Analysis of the Factors Contributing to the Lagos State Public Housing Development Scheme Vandalism

Aro Shittu Oluwakayode, Azmi Fatin Afiqah, Samsudin Salfarina

Universiti Teknologi Malaysia, Malaysia

ABSTRACT

The Lagos state government has expressed disapproval of the looting and vandalism of its housing scheme, which frequently results in delays in its housing delivery agenda and sustainability violations in its housing estates. This study aims to investigate the factors contributing to the persistent vandalism of public housing developments in the study area using a quantitative approach. It seeks to determine the order of importance of these factors and identify the underlying causes. The research strategy in this study involved adopting a quantitative approach to gather data on factors contributing to vandalism in public housing developments in Agbowa and Igbogbo towns, in Epe Local government area and Ikorodu Local government area, Lagos State respectively. Three hundred semi-structured questionnaires were distributed among the household heads in Agbowa and Igbogbo of Epe LGA and Ikorodu LGA respectively, with a 76% response rate. The data analysis involved the Relative Importance Index (RII) to rank contributing factors and Exploratory Factor Analysis (EFA) to identify and validate the underlying significant factors. The RII ranked factors based on their perceived importance, highlighting unemployment, poverty, and insecurity as the most important factors contributing to vandalism. Subsequent EFA revealed three underlying factors—economic breakdown, societal challenges, and socio-cultural challenges—explaining 68.70% of the total variance. Factor rotation was applied to enhance interpretation accuracy, resulting in a clear structure of three components. The study confirms instrument reliability and validity through Cronbach's alpha and composite reliability calculations. Practical implications for policymakers and stakeholders in addressing housing infrastructure vandalism challenges are discussed.

Keywords: vandalism, public housing developments, housing delivery agenda, Lagos state.

INTRODUCTION

A healthy housing environment promotes physical, mental, and social well-being, forming the foundation of social infrastructure development (World Health Organization, 2018). Recognising housing as essential for accessing work, education, healthcare, and social services, all levels of government must prioritise housing in urban policies, emphasising human rights and sustainable development (OHCHR & UN-HABITAT, 2009). In this regard, Nigeria's federal and state governments have been striving to provide affordable housing infrastructure to their citizens. Lagos state government is not excluded from this housing delivery policy to bridge the housing deficit gap in the state. However, achieving widespread housing provision in Nigeria remains challenging due to implementation problems, funding constraints, neighbourhood crime like vandalism and theft, and deficient infrastructure amenities (Akeju, 2007; Aribigbola, 2008; Olajide et al., 2022). This situation underscores the critical need to address housing difficulties through comprehensive and effective strategies.

Vandalism poses a significant obstacle to infrastructure development in Africa and other developing regions. Defined as the mischievous destruction of property or utilities, vandalism undermines government efforts and exacerbates socio-economic challenges. Reports from South Africa stated that the government incurs more than 30 million Rands (approximately 1.7 million USD) per annum on security guides to control the threat faced by vandalism (Sibanda, 2015). Similarly, the extensive damage caused by vandalism in Nigeria resulted in substantial economic losses and disruptions to essential services (Agbedo, 2021). In Nigeria, vandalism affects various infrastructure sectors, including housing schemes, power transmission, and public amenities, hindering socio-economic progress and development initiatives. For example, Hamid (2022), argued that

despite the challenge of insufficient public infrastructure confronting Nigeria, vandals continue to loot the available utilities and sell them as scraps for their selfish motives.

In addition, (Bennett, 2019; Bertram & Gbenga, 2019) reported that vandals caused a colossal setback in housing scheme development in the Ikorodu area of Lagos State by vandalising building components and facilities installed by the Lagos State Government. In the same trend, the Lagos State government expressed concern over the setback caused by the recent vandalisation of facilities at the Abiodun Ogunleye Housing Estate in Igbogbo town of Ikorodu, stating that it detracts from government efforts to provide subsidised homes for low-income earners (Uroko, 2024). Vandalism was reported as a persistent problem, as demonstrated by the five significant incidents in the first quarter of 2024 alone. These incidents caused transmission operations to be disrupted, requiring emergency repairs and, in some cases, the replacement of transmission lines and towers due to vandalism, highlighting the critical need for increased community support and vigilance in protecting transmission infrastructure (Addeh, 2024). The Lagos state government stressed the need for collaborative efforts among stakeholders to combat vandalism. It underscored the importance of enhancing security measures and fostering cooperation between government agencies, law enforcement, industry players, and community leaders to hold vandals accountable and safeguard collective assets (Lagos State Government, 2024). Thus, there is a need for this study to identify contributing factors to the vandalism incidents in the study area, which ultimately aid the prevention strategies.

Although research on vandalism exists, there is a lack of focus on its underlying factors, particularly in public housing schemes in Lagos State. This study aims to fill that gap by investigating the factors contributing to vandalism within the Lagos State Housing Development Scheme. The objectives are to determine the order of importance of these factors and to identify the underlying causes. The findings will inform strategies to improve housing delivery, protect public infrastructure, enhance property value, and promote sustainable development. The paper is structured as follows: Section 2 reviews the literature, Section 3 describes the study area, Section 4 outlines the research method, Section 5 presents the results and discussion, and Section 6 provides the conclusions.

Overview of Review Studies on Vandalism Contributing Factors

This section reviews pertinent literature examining the factors contributing to public infrastructure development vandalism to identify gaps between prior research and the current study. Previous studies have linked vandalism to poverty, insecurity, population growth, unemployment, conspiracy, social injustice, sabotage, and urban management, among other issues. For example, Nigeria's pervasive unemployment, particularly among the youth, contributes to vandalism as individuals resort to illegal activities for survival (Isiaq & Lawal, 2023). Similarly, Machin and Meghir (2004) also stated that unemployment has been linked with higher criminal activity rates. In other instances, Aduloju and Okwechime (2016), Edun et al. (2023), Henry and Mohammed (2023), Ajibade and Adediran (2019), and Mazikana (2019) contend that insecurity arises from security agencies' failure to protect life and property, allowing various deviant behaviours and crimes to proliferate, with threats like vandalism and theft occurring openly despite the presence of Nigerian security forces. Equally, poverty emerges as a significant factor driving vandalism, particularly in developing nations, where high poverty levels lead individuals to resort to both legal and illegal means of survival (Ikejemba & Schuur, 2018; Isiaq & Lawal, 2023; Mazikana, 2019).

