RUANG
Jurnal Perencanaan Wilayah dan Kota
Available online at http://ejournal2.undip.ac.id/index.php/ruang/

RUANG Volume 11 Nomor 2, 2025, 58-70
P-ISSN 1858-3881
E-ISSN 2356-0088

Households' Adaptation to Infrastructure Deficit in Ile-Ife, Nigeria

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ABSTRACT

In Nigeria, low quality of life is an indication of failure in infrastructure provision by government. Households therefore adapt as a coping strategy to infrastructure deficit in Ile-Ife, one of the traditional cities in Nigeria. Using multistage sampling procedures, residential areas in Ile-Ife were stratified into developmental zones comprising the core, transition and suburban. Due to homogeneity in each zone, one residential area was randomly selected in each of the three zones from which 117 residential buildings were systematically selected. Target respondent for questionnaire administration was any household member above 18 years of age from each selected building. Findings from the study revealed that similarity exists in the level of household's infrastructure deficit across the developmental zones. However, households' adaptation to infrastructure deficit varied across the developmental zones as determined by socioeconomic characteristics such as income, although respondents in the suburban zone adapted more to infrastructure deficit than those in the core and transition zones. The study recommended that community-based organizations, philanthropists and international organisations should complement the effort of government in the provision of infrastructure across the three developmental zones.

***Keywords**: Adaptation, Deficit, Household, Infrastructure, Traditional City, Residential*

1. Introduction

Urbanization has accelerated globally in recent decades, as cities attract people with the promise of better opportunities and improved living conditions (UN-Habitat, 2013). While urban areas are highly productive, there is growing concern about deficiencies in infrastructure provision and distribution (Satterthwaite & Mitlin, 2014; Mobolaji et al., 2022; Bending et al., 2023). Infrastructure—defined as the facilities that enable cities to function effectively and serve as the foundation for public health and economic well-being—remains quantitatively and qualitatively inadequate, particularly in developing countries (Africa Infrastructure Diagnostic [AICD], 2009; World Bank, 2015, 2019). In many of these countries, financial, technical, and investment constraints contribute to infrastructure gaps. As a result, urban areas often struggle to absorb the rapid growth associated with urbanization, leading to physical, social, and economic consequences. For instance, poor road conditions in Ghana have hindered the transport of agricultural goods and limited healthcare accessibility (Naazie et al., 2018; Yiridomoh et al., 2019), while a deficit in housing stocks in Kenya has accelerated the expansion of informal settlements (Agayi & Karakayaci, 2020). Such deficits are often tied to failed financing policies and inequalities in spatial distribution.

Nigeria reflects these challenges. Evidence from cities such as Lagos, Ibadan, Owo, Okitipupa, and Akure reveals that many public housing estates lack access to essential infrastructure, including healthcare, drainage, education, water, and sanitation (Adeleye & Anofojie, 2011; Morakinyo et al., 2014; Kasali, 2020; Amao & Ilesanmi, 2022; Daramola et al., 2023). The consequences are evident in poor quality of life at the household level, unreliable electricity, inadequate waste management, and heightened health risks (Asikhia & Uyoyoghene, 2011; Hoornweg & Bhada-Tata, 2012; Daramola & Olawuni, 2017; Mobolaji & Adekiya, 2021). Despite ongoing policy efforts, infrastructure deficiencies persist, leaving households to adopt coping mechanisms in response to these gaps (Satterthwaite & Mitlin, 2014; Onolememen, 2020). However, household adaptation to infrastructure deficits—defined as the strategies by which families adjust their livelihoods to cope with inadequate services—remains underexplored in policy and academic literature. This is particularly concerning in traditional Nigerian cities, where residential zones are often underserved by infrastructure.Therefore, this study aims to examine how households in the traditional city of Ile-Ife, Nigeria, adapt to infrastructure deficits, with a view to informing sustainable infrastructure planning.

