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Implementing SDGs in Rwanda's Rural Housing: Lessons from Karama Model Village

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Abstract

Rwanda has shown a strong commitment to localizing the Sustainable Development Goals (SDGs) by incorporating them into its national development plans and strategies, particularly the 1st National Strategy for Transformation 2017-2024, the 2nd National Strategy for Transformation 2014-2029 and Rwanda's Vision 2050. Within the Vision 2050, the urbanization is identified as a key driver of economic transformation and urban development. This emphasis has further promoted the development of grouped villages, locally known as 'imidugudu,' which have become a central element of the government's Integrated Development Programme (IDP) and the Economic Development and Poverty Reduction Strategy (EDPRS). Since 2010, over 60 IDP model villages have been established in Rwanda, guided by the principle of leaving no one behind, with the goal of resettling vulnerable households from high-risk areas. Karama, a model village located in the peri-urban area of Kigali and completed in 2019, serves as a case study for this research. A post-occupancy appraisal was conducted between 2021 and 2022 through direct participant observation and interviews with residents, including an assessment of their satisfaction with the new housing. In addition, a critical discourse analysis of national policies was carried out. The findings from this fieldwork are discussed in particular in relation to SDG 11, highlighting the tension between the overarching SDG discourse and its local, grassroots implementation. The qualitative data from the post-occupancy interviews, combined from the results of a satisfaction questionnaire is used to explore the potential and relevance of the SDGs in housing. By mapping the global policy framework alongside its local application, and the trend of SDG 11 targets and measures, from respondents' reflections about their daily life before and after relocation, this research identifies the extent to which context-specific projects, such as Rwanda's IDP model villages, can provide opportunities for the local implementation of the SDGs, ultimately contributing to a more resilient future for Rwanda's communities.

Keywords: Housing, Rural Housing, SDGs, sustainable development

1. Introduction

Rwanda is a landlocked country in Central-East Africa, located in the Great Lakes region. With an estimated population of over 14 million, 82% of the population resides in rural areas (World Bank, 2022). Since the 1994 genocide against the Tutsi, Rwanda has made significant

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strides in various development sectors (World Bank, 2022). The Sustainable Development Goals (SDGs) (United Nations, 2015) have been incorporated into the national development agenda through Vision 2050 (Government of Rwanda, 2015) and the National Strategy for Transformation (NST1) (Republic of Rwanda, 2017). Specifically, Rwanda's Vision 2050 aims to further transform the economy into a middle-income country by 2035 and a high-income country by 2050 through ensuring a high quality of life for all Rwandans. These goals have also shaped the Urbanization and Rural Settlement Sector Strategic Plan for the National Strategy for Transformation (Government of Rwanda, 2018). A key objective of these policies is to reduce poverty by resettling at least 70% of the rural population into formal settlements and housing. The Integrated Development Program (IDP) Model Village initiative (Government of Rwanda, 2009), launched in 2010, plays a central role in achieving this goal. This research focuses on this program due to its significant potential for poverty reduction and urbanization in Rwanda, using Karama, a rural village in the peri-urban area of Kigali, as a case study to illustrate the government's strategy. The paper explores the extent to which the SDGs have been localized and aims to uncover the challenges and barriers encountered in implementing relevant SDG targets at the local level.

In this paper we employ a critical discourse approach (Alvesson and Kärreman, 2000) to analyze policy texts and compare the institutional narrative on SDG localization with findings from thematic analysis of interviews and satisfaction questionnaires distributed to residents in Karama. Initial findings were published in some conference proceedings, and this latest version of the paper integrates a full analysis of all data collected. Our findings reveal a degree of dissatisfaction among residents, and we argue that while the adoption of the SDGs within Rwanda's rural development and urbanization strategy is evident, their full implementation at the local settlement level remains insufficient. This gap hinders the creation of sustainable and resilient communities for the rural population.

The paper begins by establishing the context for our research, employing a critical discourse approach to analyse relevant policy documents with the aim of understanding how the Sustainable Development Goals (SDGs) are integrated into government discourse on rural development and urbanisation. This is followed by an empirical section that details the methods used for data collection and analysis in the case study of Karama, along with a description of the key findings. Finally, the discussion synthesises these findings with the critical discursive evaluation of policies and strategies, and explores their implications for future research.

