015). Access to land is a fundamental requirement for human shelter, food production and other economic activities, including businesses. Although others are rooted in the socio-demographics resulting in land scarcity, different practices such as inheritance, leasing, borrowing, gifting, informal occupation, government land allocation and socio-economic situations combined with inadequate land policies, laws and regulations in the past contributed to this situation.

Population density in Rwanda was 495 people per km2 in 2019 but increased further by 2.31% from 2020 to 2021 (NISR, 2021). Conversely, Rwanda has only 1.4 million hectares of arable land, or 52% of its entire territory, with a total area of 26,336 km2 (Imasiku & Ntagwirumugara, 2020). This demonstrates how small a country Rwanda is and how the recent population growth is causing significant environmental damage. The Republic of Rwanda responded quickly to reduce the total fertility rate (TFR), with a projected 2.1% children per woman by 2050 (NISR, PHC, 2012).

The Rwandan government is promoting reduction in population growth through numerous initiatives, which should not only prove beneficial to environmental protection but also to the country and its future generations. The Kigali Master Plan was formed by Order No. 058/01 of the President of the Republic of Rwanda on 23 April 2021. It emphasizes Kigali's reform efforts. People who live in higher-risk areas (the mountains of Jali and Kigali) in three zones (Jali, Kimisagara and Karama) are being relocated to villages constructed by the Rwandan government based on categories, with the first and second categories benefiting from a free flat and the third category benefiting from compassion; this initiative was set into action to conserve the mountains, protect the environment, minimize urban sprawl and slums, and put an end to the chaotic process of urban development in Kigali. It also indicated how many roads and how many residential, commercial and industrial zones would be constructed. All of this is being done in the interest of Kigali city development and environmental protection.

Population Growth and Land Degradation: Theory and Evidence

Conventional economists treat land as a resource or a factor of production. People start substituting other factors for land when it becomes scarce. Because of the advancements in technology, people are now able to harvest on lands that were previously uncultivable (Bilsborrow, 1987). Empirical research on population and land use was conducted by natural scientists and classical economists. These

studies tried to identify areas where the land's carrying capacity is most likely to deteriorate (Malthus & Flew, 1970). This viewpoint is being applied by William Murdoch to a region in the Philippines near Laguna de Bay. A cluster of hills is being farmed by poor farmers using a shifting farming approach. As the town's population grew, so did the demand on the land, causing fallow periods to be cut short to an environmentally unsustainable level. Although the situation has worsened because of population growth, Murdoch believes that these people might live peacefully on a small piece of the vast sugarcane estates that surround the hills. According to him, the crux of the problem is a lack of access to resources and technologies that would enable people to have enough land and manage it responsibly. Access to such resources would increase the community's standard of living, decreasing the need for parents to raise large families (Murdoch, 1980).

Numerous hypotheses and pieces of evidence establish and highlight the important relationship between population and environment, with evidence that increasing population leads to environmental degradation. Besides, the research aims to demonstrate Rwanda's efforts to reduce TFR as a means of attaining environmental improvement, which leads to the goal of land use management, that is, to develop a rational policy for space management in rural areas; to develop or update master plans and special plans for land-use in urban areas; to continue with the reorganization process of the scattered human settlements into grouped settlements (imidugudu) through the creation of developmental poles equipped with basic infrastructure; to train, educate, inform and create awareness of the public in population, management of natural resources, environment and family planning. (Republic of Rwanda, Ministry of Lands, Resettlement and Environment, 2003)

Materials and Methods

The problem of population explosion in Rwanda worsened after the 1994 genocide against the Tutsis. Although the country was rebuilding and facing numerous challenges, it no longer had the support of security and peacekeeping. Despite the fact that it is a period of mass returns of Rwandans who have been in exile since 1959, primarily from neighbouring countries, due to a lack of land governance and environmental law, many people lived where they wanted, and as many of them as possible migrated onto the national land. Deforestation began when people started to reclaim the places reserved for national parks by constructing some small houses, while others moved into the mountains (Jali and Kigali). The reasons behind this migration were economic conditions, a cost of living issue, the lack of family and relatives in Kigali, where many people come to seek jobs, and because the salary was not enough to cover the rent and even feed their families, some decided to move to the cheapest areas, which include the mountains of Jali, Kigali, Jabana and Rebero, and this resulted in urban sprawl and slums and led to the development process of chaotic urbanization in Kigali. All public land was registered during the regularization of land tenure. The total area under public land management is 57,494,251 m^2, while the total area owned by men and women is 8,647 kilohertz (km^2) (Ngoga et al., 2017). These problems kept increasing to the extent that Rwanda currently has the highest percentage of population density (525 km^2)