The study area, Ile-Ife is located between latitude of 7.4905°N and a longitude of 4.5521°E. Ile-Ife being a historic city in Southwestern Nigeria is considered one of the most important cultural and religious centres in Yoruba culture, with a rich history dating back to ancient times. According to Daramola, Mobolaji, Lawal and Idowu (2022), Ile-Ife is widely recognized as the birthplace of the creation myth of Yoruba culture, and as such is regarded as a sacred city. The town has two (2) local governments area namely Ife Central and Ife East with residents that are farmers, traders, artisans but few in civil services. Ile - Ife, just like every other traditional city in Nigeria, could be classified into core, transition and sub-urban developmental zones (Afon, 2007; Daramola, 2012; Daramola et al., 2022).

The core zone was in existence prior to colonial era during the British rule. The zone with its location in the heart of the city has homogeneous residents that resides in aging structures with inadequate household infrastructure. The predominant land use in the core were residential with closely built apartment devoid of accessibility. Also, the transition zone was in existence during the colonial rule and it is characterized by residents with common interest. Accessibility and availability of household infrastructure in the transition zone was low whereas the mix of residential, commercial, and semi-urban land use are obtainable at the transition area. Furthermore, suburban zone dated to post-colonial era and it is characterized by heterogenous residents with access to adequate household infrastructure. There is combination of residential, agricultural lands, and open spaces in the suburban zone.

Over the years, the influx of people from surrounding towns to Ile-Ife propel the need for household infrastructure. As a result, government at both local and state level provides household infrastructure such as public water supply from Ede water works and electricity supply from Ibadan Electricity Distribution Company [IBEDC]. Similarly, waste collection system was provided through Osun State Waste

Management Authority. Nevertheless, in spite of the efforts of government in the provision of adequate infrastructure, cursory observation to the landscape of the three residential zones of Ile-Ife revealed evidence of inadequate infrastructure especially at the household level. Whenever residents lack adequate access to basic infrastructure or are declined of basic infrastructure at the household level, it is referred to as infrastructure deficit and the result is deprivation. And this will lead to urban communities with impoverished residents (Orekan, 2015, Daramola & Olawuni, 2017). Households must therefore adapt as a coping strategy to infrastructure deficit.

2. Metodhology

A multi-stage sampling technique was employed to capture spatial variations in residents' adaptation to infrastructure deficits across Ile-Ife. The 33 residential areas in the city were stratified into three zones—core, transition, and suburban—in order to reflect differences in settlement patterns and infrastructure access. Owing to the relative homogeneity within each zone, one residential area was randomly selected from each zone. Within the selected areas, a systematic random sampling method was applied. The first residential building was chosen at random, after which every 20th building was selected as a sampling unit. In total, 117 residential buildings were sampled, with questionnaires administered to one household member aged 18 years and above in each building. This resulted in 42 respondents from the core, 50 from the transition, and 25 from the suburban zones.

Data collection took place between February and March 2024 through structured questionnaires. The instrument was pre-tested in a neighboring community to ensure validity, while internal consistency reliability was confirmed using Cronbach's alpha. Data were analyzed using both descriptive and inferential statistical methods. Descriptive statistics (such as frequencies and percentages) were used to summarize responses, while inferential tests were employed to examine variations across zones. Analyses were conducted using SPSS and supported with Microsoft Excel for tabulation and visualization. Unless otherwise indicated, all data presented are derived from the author's field survey (2024).

3. Result and Discussions

Household infrastructure deficit in many developing countries has been ascertained by many studies (Daramola, 2012; World Bank 2015: Daramola et al., 2022a). The infrastructure deficit includes unavailability and inadequate accessibilities to water supply, sanitation, solid waste collection, and domestic energy consumption which have significant physical, social and economic consequences on households. As indicated by African Water Development Report [AWDR] (2006), Commonwealth of Australia (2012) and International Energy Agency [IEA] (2014) there must be accessibility and availability of safe and reliable water from multiple taps, basic sanitation from flushed toilets, effective waste disposal and collection and efficient energy supply in homes of every urban dweller. Therefore, household without the minimum access to infrastructure need to adapt to the available infrastructure and provide alternatives to the desired infrastructure.