Researchers such as (Wilson, 1978), posited that acts of vandalism are contingent on specific circumstances. In a study on criminal behaviour in public housing estates in Great Britain, Wilson deduced that the concentration of children, or the ratio of children per housing block, emerged as the most influential factor in predicting vandalism. Equally, Bell et al. (1988), corroborated these findings, observing graffiti patterns closely linked to the daily activities of local adolescents during an anti-graffiti campaign in Seattle, Washington. Beaulieu (1982), documented higher vandalism rates among school-age children in Toronto, with the highest incidence observed within the 14-16 age group. Gladstone (1978) noted that acts of vandalism were so prevalent among adolescents that they were perceived as normal behaviour. Besides, Erickson and Jensen (1977), found that 80% of reported acts of vandalism by American teenagers occurred in the presence of peers. These studies collectively suggest that higher levels of vandalism can be anticipated in environments with substantial numbers of young individuals.

In addition, researchers argued that the vulnerability of critical infrastructures or properties to vandalism is influenced by their locations, as demonstrated by numerous studies. (Bursik, 1986; Gottfredson, 1990; Hamzah et al., 2018; Reiss, 1976; Sampson, 1993; Sherman et al., 1989). Roncek and LoBosco (1983), opined higher rates of various index crimes are observed in areas adjacent to public high schools, considering the social, housing, and demographic composition. Similarly, Hamzah et al. (2018), argued that urban trees in prominent places like playgrounds and commercial areas are more susceptible to vandalism. Moreover, Albert et al. (1995) noted that rapid population growth can lead to socioeconomic disparities, which may increase social discontent. Disaffected individuals or groups may be more likely to engage in acts of vandalism as a form of protest or expression of frustration, particularly in overcrowded facilities and systems. This fact is supported by the observation that frustration with congestion and limited resources may escalate vandalism. Conversely, Hartnagel and Lee (1990) and Webb (1972) argued that high population density may have the opposite effect, increasing the convergence of potential offenders and suitable targets, thereby exacerbating urban problems, including higher crime rates. Meanwhile, Ehiorobo (2018) argued that extreme poverty among rural and urban populations compelled them to engage in various socially deviant behaviours, including dangerous travel patterns, prostitution, armed robberies, vandalism, and advanced fee fraud.

Furthermore, corruption within the public sector facilitates vandalism, with government officials collaborating with vandals by disclosing crucial information about public assets, thereby enabling their illicit activities (Emelu et al., 2021; Oludayo & Ayodele, 2019). Low levels of education or illiteracy and ignorance are identified as significant factors influencing vandalism, as individuals with lower levels of education may not perceive the value of social infrastructure and thus may engage in vandalism out of ignorance (Bhati, 2021; Ikejemba & Schuur, 2018; Ozougwu et al., 2023). Moreover, Edun et al. (2023), Ikejemba and Schuur (2018), and Oludayo and Ayodele (2019) opined that Sabotage is a significant factor in vandalism, often stemming from social discontent, such as income inequality and lack of opportunities, and exacerbated by government or private sector corruption, leading to financial incentives for sabotage through contracts, extortion, or illicit activities. The lack of community involvement in the installation of public infrastructure leads residents, particularly in host communities, to perceive these assets as detached from their ownership, resulting in a nonchalant attitude towards their security, as underscored by Bhati (2021), Ikejemba and Schuur (2018), and Isiaq and Lawal (2023).

Bostani et al. (2017) examined vandalism's impact on urban public spaces in Parsabad, Iran, finding that motivations such as seeking revenge against injustice, proving oneself, and seeking amusement were crucial factors. They concluded that vandalism, primarily driven by youth, undermines public order and urban quality of life, potentially leading to social unrest, though they acknowledge potential biases in juvenile perceptions. Alike, Ikejemba and Schuur (2018) examined the origin and impact of vandalism on renewable energy projects in Sub-Saharan Africa, finding that poverty and government inequality were significant drivers, recommending community involvement and various security measures, yet acknowledging that their findings may not directly apply to vandalism in housing infrastructure development.

Similarly, Oludayo and Ayodele (2019) attributed causes of vandalism to wealthy individuals in Nigeria who financed vandalism operations, government officials within Nigeria National Petroleum Company Limited (NNPCL) and the Department of Petroleum Resources (DPR) provide vandals with information on oil pipeline networks, and security agencies collaborate with vandals and local youth who also participates in vandalising public utilities. The findings suggest implementing community policing involving local youth to safeguard oil pipeline infrastructure and generate employment opportunities for unemployed youth. However, the study findings focused on petroleum resource infrastructure vandalism, which may limit the generalizability of their findings to other forms of infrastructure vandalism. Ajibade and Adediran (2019) identified weak security systems, political corruption, and unemployment as key causes of insecurity in Nigerian residential neighbourhoods. They found that local security resources were inadequate to protect property and lives, concluding that security systems in the study area needed improvement. However, the study did not address vandalism as a specific challenge affecting housing infrastructure.

Furthermore, Iaiani et al. (2021) focused on physical and cybersecurity events, conducting root cause analysis and revealing sabotage and conspiracy as primary causes of petrochemical vandalism, with property damage and economic loss being the most significant impacts. However, the study focused mainly on oil and gas

infrastructure vandalism, so which findings may not apply to housing infrastructure vandalism. Moreover, Shackleton and Njwaxu (2021) investigated the decline of urban neighbourhood parks in the Eastern Cape of South Africa due to the lack of community involvement, focusing on vandalism as a significant issue caused by substance abuse, low education levels, and unemployment. However, the study's conclusions may not directly apply to housing infrastructure development in Nigeria due to contextual differences in vandalism patterns. Misheck and Kwashirai (2021) investigated infrastructure vandalism and protection in a vulnerable community in Zimbabwe, employing both quantitative and qualitative methods to explore the criminal motivations behind vandalism and suggest preventive strategies, revealing that a nation's broken socioeconomic system was the primary driver of infrastructure vandalism, other factors like unemployment, poverty, and a lack of social value also played a role. While the significant impacts of vandalism include revenue loss and denial of essential utilities and proposing digitisation and legal regulations as solutions, the findings may not directly apply to Nigeria's context due to geographical differences.