in SSA (Gatwaza & Wang, 2021). The number of people living in the mountains of Rwanda has reached an unusually elevated level (150–800 people per km^2 [Roose & Ndayizigiye, 1997]), which has resulted in cultivated hill slopes from run-off and other types of erosion. Strong rains in the Kigali and Jali highlands cause damage, including loss of life, soil erosion and house demolition, due to a lack of water channelization.

Aside from urban sprawl and chaotic development, Kigali city has more than 13,000 households located in a high-risk area, with most of them still living on these mountaintops following the year 2018, which resulted in 234 deaths, 268 injuries and an estimated economic loss of 204 billion Rwandan francs, according to the local newspaper, *The New Times* (2019). Since 2015, Rwanda has been counting the loss of people, along with the destruction of houses, soil, roads and other important assets valued at a billion Rwandan francs. Kigali city recently recorded the loss of life, closed roads and destroyed houses because of heavy rains on 25 December 2019, which resulted in the national policy statement of closing the temporary roads Kimisagara–Nyabugogo and Kanogo–Kimisagara (local newspaper, Inyarwanda, 2019). On 4 February 2020, 13 people were killed in floods and landslides in Kigali, Rwanda (Africa Centre for Disaster Management, 2020).

The Rwandan government has responded to this calamity by taking certain measures, including relocating all those who had migrated into the mountains of Jali and Kigali, mobilizing Rwandan women to minimize births, making Kigali City safe and undertaking structural work to protect their health and the environment. The Kigali Master Plan will be fully implemented in 30 years, with the updating of the Kigali structure with the formation of Kigali future settlements and small agglomerations in accordance with the Kigali projection of 3.8 million people in Kigali by 2035 (Republic of Rwanda Official Gazette No. 15 of 26 April 2021). The study aims to highlight the importance of stopping the chaotic urbanization process, slums, population decline and relocation in Kigali, particularly in the following three areas: Mountain Jali and Mountain Kigali (Karama and Kimisagara zones), as well as the implementation policy of relocating people from this area to a new agglomeration village in Kigali constructed by the Rwandan government.

Methodology

Methodology determines the procedures for any scientific exploration (Babbie, 2010). It provides clarity for understanding many approaches that involve research processes and designs (Abutabenjeh & Jaradat, 2018). This research intends to use both qualitative and quantitative methods with the use of secondary data. This study used empirical methods and the researcher's experience during data analysis and presentation. The findings are based on longitudinal data from various reports collected from different official institutions in Rwanda, such as the NISR, ministries and other public institutions. Two methods were followed: *qualitative* and *quantitative*. The qualitative method will assist the researcher in understanding the phenomena under study through interviews in the Jali and Kigali mountains. It will assist the researcher in determining the specific location and the inconvenience to the population in this area. The quantitative approach will

assist researchers in better understanding the phoneme. Therefore, this technique may be used to consolidate quantitative data in more than three villages targeted for this study, including the Jali and Kigali mountains (Kimisagara and Karama villages).

Qualitative Method

The qualitative method uses interview-based qualitative techniques in human geography research (Dowling et al., 2016). This method has been used to gain a better understanding of how to respond during an interview to persons who have benefited from the relocation programme as well as those who have remained due to resistance or waiting for a new tour. Using this method helped with hypothesis analysis. Quantitative techniques provide meaning to the result, particularly for buildings and specific locations, and they assist the reader in comprehending the phenomenon (Dodgson, 2017). As a result, the researcher will ask a user--guided question during the interview with the resident of this location, which is in a higher-risk zone and already receives a free house from the government, from this point forward.