Scholars have documented socioeconomic characteristics of households to examine infrastructure provision in countries of the world (Boonyabancha & Mitlin, 2012; Ernest, 2016; Mobolaji et al., 2022). These studies showed that the income, age, gender, and educational level of household have a significant relationship with infrastructure provision. Likewise, the level of accessibilities and availabilities of infrastructure in any homes and communities has impact on the quality of life of household (World Bank, 2012; Gatauwa & Murungi, 2015; Daramola et al., 2022). Premised on these assertions, this study examined households' adaptation to infrastructure deficit based on their socioeconomic characteristics and availability of infrastructure in Ile-Ife, Nigeria. This was achieved based on the empirical data in the core, transition and suburban residential zones of the study area as presented in Table 1 – 3.

3.1. Socio-Economic Characteristics of the Respondents

Tabel 1. Socio–Economic Characteristics of Respondents (Writer, 2024)

Variables	**Residential Zones**			**Total**
	Core	**Transition**	**Sub-Urban**	
Gender				
Male	17 (40.5)	19 (38.1)	10 (40.1)	46 (39.3)
Female	25 (59.5)	31 (61.9)	15 (59.9)	71 (60.7)
Total	**42 (100.0)**	**50 (100.0)**	**25 (100.0)**	**117 (100.0)**
Marital Status				
Single	2 (4.7)	9 (18.1)	10 (40.1)	21 (17.9)
Married	40 (95.3)	41 (81.9)	15 (59.9)	96 (82.1)
Total	**42 (100)**	**50 (100.0)**	**25 (100.0)**	**117 (100.0)**
Level of Education				
Primary	10 (23.8)	10 (20.1)	4 (16.1)	24 (20.5)
Secondary	28 (66.7)	21 (42.1)	7 (28.1)	56 (47.8)
Tertiary	4 (9.5)	19 (37.8)	14 (55.8)	37 (31.7)
Total	**42 (100)**	**50 (100.0)**	**25 (100.0)**	**117 (100.0)**
Age				
18 – 30 (Youth)	9 (21.4)	10 (20.1)	2 (8.1)	21 (17.9)
31 – 59 (Young Adult)	21 (50.0)	13 (26.1)	10 (40.2)	44 (37.6)
≥ 60 (Adult)	12 (28.6)	27 (53.8)	13 (51.7)	52 (44.5)
Total	**42 (100.0)**	**50 (100.0)**	**25 (100.0)**	**117 (100.0)**
Length of Stay				
1 – 5 (Low)	2 (4.7)	3 (6.1)	9 (36.0)	14 (11.9)
6 – 10 (Medium)	11 (26.1)	11 (22.1)	4 (16.1)	26 (22.2)
≥ 11 (High)	29 (69.2)	36 (71.8)	12 (47.9)	77 (65.9)
Total	**42 (100.0)**	**50 (100.0)**	**25 (100.0)**	**117 (100.0)**

