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COPING WITH INFRASTRUCTURE DEFICIT: A NARRATION FROM HOUSEHOLDS' HEADS IN THE DEVELOPMENTAL ZONES OF OGBOMOSO, NIGERIA

David Mobolaji[1,2] * and Oluwole Daramola[1]

[1] Department of Urban and Regional Planning, Obafemi Awolowo University Ile-Ife, Nigeria

[2] Department of Urban and Regional Planning, Federal University Oye-Ekiti, Nigeria

*Email: david.mobolaji@fuoye.edu.ng

ABSTRACT

Despite government efforts in the provision of infrastructure, many residents in the developing countries, Nigeria inclusive experienced infrastructure deficit at the household level. This study therefore examined coping strategies to infrastructure deficit by households' heads in the three developmental zones of Ogbomoso, Nigeria. Using multistage sampling procedure, the residential areas in Ogbomoso were stratified into core, transition and suburban developmental zones for questionnaire survey. Due to homogeneity of the areas in each zone, one area was randomly selected in each zone, this resulted into sampling of every 10th residential building with the selection of 221 households' heads. This comprised 89, 72 and 60 respondents in the core, transition and suburban zones respectively. Data collected were analysed using both descriptive and inferential statistics. Findings revealed that the level of absorptive, adaptive, and transformative as coping strategies to infrastructure deficit increases as distance increases from the core to suburban zones, and this is influenced by socioeconomic characteristics of households' heads. The study concluded that there is a need for viable framework, programme and actionable plans by international actors towards the provision of sustainable infrastructure at household level, thereby complementing government efforts towards sustainable infrastructure provision especially in the core and transition developmental zones of the study area.

Keywords: *Coping Strategies, Infrastructure Deficit, Household, Developmental Zones*

INTRODUCTION

Globally, government at municipal and national levels have power to put in place all measures that will make an environment functional, supportive and conducive for living and working. One of these measures is the provision of infrastructure. Infrastructure has long been recognized as a veritable component of urban growth. Since industrial revolution of the 18th and 19th centuries, the presence and quality of infrastructure in any country has significant impact on the general standard of living and socio-economic wellbeing of residents (UN-Habitat, 2013). Infrastructure are those facilities, utilities and services put in place by government as statutory responsibility to support efficient and effective functioning of urban environment (UN-Habitat, 2014; World Bank, 2019). Also, infrastructure refers to the physical components of interrelated systems

providing services that are essential to enable, sustain and enhance living condition of urban residents (Fulmer, 2009; Akintola, 2011). Availability of infrastructure promote social and economic stability, and national development. Example of infrastructure includes roads, communication system, drainage system, health care, educational facilities among others.

At the household level, infrastructure refer to facilities and services that are put in place to achieve efficiency, stability and overall development of a household (Sulivan & Sheffrin, 2003). These include water supply, sanitation, solid waste collection and domestic energy. Availability of and accessibility to infrastructure in any home has significant impact on the health and well-being of the residents (Adeleye & Anofojie, 2011; Morakinyo et al., 2014). Household infrastructure enhances human growth, improve living standard, and contribute to environmental sustainability. However, it has been established in literature (World Bank, 2016; Fakere & Ayoola, 2018; Daramola et al., 2023) that residents in the developing countries lack infrastructure at the household level. Daramola and Olawuni (2017) opined that wherever and whenever residents lack infrastructure at the household level, the experience constitutes infrastructure deficit which is impoverishment of the household members.

Infrastructure deficit is an increasingly, yet challenging issue for policymakers, international development agencies and built environment professionals. As far as infrastructure deficit is concerned, there are staggering statistics. In Africa, there is over 76% shortage of infrastructure with East Asia having 52% while Latin America had 29% (World Bank, 2021). From Africa to Asia, America and other part of the World, deficit in infrastructure remain a common phenomenon. The only difference is the degree of deficiency and impact on urban residents. Infrastructure deficit occur as a result of steady decline in government infrastructure spending, combined with a steady increase in the cost of building additional infrastructure (Adeleye & Anofojie, 2011; Morakinyo et al., 2014; Amao & Ilesanmi, 2022; Daramola et al., 2023). Except there is adequate infrastructure provision, sustainable cities and building of resilient infrastructure, which are part of sustainable development goals, are impossible especially in sub-Saharan Africa.

In Nigeria, one of the most populous countries in Africa, government have not been able to galvanize urbanization towards infrastructure provision (Vivien & Pushak, 2011; Daramola et al., 2022). In the recent time, deteriorated public pipe-borne water system have made households depend on unimproved water sources. Likewise, inadequate waste collection has increased unregulated dumpsite and promote open defecation (Mobolaji et al., 2022). Households in Nigeria has been left to suffer the impact of infrastructure deficit. While efforts by government and other partners in providing infrastructure overtime do not commensurate with the demand and reality in many Nigerian cities, households therefore evolve coping capacities to enhance their resilience to infrastructure deficit (UNICEF, 2012; World Bank, 2019). This connotes households' coping capacity to infrastructure deficit.