1.1. Framing the context: Sustainable Development Goals (SDGs) and Rwanda rural development and urbanization strategy

The paper adopts a critical discourse perspective to examine how the Sustainable Development Goals (SDGs) are embedded within Rwanda's rural development and urbanisation strategy policies and programmes. In this context, discourse is understood not as mere 'discussion,' but rather as "a specific ensemble of ideas, concepts, and categorizations that are produced, reproduced, and transformed within a particular set of practices" (Hajer, 1995:42). A critical discourse analysis (CDA) approach centres on the 'performative role of language,' recognising that urban and housing policies, along with other government documents, convey broader economic and social values, which are embedded as "sub-discourse" within the text of these policies (Jacobs, 2021; Cummings, 2020; Jacobs, 2006; Fairclough, 2003; Hastings, 1999). CDA

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has been utilised to assess the extent to which the SDGs and the Agenda 2030 reflect contradictions arising from hegemonic neoliberal policies (Briant Carant, 2017) and to explore how techno-scientific economic discourse dominates the discourse on knowledge within the SDGs (Cummings et al., 2018). A critical discourse approach to Agenda 2030 has also questioned the coherence of the SDGs and their feasibility for implementation (Spangenberg, 2016). Rwanda has been an effective early adopter of the United Nations Millennium Development Goals (MDGs) and, since 2015, the Sustainable Development Goals (SDGs), as outlined in the Vision 2050 document (Government of Rwanda, 2015). The SDGs are embedded in Rwanda's Vision 2050 and monitored through the National Strategy for Transformation (NST1, 2017–2024), Sector Strategic Plans (SSPs), and District Development Strategies (DDSs). Between 2002 and 2022, milestones include an increase in life expectancy from 51.2 to 69.6 years and GDP per capita growth from US$ 235 to US$ 1,004 (NISR, 2022), accompanied by reductions in poverty, improved health and education services, and enhanced infrastructure. The Integrated Development Programme (IDP) Model Village (Government of Rwanda, 2009), launched in 2010, continues to serve as a key instrument in realising the ambitious goal of reducing poverty by resettling the rural population into formal settlements and housing. This document explicitly references the achievement of the MDGs as a central objective embedded within Vision 2020 (Government of Rwanda, 2000) and the Economic Development and Poverty Reduction Strategy (EDPRS) for 2008-2012 (Government of Rwanda, 2007). It underscores the potential of a rural urbanisation and development programme in reducing population growth and birth-related deaths, thereby contributing to poverty reduction, and adopts the World Bank's monetary measure of poverty as a benchmark (World Bank, 1992).

In the more recent Urbanisation and Rural Settlement Strategic Plan for the National Strategy for Transformation (Government of Rwanda, 2018), it is noted that "all of the 17 Goals relate to the Urbanisation and Rural Settlement Sector due to their cross-sectoral nature," suggesting that each contributes to the achievement of SDG 11: Sustainable Cities and Communities. SDG 11 focuses on four main areas: (1) inclusivity; (2) urban safety; (3) resilience; and (4) sustainability. Malonza & Ortega have argued that these foci, a sustainable city is idealized as one that provides access to basic services for its residents, and has lower rates of poverty, efficient transportation system, ability to respond to disasters, and good resource management practices (Malonza & Ortega 2020). However, the strategic plan does not provide specifics on how the SDG 11 and other SDGs are to be operationalised through specific plans and programmes, with further mention of them only appearing in the context of performance indicators. Outcome 3 of the document, "Liveable, well-serviced, connected, compact, green, and productive urban and rural settlements with a cultural identity," advocates for rural settlements to be designed according to place-making principles, aiming to create villages that reflect a culturally sensitive approach to mixed-use and inclusive environments that can enhance residents' quality of life. While this aspiration aligns with the goals of sustainable urban design and place-making, it faces significant challenges in bridging the gap between theory and practice (Carmona, 2009).

The second Voluntary National Review (VNR) report of 2023 (Government of Rwanda, 2023), following the initial one of 2019 (Government of Rwanda, 2019), specifically takes off from the Covid-19 pandemic that caused disruption to the economy and livelihoods both domestically and globally. Whereas VNR 1 focused on seven Sustainable Development Goals (SDGs 2, 4, 8, 10, 13, 16, and 17), along with additional insights on four other goals (SDGs 1, 3,

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5, and 9), VNR 2 focuses on five SDGs (6,7,9,11 & 17) highlighting the notions of "leaving no one behind" and "building back better". While SDG 11 was conspicuously missing from Rwanda's Voluntary SDG Report in 2019, it has been featured in the 2023 Voluntary National Review (VNR). Sustainable urbanization has since become a key target in the country's development policy documents, reflecting the government's vision for urbanization that not only aims at facilitating economic growth but also strives to promote inclusive development (Government of Rwanda, 2019, 2023; Malonza & Ortega, 2020).