Moreover, Kumar (2021), examined graffiti vandalism in the Klang Valley Mass Rapid Transit (KVMRT). Its impact on tourist satisfaction focuses on the root causes of vandalism and passenger behaviour, using quantitative methods to analyse data collected from tourists in the Klang Valley region. It reveals internal factors contributing to vandalism and negative passenger behaviour, which detrimentally affects tourist satisfaction. However, they acknowledge that their findings may not directly apply to vandalism in housing infrastructure development. Besides, Ahmed and Hirai (2021),

investigated citizen participation in combating crime and vandalism in Fukuoka City, Japan, and the study revealed citizens' concerns about crime and their reluctance to engage in vandalism prevention due to a lack of community involvement, awareness, and motivation. To address this, an urban gamification model was proposed and evaluated by the local community and city hall, showing promising results despite budget and administrative challenges. However, the study focused only on graffiti vandalism; thus, the model's sustainability for other vandalism types remains uncertain.

Equally, Qwatekana et al. (2022), examined vandalism types and severity in Pietermaritzburg, South Africa, particularly on heritage sites, attributing causes to local government negligence and residents' ignorance. However, their focus on historical monuments may yield findings differing from those on residential housing infrastructure, given the geographical distinctions between the studies. Edun et al. (2023), investigated oil pipeline vandalism in the Niger Delta, highlighting its role as the primary cause of oil spills and linking it to pipeline explosions due to insufficient security, resulting in significant economic losses and environmental damage. Although the study contributed to the genesis of vandalism, the findings may contradict the causes of vandalism in housing infrastructure development.

In their research, Olajide et al. (2022), focus on addressing Nigeria's prevalent and increasing neighbourhood crime rate by proposing the Socio-Environmental Design Factors (SEDeF) model. It underscores the importance of government involvement in redirecting spending priorities towards addressing social risk factors such as poverty, illiteracy, homelessness, unemployment, and juvenile delinquency to facilitate the implementation of the model. However, the study focused on social risk factors, neglecting other contributing factors to property crime. In addition, Henry and Mohammed (2023), assessed the severe economic repercussions of oil pipeline vandalism and theft in Nigeria, identifying inadequate security measures and government complicity as significant factors and recommending the establishment of environmental security surveillance, structural reorganisation, and a special court for prosecuting vandals. However, their focus solely on oil pipeline vandalism may limit the generalizability of their findings to other forms of infrastructure vandalism.

Isiaq and Lawal (2023), identified factors contributing to oil pipeline sabotage and vandalism in the Niger Delta, including community marginalisation, poverty, unemployment, financial motives, and ineffective law enforcement. However, their focus on the Niger Delta region may limit the general applicability of their findings to broader property crime reduction strategies. Thus, the findings may contradict the contributing factors of public housing infrastructure vandalism.

This study expands on previous research by investigating respondents' perceptions of the factors contributing to public housing infrastructure development vandalism, categorising them by the order of importance, and identifying underlying factors to facilitate a more targeted approach. By focusing on select factors rather than a broad range of variables, this approach aims to inform strategies for curbing vandalism. The unique methodological approaches, infrastructure type, and geographical location distinguish this study from others in the field. In the meantime, Table 1 contains lists of 14 contributing variables to public infrastructure development vandalism that have been taken from the literature and accompanied by references for further reading.

Table 1. List of Contributing Variables to Vandalism Derived from the Literature

Code	Variables	Back up References
CV01	Unemployment	[3]; [19]; [21]; [22]; [23]; [24]; [25]; [32].
CV02	Insecurity	[1]; [3]; [9]; [17]; [23].
CV03	Ignorance	[19]; [28].
CV04	Poverty	[10]; [19]; [21]; [23]; [24]; [25].
CV05	Lack of moral/cultural value	[24].
CV06	Illiteracy	[19]; [25]; [27]; [32].
CV07	Corruption	[3]; [9]; [11]; [26].
CV08	Population explosion	[16]; [20]; [34].
CV09	Sabotage	[9]; [18]; [19]; [26].
CV010	Conspiracy	[17]; [18]; [26].
CV011	Location	[8]; [14]; [15]; [29]; [30]; [31]; [32]; [33]
CV012	Youthful exuberance	[4]; [5]; [7]; [12]; [13]; [35].

CV013	Injustice	[7]; [11]; [19].
CV014	Lack of community involvement	[2]; [6]; [19]; [21].

Source: Authors' concept, 2024

Note: [1] Aduloju and Okwechime (2016); [2] Ahmed and Hirai (2021); [3] Ajibade and Adediran (2019); [4] Beaulieu (1982); [5] Bell et al. (1988); [6] Bhati (2021); [7] Bostani et al. (2017); [8] Bursik (1986); [9] Edun et al. (2023); [10] Ehiorobo (2018); [11] Emelu et al. (2021); [12] Erickson and Jensen (1977); [13] Gladstone (1978); [14] Gottfredson and Hirschi (1990); [15] Hamzah et al. (2018); [16] Hartnagel and Lee (1990); [17] Henry and Mohammed (2023); [18] Iaiani et al. (2021); [19] Ikejemba and Schuur (2018); [20] Isaac et al. (1995); [21] Isiaq and Lawal (2023); [22] Machin and Meghir (2004); [23] Mazikana (2019); [24] Misheck and Kwashirai (2021); [25] Olajide et al. (2022); [26] Oludayo and Ayodele (2019); [27] Ozougwu et al. (2023); [28] Qwatekana et al. (2022); [29] Reiss (1976); [30] Roncek and LoBosco (1983); [31] Sampson (1993); [32] Shackleton and Njwaxu, (2021); [33] Sherman et al. (1989); [34] Webb (1972); [35] Wilson (1978).