Asserted in literature is the diverse coping capacities to mitigate events or occurrences (Patryniak, 2016; Popoola et al., 2021; Birchall et al., 2025). According to Berkes, Colding and Folke (2003), coping capacity involves the extent of the disturbance a system can absorb without experiencing critical disruption in its functional characteristics. A good example is the work of Almedia and Mostafavi (2016) which established three overlapping components of absorptive,

adaptive and transformative coping capacities to disasters by households and communities. Although, the significance of the coping capacities was key in resilience studies, the discussion was not with focus on infrastructure deficit. The application of these coping capacities to infrastructure deficit especially in traditional cities of developing countries, however, is scanty in literature.

Coping with infrastructure is the ability of households to absorb, adapt to and transform from the impact of infrastructure deficit. Contextually, coping with infrastructure deficit is the enablement of a household to meet its infrastructure needs to the acceptable minimum standard through the strategies of absorbing, adaptation to and transformation from the impact of infrastructure deficit. Absorbability implies that households have the tenacity to cope in the face of infrastructure deficit. Adaptability involves the capacity of the households to adjust to the impact of infrastructure deficit while transformability involves the capacity of households to shift to an alternative. Coping with infrastructure thus enable the achievement of access to the provision of adequate infrastructure at the household level.

The issue of infrastructure deficit at the household level has been a major concern in many urban centres in Nigeria (UN-Habitat, 2013; World Bank, 2019). Of particular concern are those large urban centres with extensive traditional areas and rapidly growing suburbs that are devoid of adequate physical planning inputs and characterised with lack of adequate provision of infrastructure. This is apart from other parts of the cities with deteriorated infrastructure. Ogbomoso, a rapid growing urban centre along transportation corridors connecting southern and northern zone of Nigeria provides a unique opportunity to explore households' coping capacities to infrastructure deficit. The peculiarity of the city not only adds depth to the understanding of urban infrastructure challenges in secondary Nigerian cities but also offers lessons for similar transitional urban environment across sub-Saharan Africa. This study therefore focuses on Ogbomoso, a city with varying developmental zones, each of which is characterized with varying levels of households' coping capacities to infrastructure deficit.

OVERVIEW OF RELEVANT STUDIES

The concept of infrastructure has expanded overtime and has been described by numerous authors (Torrisi, 2010; Daramola, 2012; Udoka, 2013). Generally, infrastructure encompassing those basic services without which primary, secondary and tertiary productive activities cannot function in an urban environment. Infrastructure refers to those facilities and services that promote good and healthy living of urban residents. These facilities and services are transportation, communication system, drainage and sewage systems to public services from law and order through education and public health available at community levels. According to World Bank (2004) infrastructure support social, economic and physical growth of residents at community level.

At the household level, infrastructure refer to facilities and services that are put in place to achieve production, efficiency, stability and overall development of a household and also drives sustainable development (African Water Development Report, 2006; Udoka, 2013). Studies have opined that household infrastructure is a panacea to sustainable development (Daramola, 2012; World Bank Group, 2015; Yoade, 2019). The facilities and services consist of water supply and

sanitation, waste collection and domestic energy which are essential ingredient for household consumption. WHO & UNICEF (2015) opined that access to adequate infrastructure determines how healthy and prosperous a household would be. Without adequate accessibility to household infrastructure, health and well-being of urban residents is in jeopardy (UN-Habitat, 2013; WHO & UNICEF, 2015; African Water Development Report, 2016).

Literature abounds on the level of accessibility of infrastructure among households in cities of developed and developing countries (Ogwumike et al. (2014; Daramola & Olawuni, 2017). The study of Bailie and Runcie (2006) on the level of accessibility of households to water supply and sanitation in Aboriginal communities of Northern Territory of Australia revealed that stove top, oven and cold-water taps were neither available nor when available functional in homes of many indigenous Australian. Ogwumike et al. (2014) revealed that the level of accessibility to modern domestic energy sources is low amongst Nigerian households. As a result, low-income households generally use traditional stoves and cooking fuel such as charcoal and wood. Also, Daramola and Olawuni (2017) revealed that accessibility to public water supply were low in high-density residential areas of Lagos Metropolis. This suggest that infrastructure deficit is at low ebb and with significant impacts on households in countries of the World.

Studies have also discussed the impact of infrastructure deficit on households (Adenikinju, 2005; Foster et al., 2009; Obokoh & Goldman, 2016). Adenikinju (2005) discovered that poor state of electricity supply in Nigerian urban centres has imposed significant costs on household productivity and the general economic activities of the country. Foster et al., (2009) concluded that infrastructure deficit in Africa leads to increase in crime rate and corruption. Also, Obokoh and Goldman (2016) assessed infrastructure deficit and the performance of small- and medium-sized enterprises (SMEs) in Nigeria. The study concluded that there is decrease in the profitability and performance of SMEs due to high cost incurred by SMEs in self-provision of infrastructure and distribution of finished goods. These earlier studies therefore indicated that adequate household infrastructure influences physical, social and economic stability of households.