Quantitative Method

The quantitative method deals with the number in relation to describing or measuring the quantity, and the use of this approach permits a focus on details (Fox & Hayes, 1985) to help understand and potentially alleviate the problem regarding population stress on environmental issues. Quantitative methods and techniques are gaining popularity amongst earth scientists, allowing for greater liberties associated with the information of population and their geographical location. Numerical analyses have been widely carried out to study environmental phenomena (Gilbert, 1997) based on population statistics and the manner of land exploitation. Thus, quantitative data from different organs in Rwanda on this phenomenon will be used to estimate the population at the National Institute of Statistics of Rwanda. Both qualitative and quantitative methods aid in the elimination of all hypotheses from testing (Sofaer, 1999).

Sampling Size Determination

The sample size was calculated according to Nguyen (2015) from an estimated population size of around 13,000 households concentrated in Kigali, with infinite population size.

Infinite population can be calculated as follows:

$$CI = \hat{\rho} \pm \times \sqrt{\frac{\rho\,(1-\rho)}{n}}$$

where ;
is the population proportion;
is the sample size;
N is the population size.

With an estimated population size (N) of 13,000 people living in a higher-risk zone in Kigali, Q 95, find 99% confidence interval of the true proportion of the population in a high-risk zone, Q basis, and a margin error of 2.98%.

is calculated as follows:

$$= \frac{95}{13{,}000} \pm 2.98 \times \sqrt{\frac{95\left(1 - \frac{95}{13{,}000}\right)}{13{,}000}}$$

= 1,000

Higher-Risk Hotspots

One of the most common and innovative uses of high-location risk living mapping is to aggregate numerous location events into hotspot maps. As explained earlier, aggregation into administrative units may contravene the use of different boundaries, resulting in significantly different maps. Thus, the ministry's disaster and management work means that this is not a problem for the user. Ministry departments are often interested in hazard accidents in different locations, and city councils are interested in hazard rates in neighbourhoods (Republic of Rwanda, Ministry of Lands, Resettlement, and Environment, 2003). A point-in-polygon aggregation, as can be done using any GIS, will easily accomplish this task. However, the location presents a significant obstacle to accurate data interpretation for those who wish to study a problem in more detail. Of great interest to researchers, and increasingly to more sophisticated high-risk zone prevention with a sophisticated understanding of the problems themselves, is the use of techniques that do not necessarily classify risk zone events into a group with fixed boundaries. These techniques include using spatial ellipses with the mapping system.

Flood and Landslide in Kigali City

Landslide disaster management can only be successful if detailed information regarding the frequency, type and size of mass movement in each area is gathered. Any landslide mitigation strategy should be built on the foundation of landslide hazard zonation, which should provide planners and decision-makers with sufficient and easily understandable data. Jali, Rutunga, Gikomera, Nduba, Bumbogo and Jabana are just a few of the Kigali neighbourhoods, with elevations ranging from 1,799 to 2,093. Flooding or landslides are a possibility in some places. There is little reason to believe that the number of natural disasters will begin to decline any time soon or that the vulnerability of society will change dramatically. As

a result, as the climate changes, the socio-economic causes of natural disasters will become even more apparent (Henrik, 2006).

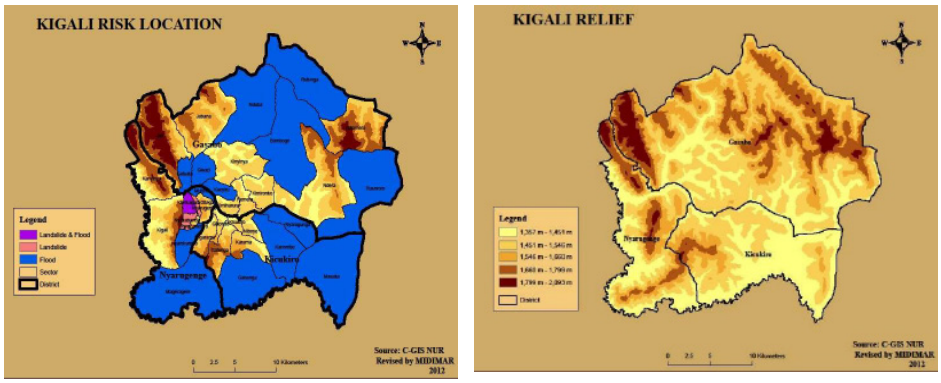

Fig. 1. *Risk Zone and Kigali Relief*

Source: Republic of Rwanda 2012. P. 24)