Study Area

Lagos is the largest city in Nigeria and the third most populous city in Africa. (United Nations, 2022). Lagos State's population is estimated to grow between 3.4% and 3.6% annually. (United Nations, 2022), while the inhabitant population of its metropolitan area was estimated to be 15.4 million as of 2022, thus making it the most extensive metro area in Africa (Lars, 2023). The state's heavily populated and developed areas, known as "the megacity" or simply "Lagos," now comprise the Lagos Metropolitan Area. Today, Lagos has become a significant hub for the corporate headquarters of domestic and international businesses and the intricate business and professional services that support them. An acute shortage of dwelling accommodations characterises Lagos state due to its population influx resulting from industrialisation and urbanisation (Global, 2018). Rapid population expansion, urbanisation, unrelenting infrastructural needs, and macroeconomic challenges at the national level are harsh factors it must contend with (Nwagwu & Oni, 2015). However, the state government's efforts to increase the public housing infrastructure development (PHID) to meet the housing needs of this population are hindered by the incidence of vandalism, which could discourage investing more funds in public housing development (Bertram & Gbenga, 2019; Sanni, 2019).

The state comprises twenty local government areas (LGAs), including Epe and Ikorodu. Both have ample land for development, with Epe located north of the Lekki Lagoon and Ikorodu, the largest LGA in Lagos State, situated northeast of Lagos. Each has a population exceeding one million, likely influencing the government's decision to focus on these areas for mass housing development. In Ikorodu, the Abiodun Ogunleye Housing Estate in Igbogbo was vandalised in early 2024, while the Odo-Onosa/Ayandelu Housing Estate in Agbowa faced vandalism three years prior. The government described these incidents as setbacks to housing infrastructure delivery in the state (Bertram & Gbenga, 2019; Uroko, 2024).

Abiodun Ogunleye Housing estate is located along Bayeku Road, Igbogbo town, under Ikorodu Local Government. The development is 40 blocks of 480 units of mixed 1, 2, and 3-bedroom flats on four floors, built on a land area of 15 hectares. Each accommodation unit affords a fitted kitchen, store, and visitor's toilet; the two and three bedrooms are "en suite." The floors are finished with vitrified tiles, windows are Aluminium sliding types, doors are combinations of wooden flush and steel panel types, and ceilings are finished with PVC. External features of the estate comprise 7No. Transformers, 1No. Injection section, 2No. Refuse houses, ample car parks, industrial water treatment plants, ground and overhead water tanks, boreholes, and 2No.

Pump houses. Other ancillary facilities include a generator house, community halls, a tarred road and drainage network, and a central sewage system.

Odo-Onasa/Ayandelu housing estate is along Agbowa-Sagamu road, in Agbowa within Ikosi-Ejinrin Local Council Development Area under Epe Local Government Area of Lagos state. The structure comprises 660 units of 70 blocks of four distinct types of dwelling accommodation. The accommodation types are eight blocks of 192 units of 1-bedroom flats, twenty-one blocks of 252 units of 2-bedroom flats, and forty-one blocks of 216 units of 3-bedroom flats on three floors, built on over 20 hectares of land. All the rooms are "en suite"; every flat affords a fitted kitchen, store, and visitor's toilet. The accommodations are tastefully finished with floor tiles, Aluminium sliding windows, wooden flush doors, and PVC ceilings. External facilities include streetlights, Transformers, electric poles, cable and wire, ample car park, an industrial water treatment plant, ground and overhead water tanks, borehole and pump houses, generator house, community halls, road and drainage network, and central sewage system Agbowa-Sagamu road which is the main thoroughfare that connects other towns is in a deplorable condition, and this may hinder accessibility to residents and other commuters.

Like other Lagos state Government housing development schemes, the two projects were constructed by seasoned professionals in the Lagos State Development and Property Corporation (LSDPC) and contractors and supervised by the LSMH. The projects commenced in 2010, while some were completed in 2021, and others were 85% completion stage. Each accommodation unit sells between the range of N5 million and N13.5 million. It is an initiative of the Lagos State Government as part of its efforts to provide affordable housing for the teeming population, which, in turn, would reduce the state's housing deficit.

RESEARCH METHODS

A quantitative research strategy was adopted in this study to collect data from the residents of Agbowa town in Epe LGA and Igbogbo town in Ikorodu LGA, Lagos state, on the factors contributing to the persistent vandalism of public housing developments in the areas. The philosophical basis for this research design is justified in the studies of Jonker and Pennink (2010) and Creswell (2014), with their belief that the researcher's perspective, as an impartial observer during the data collection process, was the best way to perceive reality. The towns were purposely selected due to the prior knowledge of the aggregation of housing scheme development and the continued incidence of housing infrastructure vandalism in the areas. A semi-structured questionnaire instrument was used for the field survey on the assumption that a questionnaire survey has the benefit of a low bias error rate and quicker and less expensive responses from many respondents. It also guarantees simple analysis and a better chance of generalising the conclusions drawn from responses (Creswell, 2009). Three hundred questionnaires were administered to the household heads of the selected buildings in the two towns. However, 229 were retrieved, giving a response rate of 76 per cent. Sampling involved random selection of the first building and subsequent selection of every tenth building for investigation. Meanwhile, 14 variables (contributing factors to the challenges) were sourced from literature and in the questionnaire piloting process.