Variabels	**Residential Zones**			**Total**
	Core	**Transition**	**Sub-Urban**	

Variables	Residential Zones			Total
	Core	Transition	Sub-Urban	
Occupation				
Schooling	2 (4.7)	5 (10.1)	-	7 (5.9)
Self-employed	29 (69.1)	23 (46.2)	5 (20.1)	57 (48.7)
Public Sector	4 (9.6)	9 (18.6)	10 (40.1)	23 (19.6)
Private Sector	5 (11.9)	2 (4.0)	9 (36.2)	16 (13.6)
Unemployed	2 (4.7)	11 (21.1)	1 (3.6)	14 (29.2)
Total	**42 (100.0)**	**50 (100.0)**	**25 (100.0)**	**117 (100.0)**
Monthly Income (#)				
Less than ₦30,000	21 (50.1)	19 (38.1)	1 (4.1)	41 (35.1)
₦31,000 - ₦50,000	11 (26.1)	10 (20.1)	2 (8.2)	23 (19.6)
₦51,000 - ₦99,999	2 (4.7)	6 (12.1)	4 (16.2)	12 (10.2)
₦100,000 - ₦149,999	5 (11.9)	5 (10.1)	6 (24.1)	16 (13.6)
≥ ₦150,000	6 (7.2)	10 (19.6)	12 (47.4)	28 (21.5)
Total	**42(100.0)**	**50 (100.0)**	**25 (100.0)**	**117 (100.0)**
Household Size				
1 – 5 (Low)	7 (16.7)	10 (20.1)	13 (52.1)	30 (25.6)
6 – 10 (Medium)	21 (50.0)	32 (64.1)	10 (40.1)	63 (53.8)
≥ 11 (High)	14 (33.3)	8 (15.8)	2 (7.8)	24 (20.6)
Total	**42 (100.0)**	**50 (100.0)**	**25 (100.0)**	**117 (100.0)**
Type of House				
Face to face	22 (52.3)	18 (36.0)	2 (8.1)	42 (35.8)
Blocks of flats	14 (33.3)	25 (50.1)	15 (60.1)	54 (46.1)
Duplex	6 (14.4)	7 (13.9)	8 (31.8)	21 (18.1)
Total	**42 (100.0)**	**50 (100.0)**	**25 (100.0)**	**117 (100.0)**
House Tenure				
Owner-occupied	6 (14.3)	26 (52.1)	15 (60.1)	47 (40.1)
Rented	28 (66.7)	23 (46.1)	7 (28.2)	58 (49.5)
Family ownership	8 (19.0)	1 (1.8)	3 (11.7)	12 (10.4)
Total	**42 (100.0)**	**50 (100.0)**	**25 (100.0)**	**117 (100.0)**

Presented in Table 1 are the results and discussions on the socioeconomic characteristics of respondents in the study area. Across the three residential zones, the majority (60.7%) of the respondents were female, with similarities in the core and suburban zones. This was tested using the chi-square formula:

$$X^2 = \sum \frac{(O-E)}{E} \quad (1)$$

ρ (rho) refers to the p-value (probability value) from the chi-square test (Pandis, 2016)

The *O* represents the observed frequency and *E* the expected frequency under the null hypothesis of independence. The chi-square test result (χ^2 = 2.331, ρ = 0.412) showed no significant association between gender and residential zones. This finding reflects the general assertion that women are often more environmentally concerned than their male counterparts. Similarly, 82.1% of the respondents were married, with the proportion more pronounced in the core and transition zones. The chi-square result (χ^2 = 2.683, ρ = 0.513) also showed no significant association between marital status and residential zones.Educational attainment varied across the zones. While 66.7% of respondents in the core zone had only primary education, 55.8% of suburban respondents attained tertiary education. Overall, 47.8% had secondary education, while about one-third (31.7%) had tertiary education. The chi-square test (χ^2 = 2.553, ρ = 0.650) revealed no significant association between education and residential zones. Nevertheless, the findings indicate that most respondents were knowledgeable, supporting the standpoint of Boonyabancha and Mitlin (2012) and Ernest (2016) that education is a determinant of households' awareness about infrastructure provision. In addition, adults aged 60 years and above constituted 44.6% of the respondents, more noticeable in the transition and suburban zones. This suggests that the maturity of older respondents could enhance their capacity to adapt to infrastructure deficits.