Due to its geological characteristics, Kigali city has seen severe calamities such as flooding and landscape changes caused by the mountains Jali and Kigali. This location is extremely vulnerable, and both disasters regularly wreak havoc on the region. However, not every sector is impacted equally. A number of factors contribute to this, including steep slopes, soil instability and the Nyabarongo River, which plays a significant role in flooding the area. On 25 December 2019, torrential rain caused high-level flooding in Kigali, taking the lives of at least four people and causing damages to approximately 100 houses and 23 hectares of crops (Abebaw et al., 2020). Deaths, injuries, agricultural damage and destruction of infrastructure, such as roads, classrooms, bridges and other structures, are all examples of heavy impacts.

Topographic Maps of the Study Location Area

Map methodologies consolidate the transient measurement through methods ranging from simple point symbols (Monmonier, 1990). The following three villages were selected randomly: Mount Jali and Mount Kigali (two fields include zones 1 and 2 of Kimisagara and Karama). The city of Kigali lies between 29° 43 0 and 29° 44 0 in longitude and 2° 35 0 and 2° 37 0 in latitude. The city is constructed on a steep terrain, spanning four ridges that are separated by vast valleys.

More than 1,845 m above sea level can be found on the higher hills in the lower half of this valley. At a latitude of 1,850 m, Mount Kigali is the highest peak in this area (Nduwayezu, et al., 2016). According to the local newspaper (*The New Times*, 2019), more than 13,000 households in Kigali City live in high-risk location, with the bulk of them living in these mountainous areas in 2018. However, despite the relief afforded by Mount Jali and Kigali, many houses are still being constructed in an unorganized fashion, with no access to water or electricity, as well as a lack of roads, health centres and schools. So, from 2000 to 2020, this study examines how

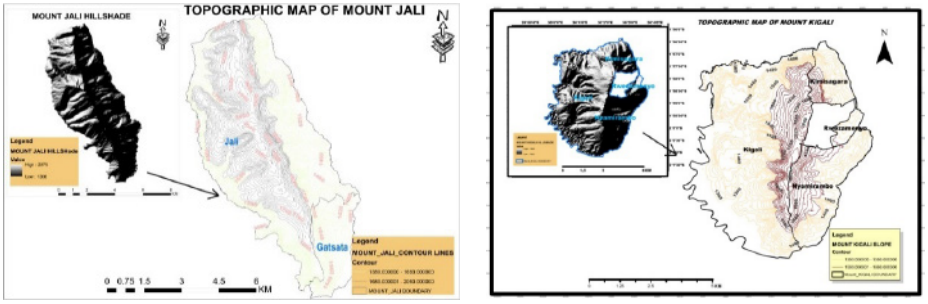

Fig. 2. Topographic Map of Jali and Kigali Mountains

Rwandans chose to build homes in these areas. People moved to Jali and Kigali mountains for various reasons, including economic considerations. In Kigali, a city in Rwanda, heavy rains caused by climate change destroyed homes and killed people in an area that had been left alone.

Results

Evolution of House Constructions on the Jali and Kigali Mountains from 1995 to 2020

Following the Tutsis genocide in 1994, individuals began to construct houses in these mountains, which increased after 2000 for various reasons. Economic migrants from other parts of the country arrive in search of jobs, without relatives or family to provide shelter.