The questionnaire comprises two sections. The initial section solicits respondents' demographic details, encompassing gender, age, educational attainment, occupation, and Years in Residence. The subsequent section concentrates on residents' perceptions regarding the factors contributing to vandalism within the public housing scheme. During the latter phase, participants were tasked with employing a five-point Likert scale, where 1 denotes "strongly disagree," 2 signifies "disagree," 3 indicates "neutral," 4 represents "agree," and 5 denotes "strongly agree," to express their alignment with the identified causes of vandalism within public housing schemes. The research process timeline extended from June 2023 to March 2024. The study employed the Relative Importance Index (RII) for data analysis, a statistical tool assessing the significance of factors or variables by ranking them based on their impact (Genc, 2021). Its primary objective was to determine the order of importance of the contributing factors. Subsequently, an Exploratory Factor Analysis (EFA) was conducted to unveil the latent variables within the dataset, simplifying complex data by extracting representative factors (Genc, 2021; Olajide et al., 2022). The stages of the EFA are illustrated in Figure 1.
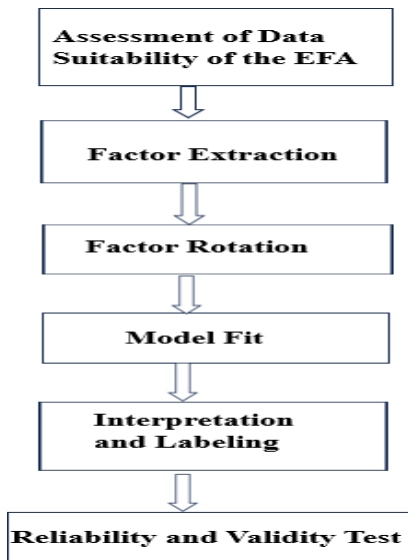
Figure 1. Stages Followed in Conducting Exploratory Factor Analysis

Authors' field survey 2024

RESULTS AND DISCUSSION OF FINDING

Field survey details

Table 2 presents details of the respondents' questionnaire distribution and response rates. A response rate of 76% was achieved; that is, 229 out of the 300 questionnaires were duly filled in and returned. This rate could have improved but for the difficulty encountered by the researchers and the field assistants in retrieving the questionnaires due to the inaccessibility of some of the respondents.

Table 2. The response rate of questionnaires distributed.

Details-of distribution	Frequency/Neighbourhood		Total Frequency	Response rate (%)
	Igbogbo	Agbowa		
Retrieved	126	103	229	76.33
Non-retrieved	24	47	71	23.66
Total	150	150	300	100

Authors' field survey 2024

Demography of Respondents

Table 3 shows the demographic characteristics of the residents. The Table revealed that the gender ratio of the respondents was 34.93% (female) to 65.07% (male), which showed that there was no gender discrimination in our field survey. The age distribution of the respondents showed that about 86.90% were between 18 and 65 years, while 13.10% were above 65 years. This indicated that the respondents were all adults. Amongst this age

bracket, about 71.62% (18-25years; 26-35 years; 36-45 years; 46-55 years) were in the active labour age, indicating that many respondents are not dependent and could know the economic and social importance of housing infrastructure. Thus, the information they provided was reliable.

Analysis of the respondents' profiles showed that most had one form of formal education or another. Respondents with primary and secondary standard education were 8.30% and 17.03%, respectively. At the same time, post-secondary education levels from NCE, OND, HND, BSc., MSc., and PhD represented 10.04%, 27.95%, 12.23, 17.90, 6.11%, and 0.44%, respectively. Therefore, the majority's information is independent of illiteracy and considered reliable. In addition, the respondents' profiles showed that 33.62% were civil servants, 18.34% were self-employed, 17.47% were unemployed, students were 20.09%, and others represented 10.48%. This showed that about half (51.96%) of the respondents are earning a source of living, and the other half (48.04%) are probably not working. Consequently, the information provided by this category of people will be helpful in the study regarding the significance of employment and unemployment factors in this research study. Moreover, Table 3 revealed that about 75.11% of the respondents had lived in the study area for over ten years, indicating that they know the history of infrastructure development in those areas. Meanwhile, about 5.68% of the respondents lived in the study area between 1 and 5 years, while 19.21% lived there between 6 and 10 years.

Table 3. Respondents' Demography

Demographic Variables	Frequency	Percentage
Gender		
Male	169	65.07
Female	80	34.93
Total	229	100.00
Age		
18-25	36	15.72
26-35	34	14.85
36-45	51	22.27
46-55	43	18.78
56-65	35	15.28
Above 65	30	13.10
Total	229	100.00
Education		
Primary school	19	8.30
Secondary school	39	17.03
NCE	23	10.04
OND	64	27.95

HND	28	12.23
BSc.	41	17.90
MSc.	14	6.11
PhD.	1	0.44
Others	-	-
Total	229	100.00
Occupation		
Civil servant	77	33.62
Self-employed	42	18.34
Unemployed	40	17.47
Student	46	20.09
Others	24	10.48
Total	229	100.00
Years in Residence		
1-5	13	5.68
6-10	44	19.21
11-15	64	27.95
16-20	51	22.27
Above 20	57	24.89
Total	229	100.00

Authors' field survey 2024

Relative importance index of factors contributing to public housing scheme vandalism in the Study Area

The level of agreement among variables, initially identified through literature and a pilot survey involving academics and experts in the building industry, was evaluated using a five-point ordinal scale (5 - strongly agree, 4 - agree, 3 - neutral, 2 - disagree, and 1 - strongly disagree). Two hundred twenty-nine opinions were collected, encompassing fourteen contributing factors to public housing scheme vandalism. These responses were gathered using a Likert scale ranging from 1 to 5. Subsequently, each factor's Relative Importance Index (RII) was computed utilising a statistical package for the social sciences (SPSS) software. The frequency of occurrence for each of the 14 factors was calculated first, followed by substitution into the RII formula given below. The resulting RII values indicated the perceived importance of each factor. Notably, unemployment received the highest RII value of 0.770306, followed by poverty (RII = 0.748472) and insecurity (RII = 0.723144). This finding aligns with the research conducted by Ikejemba and Schuur (2018), suggesting that poverty significantly contributes to vandalism and theft in public projects. Similarly, Ajibade and Adediran (2019) identified weak security and unemployment as the main factors behind vandalism, while (Edun et al., 2023) argued that inadequate security leads to vandalism in infrastructure development.