The VNR reports highlight the significance of the SDGs in establishing government targets within the National Strategy for Transformation (Government of Rwanda, 2016). The reports outline the process of adopting the SDGs, primarily focusing on various levels of public administration. Within this context, the domestication and implementation of the SDGs in sectoral strategies and plans are reported to be facilitated by the coordination across different levels of public administration and through the utilisation of so-called "home-grown" solutions. These solutions draw on pre-colonial traditions of local governance, which are not without contradictions, particularly in terms of citizen participation and the overarching model of development (Hasselskog, 2018). The first VNR report had referenced the National Housing Policy and initiatives in green urbanisation and rural areas as key contributors to SDG 13: Climate Action (Government of Rwanda, 2019:54), as well as improvements in road infrastructure aimed at connecting rural populations to markets and major cities, as part of efforts to promote sustainable industrialisation under SDG 9 (Government of Rwanda, 2019:83). When addressing progress and challenges related to SDG 1: No Poverty, the report identifies a range of sectoral indicators closely linked to the Integrated Development Programme (IDP), including references to fostering "climate-smart agriculture," which reflects a techno-scientific approach that may not fully address other issues of inequality related to food production (Taylor, 2018).

The second VNR report nonetheless frames housing alongside SDG4: Clean water and sanitation, an area in which Rwanda has got closer to the NST1 goal to ensure that all Rwandans have access to water by 2024. Although access to clean water has not reached 100%, the latest (2022) Population and Housing Census shows 82% of the population nationwide can access improved water sources, with rural access rising from 22.6% in 2005 to 76.7% in 2022, and urban access from 55.4% to 95.7%. Access to adequate sanitation reached 100% in 2024, up from 84% in 2016, driven by the development of waste management systems in Kigali, secondary cities, district towns, and rural areas (NISR, 2022). According to the latest VNR, Rwanda has also advanced SDG 7 by increasing electricity access and reducing biomass use for cooking from 83% in 2017 to 42% in 2024, as outlined in NST1's targets (GOR, 2017).

The subsequent section provides a more detailed examination of the policy development surrounding the IDP model village and explores the tensions that emerge between rural and urban development discourses.

1.2. IDP programme and the model villages

The IDP Model Village (Government of Rwanda, 2009) represents an integrated approach to land use and human settlements within governmental discourse, aiming to foster social cohesion and reduce poverty and inequality, as initially outlined in Rwanda's Economic Development and Poverty Reduction Strategy II (EDPRS II) (Government of Rwanda, 2013). This initiative was introduced in response to the partial failure of previous efforts to address housing shortages and

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counteract the dispersed urbanisation of rural areas. It seeks to promote improved land-use practices to free up fertile land for agriculture and farming (Government of Rwanda, 2009; Ansoms, 2009; Van Leeuwen, 2001; Hilhorst and Leeuwen, 2000). Under the IDP, rural settlements have been restructured to provide better access to economic opportunities and services, with a goal of establishing at least one model village by 2019 in each of the country's 30 districts. Since the programme's launch in 2010, it has been implemented primarily by local governments, with financial and technical support from various international organisations, each contributing with different levels of emphasis and success regarding local community involvement (Mazimpaka and Irechukwu, 2022). To date, over 130 villages have been developed across the four provinces and Kigali, the capital city. The programme is based on 11 strategic pillars, including land productivity, infrastructure development, and social protection, which remain consistent with the SDGs referenced in higher-level policies and some in particular to SDG 11 (see Fig. 1 and 2 below).

Figure 1. SDG 11 Sub goal targets. Adapted from un.org

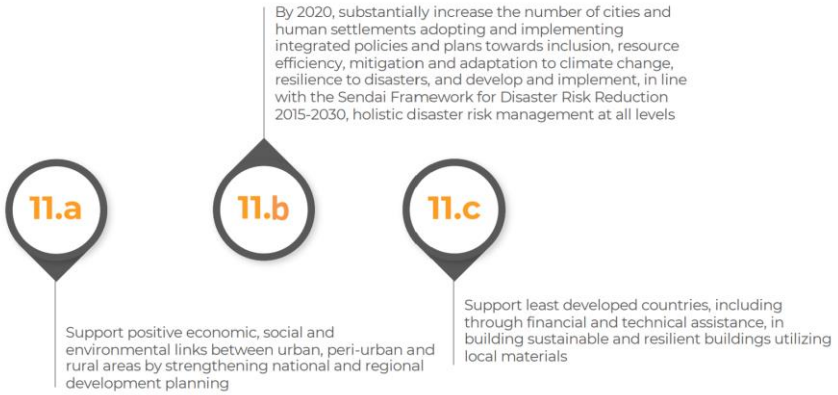

Figure 2. SDG 11 Sub goal measures. Adapted from un.org

Local authorities identify vulnerable households for relocation through a socio-economic vulnerability ranking conducted by the community via the Ubudehe initiative—a 'home-grown' approach (National Institute of Statistics of Rwanda, 2015). However, contrary to the government's narrative, this initiative has sometimes been perceived as less community-led (Hasselskog, 2018). Building on the significant socio-economic progress of the past two decades, the government has increasingly promoted the IDP Model Villages as essential infrastructure for modernizing the primary sector. These villages are also seen as a means to achieve social