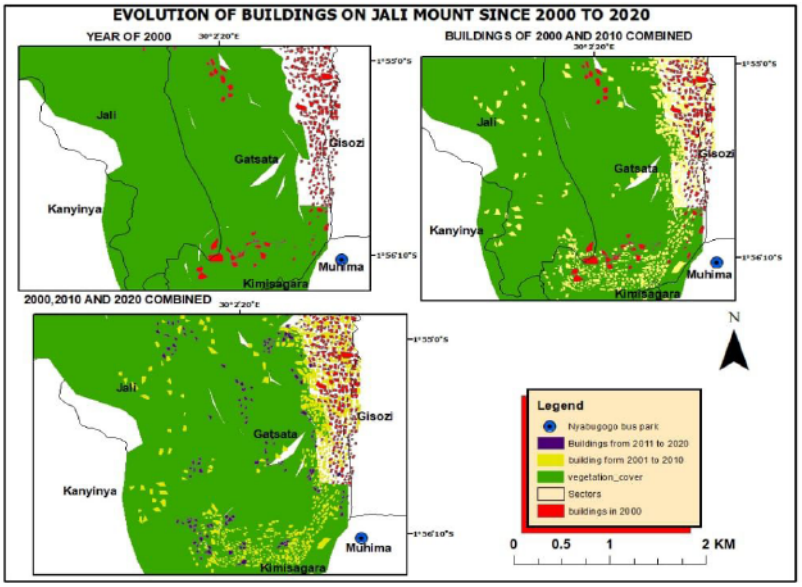

Fig. 3. Jali Mountain Construction Evolution Map from 2000 to 2020

At least 630,657 people lived in Kigali in 2017, up from 358,200 in 1996, demonstrating the city's rapid growth. Because of the rise in the number of low--income residents, more bungalows have been constructed in the most desirable suburbs and more sub-facilities have been erected and renovated on the outskirts (Nduwayezu, 2021). People began to move into small-scale housing because there was no proper land legislation from 1995 to 2000. Kigali was a small town in 2000, but by 2013, Kimisagara had the highest population ever. Before the Kigali 2050 main plan was released in 2013, there was a significant slowdown in the construction of new homes in the city until 2020 because permits were already in place before the construction of houses started. Building had to stop, and people had to relinquish the mountains of Kigali and Jali, especially those in high-risk areas.

Since 2000, the population in Zones 1 and 2 has grown, as has the number of new homes constructed. Land degradation, biodiversity loss, excessive deforestation, water shortages and food security issues have all been exacerbated by the rapid rise in population (Li et al., 2021).

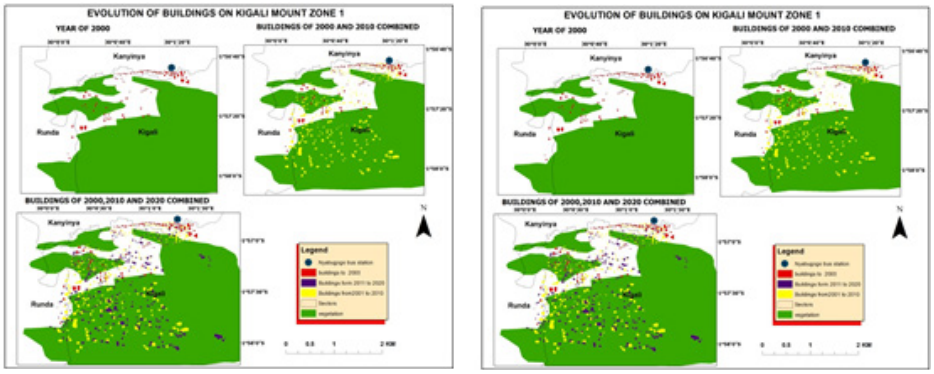

Fig. 4. Kigali Mountain Construction Evolution Map from 2000 to 2020

There have been more homes constructed since *Presidential Order No. 058/01 of 24 April 2021*, which set up the National Land Use and Development Master Plan. The number of homes has grown, but not at the same rate as before. The relocation of people living in high-risk locations began in 2021, and the process will be completed by 2022. Data were collected in Kigali City (including the Jali and Kigali mountains) over the course of a month using the Google Doc method, and it was documented with the help of a research assistant using a guided questionnaire. The 900 households represent families that are still residing in the higher-risk zones, whereas the 100 households are representative of the 240 families that were given free flats in the Karama Model Village.

Discussion and Conclusion

Relocation Policy Process

There was an increase in urban sprawl and slums in Kigali because of population growth due to urbanization, which resulted in environmental degradation as people moved from smaller cities to Kigali and chose to live in the mountains because of the higher cost of living. Additionally, the implementation of other safeguards has occurred since that time as well. Included in this is the mobilization of family planning through the use of modern contraception, with more than 23.4% of respondents confirming and 80.1% confirming the government's relocation strategy in the new safe zone. Thus, the Kigali master plan helped stop the pressured construction of small houses and reduce urban sprawl. Thus, even with all the preventative measures that have been taken in Kigali City since 2013, there are still some risks, particularly during the rainy season.