Studies have further opined that availability and accessibility to household infrastructure is a panacea to sustainable development (African Water Development Report, 2006; Daramola, 2012; World Bank Group, 2015). These studies concluded that access to adequate water supply, sanitation, waste collection and domestic energy determines how healthy and prosperous a household would be. In particular, studies have documented infrastructure deficit in developing countries, particularly Nigeria in terms of water supply, sanitation, and solid waste collection with less efforts on the coping capacities employed by households (Afon, 2007; Toyobo, 2014; Adetunji et al., 2018; Odunola et al., 2017).

Studies have documented socioeconomic characteristics of household heads to examine the expression of their homes (Olawuyi &f Rahji, 2012; Bilenkisi & Tapsin, 2015; Owolabi, 2017). The study of Olawuyi and Rahji (2012) examined the livelihood strategies of household heads in Ode-Omi Kingdom, Ogun State, Nigeria. The study concluded that poverty increased in the city as a result of income, age and educational status of household heads. In particular to infrastructure provision, Sarkar et al. (2014) and Jaiyeoba (2017) made use of income, age and gender of household heads to measure the level of deprivation of access to infrastructure in West

Bengal, India and Lagos and Ogun, Nigeria, respectively. In the same vein, Bilenkisi and Tapsin (2015) established that income of households is a determinant to the level of accessibility to infrastructure at household level. In Ibadan, residents' socioeconomic characteristics such as age, income and education attainment influence coping capacity to infrastructure deficit in public housing estates (Daramola et al., 2024). Therefore, socioeconomic characteristics of households is a determinant of accessibility and availability of household infrastructure and also important variables in determining coping capacities to infrastructure deficit.

Studies such as that of Patryniak (2016), Popoola et al. (2021), Upton et al. (2021), Villada-Canela (2025) provided insight to households' coping capacities to events or stress. Particularly, Daramola et al. (2023) established absorptive, adaptive and transformative coping capacities by households to water supply and sanitation deficit in Nigerian cities. It was established that despite inadequate water supply and sanitation, households evolved coping capacities thereby increases their resilience. In the application of the coping strategies in Lagos Metropolis, Odunsi (2020) indicated that absorbability and adaptability coping capacity involves households taken intentional protective action to buffer events while ensuring capacity for flexibility and incremental adjustment by households to changing conditions. Transformability in the capacity of households to shift completely into a new condition in order to withstand the impacts of events or occurrence. Coping strategies often take the form of short-term adjustments, structural adaptations, or even long-term shifts in livelihood patterns (; Douglas et al., 2008; Pelling & Wisner, 2009).

Based on the foregoing, absorptive, adaptive and transformative coping capacities to infrastructure deficit form vital input for infrastructure planning. Yet, there are scanty of studies on households' heads coping capacities to infrastructure deficit in the developmental zones of Ogbomoso, a traditional city in Nigeria.

MATERIAL AND METHODS

The study area is Ogbomoso, Oyo State, Nigeria. The city is a pre-colonial urban centre, and the second largest city in terms of population and spatial extent in Oyo State, Nigeria (Adeboyejo & Abolade, 2009). The city is located between Latitude 07°55'N and 08°39'N and Longitude 03°05'E and 04°27'E, covering an area of about 263.382sqkm in the present-day Oyo State (See figure 1.1). The population of Ogbomoso had risen to 576,557 from 299, 238 that was recorded in 2006 during the national population census on the basis of a growth rate of 3.2% (Olaosegba et al., 2022). Ogbomoso, a rapid growing urban centre along transportation corridors connecting southern and northern zone of Nigeria (Mobolaji, 2020). Also, the town consists of Ogbomoso South and Ogbomoso North Local Government Areas which are located within Ogbomoso Metropolis (See figure 1.2).

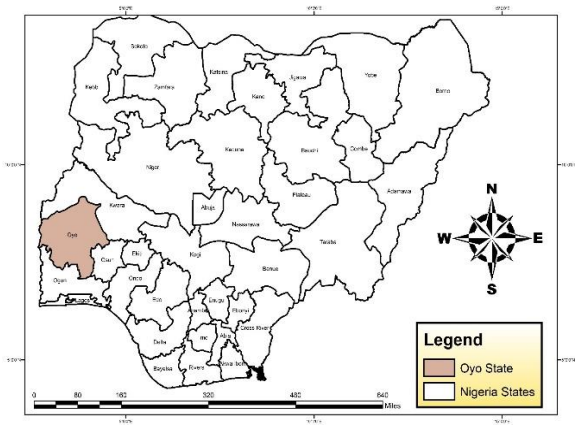

Figure 1.1: Oyo State in the context of Nigeria
Source: National Space Research and Development Agency [NASRDA], (2022)