3.2 Level of Households' Infrastructure Deficit

Presented in table 2 is the result and discussions on the level of households' infrastructure deficit in the study area. Findings indicated that majority 57.3% declared not availability to water supply and it is more pronounced in the core and transition zones. Also, 34.1% of the respondents utilized borehole with hand pumps as their sources of supply. Although, pipe borne with multiple taps accounted for 13.6% and this is only available in the suburban zone. As a result, water supply is quantitatively and qualitatively low in the study area. The findings do not conform with the provision of World Health Organization (2011) that every home must have access to safe and reliable water from multiple taps.On the availability of toilet supply, majority 55.6% had toilet supply while 44.4% declared not availability to toilet supply across the study area. Except in the suburban where 72.1% had toilet supply, 68% declared not availability in the transition zone. This implies that there is disparity in the availability of toilet supply from the core to the suburban zones. Also, flushed toilet is relatively low in the core with half 52.5% of the respondents that utilized pit latrine with slab. The findings however have implication on the sanitation practices of respondents. In fact, the findings are not in consonance with the requirement of WHO and UNICEF (2000), African Water Development Report (2006), United Nations Children's Fund (2017), that there must be at least one water flushed toilet in every house with facilities for personal hygiene. Therefore, deficit in the availability of flush toilet is a threat to sustainable living.

Tabel 2. Level of Households' Infrastructure Deficit (Writer, 2024)

Parameters	Residential Zones			Total
	Core	Transition	Sub-Urban	
Availability of water supply				
Yes	18 (42.8)	17 (34.1)	15 (60.1)	50 (42.7)

Parameters	Residential Zones			Total
	Core	Transition	Sub-Urban	
No	24 (57.2)	33 (65.9)	10 (39.9)	67 (57.3)
Total	**42 (100)**	**50 (100)**	**25 (100)**	**117 (100)**
Parameters	**Residential Zones**			**Total**
	Core	**Transition**	**Sub-Urban**	
Source of water supply				
Pipe borne with multiple taps	-	-	16 (64.1)	16 (13.6)
Borehole with hand-pumps	16 (38.1)	22 (13.8)	2 (8.1)	40 (34.1)
Protected spring	8 (19.0)	18 (36.1)	-	26 (22.2)
Well	18 (42.9)	10 (50.1)	7 (27.8)	35 (30.1)
Total	**42 (100)**	**50 (100)**	**25 (100)**	**117 (100)**
Availability of toilet supply				
Yes	18 (42.9)	16 (32.0)	18 (72.1)	52 (44.4)
No	24 (57.1)	34 (68.0)	7 (27.9)	65 (55.6)
Total	**42 (100)**	**50 (100)**	**25 (100)**	**117 (100)**
Types of toilets				
Flushed toilet	6 (14.2)	9 (18.1)	21 (84.1)	36 (30.7)
Ventilated Improved Pit (VIP) Latrine	14 (33.3)	21 (42.1)	3 (12.1)	38 (32.4)
Pit Latrine with slab	22 (52.5)	20 (39.8)	1 (3.8)	43 (36.9)
Total	**42 (100)**	**50 (100)**	**25 (100)**	**117 (100)**
Availability of Waste Collection				
Yes	29 (69.0)	31 (61.9)	18 (72.1)	78 (66.7)
No	13 (31.0)	19 (38.1)	7 (27.9)	39 (33.3)
Total	**42 (100)**	**50 (100)**	**25 (100)**	**117 (100)**
Method of Wastewater Disposal				
Burning	10 (23.8)	10 (20.0)	2 (8.0)	22 (18.8)
House to House collection	14 (33.3)	19 (38.1)	15 (60.1)	48 (41.0)
Dumping on refuse site	8 (19.0)	11 (22.1)	6 (24.1)	25 (21.3)
Burying	7 (16.6)	8 (16.1)	2 (7.8)	17 (14.5)
Others	3 (7.3)	2 (3.7)	-	5 (4.4)
Total	**42 (100)**	**50 (100)**	**25 (100)**	**117 (100)**
Availability of drain				

Parameters	Residential Zones			Total
	Core	Transition	Sub-Urban	
Yes	14 (33.3)	13 (26.1)	11 (44.1)	38 (32.4)
No	28 (66.7)	37 (73.9)	14 (55.9)	79 (67.6)
Total	**42 (100)**	**50 (100)**	**25 (100)**	**117 (100)**