Even though precautions have been taken, accidents continue to occur and heavily impact Kigali City and its surrounding neighbourhoods. Moreover, it is a big issue for the Jali and Kigali mountains and other areas such as Rebero and Kimisagara, as Kigali City is merely a high mountain. A lack of drainage systems in the Jali and Kigali mountains means that residents are frequently subjected to torrential rain and high winds. Kigali's Nyabugogo–Karanogo street, for example, is frequently closed because of erosion from the Kigali and Jali mountains.

Distance Between Inhabitants and Infrastructure

The findings of the investigation indicate that the inhabitants of the Kigali and Jali mountains are located a significant distance away from the infrastructure. Figure 5 shows that 52% of respondents indicate that to receive water from their homes, they must be at least 2 km away. Furthermore, more than 34% of participants indicate the market is still challenging because they must walk more than 3 km for their daily business. Finally, 12.76% of respondents indicate that they must walk at least 4 km to school and the health centre. The Rwandan government gave priority to moving the most vulnerable people living in Jali and Kigali. They started a relocation policy as a long-term solution to the problem of moving them closer to water, toilets, schools, health facilities, electricity and local markets. The policy of relocation is a long-term solution implemented by the Rwandan government. The residents of the flat complex in Karama that was given away now have access to basic amenities, such as water and electricity, as well as nearby schools and clinics (including a health centre, which is a primary goal). Thus, the Karama Model Village was started with 240 families.

People often find it particularly difficult to adapt to new ways of living compared to the past. The families who had been relocated to the new flats were exacerbated for some by this change. Some of these families had been relocated because of an emergency caused by the potential higher risk of their habitation area.

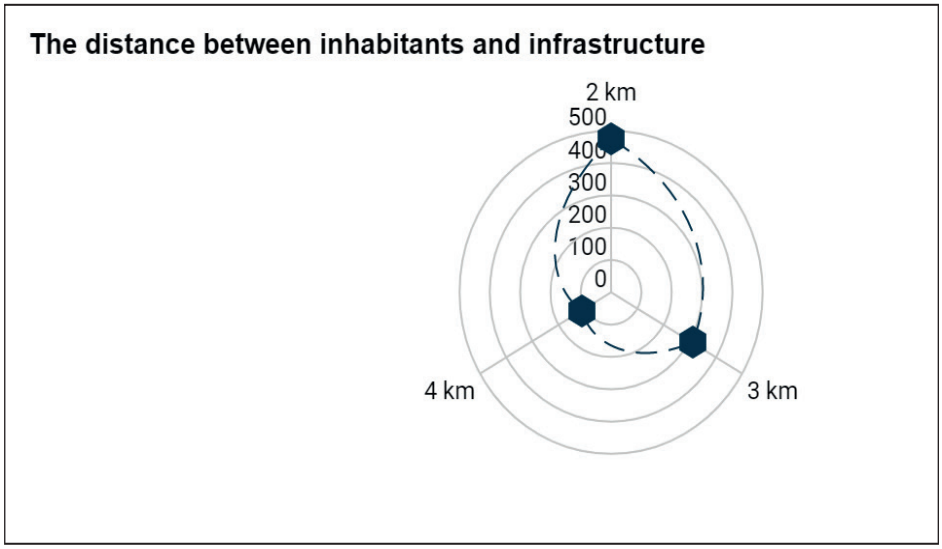

Fig. 5. Population and Infrastructure Distance (Jali and Kigali Mountains)

As practically all of them appeared to be seeing the flat for the first time, 76% of the households in the Karama Model Village that received house compensation indicated satisfaction with the steps taken by the Rwandan government: 15% of participants were neither satisfied nor dissatisfied with the flat compensation, whereas 9% were dissatisfied with the flat compensation. According to the results of the data collected, families with five members or more reported the highest levels of dissatisfaction, which suggests that they are not as happy as they were before they moved into these flats. Others have mentioned the fact that their place of job is fairly far away from the flats. According to the Rwandan expropriation law, *As far as expropriation is concerned, assessment of the rule dimension focuses on the appropriateness of the expropriation law with regard to the procedures actors follow in calculating compensation and the involvement of property owners* (Uwayezu & de Vries, 2019). As a result, some people have resisted receiving compensation for their flat and instead focused on what the expropriation rules require in terms of monetary compensation. The Rwandan government, on the other hand, can clearly provide two benefits: relocation of people to a safe zone and environmental protection.