Conversely, illiteracy, ignorance, and location were attributed with the least importance, with descending RII values of 0.600000, 0.595633, and 0.581659, respectively. The RII values for all 14 factors are presented in Table 4

Relative Important Index (RII) = $5\cap5+4\cap4+3\cap3+2\cap2+1\cap1$ /A*N..........................(i)

$\cap_5$ = Number of respondents for Strongly Agree

$\cap_4$ = Number of respondents for Agree

$\cap_3$ = Number of respondents for Neutral

$\cap_2$ = Number of respondents for Disagree

$\cap_1$ = Number of respondents for Strongly Disagree

A = (highest weight) = 5

N = (Total number of respondents) = 229

Table 4. RII of Factors Contributing to Public Housing Scheme Vandalism

Factors	RII	Rank
Unemployment	0.770306	1st
Poverty	0.748472	2nd
Insecurity	0.723144	3rd
Corruption	0.71179	4th
Lack of moral/cultural value	0.669869	5th
Injustice	0.660262	6th
Sabotage	0.641048	7th
Youthful exuberance	0.632314	8th
Population explosion	0.623581	9th
Lack of community involvement	0.608734	10th
Conspiracy	0.600873	11th
Illiteracy	0.600000	12th
Ignorance	0.595633	13th
Location	0.581659	14th

Source: Authors' concept, 2024

Factor Analysis

Despite conducting a Relative Importance Index (RII) to rank all identified contributing factors to vandalism in public housing development within the study area, factor analysis utilising principal components extraction was also performed to identify and validate the underlying significant factors (Genc, 2021; Olajide et al.,

2022). Factor analysis is a data reduction technique that explores interrelationships among numerous variables while uncovering underlying dimensions or factors that explain correlations within a variable set (Shrestha, 2021). The process of factor analysis entails six primary steps: assessing data suitability, factor extraction, factor rotation, model fit, interpretation and labelling, and reliability and validity test. The results of the EFA for this study from stages 1 to 6 are illustrated in Figure 2.
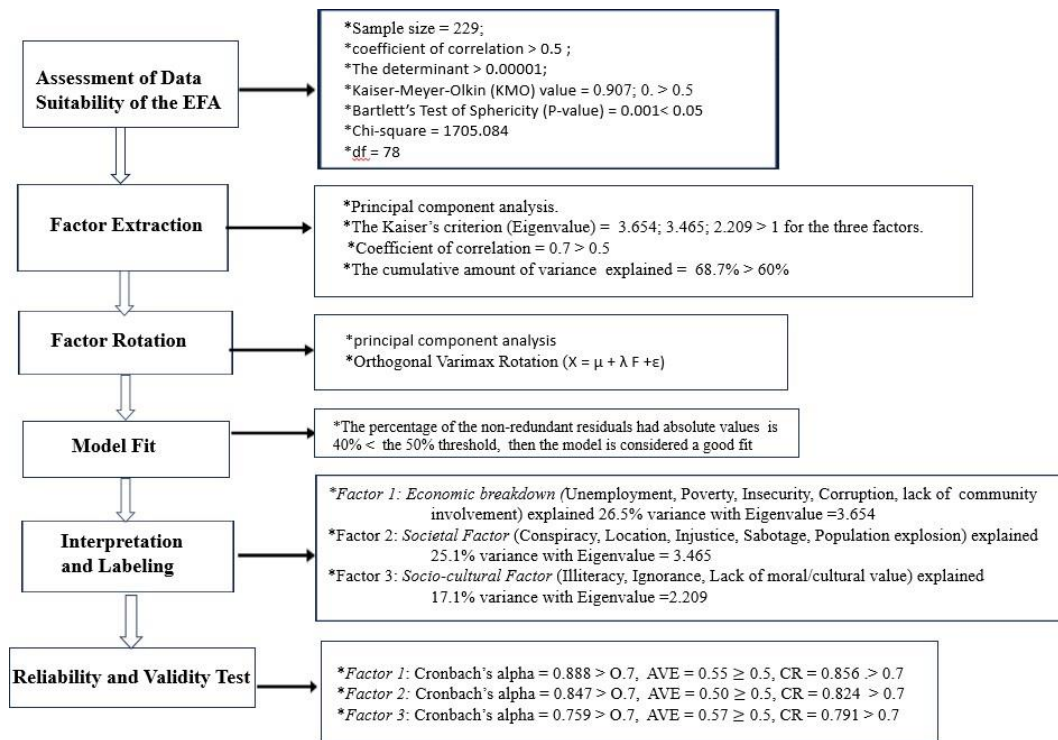

Figure 2. Stages of the Factor Analysis Results for the Study

Source: Authors' concept, 2024

Results of the Factor Analysis

Step 1: Assessment of the Suitability of the Data

To investigate the factors contributing to the persistent vandalism of public housing developments, Kaiser-Meyer-Olkin is used to measure the suitability of data for factor analysis. Similarly, Bartlett's test of Sphericity, correlation matrix, and determinant score are computed to detect the appropriateness of the data set for functioning exploratory factor analysis.

For factor analysis, a larger sample size, ideally with ten cases per item, is recommended based on the sample size and the strength of item relationships. However, smaller sample sizes can be acceptable if the solution includes several high-loading marker variables less than 0.80 (Stevens, 1996). In this study, the number of cases per item exceeded 10, and several high-loading marker variables below 0.80 were observed. Additionally, for sample sizes below 300, the communalities of retained items must be evaluated. Despite the sample size being 229, which is less than 300, the average communality of the retained items was 0.687, exceeding the acceptable threshold of 0.6 for sample sizes between 100 and 200 (Guttman, 1954; Tabachnick and Fidell, 2013). This supports the appropriateness of factor analysis for this study.

Table 5 shows that the Kaiser-Meyer-Olkin (KMO) statistic is 0.907, well above the 0.6 threshold, indicating that sampling is adequate, and the data is suitable for factor analysis (Guttman, 1954; Tabachnick and Fidell, 2013). Bartlett's test of sphericity, used to assess the adequacy of the correlation matrix, is highly significant with a p-value of 0.001, showing that the correlation matrix is not an identity matrix and that the variables are sufficiently related for meaningful EFA. The test value is 1705.084 with a significance level of less than

0.0001, rejecting the null hypothesis that the correlation matrix is an identity matrix. A significance value below 0.05 suggests that factor analysis is appropriate for this dataset (Adabre et al., 2020; Shrestha, 2021).