Parameters	Residential Zones			Total
	Core	Transition	Sub-Urban	
Types of drain				
Piped drain	-	2 (4.1)	1 (4.1)	3 (2.5)
Open drain	18 (42.8)	28 (56.1)	8 (32.1)	54 (46.1)
Covered drain	24 (57.2)	20 (39.8)	16 (63.8)	60 (51.4)
Total	**42 (100)**	**50 (100)**	**25 (100)**	**117 (100)**
Availability of Electricity Supply				
Yes	13 (30.9)	13 (26.0)	11 (44.1)	37 (31.6)
No	29 (69.1)	37 (74.0)	14 (55.9)	80 (68.4)
Total	**42 (100)**	**50 (100)**	**25 (100)**	**117 (100)**

Across the three residential zones, majority 66.7% declared availability to waste collection and the findings revealed similarity in respondents' response in the three zones. Although, 41% of the respondents declared house to house collection (waste collection truck) as the commonest method of waste collection across the three zones. Even though, this is more pronounce in the suburban than transition when compared to core zones. Also, two third 67.6% of the respondents declared not availability to drain across the three zones whereas covered drain accounted for 51.4%. Apart from core zone without piped drain, fewer 4.1% declared availability of piped drain in both transition and suburban zones respectively. In addition, 68.4% of the respondents declared not availability to electricity and the findings is similar across the three residential zones. The results is similar to the study of Ogunniyi, Adepoju and Olapade-Ogunwole (2012) that access to electricity is generally low in Nigeria with consequential effects on the country's economy. Finally, similarity exist in the level of household's infrastructure deficit in the three residential zones of the study area.

3.3. Respondents' Capacity to Adapt to Infrastructure Deficit

As presented in Table 3, findings were made on the respondents' capacity to adapt to infrastructure deficit based on the mean index computation in the three developmental zones. Households' capacity to adapt to infrastructure deficit was determined using mean indices to measure the level of their coping capacity. The mean indices were interpreted based on the following scores; 1 – 2.4 (low), 2.5 – 3.5 (moderate) and 3.6 – 5.0 (high) on the adaptation to water supply, sanitation, waste disposal and domestic energy deficit in the three residential zones. Here is the formula to calculate the Residents' Agreement Index (RAI).

$$RAI = \sum \frac{X}{N} \quad (2)$$

$$MD = RAI - X \quad (3)$$

Where RAI is the relative impact index, N is the total number of variables X is the Likert scale mean for each variable MD is the mean deviation. Based on the findings, the mean residents' agreement index [RAI] 2.25 and 2.39 was low in the core and transition zones unlike in the suburban where the RAI 2.58 was high. The positive deviation above the mean index indicated a high level of adaptation while the negative one signified low level of adaptation. It was found that respondents in the core adapt to infrastructure deficit through open defecation (2.81), burning of waste (2.78), rainwater collection (2.56), water storage in covered container (2.51) and refuse on illegal dump site (2.49). In the transition zone, respondents also adapt to infrastructure deficit through open defecation (2.83), burning of waste (2.70), refuse on illegal dump site (2.62), rainwater collection (2.60) and water storage in covered container (2.56). While respondents in the suburban zone adapt through the use of inverter (3.19) and generator (3.08), burning of waste (3.01), use of chargeable lamp (2.89), and change of sanitation practices (2.81).

Based on the findings, open defecation (1st) and burning of waste (2nd) was ranked as predominant adaptative coping capacity in the core and transition unlike in the suburban with inverter (1st) and generator (2nd) ranked mostly. In addition, respondents in the core rank their adaptation capacity higher through rainwater collection (3rd), water storage in covered container (4th) and refuse on illegal dump site (5th) while in the transition, refuse on illegal dump site (3rd), rainwater collection (4th) and water storage in covered container (5th) were ranked higher. Also, in the suburban zone, respondents ranked higher burning of waste (3rd), use of chargeable lamp (4th) and change of sanitation practices (5th). The findings indicated similarity in respondents' adaptation in the core and transition zones which could be a result of similarity in respondents' income level unlike in the suburban zone.