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transformation and economic development through education and job creation. However, this promotion has faced criticism due to limited choices and the uneven impact on the well-being of the poorest segments of society (Ansoms and Cioffo, 2016; Dawson, 2018; Hamblin et al., 2021). The rapid rollout of the program, combined with the tension between its dual objectives, has led to challenges, revealing discrepancies between government expectations and the reality on the ground. Issues such as limited resident involvement, infrastructure management, and shortages of water and electricity, as well as cases of malnutrition, have been documented (Mazimpaka and Irechukwu, 2022; Ntirenganya, 2022; Ngabonziza, 2019). The friction between rural and urban lifestyles, along with the spatial and physical organization of the model villages, is particularly evident in peri-urban areas surrounding the rapidly growing capital, Kigali, where 70% of the population is still considered rural (Uwayezu and de Vries, 2020). Karama, an IDP model village established in 2019 in Nyarugenge, one of Kigali's three districts (Uwayezu, and de Vries, 2020), offers an opportunity to examine the contradictions between the national policy discourse on the domestication of SDGs and their local implementation, as reflected in the everyday practices within the local community.

2. Materials and Methods

2.1. Karama IDP model Village case study

Fieldwork was conducted in Karama, an IDP model village established in 2018 and home to 240 households, equating to approximately 1,000 residents relocated from high-risk areas in the peri-urban zones of Kigali. The village is located on the western slopes of Mount Kigali (1,852 meters high), approximately 10 km from Kigali's city centre (see Fig. 3). The 240 apartments are organised in six multi-storey linear blocks (see Fig. 4), with units ranging from one to two bedrooms and varying in size from 46 to 64 square meters. The village includes various amenities and support services such as greenhouses, a poultry farm, a water and wastewater treatment facility, an Early Childhood Development (ECD) school, and both primary and secondary schools. Karama is selected as a "place-based exemplifying" case study (Bryman, 2012) and serves as the primary method of investigation due to its ability to "capture the circumstances and conditions of an everyday or common-place situation" (Yin, 2018). This approach provides detailed and rich insights (Flyvbjerg, 2011) that are well-suited to an anthropological examination of housing research (Bosmans et al., 2022; Stender, 2017).

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Figure 3: Karama Model village location in the peri-urban area of Kigali. Source: Authors (2022), adapted from GoogleEarth.

Figure 4: Urban structure of Karama housing blocks

2.2. Field work, sample, data collection and analysis

Site visits were conducted between March 2021 and August 2022, during which undergraduate architecture students from the University of Rwanda served as research field assistants. A sample of 100 households was randomly selected, comprising 30 from each of the three blocks in Karama and 10-15 from each floor in the three-storey blocks. Participants' socio-economic characteristics were assessed using a post-occupancy survey questionnaire (see Table 1) to provide context for their responses and to guide the structured interviews. The questionnaire's range of questions was informed by a previous round of unstructured interviews (n=10) with local residents. Among the 100 respondents, 65% were female and 35% were male, which differs from the national population distribution in Rwanda (50.8% female) and may indicate a higher degree of vulnerability among women. The questionnaire included a set of questions employing a Likert scale designed to assess residents' satisfaction across three domains: interior spaces, exterior spaces, and construction workmanship. Each question prompted participants to rate their satisfaction on a scale of 1 (Low), 2 (Medium), and 3 (High).

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Questions related to interior spaces focused on areas such as the living room, kitchen (both indoor and outdoor), bathroom, and bedroom. For exterior spaces, the questions examined the usability and quality of features like kitchen gardens, greenhouses, poultry farms, play areas, and water tanks. In terms of workmanship, participants evaluated aspects such as floor and wall finishes, roofing, plumbing, doors, and windows. This structured approach allowed for a quantifiable analysis of satisfaction levels and provided insights into areas requiring improvement.
The questions were also used as semi structured prompts and responses were noted during the interviews and then analysed using a "thematic analysis" approach (Braun & Clarke, 2012; Bryman, 2012; Nowell et al., 2017), organising the data into main themes of meaning or interest. An analytical framework was then constructed around these clusters of themes.

S/N	VARIABLE	CATEGORICAL VALUE	PERCENTAGE
1	Age group	20-30	12
		31-40	15
		41-50	24
		51-60	34
		61-70	11
		>70	4
		Total	**100**
2	Gender	Female	65
		Male	35
		Total	100
3	Marital status	Married	73
		Not married	16
		Widow	11
		Divorced	0
		Total	**100**
4	Education level	University/college	14
		High school	47
		Primary school	39
		Total	**100**
5	Main source of household income	Employment	8
		Business (formal)	12
		Informal/casual work	68
		Other	12
		Total	**100**

Table 1: Distribution of households' age group, sex, marital status, education level and main source of household income (n=100) Source: Authors (2023)

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3. Results

In this section we describe first the results of the degree of satisfaction resulting from the likert scale responses analysis. This is followed by the description of the thematic analysis results which expand the discussion beyond the physical structure of housing units to the wider village and the economic opportunities its location affords.