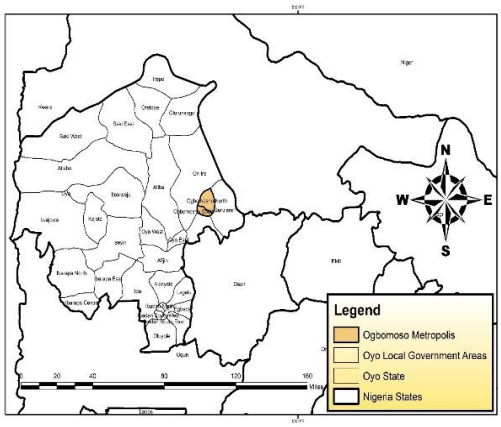

Figure 1.2: Ogbomoso Metropolis in the context of Oyo State
Source: National Space Research and Development Agency [NASRDA], (2022)

As a typical traditional city, Ogbomoso is made up of three distinct zones (Afon, 2007). These are the core, transition, and sub-urban zones. The urban development and activities of these zones has been attributed to three historical period in the country (Daramola, 2012). The core zone was in existence prior to pre-colonial era mostly with indigenes as residents. Transition was dated to the colonial period with residents who are both indigene and non-indigene. Likewise, suburban zone was dated to the post-colonial era and with both indigene and non-indigene as residents. Each of the three zones is homogeneous in nature as evident in the building types and layout of their physical environment.

The increasing population surge coupled with urbanization has made infrastructure provision necessary and important in the city. Government provides facilities and services for the betterment of residents in the city. These include public water supply from *Yaku* and *Ajinipa* Water Works and supply of electricity by Ibadan Electricity Distribution Company [IBEDC]. A cursory look however revealed that the growth of the town has outstripped the available household infrastructure. Residents in the three developmental zones have no access to public water supply, due to the moribund nature of the waterworks. Also, waste collection is an issue in the city. For instance, the presence of many unregulated waste dump sites and dumping of waste in river channels are evidence of inadequate waste collection. For domestic energy, several buildings are not connected with electricity and it is a common knowledge in Nigeria that those with connection do not enjoy adequate service. This inadequate supply of electricity has made domestic energy to be at the rudimentary level. Infrastructure deficiency in the town has made many households to evolve coping strategies to sustain their living standard. This study therefore provides empirical data that can form vital input for planning and design of household infrastructure in the town.

For this study, multi-stage sampling technique was employed. This started with the stratification of all the 114 identified residential areas in Ogbomoso into core, transition and sub-urban developmental zones. This was done in order to bring out the variation in households' coping strategies to infrastructure deficit in each zone based on their period of development. This is

because infrastructure provision differs in form and dimension during the three historical period (pre-colonial, colonial and post-colonial) in the city. Whereas, deficit in infrastructure is a reflection of the period of development. Thus, according to reconnaissance survey, there are 38, 29 and 47 residential areas in the core, transition and suburban developmental zones of the study area. Due to homogeneity of the areas in each zone, one residential area was randomly selected from each stratum of the zones for a detailed investigation.

Using the residential area as an investigation unit, a systematic random sampling approach were used in selecting the sampled residents in the three developmental zones of the study area. For questionnaire survey, findings from the Google Earth Imagery (2023) coupled with author's reconnaissance survey revealed that there are 2,229 residential buildings in the selected areas. This comprises 898, 724 and 607 residential buildings in the core, transition and suburban zones respectively. In this case, the first building was randomly selected. The subsequent unit of investigation were on every 10th building in the selected areas. Thus, 221 residential buildings were sampled across the selected developmental zones of the study area. The target persons for questionnaire administration were household head in each of the selected residential buildings. Therefore, 221 household heads were sampled to form the sample size for the study. This comprises 89 respondents in the core, 72 respondents in the transition and 60 respondents in suburban developmental zones. For secondary data, maps were sourced from the National Space Research and Development Agency (NASRDA, 2022).

Data collected through questionnaire survey include respondents' socio-economic characteristics and housing attributes, and their level of absorptive, adaptive and transformative coping capacities to infrastructure deficit in the three developmental zones of Ogbomoso, Nigeria. Data obtained on socioeconomic characteristics and housing attributes were on the respondents' gender, age, income, household size, educational status and types of houses occupied. In analysing the data, crosstabulation, Chi-square test, and Analysis of Variance were employed in the study. Similarly, respondents were requested to rate their level of absorptive, adaptive and transformative coping capacities to infrastructure deficit on a 5-point Likert Scale of 'Strongly Disagree', 'Disagree', 'Just Agree', 'Agree', 'Strong Agree' with weight value of 5,4,3,2 and 1 respectively. The analyses of the ratings indicated by the residents from the Likert's scales adopted evolved into indexes called "Relative Absorptive Capacities" (RAC), "Relative Adaptive Capacities" (RAC) and "Relative Transformative Capacities" (RTC).

This can be expressed mathematically as:

$\overline{X} = \sum F_i / n$.....(1)

F_i = Frequency of the level of capacity *i*

n = Total number of the identified variables in the study area.

$WV = F_i V_i$.....(2)

The Weighted Value (WV) for each coping capacities was obtained as the product of the number of respondents for each variable and their respective weight values.