Table 5. Determinant of Correlation Matrix, Bartlett Test of Sphericity, and KMO Test for the Study

Determinant of the correlation matrix (Det)		0.000
Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy		0.907
Bartlett's test of sphericity	Chi-square	1705.084
	Degree of freedom	78
	p-value (Sig.)	0.00

Source: Authors' concept, 2024.

Step 2: Factor Extraction

Kaiser's criterion was used to determine the number of initial unrotated factors to extract. Eigenvalues represent the variance explained by each factor. Any factor loadings below 0.5 were suppressed (Kaiser, 1970). Table 6 shows the eigenvalues and total variance explained. The extraction method used was principal component analysis. Initially, 14 linear components were identified, but one variable (CV012) was removed due to its factor loading of 0.449, which was below the 0.5 threshold, resulting in 13 factors being analysed. After extraction, three distinct linear components with eigenvalues greater than 1 were identified and retained for relevance (Chan et al., 2018) , accounting for 68.701% of the total variance, exceeding the recommended 60% threshold (Lavrakas, 2008; Thompson, 2004). This result indicates that three factors explain the common variance the remaining thirteen variables shared. The KMO value of 0.907 further supports the appropriateness of factor analysis for this dataset.

Table 6. Total Variance Explained in the EFA Model for the Study

Components	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.593	50.716	50.716	6.593	50.716	50.716	3.447	26.519	26.519
2	1.326	10.201	60.917	1.326	10.201	60.917	3.264	25.104	51.623
3	1.012	7.784	68.701	1.012	7.784	68.701	2.220	17.078	68.701
4	.727	5.589	74.290						
5	.548	4.219	78.509						
6	.506	3.890	82.399						
7	.470	3.616	86.015						
8	.435	3.350	89.365						

9	.376	2.889	92.254							
10	.330	2.538	94.792							
11	.296	2.278	97.070							
12	.219	1.682	98.752							
13	.162	1.248	100.000							

Extraction Method: Principal Component Analysis

Step 3: Factor Rotation.

However, the factors generated were consolidated in one component and complicated due to numerous cross-loadings among retained variables, prompting the application of factor rotation extraction. Factor rotation in factor analysis aids interpretation by adjusting factor loadings. Specifically, target rotation, such as the varimax version of orthogonal rotation employed in this study, enhances interpretation accuracy (Guangjian et al., 2019). After re-running the model, a clear, simple structure of three components emerged (see Table 7), with many variables evenly distributed, resulting in three underlying factors explaining 68.70% of the total variance.

Step 4: Model Fit

The reproduced correlation matrix indicates that 40% of the non-redundant residuals had absolute values greater than 0.05 (see Appendix 1). Since this is below the 50% threshold, the model is considered a good fit (Broen et al., 2015; Mahmud et al., 2018).

Step 5: Interpretation and labelling.

To investigate the factors contributing to the persistent vandalism of public housing developments, the researcher applied principal component analysis with the varimax version of orthogonal rotation. As shown in Table 7, this resulted in a simple structure of three components, with variables evenly distributed across them, explaining 68.70% of the total variance. Factor loading values indicate the strength of each variable's relationship to the underlying factors, with loadings above 0.50 representing significant associations.

Table 7. Results of the factor analysis

Code	Contributing Factors	Factors		
		1	2	3
Factor 1	Economic breakdown			
CV01	Unemployment	0.878	-	-
CV04	Poverty	0.805	-	-
CV02	Insecurity	0.799	-	-
CV07	Corruption	0.625	-	-
CV014	Lack of community involvement	0.547	-	-
Factor 2	Societal challenges			

CV010	Conspiracy	-	0.820	-
CV011	Location	-	0.694	-
CV09	Sabotage	-	0.693	-
CV013	Injustice	-	0.688	-
CV08	Population explosion	-	0.570	-
Factor 3	Socio-cultural challenges			
CV06	Ignorance	-	-	0.855
CV03	Illiteracy	-	-	0.854
CV05	Lack of moral/cultural value	-	-	0.500
Eigenvalue		3.654	3.465	2.209
Variance (%)		26.519	25.104	17.078
Cum. Var. (%)		26.519	51.623	68.701

Notes: Cum. = cumulative; Var. = variance

Source: Authors' concept, 2024

Factor 1, labelled "Economic Breakdown," consists of unemployment (loading: 0.878), poverty (0.805), insecurity (0.799), corruption (0.625), and lack of community involvement (0.547). This factor explains 26.5% of the variance, with an eigenvalue of 3.654, aligning with findings by Misheck and Kwashirai (2021) and Olajide et al. (2022), which linked socioeconomic issues like poverty and unemployment to infrastructure vandalism.

Factor 2, "Societal Challenges," includes conspiracy (loading: 0.820), location (0.694), sabotage (0.693), injustice (0.688), and population explosion (0.570), accounting for 25.1% of the variance, with an eigenvalue of 3.465. This supports Albert et al. (1995) and Groff (2015), who suggested that rapid population growth and location influence socioeconomic disparities and vandalism, as well as Hamzah et al. (2018), who found infrastructure vulnerability is location-dependent.

Factor 3, "Socio-cultural Challenges," involves ignorance (loading: 0.855), illiteracy (0.854), and lack of moral/cultural values (0.500), explaining 17.1% of the variance, with an eigenvalue of 2.209. This mirrors the findings of Ikejemba and Schuur (2018), Qwatekana et al. (2022), and Shackleton and Njwaxu (2021) , where illiteracy and ignorance were linked to frustration, increasing the risk of vandalism as a form of protest.

Step 6: Reliability and Validity Test Results

Internal consistency was assessed through Cronbach's alpha and composite reliability calculations to ensure instrument accuracy. Cronbach's alpha values for factors 1, 2, and 3—economic breakdown, societal challenges, and socio-cultural challenges—were 0.888, 0.847, and 0.759, respectively, confirming instrument reliability. Convergent validity was confirmed with average variance extracted (AVE) values ≥ 0.5 for economic breakdown, societal, and socio-cultural challenges (0.549429, 0.500000, and 0.570114, respectively). All AVE values in Table 8 met or exceeded this threshold, validating convergent validity (Fornell

and Larcker, 1981). Composite reliability values for factors 1, 2, and 3 were 0.8556, 0.8238, and 0.7910, respectively, evidencing internal consistency in scale items.