3.1. Karama residents' housing satisfaction

The findings, based on a Likert scale reveal varying levels of satisfaction among Karama residents (see table 2 below) across interior spaces, exterior spaces, and workmanship. In relation to interior spaces, the living room achieved high satisfaction (predominantly rated 3), while the indoor kitchen and bathroom were moderately satisfactory (mixed ratings of 2 and 3). Conversely, the outdoor kitchen and bedroom were rated mostly 1, indicating dissatisfaction. In relation to exterior spaces, kitchen gardens and water tanks were moderately satisfactory, with ratings spread across 2 and 3. However, the greenhouse, poultry farm, and play areas were primarily rated 1, reflecting dissatisfaction. With regard to workmanship, high ratings of 3 were observed for floor finishes, roof/ceiling, and windows, signifying satisfaction. Doors were moderately satisfactory, with a mix of 2 and 3 ratings. However, wall finishes, plumbing, and pipes were predominantly rated 1, highlighting dissatisfaction.

These results underline a mix of satisfaction levels, with key areas—especially exterior spaces and aspects of workmanship—requiring significant attention for improvement.

QUALITY OF INTERIOR SPACES/PARTITIONS	**LIKERT SCALE**			CLASSIFICATION
	1 (Low)	2 (Med)	3 (High)	
Living room	5	15	60	Satisfied
Indoor kitchen	30	25	25	Moderately Satisfied
Outdoor kitchen	50	20	10	Not Satisfied
Bathroom (WC+ Shower)	10	25	45	Moderately Satisfied
Bedroom	65	15	0	Not Satisfied

QUALITY OF EXTERIOR SPACES/SHARED	1 (Low)	2 (Med)	3 (High)	CLASSIFICATION
Kitchen gardens	30	35	15	Moderately Satisfied
Green house	60	20	0	Not Satisfied
Poultry farm	50	15	15	Not Satisfied
Play areas	50	20	10	Not Satisfied

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Water tanks	35	25	20	Moderately Satisfied

QUALITY OF WORKMANSHIP	1 (Low)	2 (Med)	3 (High)	CLASSIFICATION
Floor finishes	20	20	40	Satisfied
Wall finishes (painting)	50	20	10	Not Satisfied
Roof/ceiling	10	25	45	Satisfied
Plumbing/pipes	40	30	10	Not Satisfied
Doors (materials)	35	30	15	Moderately Satisfied
Windows (materials)	20	20	40	Satisfied

Table 2: Karama residents' satisfaction in relation to three main housing domains. Source: Field survey, 2024

3.2. Tangible and intangible dimensions of housing

The thematical analysis of the responses to the structured interviews identified five main themes (fig. 5), namely location, spatial layout, basic services, public space and economic gains. They span from the tangible/architectural/technical dimensions, such as the location, the spatial layout, and house design and availability of services which confirm and expand on the degrees of satisfaction discussed before, but also expand into the intangible/socio-cultural and economic dimensions like the uses of public space and economic gains. The range of subthemes with a selection of relevant quotes is described in table 3 below.

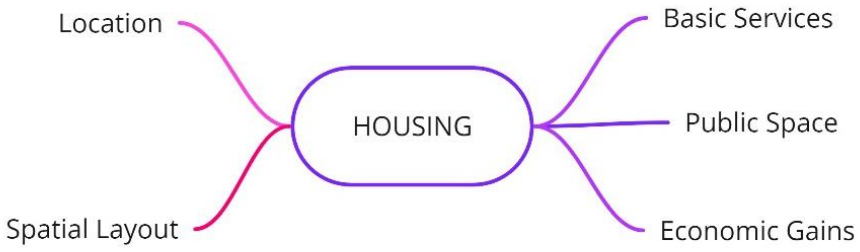

Figure 5: Tangible and intangible dimensions of housing. Source: Authors (2023)