WV = Weighted Value

F_i = Frequency of the coping capacity *i*

V_i = Weight attached to coping capacity *i*

Furthermore, the Summation of Weighted Value (SWV) for each coping capacities were derived by adding the product of the responses of each rating and their respective weight values as;

SWV = $\sum F_i V_i$.....(3)

SWV = Sum of the weighted va1ues

F_i = Frequency of the coping capacity rating *i*

V_i = Weight attached to the coping capacity *i*

Therefore, mean index for each coping capacities was obtained by dividing the *SWV* of each capacity by the total number of the respondents (221). This can be computed mathematically as,

Mean Index = $\sum F_i V_i$/N.....(4)

The summation of the coping capacities (RAC, RAC, RTC) in the study area was divided by the tota1 number of the identified variables. Therefore, the Mean (M) and Mean Deviation (MD) of the capacity in the study area were computed. Data collected were therefore analysed using both descriptive and inferential statistical methods.

RESULTS AND DISCUSSION

Socioeconomic and housing characteristics of the residents

The results on the socioeconomic characteristics and housing attributes of respondents across the developmental zones were presented in Table 1. Findings on the gender of respondents revealed that 62.8% of the respondents were male while 37.2% were female. The findings further indicated that male constituted larger percentage in the core and transition unlike in the suburban zones. As a result, there was adequate representation of each gender, and the proportion of male was more pronounced in the core and transition zones. The Chi-Square test result ($\chi^2 = 2.718$, $p = 0.742$, $\alpha = 0.05$) indicates no significant variation in gender distribution across developmental zones, as the p-value is greater than the significance level. Likewise, across the three developmental zones, majority (82.8%) of the respondents were married and matured enough to give accurate information about their coping capacities to infrastructure deficit. These results are similar to those of some earlier studies carried out where conclusions were made that residents that are married has a higher level of maturity than those that are not married especially when it is about environmental issues (Bilenkisi et al., 2015; Owolabi, 2017).

As indicated by Sinclair (2006) education play important role in people's knowledge about any event. Based on the result, it was found that 33.7% and 44.9% of the respondents in the core zone had primary and secondary education respectively and the proportion was 29.2% and 56.9% in the transition zone. It was also found that 8.3% and 88.4% attained secondary and tertiary education level in the suburban zone respectively. The findings further indicated that majority (51.2%) had tertiary education even though it was not predominant across the three zones. The Chi-square test ($\chi^2 = 4.124$, $p = 0.817$, $\alpha = 0.05$) indicated that there is no significant

association between developmental zones and respondents' educational level, since the p-value exceeds 0.05. Furthermore, findings on the respondents age revealed that except in the core developmental zone where 57.4% of the respondents were above 60 years, 72.3% and 43.3% of respondents in the transition and suburban zones were between 40 to 59 years, respectively. This would be a basis to ascertain the studies of Mesquita et al. (2020) and Mobolaji (2020) that age plays a significant role because maturity could influence coping capacities to environmental issues.

On the years of living in the study area, 49.9% of the respondents have stayed above eight (8) years and were capable of taken cognizance of infrastructure deficit in their houses and the communities. Although, findings revealed that in the core and transition zones, 56.3% and 59.8% of the respondents had stayed above 8 years respectively; whereas, in the suburban zone 45.0% of the respondents had stayed between 4 and 7 years. These findings could be attributed to the variation in the years of existence of each developmental zone as evident in traditional African cities where the core was dated back to the pre-colonial era, transition to the colonial era and suburban to the post-colonial era (Mabogunje, 1968). Hence, respondents' length of stay in their house were important variable to validate information on the subject matter. This is in consonance with the findings of Mobolaji (2020) that residents' length of stay in an environment influences perception about environmental problems. This is because the longer the period people live in an area, the more they are likely to understand the prevailing environmental challenges in their area.

Across the three developmental zones, majority (51.8%) of the respondents had large size households in the core developmental zone unlike in the suburban developmental zone where majority (73.3%) had small household sizes. Across the three zones, majority (42.1%) had medium household size and there are no varying degrees. The ANOVA result ($F = 12.439$, $p = 0.116$, $\alpha = 0.05$) confirm that there is no statistically significant variation in household size across the developmental zones. Also, significant variation was not perceived in the occupation distribution of respondents across the three developmental zones. Furthermore, on the income of the respondents, majority (64.2% and 70.8%) of the respondents in the core and transition developmental zones earned less than ₦50,000 respectively but in the suburban developmental zone, 53.3% earned between ₦100,000 to ₦149,999. The result of ANOVA ($F = 12.817$; $\rho < 0.05$) established that income distribution of respondents varied significantly across the developmental zones. Impliedly, there was a variation between respondents' income and increase in distance from the core towards the suburban. The findings however indicated that households' coping capacities to infrastructure deficit varied across the developmental zones based on income level.

Further findings revealed that in the core developmental zone, face-to-face houses accounted for 76.4% of those existing unlike in the suburban developmental zone where 65.0% of houses were blocks of flats. Impliedly, varying types of buildings occupied by respondents could lead to varying levels of coping capacities to infrastructure deficit. In addition, 44.9% and 48.6% of the respondents in the core and transition developmental zones respectively resided in rented houses whereas 58.3% of the respondents in the suburban developmental zone resided in owner-occupied houses. Based on these findings, it can be deduced that respondents would appreciate the importance of adequate household infrastructure as one-third of the respondents stayed in

owner-occupied houses. In all, findings indicated that variation exist on the socioeconomic characteristics and housing attributes of respondents across the three developmental zones of the study area.