In Karama Model Village, each household has been compensated with one flat consisting of two bedrooms, a living room, a kitchen and a bathroom, built on an area of 46 $m^{2.}$ The school has 24 classrooms (840 students), with 35 students per classroom.

It has labs, one smart classroom, a library, an administration block, a dining hall, a kitchen and recreational facilities, plus two blocks with six rooms and 210 children, and one classroom with approximately 35 children, plus playgrounds and related facilities.

Fig. 6. Karama Model Village

Source: Malonza & Brunelli, 2023, p. 8.

Reasons for Not Being Satisfied

The majority of those who have been relocated to Karama Model Village expressed contentment with the way of life they have adopted there. Those who have large families are dissatisfied with their flats because they are too small for the family and also because the family does not have enough privacy due to a lack of separation from the neighbours. In contrast, those who had lived in the Jali and Kigali mountains before the relocation had more space between their homes. The findings indicate that there is an issue with adapting to changes in lifestyles, as previously everyone lived in their own small house. Therefore, what they all have in common is that none of them will have to worry about rain during the rainy season destroying houses or taking people's lives, a lack of water, good roads, electricity, clinics and schools, or other hazards they experienced during their stay in the Jali and Kigali mountains.

Karama Model Village Inhabitants Daily Occupation

Trading in essential furniture and appliances for homes is the primary occupation of the residents of Karama Model Village. Others, particularly older people, are showing an interest in farming, even though Kigali is a business- and service-oriented city. As a result, some people claim that the lengthy commute to work is necessary