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Theme and subthemes	**Participant Quotes (PQ)**
1. Housing & Location a) Land value	*"The project brought development to the area. As a result of new infrastructure, the cost of around Karama village has increased 30 times in a span of five years" ... "A plot of land here was Rwf half a million in 2017 but today (2022), it is around Rwf15 million*." Man 47, father of 2
b) Safety	*"When it rains, I am not bothered because I know everyone here is safe. ... where we were living before, rainy seasons were always a nightmare. We worried if our children would safely come back home. I attended burial ceremonies for my neighbours who died from mudslides and each strong rain gave me these bad memories. "*. Man 55, father of 4.
2. Housing & Spatial layout a) Redundant space	*"They provide so many cars parking spaces and yet none of us in this village owns a car… they should have given us more green areas and playgrounds for our children instead".* Man, 31, father of 3.
b) Utility space	*"We do not have a dedicated laundry place to dry our clothes. ... we were used to dry clothes on small bushes".* Woman, 37, mother of 2.
c) Acoustics	*"Our children sleep in the sitting room at night. The partition between the sitting room and parents' bedroom is not good for us. It is made of triplex - plywood - so noise goes through".* Man, 28, father of 2.
d) privacy	*"I screen my cooking area, because I do not like people to see what and how I am cooking ... we are not allowed to cook with firewood but we cannot afford the cost of gas, so we use firewood hiding from the village leader and local leaders"* Woman, 33, mother of 1
e) storage	*"I am drying beans from my farm where I was living before. I wish they could let me farm some beans in the plots near this village".* Woman, 40 -year -old, mother of 4.
3. Housing & public space a) kitchen gardens	*"We have no way to access the akalima k'igikoni (kitchen garden) because they put a barrier for us, I have to go around the whole block to access the garden in front of my house". Woman, 29, mother of 4.*
b) playgrounds	*"our children do not have spaces for play in this village. They have to go to their school playgrounds in the weekends to play. Sometimes the schools do not allow them so they go the football pitch in our neighbouring area". Man, 31, father of 3.*
4. Housing & Basic services a) water	*"The WASAC water in our houses is very expensive. We prefer to fetch at a public tap by the roadside. Additionally, I personally like going there because I meet my friends and we chat a bit about life".* Woman, 29, mother of 2.
b) Energy	*"We only use electricity for lighting our homes at night, and charging phones. we use charcoal and firewood for cooking"* Woman, 33, mother of 4.
c) Education	*"Our children used to go to school in Gatsata, before we were relocated here, but we do nnot have the money to pay to the school so our children have*

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	stopped going to school". Man, 30 -year -old, father of 2..
5. Housing & Economic gains a) Informal business	*"We are not making money now. We are no longer able to do the agataro (women street vendors) business in this modern village, like we used to do in the informal settlement we lived in." Woman, 40, mother of 4.*
b) wellbeing	"*They sell all the eggs from the chicken farm to outsiders. We do not receive any eggs from the chicken farm"* Woman, 35, mother of 3.
c) food security	"*The green houses you see here were only productive during our first year here. We can no longer afford water for irrigating them so the plants dried up"* Man 40, father of 2

Table 3: Themes, sub themes and participant quotes. Source: Authors (2023)

3.2.1 Housing and location

Rwanda's hilly topography and geological composition pose significant and growing environmental risks, including flooding and landslides, which contribute to the loss of fertile soil (Nsengiyumva et al., 2018). The village is seen as adding economic value to the region, with land prices having tripled and ongoing modern construction projects (see Figure 6).

Figure 6: Construction of a modern housing project adjacent to Karama ongoing. Source: Authors (2022)

Given that the residents of Karama were relocated from environmentally vulnerable areas throughout Kigali city, their perceptions can be linked to their expectations of improved housing quality (PQ1b). They view the new housing as significantly safer, appreciate the enhanced quality of life, and anticipate that their relocation will further contribute to the protection of their economic, physical, social, cultural, and environmental assets. This perspective underscores

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housing as a fundamental element for creating inclusive, equitable, safe, resilient, and sustainable cities and communities. In Karama, residents face no immediate environmental threats and, in contrast, are inclined to reflect on the positive memories associated with funeral services for friends and relatives who previously suffered from environmental disasters such as landslides (PQ1b). However, they have sacrificed the convenience of commuting to their former workplaces and are struggling to find suitable employment within or near Karama due to the lack of affordable public transport.

3.2.2 Housing and spatial layout

In line with the results from the satisfaction questionnaire, most participants expressed appreciation for their improved housing but voiced concerns about the low-quality partition materials, which have poor acoustic properties and diminish privacy levels between living rooms—often repurposed as bedrooms at night to separate boys from girls—and between bedrooms themselves (PQ2c). In comparison to their previous informal housing, some participants felt that their former homes offered greater flexibility. They used to dry beans on the walls after harvest, create fireplaces wherever they wished, and subdivide the space into rooms more easily. In contrast, the rigid separation between interior and exterior spaces in Karama's multi-storey buildings is perceived as restrictive. It limits activities such as cooking and laundry, which were previously conducted in a shared backyard, and is particularly inconvenient for residents of the upper-floor apartments (see Figure 7).