Table 1: Socioeconomic Characteristics and Housing Attributes of the Respondents

Attributes	Core	Transition	Suburban	Total
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Gender				
Male	60 (67.4)	44 (61.1)	35 (58.3)	139 (62.8)
Female	29 (32.6)	28 (38.9)	25 (41.7)	82 (37.2)
Total	**89 (100)**	**72 (100)**	**60 (100)**	**221 (100)**
Educational Attainment				
Primary	30 (33.7)	10 (13.9)	2 (3.3)	42 (19.0)
Secondary	40 (44.9)	21 (29.2)	5 (8.3)	66 (29.8)
Tertiary	19 (21.4)	41 (56.9)	53 (88.4)	113 (51.2)
Total	**89 (100)**	**72 (100)**	**60 (100)**	**221 (100)**
Marital Status				
Married	61 (68.5)	67 (93.1)	55 (91.7)	183 (82.8)
Have Been Married	28 (31.5)	5 (6.9)	5 (8.3)	38 (17.2)
Total	**89 (100)**	**72 (100)**	**60 (100)**	**221 (100)**
Age				
Less than 40	17 (19.1)	15 (20.8)	24 (40.0)	56 (25.4)
41 – 59	21 (23.5)	52 (72.3)	26 (43.3)	99 (44.7)
60 and above	51 (57.4)	5 (6.9)	10 (16.7)	66 (29.9)
Total	**89 (100)**	**72 (100)**	**60 (100)**	**221 (100)**
Average Monthly Income				
Less than ₦50000	57 (64.2)	51 (70.8)	6 (10.0)	114 (51.5)
₦51,000 - ₦99,999	24 (26.9)	11 (15.2)	10 (16.6)	45 (20.3)
₦100, 000 - ₦149, 999	6 (6.7)	5 (6.9)	32 (53.3)	43 (19.4)
₦150,000 - ₦199,999	1 (1.1)	3 (4.4)	5 (8.3)	9 (4.1)
Above ₦200, 000	1 (1.1)	2 (2.7)	7 (11.8)	10 (4.7)
Total	**89 (100)**	**72 (100)**	**60 (100)**	**221 (100)**
Length of Stay				
1 - 3 years	8 (8.9)	11 (15.2)	16 (26.6)	35 (15.8)
4 – 7 years	31 (34.8)	18 (25.0)	27 (45.0)	76 (34.3)

Above 8years	50 (56.3)	43 (59.8)	17 (28.4)	110 (49.9)
Total	**89 (100)**	**72 (100)**	**60 (100)**	**221 (100)**
Occupation				
Public Sector	8 (8.9)	13 (18.1)	20 (33.3)	41 (18.5)
Private Sector	7 (7.8)	11 (15.2)	18 (30.0)	36 (16.2)
Business	33 (37.1)	21 (29.1)	17 (28.3)	71 (32.1)
Artisans	41 (46.2)	27 (37.6)	5 (8.4)	73 (33.2)
Total	**89 (100)**	**72 (100)**	**60 (100)**	**221 (100)**
Household Size				
1 – 5	11 (12.3)	32 (35.9)	46 (51.8)	65 (29.4)
6 – 10	10 (13.8)	51 (70.8)	11 (15.4)	93 (42.1)
Above 10	44 (73.3)	10 (16.7)	6 (10.0)	63 (28.5)
Total	**89 (100)**	**72 (100)**	**60 (100)**	**221 (100)**
Types of Buildings				
Face to Face	68 (76.4)	46 (63.8)	9 (15.0)	123 (55.6)
Blocks of Flats	16 (17.9)	20 (27.8)	39 (65.0)	75 (33.9)
Duplex	5 (5.7)	6 (8.4)	12 (20.0)	23 (10.5)
Total	**89 (100)**	**72 (100)**	**60 (100)**	**221 (100)**
House Tenure				
Owner-Occupied	27 (30.3)	19 (26.4)	35 (58.3)	81 (36.6)
Rented	40 (44.9)	35 (48.6)	15 (25.0)	90 (40.7)
Family Owned	22 (24.8)	18 (25.0)	10 (16.7)	50 (22.7)
Total	**89 (100)**	**72 (100)**	**60 (100)**	**221 (100)**

Coping strategies to Infrastructure deficit

The respondents' coping strategies to infrastructure deficit were based on the mean index computation. The absorptive coping capacity was interpreted based on the following scores: 1 – 2.4 (high), 2.5 – 3.5 (medium) and 3.6 – 5.0 (low). It should be noted that any positive deviation above the mean index indicated good condition while the average signify fair condition. Also, any negative deviation below the mean indicated bad condition.