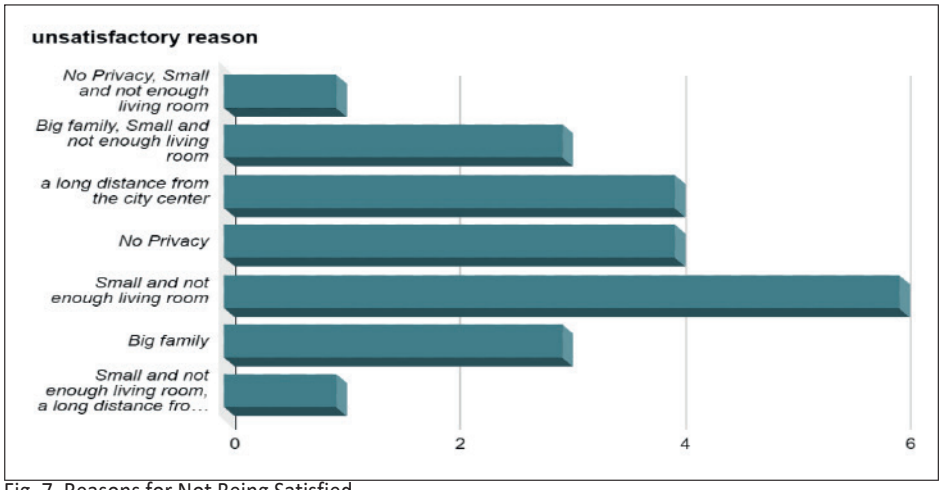

Fig. 7. Reasons for Not Being Satisfied

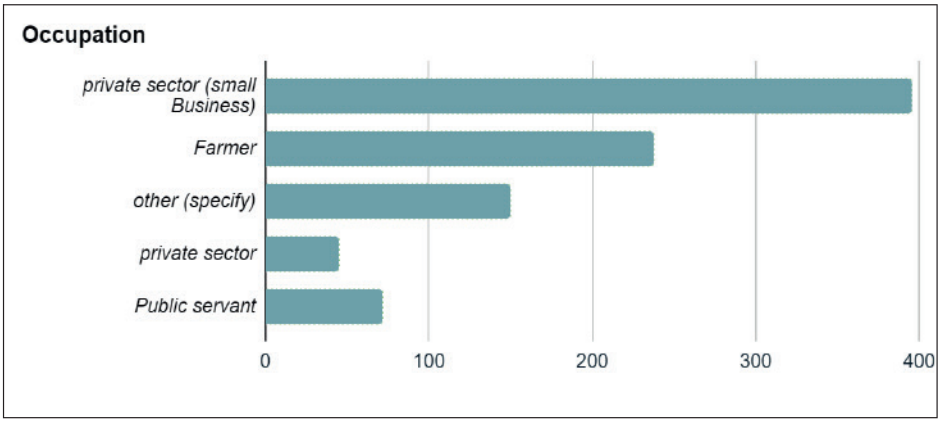

Fig. 8. Daily Occupation

for their daily survival in the Village. The number of self-employed people is low and includes occupations such as driving and riding motorcycles.

Family Planning Policy Awareness

The awareness campaign in Rwanda aimed at people living in slums, Jali and the mountains surrounding Kigali goes hand in hand with the message that family planning is important. The campaign is run on a national scale, and it involves the participation of health community volunteers at all levels, from the health sector to the village level.

Rwanda is one of the countries in SSA that has adopted a strategy to increase access to family planning services provided by faith-based health community volunteers (Ruark et al., 2019). With rapid rise in contraceptive prevalence caused

by the role of family planning programmes in relation to socio-economic development and the relative increase in contraceptive use with women's education, as in Rwanda (Bongaarts & Hardee, 2019), community workers in the health sector are playing a significant role in increasing family planning awareness in middle--income countries (Scott et al., 2015) and in the delivery of basic health services in Rwanda (Haver et al., 2015) from the district, cell and village levels (Haver et al., 2015).

Wealth Index Indicator

Rwanda is one of the poorest countries in the world. It had an annual growth rate of 7.2% over the decade until 2019, then fell by 3.4% in 2020 because of the COVID-19 pandemic. However, there was an 11% increase in economic growth in 2021 (World Bank, 2022).

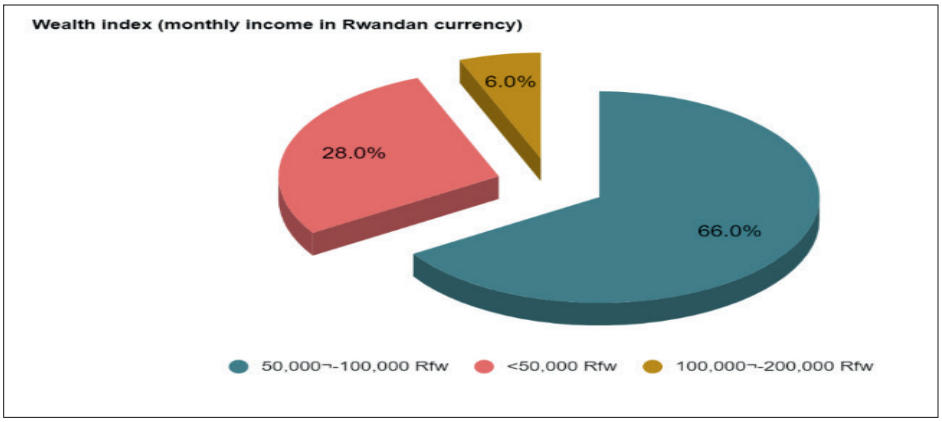

Fig. 9. Wealth Index

Among the study participants, 6% earned less than US$50 per month, 66% earned between US$50 and US$100 per month and only 6% earned US$100 or more per month. Moreover, the wealth index in Rwanda is supporting population decline because Rwanda's GDP per capita has risen from US$260.6 in 2000 to US$820.1 in 2019. In 2021, during the COVID-19 pandemic, there was a slight decrease with GDP per capita at US$797 (World Bank, 2022). As a result of the study's findings, we can state unequivocally that the indicators prove the importance of family planning in Rwanda. The study reveals a continuous, well-defined relocation policy in which residents from high-risk zones (Jali and Kigali mountains) are relocated with free flat compensation. Additionally, Rwanda will benefit from the primary goal of environment protection and land-use management. However, Rwanda requires more than US$1.4 billion to carry out the free relocation programme for all affected families.

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