Figure 7: Iniquities of vertical housing in Karama. Source: Authors (2022)

3.2.3 Housing and Basic Services

For residents of Karama, the piped water provided by the Water and Sanitation Corporation (WASAC) is perceived as costly, with prices ranging from 340 to 877 Rwf per cubic metre

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depending on consumption. Consequently, they prefer to collect water from the public tap (Fig. 8), which costs 100 Rwf per 20 litres (equivalent to 323 Rwf per cubic metre). This perception of 'expensive water' (PQ4a) also affects sanitation practices, as residents may feel that activities such as flushing toilets result in excessive water use and increased expenses. Furthermore, most residents rely on charcoal and firewood as their primary cooking energy sources. This practice is unofficially tolerated by the government despite environmental policies, leading residents to use these resources discreetly (PQ4b). Education is also impacted, as residents find local schools too expensive for their children, given their household incomes (PQ4c).

3.2.4 Housing and Public space

In Karama, any space outside the home is perceived as potentially useful for meetings or gatherings and is thus considered public space, even though car parking—whether occupied by cars or not—accounts for over 50% of the open areas. Residents have expressed dissatisfaction with the lack of designated playgrounds (PQ3b), despite the potential benefits for social cohesion and well-being (Kawachi and Berkman, 2000). Additionally, the absence of defined boundaries around the village allows children from neighbouring areas to enter freely, using the space for play and, as observed, gathering in stairways and hallways. Sharing social spaces in Karama often fosters a sense of home beyond one's private residence, contributing to the development of ownership and stewardship (Cattell et al., 2008; Brain, 2019). This is particularly evident in relation to domestic activities, especially among women, as illustrated in Figure 9. However, the allocation of space between blocks for kitchen gardens (see Fig. 7) and the challenges associated with accessing these areas have been reported to negatively affect daily life for households, starkly contrasting with their previous informal living arrangements.

Figure 8: Residents sourcing water from a shared public water tap. Source: Authors (2022)

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Figure 9: Residents drying their crops on the lawn in Karama. Source: Authors (2022)

3.2.5 Housing and economic gains

The economic benefits associated with housing are both direct and indirect, but they are significantly shaped by spatial relocation. Before moving to Karama, most residents engaged in informal activities such as vending and growing food for personal consumption (PQ5a). These opportunities are less accessible in their new environment. Residents have reported that the relocation has negatively impacted their ability to generate income, leading to job losses or reduced economic activity, without delivering the expected benefits of improved access to opportunities in central Kigali. Many feel that the formal rural productive model in Karama does not benefit all households (PQ5a) as effectively as their previous subsistence farming and is perceived as an additional disruption to their socio-economic development.

Living on the ground floor provides distinct advantages, such as easier access to kitchen gardening—known locally as ‘akarima kigikoni’—and backyards, or ‘mugikari’, which are used for cooking and laundry. These features create unequal opportunities among residents to sustain traditional practices that support their health and well-being. Furthermore, the greenhouses that were operational at the time of relocation are no longer functional (PQ5c) due to the unaffordability of water for irrigation during the dry season, reinforcing the earlier issue of ‘expensive water’ faced by residents.

4. Discussion and Conclusion

In discussing the SDGs (table 4 below), the relocation from Gatsata hillsides/wetlands to Karama presents a nuanced picture. While the quality of housing improved from sub-standard to standard (11.1), with reduced or subsidised housing costs, access to public transport became more challenging (11.2). The shift to vertical housing optimised area consumption (11.3), but public

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expenditure on cultural and natural heritage declined (11.4). Notably, disaster-related deaths and damages were eliminated (11.5), and waste management improved, albeit at a higher cost (11.6). However, access to green and open spaces significantly decreased (11.7). From a broader perspective, urban-rural linkages weakened in Karama (11.a), but there was progress in inclusion, resource efficiency, climate adaptation, and disaster risk reduction (11.b). Furthermore, the adoption of sustainable and resilient building practices using local materials improved significantly (11.c).

Sub-goal	**Pre-relocation residence (Gatsata hillsides/wetlands)**	**New residence (Karama)**	**Trend**
Target			
11.1	Quality of housing (Sub-standard)	Quality of housing (Standard)	↑
	Housing costs (low)	Housing costs (Lower/Free housing by Government)	↑
11.2	Access to Public Transport (easy)	Access to public transport (Difficult/ initially no bus route)	↘
11.3	Area consumption per inhabitat (only ground)	Area consumption per inhabitat (vertical housing)	↗
	Total area consumption (Horizontal/ FAR)	Total area consumption (Vertical/FAR/Economical)	↑
11.4	Public expenditure on cultural/natural heritage (high)	Public expenditure on cultural/natural heritage (low)	↑
11.5	Deaths/Damage attributed to disasters (High)	Deaths/Damage attributed to disasters (None)	↑
11.6	Waste management (low cost/ polluting environment)	Waste management (high cost/ not polluting environment)	↗
11.7	Access to green and open space (High/Unlimited)	Access to green and open space (Low/Limited)	↘
Measures			
11.a	Urban-Rural Linkages (strong/well connected)	Urban-Rural Linkages (weak/un-connected)	↘
11.b	Inclusion, resource efficiency, mitigation & adaptation to climate change/ Disaster risk reduction (Low)	Inclusion, resource efficiency, mitigation & adaptation to climate change/ Disaster risk reduction (High)	↑
11.c	Sustainable and resilient buildings, using local materials (Low)	Sustainable and resilient buildings, using local materials (High)	↑