As contained in Table 2, findings were made on the level of respondents' capacity to absorb the impact of infrastructure deficit. The RAC were 3.35, 3.41 and 3.24 in the core, transition and suburban zones respectively. This indicated that a moderate level was found in the absorptive capacity of households. Based on the RAC for core zone, the absorptive coping capacity that was high were rationalizing drinking water (0.29), rationalize cooking (0.21) and reduction in drain cleaning (0.18). In the transition zone, rationalize cooking food (0.28), rationalize energy (0.24) and rationalize drinking water (0.20). Meanwhile, respondents in suburban zone rationalize energy consumption (0.43), burning of solid waste in the compound (0.41) and dumping of waste on road/river channel (0.37) based on the RAC. Thus, the absorptive coping capacity that were ranked high and are closely ranked were rationalize drinking water and cooking. This may likely have impact on the health and well-being of household members.

Based on the mean index for the absorptive coping capacity, rationalize drinking water and cooking were rated high across the three developmental zones. This could be premised on the common knowledge that inadequate water supply reflects in inconsistent cooking food among households in developing countries. More so, rationalizing drinking water and cooking reduces food consumption rate in the three zones of the study area. Similarly, respondents rated rationalizing of energy consumption high as one of the predominant absorptive coping capacities to infrastructure deficit. This may likely lead to reduction in the usage of electrical appliances as a result of inadequate energy supply.

Based on the findings, variation exists in respondents' level of absorptive coping capacity to infrastructure deficit in the three developmental zones of the study area. Although, a moderate level was for the absorptive capacity in the study area, the mean index for the absorptive capacity was lower in the suburban zone, compared with the core zone which was lower than that of transition zone. This implies that the respondents in the suburban zone were less likely to withstand the impact of household infrastructure deficit compared to those in the core zone that were also more absorptive than those in the transition zone. As a result, variation exists in respondents' level of absorptive capacity in the three developmental zones. Based on the findings, respondents' level of absorptive to infrastructure deficit could be a resultant effect of variation in socioeconomic characteristics of respondents. This may be explained by factors other than income level as noted by previous studies such as that of Daramola and Olawuni (2017), Fakere and Ayoola (2018).

Table 2: Level of respondent's capacity to absorb the impact of infrastructure deficit

Capacity	Core			Transition			Suburban		
	Rank	**RAC**	**DM**	**Rank**	**RAC**	**DM**	**Rank**	**RAC**	**DM**
Rationalize drinking water	1	3.64	0.29	3	3.61	0.20	7	2.71	-0.53
Rationalize cooking	2	3.56	0.21	1	3.69	0.28	5	2.96	-0.28
Reduction in bathing	4	3.49	0.14	5	3.55	0.14	6	2.81	-0.43
Reduction in drain cleaning	3	3.53	0.18	4	3.59	0.18	4	3.29	0.50
Rationalize energy consumption	6	2.99	-0.36	2	3.65	0.24	1	3.67	0.43
Dumping of waste on road or river channel	7	2.93	-0.42	7	2.89	-0.52	3	3.61	0.37
Burning of solid waste in the compound	5	3.31	-0.04	6	2.92	-0.49	2	3.65	0.41

Note: DM is the Deviation about the Mean
Relative Absorptive Capacity (RAC) for Core = 3.35, Relative Absorptive Capacity (RAC) for Transition = 3.41, Relative Absorptive Capacity (RAC) for Suburban = 3.24

As contained in Table 3, findings were made on the level of respondents' capacity to adapt to the impact of infrastructure deficit. Based on the result, a similar moderate level was found in relative adaptive capacity in the core (3.28), transition (3.21) but there was low level in the suburban zone (2.39). As a result, their mean indices were higher in the core zone, compared with the transition zone which was also higher than that of the suburban zone. Based on the RAC for core zone, the adaptive coping capacities that was high were water storage in covered container (0.82), opening window for ventilation and illumination (0.73) and rain water collection (0.71). In the transition zone, using chargeable lamp (0.69), opening window for ventilation and illumination (0.80) and water storage in covered container (0.05). Also, regulated lighting of the house (0.76), purification of water (0.72) and using chargeable lamp (0.71) based on the RAI in the suburban zone. Thus, the adaptive coping capacity that were ranked high and are closely ranked were opening window for ventilation and illumination and using chargeable lamp. This may likely have impact on the quality of the environment.

Based on the RAC in the three zones, water storage in covered container and purification of water were rated high across the three developmental zones. This could be based on the fact that water supply is quantitatively and qualitatively low. Similarly, rationalizing drinking water and cooking reduces food consumption. Similarly, respondents rated rationalizing of energy consumption high as one of the predominant adaptive coping strategies to infrastructure deficit.

This may enhance reduction in the usage of electrical appliances as a result of inadequate energy supply.

Based on the result, a similar moderate level was found in the adaptive capacity of households in the core and transition but there was low level in the adaptive capacity of households in the suburban zone. As a result, mean indices were higher 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. In essence, respondents' level of adaptive capacity was similar but with little variation from the core to transition developmental zones. This is premised on the fact that residents in the study area have homogeneous social and economic attributes. The findings however are similar to the works of Mabogunje (1968), Onibokun (1985), Egunjobi (1987) that typical Nigerian traditional cities have similar attributes in response to environmental concerns.