Tabel 3. Respondents' capacity to adapt to infrastructure deficit (Writer, 2024)

Coping Strategy	**Core**		**Transition**		**Suburban**	
	Mean	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**
Water storage in covered container	2.51	4	2.56	5	2.52	8
Rainwater collection	2.56	3	2.60	4	2.01	14
Well water source	2.33	7	2.41	8	2.43	9
Running water supplied from well	2.24	9	2.49	7	2.66	7
Running water supplied from the borehole	2.29	8	2.32	10	2.72	6
Burning of waste	2.78	2	2.70	2	3.01	3
Use of illegal dump site	2.49	5	2.62	3	2.31	10
Open defecation	2.81	1	2.83	1	2.11	13
Use of torchlight or chargeable lamp	2.44	6	2.51	6	2.89	4
Use of solar-powered lamp	1.31	14	2.11	12	2.18	12
Use of inverter	1.40	13	2.01	13	3.19	1
Use of generator	1.98	12	1.81	14	3.08	2
Change of sanitation practices	2.21	10	2.35	9	2.81	5

Coping Strategy	Core		Transition		Suburban	
	Mean	Rank	Mean	Rank	Mean	Rank
Dependency on community provision	2.18	11	2.23	11	2.29	11
RAI	**2.25**		**2.39**		**2.58**	

Further findings revealed that respondents in the core adapt to infrastructure deficit through change of sanitation practices (2.21), dependency on community provision (2.18), use of generator (1.98) inverter (1.40), and solar-powered lamp (1.31). In the transition zone, respondents also adapt through running water supplied from community borehole (2.32), dependency on community provision (2.23), use of solar-powered lamp (2.11) inverter (2.01) and generator (1.81). Likewise, in the suburban zone, respondents adapt through use of illegal dump site (2.31), dependency on community provision (2.29), use of solar-powered lamp (2.18), open defecation (2.11) and rainwater collection (2.01).

Respondents in the core also rank low change of sanitation practices (10th), dependency on community provision (11th), use of generator (12th) inverter (13th) and solar-powered lamp (14th) low. Unlike in the transition zone where respondents rank running water supplied from community borehole (10th), dependency on community provision (11th), use of solar-powered lamp (12th) inverter (13th) and generator (14th) low. While, in the suburban zone, respondents rank use of illegal dump site (10th), dependency on community provision (11th), solar-powered lamp (12th), open defecation (13th) and rainwater collection (14th) low. Although, there is variation in respondents' adaptation to infrastructure, dependency on community provision were common in the three zones of the study area. Therefore, there is a significant statistical association between households' adaptation capacity and residential zones. Based on the findings, the mean residents' agreement index [RAI] 2.25 and 2.39 was low in the core and transition zones unlike in the suburban where the RAI 2.58 was high. This indicated that mean indices were lower in the core zone, compared with the transition zone which was also higher than that of the suburban zone. This implies that the respondents in the core zone adapted more to infrastructure deficit than those in the transition and suburban zones.

4. Conclusion and Recommendations

The study demonstrates that households' adaptive capacities to infrastructure deficits differ significantly across urban zones, being lowest in the core and transition areas and highest in the suburban zone. These variations highlight the influence of socioeconomic characteristics on resilience to infrastructural challenges. Policy responses should therefore move beyond government-led initiatives to embrace collaborative efforts with community-based organizations, philanthropists, and international agencies. Zone-specific interventions are particularly crucial—strengthening adaptive strategies in the core and transition zones while consolidating the resilience already evident in the suburban zone. Despite these insights, the study is limited by its geographical scope and cross-sectional design; future research should broaden the spatial coverage and employ longitudinal methods to better track changes in household adaptation over time.

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