Table 4: Summary of analysis of results in relation to application of SDG 11 targets and measures. Source: Authors, (2023)

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From Sustainable Development Goals to Sustainable Communities

Housing intersects with the social, economic, and environmental dimensions of sustainability (Golubchikov and Badyina, 2012), contributing both directly and indirectly to the achievement of many Sustainable Development Goals (SDGs) and serving as a cornerstone of household resilience. A critical examination of Rwandan government policies and programmes highlights that the integration of SDGs is central to the country's rural development and urbanisation strategies. Although the IDP Model Villages programme's 11 pillars were established prior to the SDGs, they remain aligned with these goals, positioning local authorities in Rwanda as key intermediaries between global policy agendas and community actions (Malonza & Ortega, 2020). This research reveals that the transformative change envisioned by the government's SDG narrative encounters significant challenges at the implementation level. In Rwanda, residents are relocated to formal settings with improved services; however, these improvements come with higher costs that many cannot afford. Before moving to Karama, most residents engaged in informal activities such as vending and subsistence farming. The cultural and spatial constraints imposed by the formal housing scheme often conflict with these previous practices, generating varying degrees of dissatisfaction. In line with a recent survey (Gatera, 2023) it has also emerged that geographical relocation has disrupted income generation, as residents are moved further from their established work locations, both formal and informal. Although closer to the city centre, some Karama residents feel more disconnected from the economic opportunities typically associated with urban areas. This is compounded by the lack of affordable public transport, a critical issue considering that over 70% of residents in informal settlements in Kigali work within 2 km of their homes (Hitayezu et al., 2018).

The growing emphasis on consistent monitoring and evaluation of SDG compliance has encouraged greater engagement from local governments and communities. From this perspective, housing should serve as a catalyst for transformation. Indeed, according to UN-HABITAT, housing extends beyond just four walls and a roof: "Adequate housing means more than a roof over one's head. It also means adequate privacy; adequate space; physical accessibility; adequate security; security of tenure; structural stability and durability; adequate lighting, and ventilation; adequate basic infrastructure, such as water-supply, sanitation and waste management facilities; suitable environmental quality and health related factors; and adequate and accessible location with regard to work and basic facilities: all of which should be available at an affordable cost" (UN-HABITAT, 2003).

Adequate housing not only improves health outcomes (Haines et al., 2013) but also enhances opportunities for human capital development and access to urban resources (Kumar, 2021), although relocation can sometimes have adverse effects (Picarelli, 2019). Adequate housing is widely recognised as a critical factor in poverty reduction (Adarkwa and Oppong, 2007), offering potential benefits such as job creation, enhanced service provision, and overall economic development. To be deemed adequate, housing must be socially acceptable (Choguill, 2007) and provide essential amenities, including water, sanitation, physical safety, comfort, energy for cooking and heating, lighting, food storage, and refuse disposal. Furthermore, it must be affordable and well-located to ensure it does not hinder occupants' employment opportunities or access to essential services such as healthcare and education (UN-Habitat, 2014).

In conclusion, the implementation of a 'hybrid' model in Karama, which incorporates multi-storey housing characteristic of more densely populated urban areas, diverges from the official narrative that describes rural settlements as "a low number of houses, generally not rising high" (Government of Rwanda, 2009). The integration of facilities designed to support rural activities

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beyond subsistence has, in some cases, resulted in unintended outcomes, creating a sense of detachment from familiar everyday spaces (Aalbers and Gibb, 2014). The tensions between informal lifestyles and the new housing and public spaces, combined with limited income-generating opportunities and the lack of affordable services, undermine the potential for SDGs to become practical and meaningful in residents' daily lives, reducing the anticipated benefits of relocation. A critical question remains: how can model villages—and specifically, what types of spatial and material infrastructure—effectively support the full integration of SDGs at the local and community levels in Rwanda? This question addresses a concern highlighted by Fairclough (2013, p. 247), who noted a gap in the discourse of change that remains confined to high-level policy rather than translating into tangible, on-the-ground improvements.

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