The result on the level of respondents' capacity to transform from the impact of infrastructure deficit in the core, transition and suburban developmental zones were presented in Table 4. Based on the result, a moderate level was found in the respondents' transformative capacities in the core (2.62), suburban (3.32) but there was low level in the transition zone (1.94). As a result, mean indices were higher in the suburban zone, compared with the core zone which was also higher than that of transition zone. This implies that the respondents in the suburban zone transform from infrastructure deficit compared to respondents in the core and transition zones.

Table 3: Respondent's capacity to adapt to the impact of infrastructure deficit

Capacity	Core			Transition			Suburban		
	Rank	**RAC**	**DM**	**Rank**	**RAC**	**DM**	**Rank**	**RAC**	**DM**
Purification of water	6	2.38	-0.9	7	2.80	-0.41	2	3.11	0.72
Water storage in covered container	1	4.10	0.82	3	3.26	0.05	7	1.21	-1.18
Rain water collection	3	3.99	0.71	4	3.25	0.04	8	1.15	-1.24
Dependency on public service delivery	7	2.37	-0.91	8	2.17	-1.04	6	2.10	-0.29
Regulated lighting of the house	5	3.10	-0.18	6	3.07	-0.14	1	3.15	0.76
Opening window for ventilation and illumination	2	4.01	0.73	2	4.01	0.80	4	3.01	0.62
Change of environmental sanitation behaviour	8	2.33	-0.95	5	3.11	-0.10	5	2.30	-0.09
Using chargeable lamp	4	3.97	0.69	1	4.02	0.81	3	310	0.71

Note: DM is the Deviation about the Mean
Relative Adaptive Capacity (RAC) for Core = 3.28, Relative Adaptive Capacity (RAC) for Transition = 3.21, Relative Adaptive Capacity (RAC) for Suburban = 2.39

Based on the findings, the RTC for core zone that was high were borehole water supply by community development association (1.20), borehole water supply by individuals and international organisation (0.71) and donation towards community service delivery (0.49). In the transition zone, using chargeable lamp (0.69), opening window for ventilation and illumination (0.80) and water storage in covered container (0.05). Also, regulated lighting of the house (0.76), purification of water (0.72) and using chargeable lamp (0.71) based on the RTC in the suburban zone. Thus, the transformative coping strategies that were ranked high and are closely ranked were opening window for ventilation and illumination and using chargeable lamp. This may likely have impact on the quality of the environment. Therefore, respondents' level of

transformability to the impact of infrastructure deficit varied across the three developmental zones. The findings are in consonance with the findings of World Bank (2021) that residents in developing countries transform from infrastructure deficit based on their socioeconomic characteristics.

Table 4: Respondent's capacity to transform from the impact of infrastructure deficit

Capacity	Core			Transition			Suburban		
	Rank	**RTC**	**DM**	**Rank**	**RTC**	**DM**	**Rank**	**RTC**	**DM**
Water supply by water vendor	6	2.11	-0.51	3	2.11	0.17	4	3.21	-0.11
Borehole and well water supply by the neighbour	8	1.22	-1.40	5	1.90	-0.04	2	3.99	0.67
Borehole water supply by community development association	1	3.82	1.20	1	3.11	1.17	6	3.14	-0.18
Borehole water supply by individuals and international Organisation	2	3.33	0.71	4	2.09	0.15	1	4.01	0.69
Donation towards community service delivery	3	3.11	0.49	7	1.11	-0.83	7	3.07	-0.25
Depending solely on solar power supply	7	2.09	-0.53	8	1.01	-0.93	3	3.81	0.49
Calling for external support	4	3.09	0.47	2	3.09	1.15	8	2.29	-1.03
Engagement of private service provider	5	2.24	-0.38	6	1.14	-0.80	5	3.11	-0.21

Note: DM is the Deviation about the Mean
Relative Transformability Capacity (RTC) for Core = 2.62, Relative Transformability Capacity (RTI) for Transition = 3.32, Relative Transformability Capacity (RTC) for Suburban = 1.94

CONCLUSION AND RECOMMENDATIONS

This study established that socioeconomic characteristic of households' heads and coping strategies to infrastructure deficit varied across the three developmental zones, and the variation was more pronounced in the core when compared with other zones. Although water supply and sanitation is generally low in the three zones, there is a higher level of transformative coping capacity in the suburban zone than others. Based on the findings of the study, it can be concluded that absorptive, adaptive and transformative coping capacities to infrastructure deficit increases as distance increases from the core to suburban zones, and this is influenced by socioeconomic characteristics of households' heads. The study recommended that viable framework, programme and actionable plans by international actors towards the provision of sustainable infrastructure at household and community levels, thereby complementing government efforts towards sustainable infrastructure provision in the study area. Also, community-based organizations should support infrastructure development especially on the provision of water supply and sanitation in the three developmental zones. Particularly in the suburban zone with increasing income level, there is a need to devise various self-help techniques to address the needs for infrastructure provision at the household and community levels.

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