Table 8. Reliability, Average Variance Extracted (AVE) and Composite Reliability (CR)

Factors	Reliability (Cronbach's alpha)	AVE	CR
Factor 1: Economic Breakdown	0.888	0.549429	0.855628
Factor 2: Societal challenges	0.847	0.500000	0.823828
Factor 3: Socio-cultural challenges	0.759	0.570114	0.790957

Source: Authors' concept, 2024

CONCLUSION

The study adopts a quantitative research approach to investigate the factors contributing to the persistent vandalism of public housing developments in Agbowa town in the Ikosi-Ejinrin Local Council Development Area LCDA under Epe LGA, and Igbogbo town in Ikorodu LGA of Lagos state. This approach aligns with the perspective that a researcher's impartial observation during data collection best captures reality, as Jonker and Pennink (2010) and Creswell (2014) asserted. The selection of these towns was deliberate, grounded in prior knowledge of housing scheme development and the prevalence of housing infrastructure vandalism in the area. A semi-structured questionnaire was employed for data collection due to its low bias error rate, cost-effectiveness, and simplicity in analysis, enabling generalisable conclusions. A total of 229 questionnaires were retrieved out of the 300 administered, yielding a response rate of 76%.

The data analysis involved the Relative Importance Index (RII) to rank contributing factors and Exploratory Factor Analysis (EFA) to identify and validate the underlying significant factors. The RII ranked factors based on their perceived importance, highlighting unemployment, poverty, and insecurity as the most important factors contributing to vandalism. Subsequent EFA revealed three underlying factors—economic breakdown, societal challenges, and socio-cultural challenges—explaining 68.70% of the total variance. Factor rotation was applied to enhance interpretation accuracy, resulting in a clear structure of three components. The instrument's internal consistency was confirmed through Cronbach's alpha and composite reliability calculations, ensuring reliability and validity.

The study employs rigorous quantitative methods to comprehensively analyse the complex phenomenon of public housing vandalism, providing valuable insights into its contributing factors and underlying dimensions. The findings offer practical implications for policymakers and stakeholders in addressing housing infrastructure vandalism challenges in the study area and beyond.

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APPENDIX 1

Reproduced Correlations

		UnemployF	InsecuF	PovertyF	CorruptF	LCInvF	LMCValF	IlliterF	IgnorF	PopExpF	SabotaF	ConspiF	LocatioF	InjustiF
Reproduced Correlation	UnemployF	.649	.648	.647	.648	.611	.401	.378	.356	.614	.629	.603	.552	.661
	InsecuF	.648	.649	.642	.649	.616	.364	.341	.319	.606	.618	.599	.551	.665
	PovertyF	.647	.642	.656	.642	.598	.475	.451	.429	.627	.647	.610	.552	.651
	CorruptF	.648	.649	.642	.650	.616	.363	.340	.318	.606	.618	.599	.551	.665
	LCInvF	.611	.616	.598	.616	.589	.286	.265	.244	.560	.568	.558	.519	.633
	LMCValF	.401	.364	.475	.363	.286	.845	.826	.809	.495	.546	.435	.347	.340
	IlliterF	.378	.341	.451	.340	.265	.826	.807	.791	.472	.521	.413	.327	.316
	IgnorF	.356	.319	.429	.318	.244	.809	.791	.776	.450	.499	.392	.308	.294
	PopExpF	.614	.606	.627	.606	.560	.495	.472	.450	.603	.625	.583	.524	.612
	SabotaF	.629	.618	.647	.618	.568	.546	.521	.499	.625	.650	.601	.537	.623
	ConspiF	.603	.599	.610	.599	.558	.435	.413	.392	.583	.601	.568	.514	.608
	LocatioF	.552	.551	.552	.551	.519	.347	.327	.308	.524	.537	.514	.471	.563
	InjustiF	.661	.665	.651	.665	.633	.340	.316	.294	.612	.623	.608	.563	.683
Residual[b]	UnemployF		.133	.161	-.014	-.062	.013	.014	.019	-.082	-.099	-.141	-.133	-.097
	InsecuF	.133		.030	-.033	-.051	.017	.002	.027	-.057	-.054	-.093	-.130	-.104
	PovertyF	.161	.030		.004	-.050	.010	-.022	.022	-.055	-.107	-.151	-.090	-.077
	CorruptF	-.014	-.033	.004		-.106	-.001	.000	.021	-.034	4.542E-5	-.044	-.083	-.039
	LCInvF	-.062	-.051	-.050	-.106		.025	.033	.040	-.071	-.077	-.073	.007	.008
	LMCValF	.013	.017	.010	-.001	.025		-.060	-.073	-.016	-.033	-.021	-.039	.026
	IlliterF	.014	.002	-.022	.000	.033	-.060		-.101	-.020	-.035	-.012	.046	.011
	IgnorF	.019	.027	.022	.021	.040	-.073	-.101		-.072	-.050	-.027	.004	.026
	PopExpF	-.082	-.057	-.055	-.034	-.071	-.016	-.020	-.072		.076	-.007	-.039	-.041
	SabotaF	-.099	-.054	-.107	4.542E-5	-.077	-.033	-.035	-.050	.076		.139	-.038	-.060
	ConspiF	-.141	-.093	-.151	-.044	-.073	-.021	-.012	-.027	-.007	.139		.017	.046
	LocatioF	-.133	-.130	-.090	-.083	.007	-.039	.046	.004	-.039	-.038	.017		.025
	InjustiF	-.097	-.104	-.077	-.039	.008	.026	.011	.026	-.041	-.060	.046	.025	

Extraction Method: Principal Component Analysis.

a Reproduced communalities

b Residuals are computed between observed and reproduced correlations. There are 37 (40.0%) nonredundant residuals with absolute values greater than 0.05.